

Labour Productivity in Northern Ireland

UUEPC Briefing Paper

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Northern Ireland's Labour Productivity Summary

£44bn

NI's nominal GVA
in 2019

£49k

NI's labour
productivity in
2019

£58k

UK's labour
productivity in
2019

£2,017bn

UK's nominal GVA
in 2019

£27k

NI's labour
productivity in
1998

£32k

UK's labour
productivity in
1998

1.4%

Annual average
growth of NI nominal
GVA 1998-2019

**PUBLIC ADMIN' &
DEFENCE**

NI's highest labour productivity at
£65k (2019)

1.9%

Annual average
growth of UK
nominal GVA 1998-
2019

**FINANCE &
INSURANCE**

NI's 2nd highest
labour productivity at £61k (2019)

NI's labour
productivity remains
below UK, England
and Scotland, but
above Wales.

WHOLESALE & RETAIL

NI and UK's biggest sector by employment
at 17% and 15% of total employment,
respectively (2019).

1. Introduction

'Productivity isn't everything, but in the long run, it's almost everything.'

Paul Krugman, The Age of Diminished Expectations

1. Productivity improvements are associated with enhanced economic and social wellbeing; however Northern Ireland (NI) has a long-standing productivity problem impacting growth across the region. To better understand NI's productivity performance this briefing paper presents an analysis of headline Gross Value Added (GVA) to understand the output of the economy. This paper then goes on to present NI's productivity with a sectoral breakdown¹.
2. This research aims to add to the literature already available on broad 1-digit sic sectors, by **providing a 2-digit, sub-sector analysis of productivity presented for five sectors in NI**. This sub-sectoral analysis is provided for wholesale and retail, ICT, finance and insurance, health and social work and manufacturing and aims to highlight the productivity differences within sectors to provide an analysis of sector's strengths and weaknesses.
3. To make comparisons across the UK, productivity figures within this briefing have been sourced from ONS². The in-house NI economic model from Ulster University Economic Policy Centre (UUEPC) has also been utilised to include data on GVA and employment from the Northern Ireland Statistics and Research Agency (NISRA) and the ONS. The data providing a 1-digit sectoral breakdown for output per job and hour have been sourced from ONS whilst the 2-digit output per job has been calculated by UUEPC using employment and GVA figures also from ONS, therefore the 2-digit sectoral breakdown may not sum due to variations in the data.
4. It is important to note that the publication of GVA data is lagged and the most recent data available is 2020. However, **2019 productivity figures have been used as the latest data point in this analysis, due to the adverse impacts of COVID-19 in 2020**. Use of 2019 data enables UUEPC to provide a pre-pandemic analysis of trends. This information can then be utilised to better understand where the NI economy should be aiming to reach and exceed 'normal' economic performance as society adjusts to post-pandemic life.
5. This paper has been produced by Gillian Martin, Anastasia Desmond and Ruth Donaldson as a basis to identify potential new research areas to explore productivity further.

¹ NI's key sectors were determined using NI's Department for the Economy (DfE) 10x Economy report as well as employment data for NI.

Throughout this briefing paper real estate has been excluded as data is driven to a large extent by imputed rents in addition to wages and profits.

² Available at: <https://www.ons.gov.uk/economicoutputandproductivity/productivitymeasures>

2. Definitions

1. **Productivity is defined as the ability to produce outputs (GVA) with a given level of inputs** (such as raw materials, capital and labour)³. For economists labour productivity is calculated by dividing GVA (the total output within the economy) by total employment.

$$Productivity = \frac{Gross\ Value\ Added}{Employment}$$

2. Additional methods to calculate productivity include:
 - a. **Output per job** is calculated for each industry by dividing gross value added (GVA) by jobs for that industry⁴. **Within this briefing paper output per job and output per hour has largely been utilised to measure productivity⁵.**
 - b. **Output per hour worked** is an additional method of calculating productivity by dividing GVA by the average number of hours worked within the economy or a specific sector.
3. **GVA** is the total income generated by an economy (the value of the amount of goods and services produced), minus the cost of all inputs and raw materials that are directly attributable to production. GVA 'is measured at current basic prices, which include the effect of inflation, excluding taxes (less subsidies) on products (for example, Value Added Tax)⁶.'
 - a. **Nominal GVA** is the current monetary value without any inflation adjustment for the contribution to the economy of each individual producer, industry or sector. It presents the current headline monetary figure. **Nominal GVA has been used throughout this briefing paper to calculate productivity.**
 - b. **Real GVA** values are adjusted to account for the effects of inflation. This provides a guide to the actual purchasing power and the opportunity cost of workers regarding the value of the amount of goods and services produced.
4. **Employee jobs** are defined as jobs ongoing on a specific reference date, employing individuals aged 16 years and over, that the contributor directly pays from its payroll(s), in return for individuals carrying out a full-time or part-time job or being on a training scheme.

³ UUEPC (2019). Understanding Productivity in Northern Ireland.

⁴ ONS

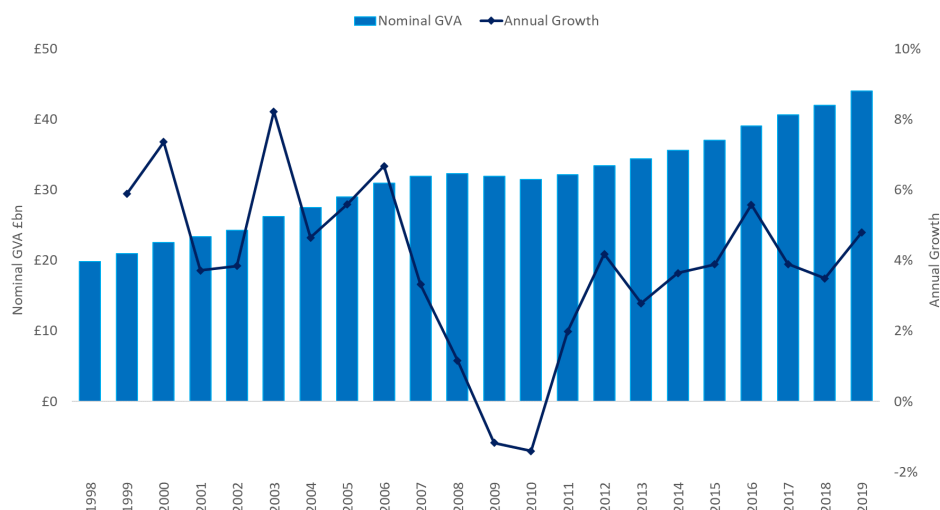
⁵ Output per job has been used as the UUEPC model is employment driven.

⁶ Gov.uk (2022). Rural productivity and gross value added (GVA)

3. Nominal GVA Headline Information

1. NI's nominal GVA reached a high of £44bn in 2019, growing by 4.8% or just over £2bn since 2018. Overall, NI has experienced a compound annual growth rate (CAGR) of 3.9% from 1998 to 2019. Interestingly, during this period the UK experienced the same annual average growth rate growing from £899bn in 1998 to £2,017bn in 2019.

Figure 1. Nominal GVA, £bn (left axis) and annual growth, %, (right axis), NI, 1998-2019



Source: ONS & UUEPC

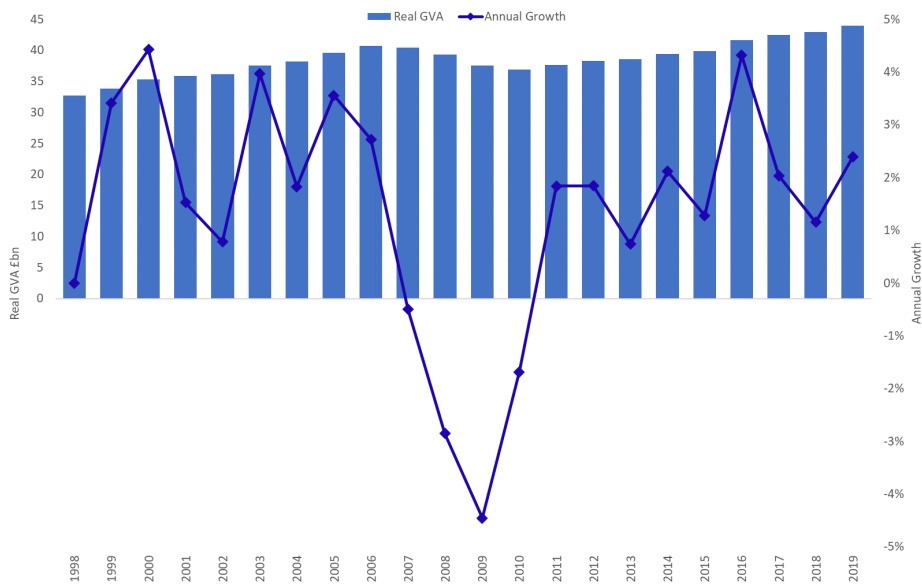
2. NI, like the rest of the UK, was impacted by the 2008 financial crisis and growth subsequently declined. In 2009 and 2010 annual growth was -1.2% and -1.4% with GVA being £31.9bn and £31.4bn respectively, down from £32.3bn in 2008. NI experienced a positive recovery with an annual growth rate of 4% from 2011 to 2019⁷.

⁷ Notably in Figure 1, NI experienced significant growth of 8.2% in 2003, or an increase of £2bn causing an outlier in terms of growth. This could be as result of weak sampling sizes.

4. Real GVA Headline Information

1. NI's real GVA reached a high in 2019 at £44bn, growing from £31bn in 1998 (2019 prices) resulting in an annual average growth rate of 1.7%. For comparison the UK experienced a higher growth rate of 1.9% during this period when real GVA grew from £1,357bn in 1998 to £2,017bn in 2019.⁸
2. Figure 2 highlights that amidst the 2009 recession real GVA growth dipped by 4.5%. Whilst 2020 is not displayed real GVA experienced negative growth of -8% that year, a much lower rate of growth than that experienced in the 2009 recession.
3. Notably in Figure 2, NI experienced significant growth of 4.5% in 2000 when real GVA reached £35.5bn (2019 prices). Growth of over 4% was not experienced again until 2016 when it reached 4.3% as real GVA rose to £41.6bn.

