Northern Ireland's Productivity Challenge: Exploring the issues

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1. Introduction

1.1. Northern Ireland is a region of just under 1.9 million people, and accounts for 2.8% of the UK's population. It was once well-known for shipbuilding and the linen industry, but these industries experienced decline and have now disappeared. The regional economy remains more concentrated in agriculture and manufacturing relative to the rest of the UK, but it is also seeing growth in specific areas of services, including the knowledge economy. It has a devolved government, the Northern Ireland Assembly, which is responsible for many aspects of policy relating to the local economy. Belfast is the only city in Northern Ireland with a population more than 100,000. Northern Ireland is also the only part of the UK to share a land border with an EU member state, the Republic of Ireland.

1.2. Increasing productivity is key to improving Northern