Figure 2. Real GVA, £bn (left axis) and annual growth, %, (right axis), NI, 1998-2019



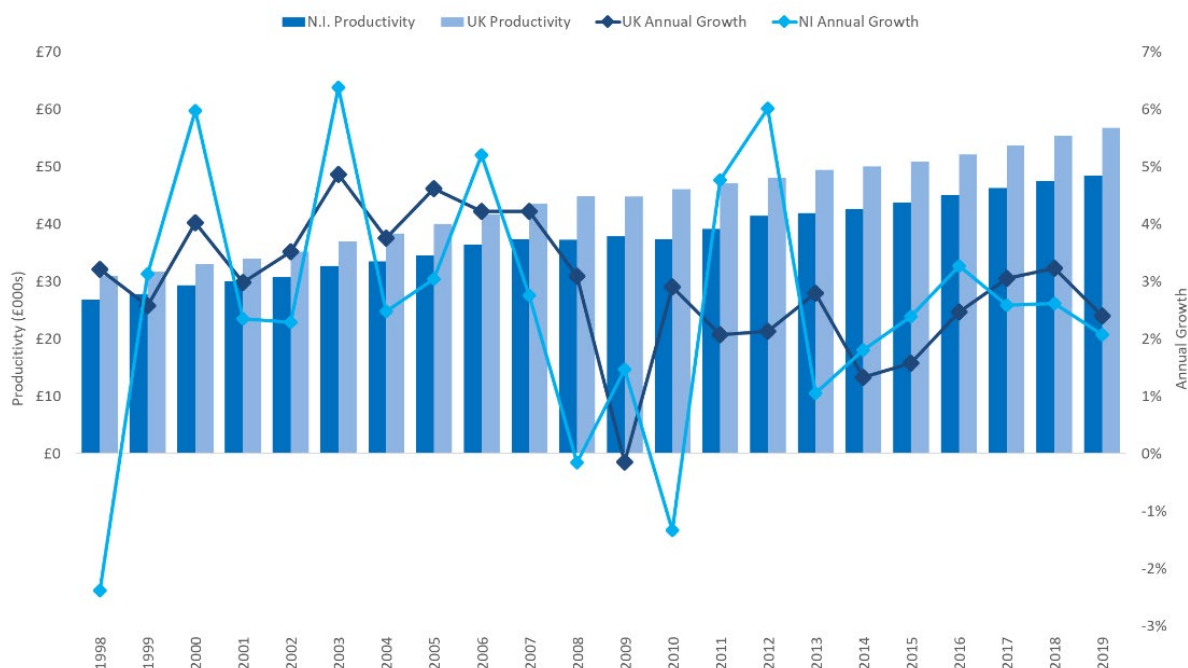
Source: ONS & UUEPC

⁸ Whilst NI and the UK have the same nominal growth, growth differentiates for real GVA between the UK and NI due to differences in ONS published figures.

5. Productivity⁹ Headline Information

1. In 2019 NI's nominal productivity¹⁰ had risen to £48k from £27k in 1998 giving an overall annual average growth rate of 2.8% over the period. NI's productivity growth and recovery from the 2008 recession is below the UK average. Figure 3 below illustrates that the UK's productivity grew to £57k in 2019 from £31k in 1998 with an annual growth rate, just above NI, at 2.9% during this period¹¹.

Figure 3: Annual productivity (£000s) left axis and growth rates (%) right axis, UK and NI, 1998-2019



Source: ONS, NISRA & UUEPC

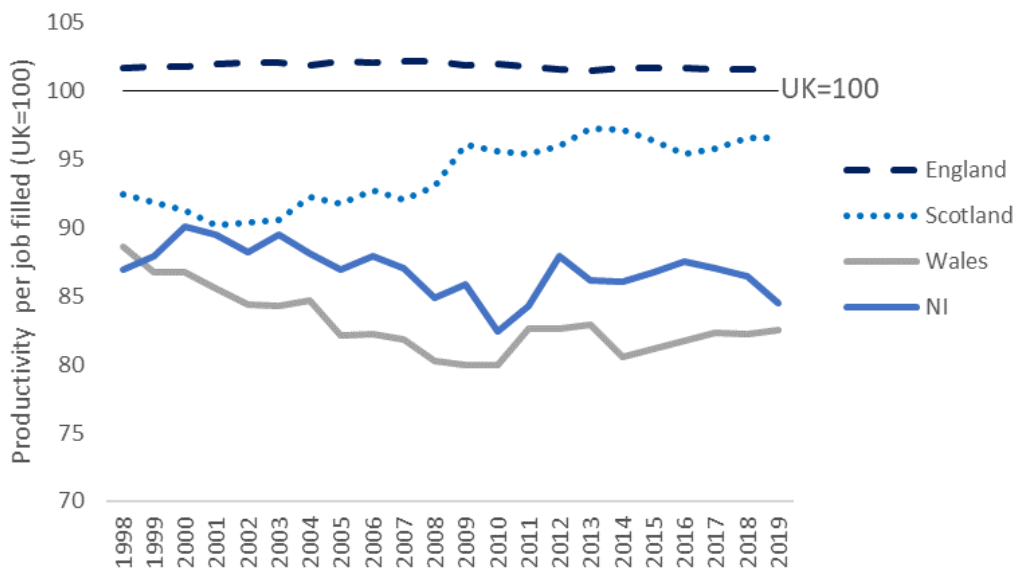
2. Figure 4 below displays NI's labour productivity compared to England, Wales and Scotland relative to the UK (UK=100) and highlights NI's declining productivity performance. **Overall, since the late nineties NI's labour productivity has remained below the UK, England and Scotland, but above Wales.**
3. England has continued to outperform the other UK regions and remains above the UK average. Interestingly, the gap between Scotland and NI has widened as Scotland's labour productivity has moved closer to the UK average, from 92.4% of the UK average in 1998 to 96.6% in 2019.
4. NI continues to outperform Wales, having overtaken this region in the late nineties. However, the gap has narrowed more recently with Wales' GVA labour productivity reaching 82.5% of the UK average in 2019. Figure 4 suggests that NI, Wales and Scotland experience more volatile GVA trends compared to England which may be due to the sample size of this region and the nature of the labour and sectoral makeup.

⁹ GVA divided by employment

¹⁰ GVA divided by employment

¹¹ In terms of annual growth, NI has experienced more fluctuating growth than the UK average as shown in Figure 2. For instance, in 2010 growth was down 1% from the previous year but grew by 5% in 2011, before steadying out at more 'normal' growth rates of 1% and 2% in 2013 and 2014 respectively. These figures could be a result of weak data sampling.

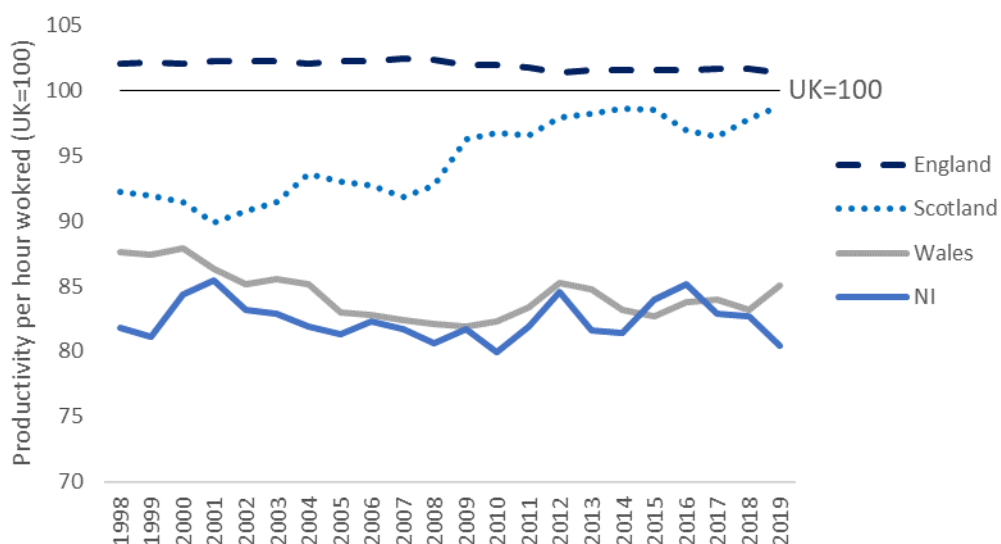
Figure 4: Productivity by UK country (UK=100), 1998-2019



Source: ONS

- Figure 5 indicates that **NI is the weakest performing UK region on the basis of output per hour worked** since 2017 and is 80.4% of the UK average. It is an area of persistent weakness for NI as Figure 5 highlights. The only year in which NI was not bottom of regional productivity per hour worked was in 2016 but its subsequent decline has opened a gap again.
- Meanwhile England continues to perform above the UK average, making it the UK's most productive nation. Notably, Scotland's productivity per hour worked has been steadily rising and widening the gap between Wales and NI to reach almost parity with the UK average in 2019.

Figure 5: Output per hour worked by country (UK=100), 1998-2019

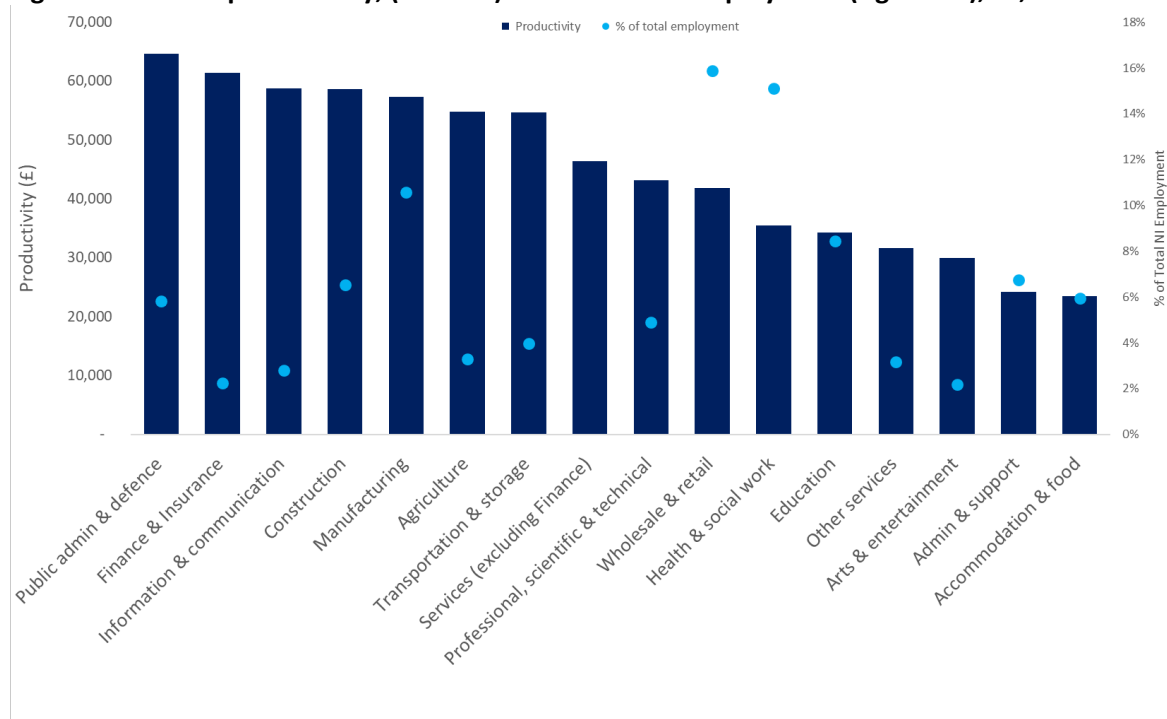


Source: ONS

6. Sectoral Productivity

1. Assessing productivity at a sectoral level is an approach used to understand if certain sectors are driving overall productivity and economic wellbeing. Additionally, **productivity growth within sectors boosts NI's competitiveness, resilience, and economic and social progress.**
2. **In 2019, public administration and defence had the highest productivity at £65k per job**, this sector accounts for 6% of total employment in NI. This is followed by finance and insurance with productivity per job at £61k and making up 2% of NI employment.
3. In comparison, **administration and support services along with accommodation have the lowest productivity at £24.2k and £23.5k, respectively.** Administration and support and accommodation account for 7% and 6% of total employment, however **part-time working makes up 33% and 59% of employment within these sectors** respectively, this factor contributes to their lower productivity.

Figure 6: Sectoral productivity, (left axis) and % of total employment (right axis), NI, 2019



Source: ONS & UUEPC

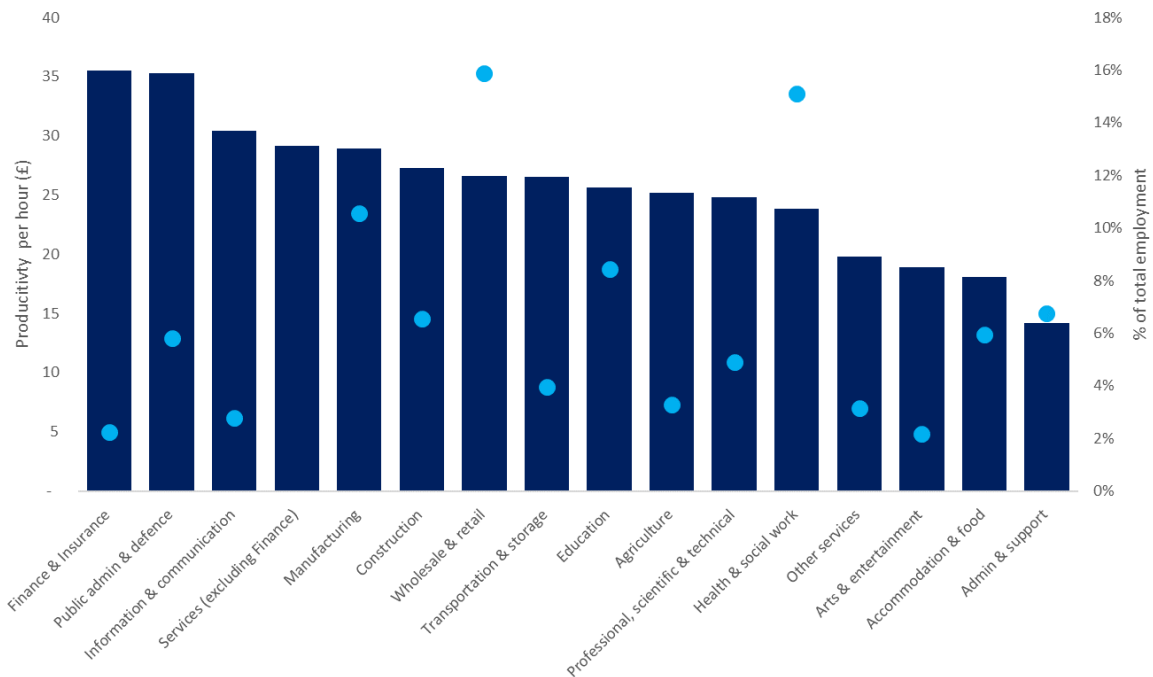
Note: No employment data is available in the UUEPC for 'Services (excluding finance)' due to the definition of the sector

4. Notably, wholesale and retail and health and social work have two of the largest shares of NI's employment at 16% and 15% respectively in 2019, as shown in Figure 6 and 7. However, whilst they have a large share of NI's total employment their productivity is low in comparison to other sectors at £42k and £36k, respectively¹². In comparison, manufacturing is NI's third largest employer with 11% of total employment in NI and it produced a higher productivity at £57k in 2019.

¹² It is important to note that productivity within public sectors, including health, are not easily measured as outputs (e.g hospital treatments) can be non-traditional, with goods and services free at the point of use. For more information please see: [Atkinson Review: Final Report Measurement of Government Output and Productivity for the National Accounts](#). For the purposes of this briefing paper, and to make comparisons, productivity is calculated using the same method as the other sectors.

- There is limited difference between sectoral productivity per hour worked (Figure 7) and productivity per job (Figure 6). Finance and insurance and public administration and defence remain highest at £35.5 and £35.3, respectively whilst accommodation and food (£18 per hour) and administration and support (£14 per hour) continue to be the lowest rank.

Figure 7: Sectoral output per hour worked, (left axis) and % of total employment (right axis), NI, 2019



Source: ONS & UUEPC

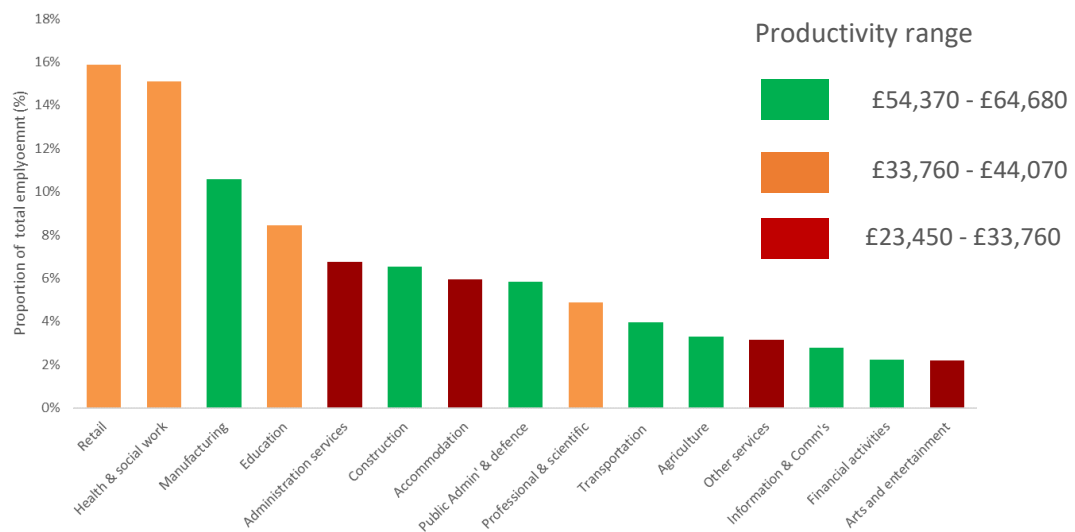
Note: No employment data is available in the UUEPC for 'Services (excluding finance)' due to the definition of the sector

- Figure 8 takes the highest and lowest sectoral productivity in NI (Public admin, £64,680 & Accommodation & food, £23,450) dividing it into four¹³ equal ranges to benchmark the productivity of sectors by quartile¹⁴. The axis denotes the proportion of overall employment within the sector in NI. **Average NI productivity would sit within the light green range at £48,770.**

¹³ £44-54k has not been included as a range as no sectors fell into this category.

¹⁴ Real estate has been included on the chart as a % of employment however it's valued productivity of £475.6k has been excluded from the productivity range. Real estate is excluded as data is driven to a large extent by imputed rents in addition to wages and profits.

Figure 8. Proportion of total jobs in NI, with output per job (colour coded), 2019



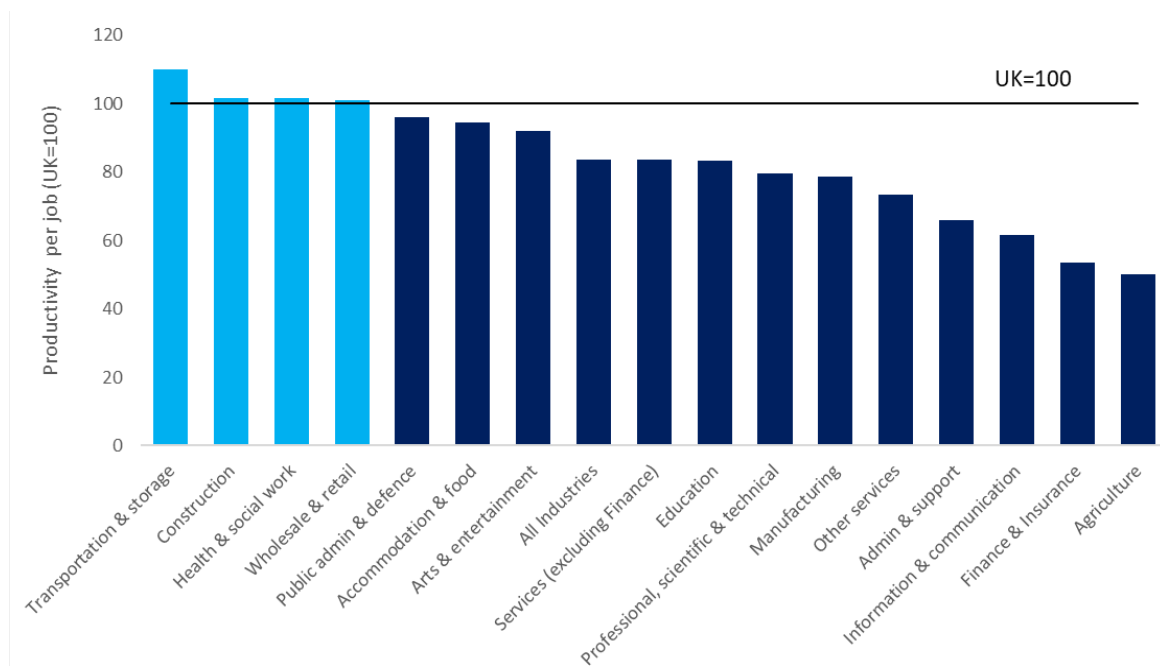
Source: ONS & UUEPC

Note: £44-54k has not been included as a range as no sectors fell into this category

7. Interestingly when combined, ICT and finance and insurance represent 5% of NI's total employment. However, whilst their employment is smaller compared to other sectors, their value to the economy is significant as collectively, they accounted for 7% of nominal GVA for 2019. This has resulted in these sectors having higher value productivity with ICT at £59k and finance at £61k, signalling their importance to the NI economy. This highlights a problem for NI as these sectors have high productivity yet are the amongst the smallest in terms of employment suggesting a shift is required to focus on growing high productivity sectors.
8. In comparison with the UK¹⁵, NI performs just above average in four sectors, this includes two of NI's largest employers, health and retail. **Figure 9 suggests that there is significant room for improvement in NI, particularly in those sectors considered high-value added which typically demand employees with higher formal qualifications and are often higher paid such as in finance and ICT.**

¹⁵ Relative output per job (OpJ) values compare current price productivity for each industry in each region to overall UK productivity for that industry for a particular time period. Values greater than 100 indicate an industry that had productivity higher in the region than in the UK as a whole. Values less than 100 indicate the opposite. (ONS)

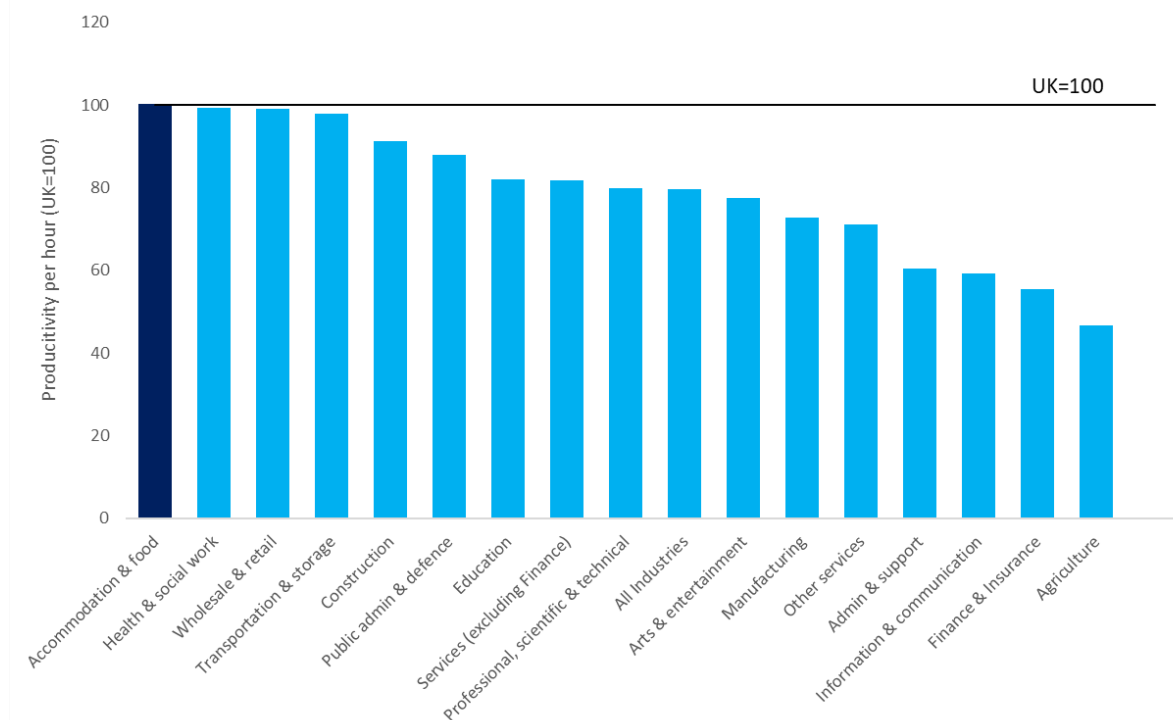
Figure 9: NI output per job relative to the UK, (UK=100), 2019



Source: ONS

9. Additionally, NI performs less well on a relative productivity per hour basis as shown in Figure 10. Accommodation and food is the top performing sector, with productivity equalling the UK average. Productivity per hour within health and social work, wholesale and retail and transport and storage also display a relatively strong performance just below the UK. However, ICT, finance and insurance and agriculture are substantially below the UK average.

Figure 10: NI output per hour relative to the UK (UK=100), 2019



Source: ONS

10. Furthermore, **Scottish productivity has been utilised for comparative purposes (Figure 11) due to the country being the UK's second highest performer in terms of GVA enabling reasonable and aspirational economic goals to be considered for NI.** Future policy responses to support productivity may look to Scotland to more thoroughly examine their performance to provide good practices for NI.

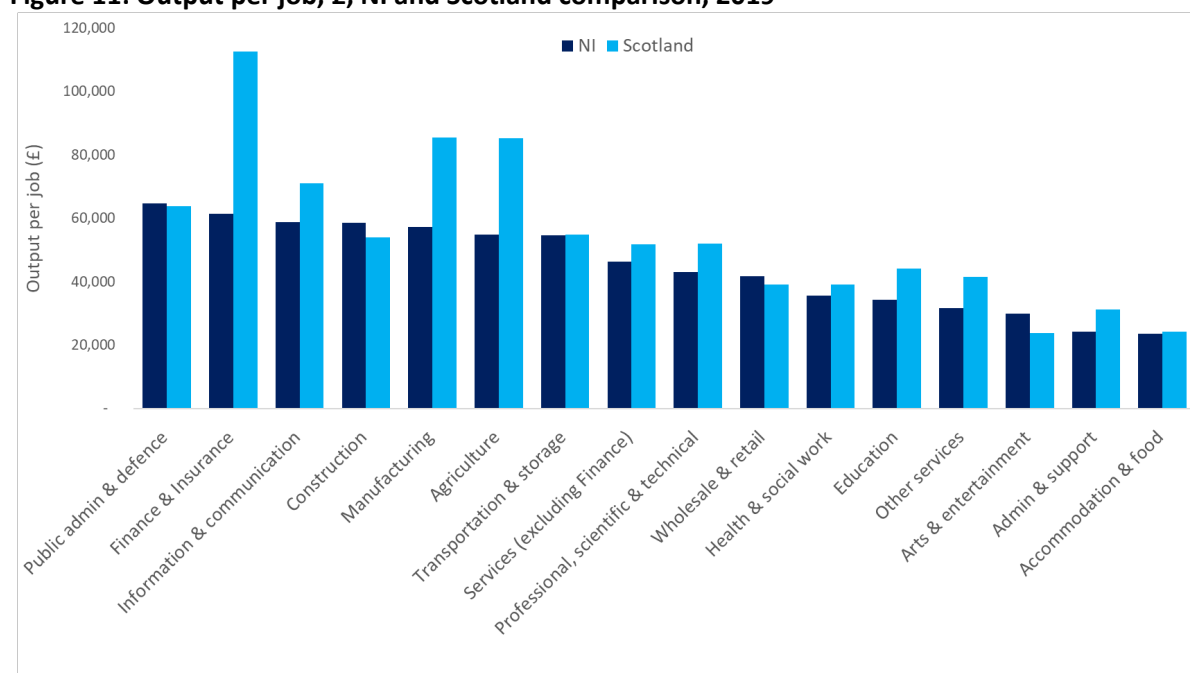
11. When a Scottish comparison is made there are significant variations in productivity between the two regions with NI outperforming Scotland in four sectors for output per job in 2019. These were:

- Public administration and defence (NI £64.7k, Scotland £63.9k)
- Construction (NI £58.7k, Scotland £52.9k)
- Wholesale and retail (NI £41.8k, Scotland £39.1k)
- Arts and entertainment (NI £30k, Scotland £23.8k)

12. Meanwhile Scotland significantly outperforms NI in several sectors including:

- Finance and insurance (NI £61.4k, Scotland £112.6k)
- ICT (NI £58.7k, Scotland £71.1k)
- Manufacturing (NI £57.3k, Scotland £85.4k)
- Agriculture (NI £54.8k, Scotland £85.2k)

Figure 11: Output per job, £, NI and Scotland comparison, 2019



Source: ONS

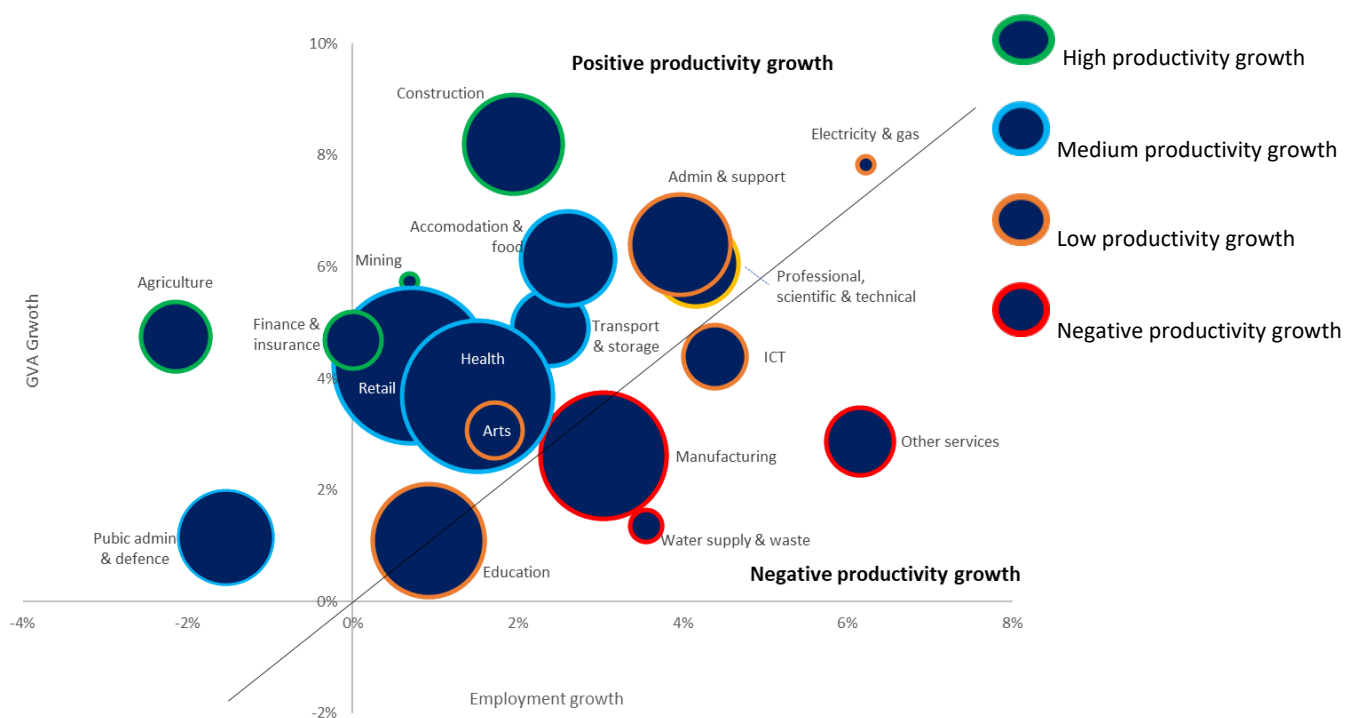
13. Activities within sectors in Scotland and NI may be very different for instance head offices within the finance and insurance sector may be located in Scotland and business support offices based in NI. Therefore, further research is required at a sub-sectoral level to provide additional reasoning for these differences.

14. **A sector must have GVA growing at a higher rate than employment for productivity to increase. Therefore, productivity growth can be achieved within sectors with low/negative employment growth coupled with GVA growing at a higher rate (Figure 12).** The question then turns to what kind of productivity growth should an economy be aiming for and what policy should a region be targeting. The construction sector illustrates “ideal” conditions where employment is growing,

offering employment opportunities for residents, whilst GVA growth increases at a higher rate. Electricity and gas, a much smaller sector in terms of overall employment, has relatively high GVA growth but even higher employment growth thus reducing productivity. This highlights the trade-off between employment and GVA growth to achieve increasing productivity. On the other hand, agriculture is achieving higher productivity through declining employment. **Policy makers must therefore identify what appropriate conditions are with regard to sectoral growth and what should be targeted in the future.**

- It is also pertinent to note that not all jobs within “high-value” sectors will be high productivity jobs. The **occupation mix** within sectors is varied with many employees in high value firms or industries filling positions that do not require a high level of skills, or formal qualifications. Hence when employment growth is recorded in higher value added sectors, productivity growth may not occur at the same rate.
- Figure 12 conveys the growth of sectors in terms of both employment and GVA whilst giving an insight into the size of the sector (relative size of the bubble) in terms of employment within NI. The rate of productivity growth is relative to growth in other sectors within the country.

Figure 12: GVA and Employment growth, Northern Ireland, 2012-2019



Source: ONS, UUEPC model

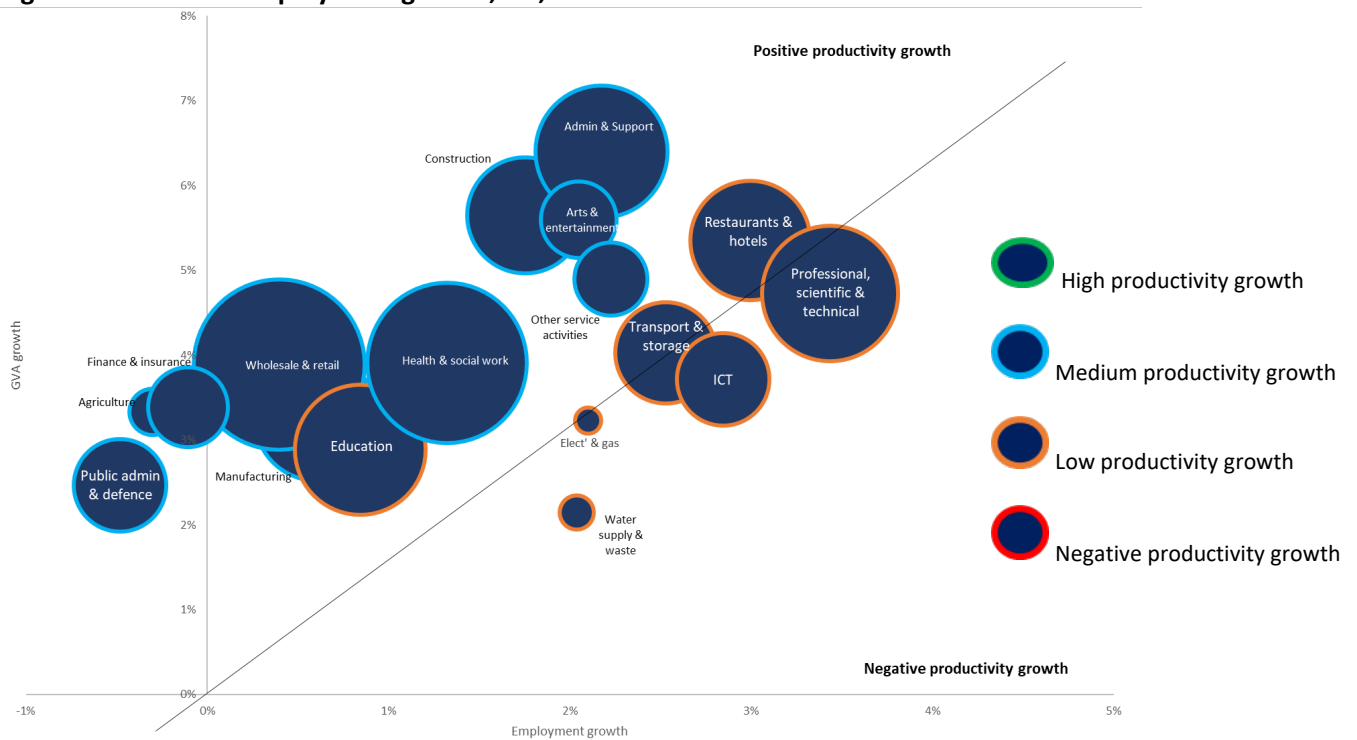
Note: The size of the bubble indicates the number of jobs in the sector in NI

- Sectors clustered in the mid region of the chart (above the diagonal line), such as health, accommodation and food and transport and storage, whilst not achieving high productivity growth, appear to be successfully balancing both employment and GVA growth.** However, as the labour market continues to experience shortages and recruitment difficulties coupled with the prevalence of automation and the use of technology, emphasis may move away from creating further employment opportunities and focusing on making the most of existing labour resources through training and skills development, hence improving productivity.

18. Similar to Figure 12 above, Figure 13 looks to compare each sector by GVA and employment growth and the size of each sector at a UK level. The size of each bubble represents the employment per sector.

19. For the UK overall, administration and support services show a good mix of GVA growing at a higher rate than employment. Additionally, the UK's agriculture sector has also experienced productivity growth due to falling employment. In all sectors productivity growth is medium to low and less volatile than NI.

Figure 13: GVA and Employment growth, UK, 2012-2019



Source: ONS, UUEPC model

Note: The size of the bubble indicates the number of jobs in the sector in UK. The legend uses NI breakdowns for high, medium, low and negative productivity growth breakdowns

Northern Ireland's 2-digit Sectoral Summary

WHOLESALE & RETAIL

Productivity £42k (2019)

WHOLESALE TRADE (excluding vehicles)

Highest productivity of sub-sectors within wholesale & retail at £72k (2019)

HEALTH & SOCIAL WORK

Productivity £36k (2019)

Human Health

Highest productivity of sub-sectors within health & social work at £43k (2019).

MANUFACTURING

Productivity £57k (2019)

COMPUTER & ELECTRONICS

Highest productivity of sub-sectors within manufacturing at £134k (2019)

ICT

Productivity £59k (2019)

TELECOMMUNICATIONS

Highest productivity of sub-sectors within ICT at £112k(2019)

FINANCE & INSURANCE

Productivity £61k (2019)

INSURANCE & PENSION FUNDING

Highest productivity of sub-sectors within finance & insurance at £220k (2019)

7. Sectors in Focus with 2-Digit Breakdown

1. To provide further understanding of productivity within NI, this section presents productivity at a sectoral level for five chosen sectors along with their sub-sectors. Table 1 below outlines the sectors that have been chosen and the reasoning for this. This section also provides a 2-digit, sub-sectoral breakdown of productivity within these five sectors to better understand what sub-sectors are driving productivity.

Table 1: Sectors in focus

| 2-digit sectors in focus | Reasoning |
|-------------------------------|---|
| Wholesale and retail | <ul style="list-style-type: none">• Accounted for 17% of NI's total employment in 2019 |
| Health and social work | <ul style="list-style-type: none">• Importance within 10x Economy strategy- life and health science• Accounted for 17% of NI's total employment in 2019 |
| Manufacturing | <ul style="list-style-type: none">• Importance within 10x Economy strategy- advanced manufacturing & engineering and Agri-tech• Accounted for 11% of NI's total employment in 2019 |
| ICT | <ul style="list-style-type: none">• Importance withing 10x Economy strategy- digital, ICT and creative industries |
| Finance and insurance | <ul style="list-style-type: none">• Importance within 10x Economy strategy- fintech/ financial services |

Source: UUEPC, Economy NI – 10x Economy¹⁶

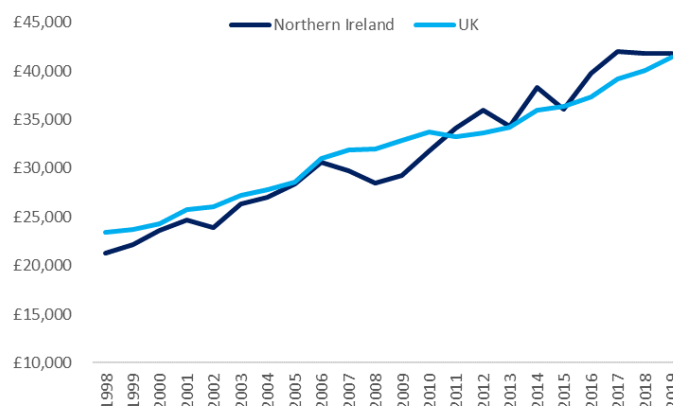
2. Within this section output per job is based on nominal figures.

¹⁶ DfE (2021). [10x Economy - an economic vision for a decade of innovation](#)

Wholesale and retail

- NI's wholesale and retail sector is the largest employer accounting for 17% of total employment in 2019. This sector's productivity has increased from £21k in 1998 to £42k in 2019. Interestingly, NI's productivity within wholesale and retail overtook the UK in 2015, however the gap has since closed with NI's retail productivity declining since 2017. Overall, retail's nominal productivity has experienced an average annual growth rate of 3.27%.

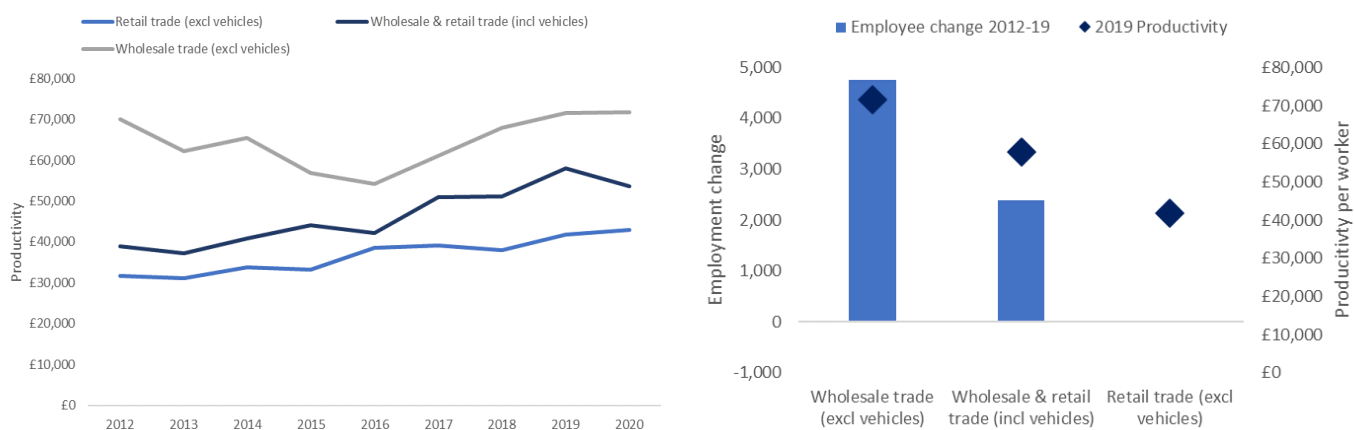
Figure 14: Output per job, wholesale and retail, NI and UK, 1998-2019



Source: ONS

- Within the wholesale and retail sector there are three subsectors with varying levels of productivity. In 2019, **wholesale trade (excluding vehicles) has the highest productivity at £72k**. This sub-sector experienced an annual average growth of 0.3% from 2012 to 2019. During this time this sub-sector also experienced the largest increase in employment change with employment rising by 4,800.
- Wholesale and retail trade (including vehicles) also experienced an increase in productivity rising to £58k in 2019 from £39k in 2012, with an annual average growth of 6%. Retail trade (excluding vehicles) experienced 4% annual growth with productivity reaching £42k in 2019.

Figure 15: 2-digit wholesale and retail, output per job, NI, 2012-2019 (left chart) and 2-digit employment change (2012-2019) and 2019 productivity, NI (right chart)



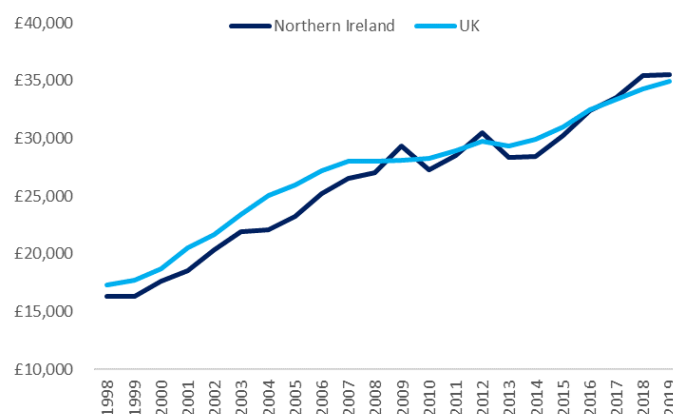
Source: ONS & UUEPC

Note: In the right-hand chart there is no employee change in retail trade (excluding vehicles)

Health and Social Work

6. The **health and social work sector is NI's second-largest employer**, employing over 137,000 people. Life and health sciences also named as a priority cluster area within the 10x Economy from DfE¹⁷.
7. **Health and social work productivity has continued to rise from £16k in 1998 to £36k in 2019.** NI's productivity per worker overtook the UK in 2017, although the gap has narrowed slightly as NI has slowed whilst UK productivity has risen to £35k in 2019.

Figure 16: Output per job, health and social care, NI and UK, 1998-2019



Source: ONS

8. Within the health and social care sector, there are three sub-sectors at a 2-digit level including residential care which has experienced an increase of 12,800 jobs between 2012-2019. Residential care has seen a significant decline as shown in Figure 17 below as in 2019 productivity was £41k, dropping from £59k in 2012, a contraction of -5%. However, this can be partially explained by a reclassification of jobs within the healthcare sub sectors in late 2014 as a result several people moved from human health activities being reallocated under residential care activities. This change does weaken the level of analysis for this sector.
9. It is important to note that productivity within public sectors, including health, are not easily measured as outputs, for example hospital treatment can be non-traditional, with goods and services free at the point of use¹⁸. For the purposes of this briefing paper, and to make comparisons, productivity is calculated using the same method as the other sectors.
10. **Human health is the most productive within health and social work with productivity of £43k in 2019.** Human health has experienced steady growth, increasing productivity from £35k in 2012 resulting in a 3% annual growth rate. However, employment within this sub-sector has declined by 4,700 during this period¹⁹.

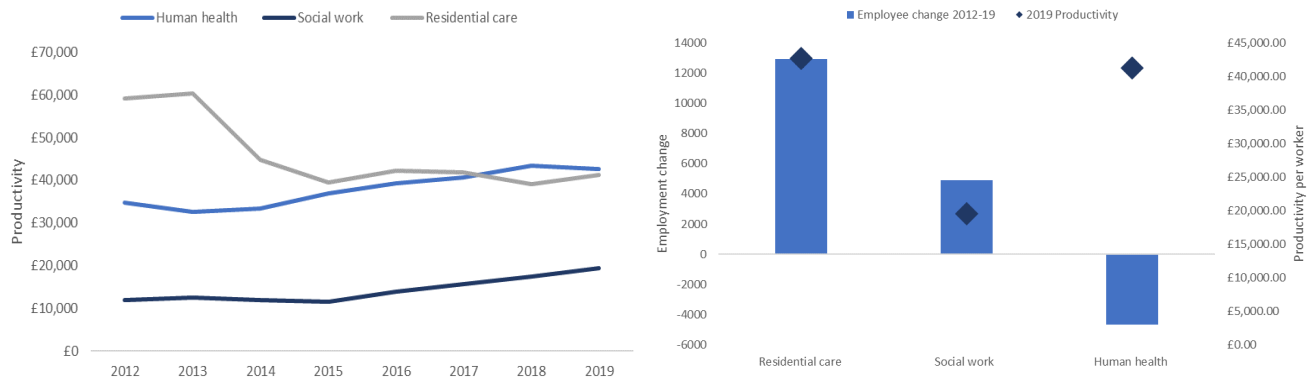
¹⁷ DfE (2021). [10x Economy - an economic vision for a decade of innovation](#)

¹⁸ For more information please see: Atkinson Review: Final Report Measurement of Government Output and Productivity for the National Accounts.

¹⁹ Human health includes hospital activities, medical and dental practice activities and other human health activities at a 3-digit level.

11. Social work has the lowest productivity level at £20k in 2019 however, this is an increase of £7k from 2012 equating to 7% annual growth during this time. This sector has experienced positive employment change during this period with nearly 5,000 additional workers.

Figure 17: 2-digit health and social work, productivity per job, NI, 2012-2019 (left chart) and 2-digit employment change (2012-2019) and 2019 productivity, NI (right chart)



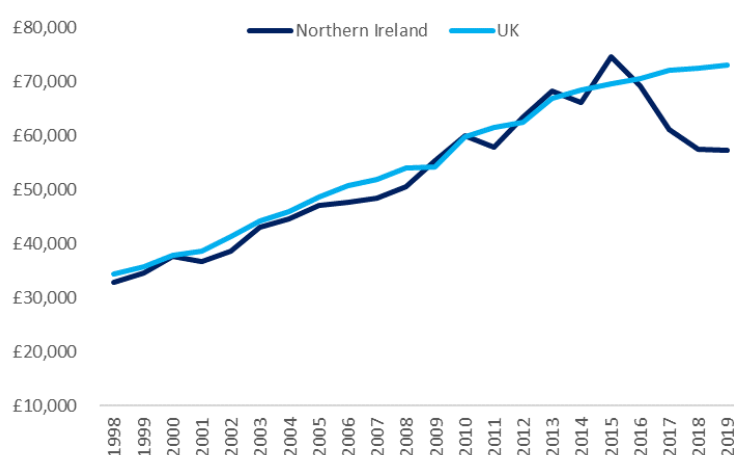
Source: ONS & UUEPC

Note: Decline in 2014 of Residential Care productivity may be due to a reclassification of employees from human health into residential care. This also explains the drop in employment in Human Health

Manufacturing

- Advanced manufacturing and engineering are identified as priority cluster sectors within the 10x Economy strategy, noting that use of technology and innovative methods will improve competitiveness within this sector²⁰. **NI's manufacturing sector plays an important role in the economy as the sector accounts for 11% of NI's total employment or over 96,000 individuals.**
- Manufacturing productivity has experienced a decline since 2015 when it reached a high of £75k, overtaking the UK average, before falling to £57k in 2019 as highlighted in Figure 18. This drop can be largely explained by the closure of Gallaher's tobacco factory²¹ and has resulted in a widening gap between the UK and NI as the UK's productivity was £73k in 2019.**

Figure 18: Output per job, manufacturing, NI and UK, 1998-2019



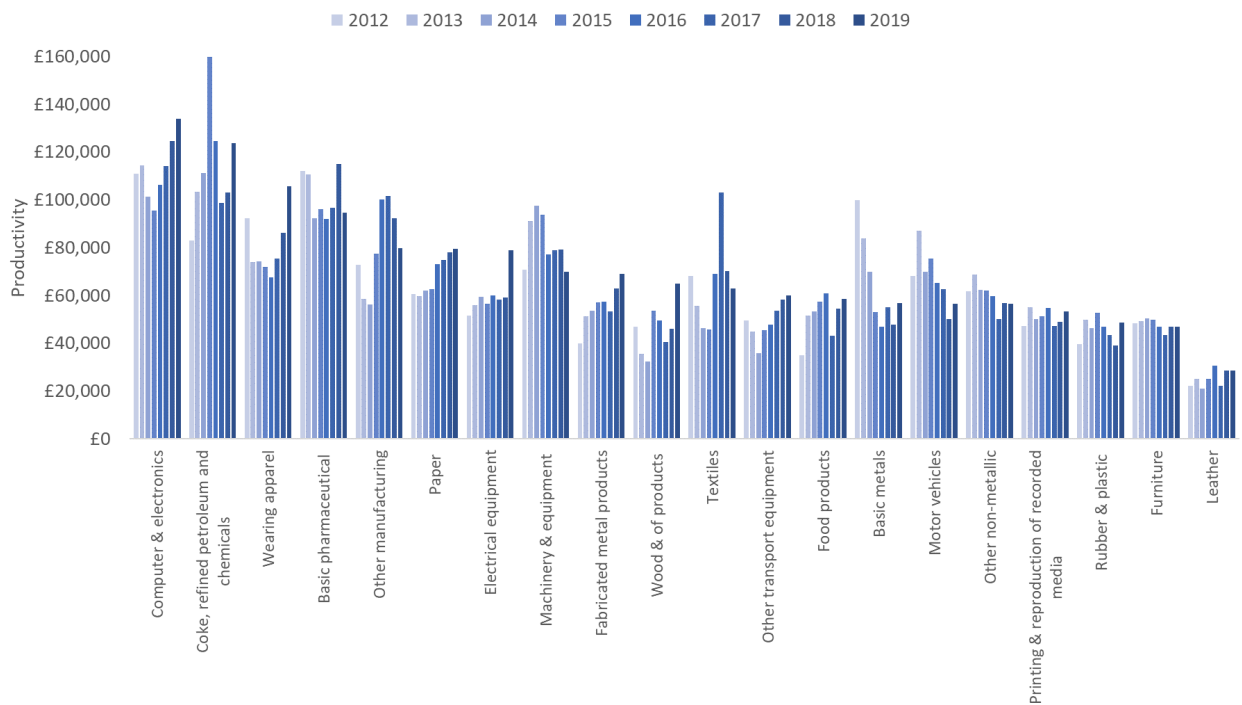
Source: ONS

- Manufacturing has numerous 2-digit sub-sectors as displayed in Figure 19. In 2019, **computer and electronics had the largest productivity at £134k**, which has steadily risen from £111k in 2012, experiencing a 3% annual growth rate during this period. The second largest productive sector was coke, refined petroleum and chemicals reaching an output of £124k in 2019 from £83k in 2012 with an annual growth rate of 6%.
- At the other end of the scale, the sub-sector with the lowest productivity was manufacturing of leather at £29k in 2019, rising from £22k in 2012 with an annual growth rate of 4%.

²⁰ DfE (2021). [10x Economy - an economic vision for a decade of innovation](#)

²¹ Also in 2015 Manufacturing was impacted by Caterpillar and Howden UK closing, followed by Michelin later on (2,500 jobs lost) impacting GVA post 2015

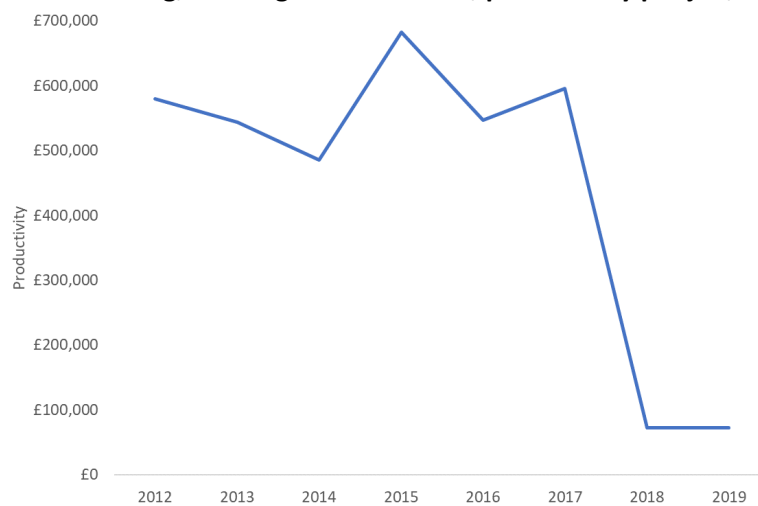
Figure 19: 2-digit manufacturing, productivity per job, NI, 2012-2019



Source: ONS & UUEPC

16. In 2017, beverages and tobacco was the most productive sub-sector within manufacturing at £596k output per worker, significantly above computer and electronics at £114k - the second largest sub-sector at this time. However, due to the closure of Gallaher’s in 2017, productivity within this sector dropped significantly to £73k in 2018, a decline by £523k. This sub-sector has also decreased the number of people in employment by 1,000 since 2012.

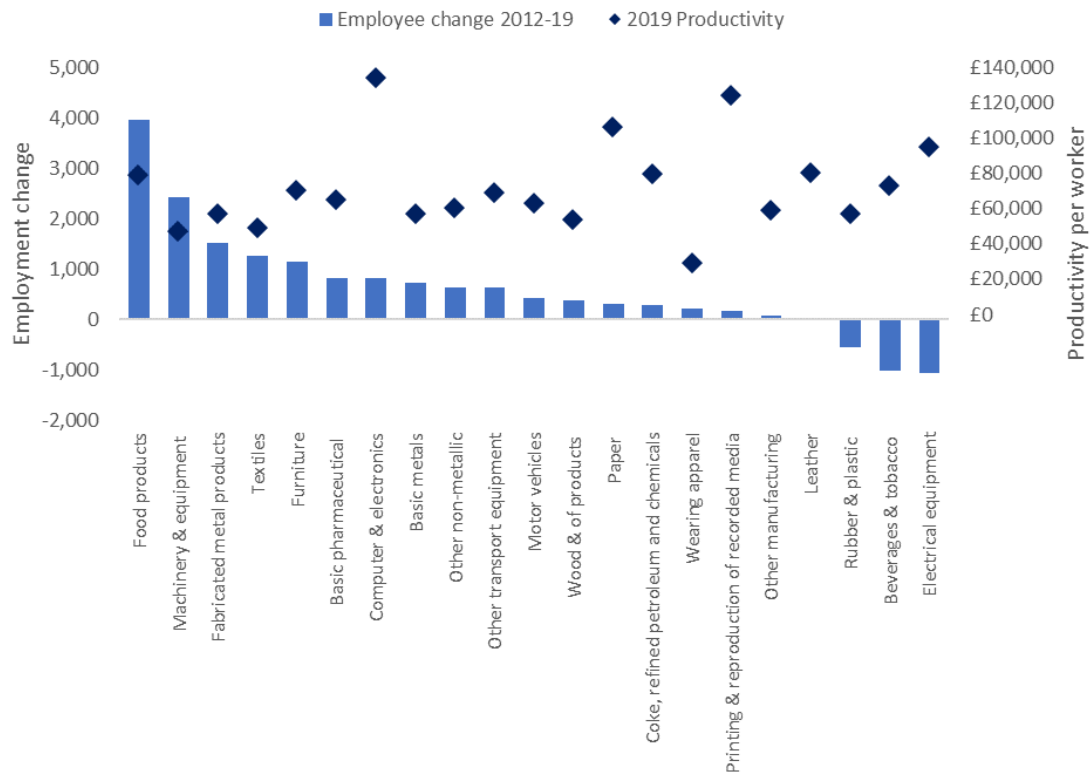
Figure 20: 2-digit manufacturing, beverages and tobacco, productivity per job, NI, 2012-2019



Source: ONS & UUEPC

17. The manufacturing of food products has experienced the largest employee change since 2012 increasing by nearly 4,000 whilst its productivity has also increased to £59k in 2019. This is followed by machinery and equipment where employment has increased by 2,400 since 2012. However, productivity has contracted with an annual growth of -0.2% from 2012 to 2019. Productivity within machinery and equipment has dropped to £70k in 2019 from £79k in 2012.

Figure 21: 2-digit manufacturing, employment change and productivity, NI, 2012-2019

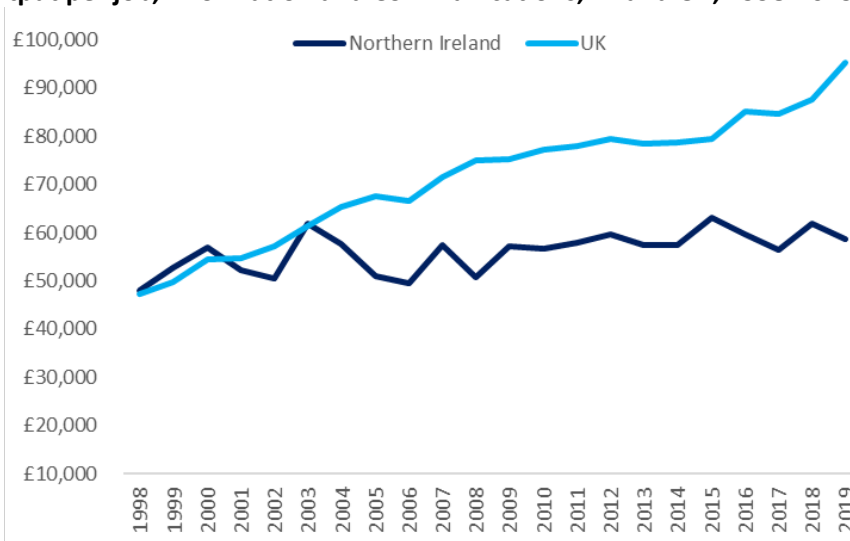


Source: ONS & UUEPC

Information and Communications

18. With the growth of technology across society, *Information and Communications* has an increasingly important role in the economy. Digital, ICT and creative industries is also named in the 10x Economy²² strategy including cybersecurity, AI & data analytics, telecom, mobile and data.
19. Noticeably from Figure 22 below, **the gap between NI and UK productivity has widened as NI's output per job decreased to £59k in 2019 from £62k in 2018. Meanwhile, UK productivity has increased to £95k in 2019 from £87k in 2018.**

Figure 22: Output per job, Information and Communications, NI and UK, 1998-2019

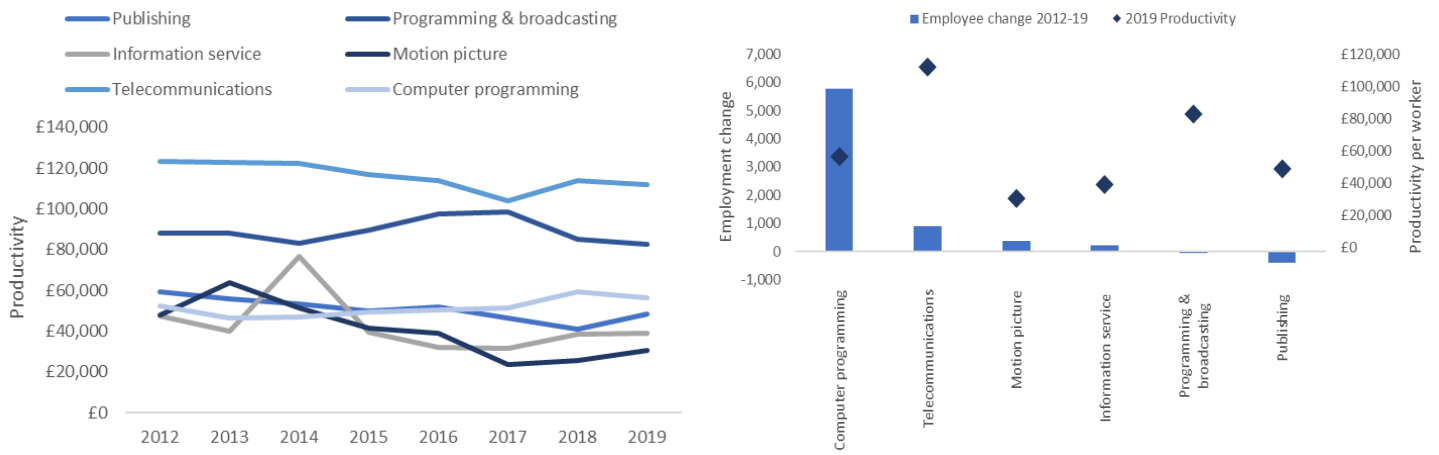


Source: ONS

20. The telecommunications sub-sector had the highest output per job at £112k in 2019 but remained below its 2012 peak of £123k per job, equating to a negative annual growth rate of -1%. Programming and broadcasting also experienced negative productivity growth of -0.9% across the 2012-2019 period.
21. Computer programming has experienced the largest employment growth since 2012 with 5,800 additional workers. This sub-sector experienced a positive annual growth rate in productivity of 1% (2012-2019) however, in 2019 productivity declined slightly to £57k in 2019 from £60k in 2018.

²² DfE (2021). [10x Economy - an economic vision for a decade of innovation](#)

Figure 23: 2-digit Information and Communication, productivity per job, NI, 2012-2019 (left chart) and 2-digit employment change (2012-2019) and 2019 productivity, NI (right chart)

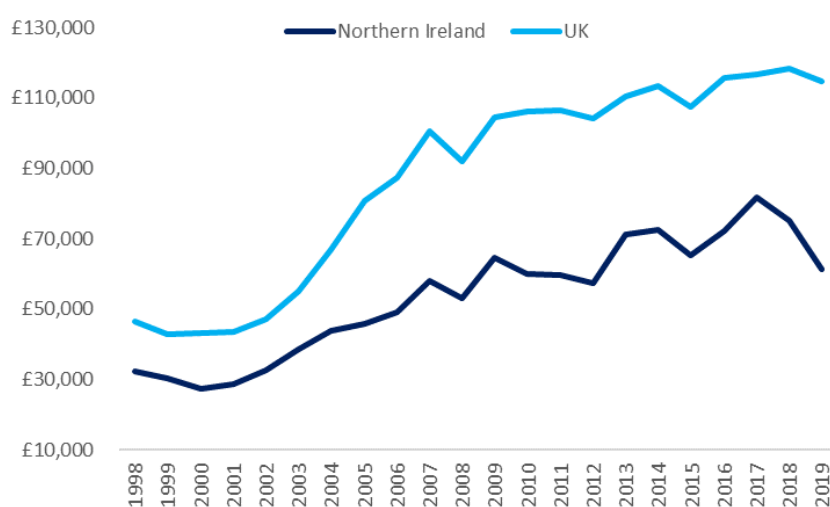


Source: ONS & UUEPC

Finance and Insurance

22. In 2019 finance and insurance accounted for over 20,300 jobs in NI, or 2% of total employment. Within the 10x Economy report²³ fintech/ financial services has been identified as a priority cluster area. Therefore, the sector plays an important role for NI in an increasingly digital world along with being an influential sector for attracting foreign direct investment (FDI).
23. **Since 1998, productivity in NI's finance and insurance sector has remained below the UK average with the gap widening in 2019 as NI output per job decreased to £61k from £75k in 2018.** Since 1998, the sector has experienced annual growth of 3.1% whilst the UK has experienced 4.40% growth rising to an output of £115k per job.

Figure 24: Output per job, finance, NI and UK, 1998-2019²⁴



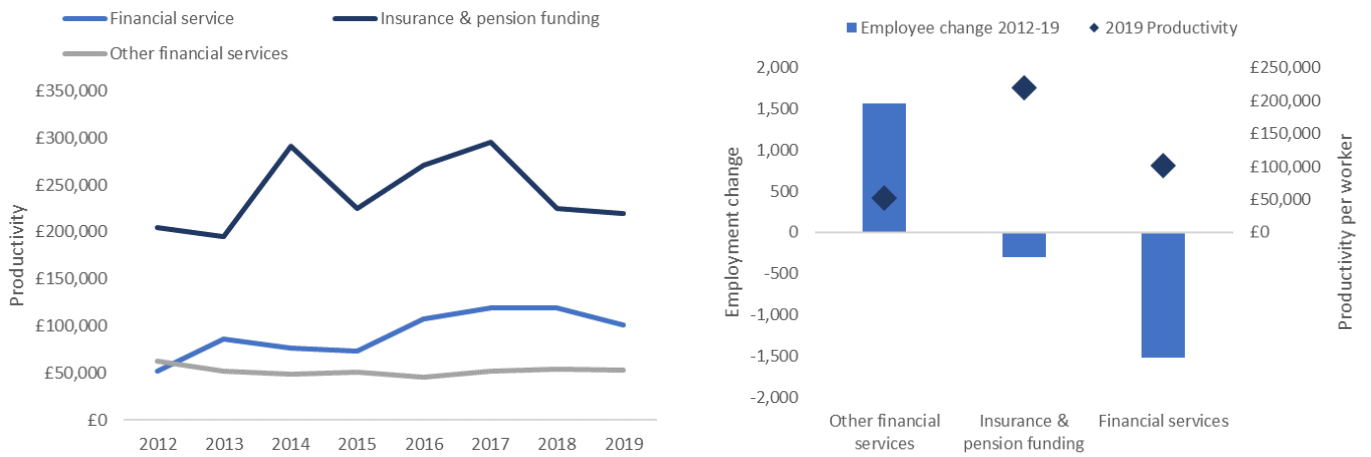
Source: ONS

24. At a sub-sectoral level, **insurance and pension funding continued to have the largest productivity in NI at £220k in 2019 growing from £205k in 2012**, a 1% annual growth rate. Financial services has experienced a significant 10% annual growth rate resulting in productivity rising to £101k in 2019 from £52k in 2012. However, this sub-sector has decreased its employment by 1,500 during this time.
25. Meanwhile, other financial services have increased employment by 1,600 since 2012 but productivity decreased to £53k in 2019 from £62k in 2012. Annual growth for this sub-sector contracted by -2% also during this time.

²³ Ibid.

²⁴ NI's drop from 2017 could partly be explained by Insurance and pension funding which experienced a £93,200 drop in productivity from 2017-19, with its GVA dropping from £346 to £273 million. For 2016 to 2017 HMRC received in total 3,867 applications to register pension schemes. This is a 12% reduction compared to applications received in 2015 to 2016. Also from April 2016-November 2018 women's state pension age increased to 65. This area requires additional research to fully assess the change.

Figure 25: 2-digit finance and insurance, productivity per job, NI, 2012-2019 (left chart) and 2-digit employment change (2012-2019) and 2019 productivity, NI (right chart)



Source: ONS & UUEPC

Note: At a 3-digit level Financial Services includes monetary intermediation, activities of holding companies trusts; funds and similar financial entities, Insurance and & pension funding includes; insurance, reinsurance and pension funding
 Other financial activities includes (originally called activities auxiliary to financial services & insurance activities); Activities auxiliary to financial services; except insurance and pension funding, Activities auxiliary to insurance and pension funding and Fund management activities

8. Conclusions

'Productivity matters because increasing productivity is critical to increasing economic growth in the long-run.' Office of National Statistics (ONS)

1. This briefing paper provides an insight into current productivity levels in NI, initially highlighting that **NI has improved its GVA and productivity from 1998 to 2019 in absolute terms**, however, in relative terms, **the gap between NI and the UK has widened**.
2. **NI has strengths in sectors such as transport and storage, construction and health and social work relative to the UK. Compared to Scotland, NI has higher productivity in public administration, construction, wholesale and retail along with arts and entertainment.** Overall, however NI has few sectors experiencing high productivity growth and those that do experience growth make up a low proportion of NI's total employment.
3. The 10X Economy strategy makes reference to the importance of **"development, diffusion and dissemination of innovation" particularly in areas of low productivity**²⁵. The adoption of technology and best practice are seen as areas that smaller firms struggle to embrace but are imperative to making them more productive and competitive. The data presented from 1998 within this paper may suggest that productivity requires **long term policy action** for changes to be felt within the economy.
4. Further insight into relative importance of key sectors for employment and the 10x Economy has also been provided to uncover performance within **2-digit sub-sectors. This analysis highlights the variation of output within sectors, showing which sub-sector is driving productivity.** Table 2 below highlights the 2-digit sub-sectors that are experiencing employment and productivity growth and vice-versa.
5. Table 2 also shows that most 2-digit sub-sectors, outlined within this briefing paper, performed above NI's 2019 productivity average of £49k. This is except for Health and Social Work's 2-digit sub-sectors which all performed below NI's 2019 average as Human Health was £43k, Residential Care £41k and Social Work £20k.

²⁵ DfE (2021). [10x Economy - an economic vision for a decade of innovation](#)

Table 2: Employment and productivity growth for 2-digit sub-sectors, 2012-19 and 2019 NI average comparison

| 1-digit sector | 2-digit sub-sector | Growing employment (2012-2019) | Growing productivity (2012-2019) | Productivity comparison with NI 2019 average (£49k) |
|--------------------------------|---|--------------------------------|----------------------------------|---|
| Wholesale and Retail | Retail trade (excl vehicles) | Yes | Yes | Lower |
| | Wholesale & retail trade (incl vehicles) | Yes | Yes | Higher |
| | Wholesale trade (excl vehicles) | No | Yes | Higher |
| Health and Social Work | Human health | No | Yes | Lower |
| | Residential care | Yes | No | Lower |
| | Social work | Yes | Yes | Lower |
| Manufacturing | Food products | Yes | Yes | Higher |
| | Beverages & tobacco | No | No | Higher |
| | Textiles | Yes | No | Higher |
| | Wearing apparel | Yes | Yes | Higher |
| | Leather | No | Yes | Lower |
| | Wood & of products | Yes | Yes | Higher |
| | Paper | Yes | Yes | Higher |
| | Printing & reproduction of recorded media | Yes | Yes | Higher |
| | Coke, refined petroleum and chemicals | Yes | Yes | Higher |
| | Basic pharmaceutical | Yes | No | Higher |
| | Rubber & plastic | No | Yes | Equal |
| | Other non-metallic | Yes | No | Higher |
| | Basic metals | Yes | No | Higher |
| | Fabricated metal products | Yes | Yes | Higher |
| | Computer & electronics | Yes | Yes | Higher |
| | Electrical equipment | No | Yes | Higher |
| | Machinery & equipment | Yes | No | Higher |
| | Motor vehicles | Yes | No | Higher |
| | Other transport equipment | Yes | Yes | Higher |
| Furniture | Yes | No | Lower | |
| Other manufacturing | Yes | Yes | Higher | |
| Information and Communications | Publishing | No | No | Equal |
| | Motion picture | Yes | No | Lower |
| | Programming & broadcasting | No | No | Higher |
| | Telecommunications | Yes | No | Higher |
| | Computer programming | Yes | Yes | Higher |
| Finance and Insurance | Information service | Yes | No | Lower |
| | Financial service | No | Yes | Higher |
| | Insurance & pension funding | No | Yes | Higher |
| | Other financial services | Yes | No | Higher |

Source: UUEPC

Note: In late 2014 there was a reclassification of jobs within the healthcare 2-digit sub-sector, as a result several people moved from human health activities being reallocated under residential care activities.

6. Within Information and Communications, whilst computer programming has experienced a large employment increase between 2012 to 2019, telecommunications has the highest productivity within this sector at £112k. The breakdown also highlighted **the widening productivity gap between ICT in NI and the UK** of £35k in 2019 from £26k in 2018.
7. **It is also interesting to note the wide range of sub-sectors within manufacturing and the impact that the loss of Gallaher's had on productivity.** The beverage and tobacco 2-digit sector experienced a productivity drop from £597k in 2017 to £73k in 2018, impacting overall productivity for the sector. **Currently, computer and electronics manufacturing has the largest productivity which has been rising since 2015 and stood at £134k in 2019.**
8. **Wholesale and retail's productivity reached £42k in 2019 and has remained above the UK since 2015. Wholesale trade (excluding vehicles)** experienced a positive increase of 4,800 jobs since 2012 to 2019 and grew productivity to £72k, in the same period, implying the high value output

within this sub-sector. This is an example of growing employment in a higher productivity sub-sector.

9. Productivity within **finance and insurance reduced from £75k in 2018 to £61k in 2019**, widening the gap with the UK. The sub-sectoral analysis highlights that insurance and pension funding is the largest contributor to productivity reaching £220k in 2019, however this is a fall from £296k in 2017- the same time that the overall sector experienced a contraction in productivity.
10. Lastly, since 2017 **NI health and social care productivity has remained slightly ahead of the UK levels**, with productivity reaching £36k (NI) and £35k (UK) in 2019, representing progress for the sector locally. Within the 2-digit sub-sectors further analysis is required to understand the impact of human health activities being reallocated under residential care activities. The data currently indicates that the 2-digit sub-sectors **human health** has overtaken residential care in recent years for output per job, partially attributable to a change in how data is classified, but also representing **high value jobs within this sector maintaining high output**.
11. **Overall, productivity growth occurs where GVA growth exceeds employment growth**. In some sectors, productivity gains may not be occurring, or not occurring at a faster rate, due to employment growth being larger than GVA growth.
12. Referring to Table 2 above, productivity is not growing across all 2-digit sub-sectors and hence weakening the overall performance of 1-digit sectors for instance within Information and Communication. Within this sector, whilst there has been job growth in the majority of 2-digit sub-sectors this has not resulted in improved productivity performance suggesting low productivity jobs have been created. Meanwhile some of Manufacturing's 2-digit sub-sectors including Textiles, Basic Pharmaceuticals, Machinery and Equipment and Motor have also experienced job growth combined with negative productivity growth so further research is required to understand if high value employment is being created within sub-sectors.
13. Conversely, there has been positive employment and productivity growth in a number of 2-digit sectors for instance within Wholesale and Retail, Retail (excluding vehicles) and Wholesale and Retail (including vehicles). This may suggest that these are strong contributors to NI's economic performance for jobs and productivity growth. Within Manufacturing, 48% of the 2-digit sub-sectors display positive job and productivity growth including Food Products, Wearing Apparel and Computer and Electronics. This would suggest that these 2-digit sub-sectors are helping to drive productivity growth for the 1-digit sector. **Overall, where there is productivity and employment growth would suggest that higher value jobs have been added which contribute positively to productivity**.
14. **High value employment** is also a notable factor which can help to drive productivity within sectors. However, this presents policy makers with the challenge of targeting improved productivity, employment growth and high value jobs.

About UUEPC

UUEPC is an independent research centre focused on producing evidence-based research to inform policy development and implementation. It engages with all organisations that have an interest in enhancing the Northern Ireland economy. The UUEPC's work is relevant to Government, business and the wider public with the aim of engaging those who may previously have been disengaged from economic debate.



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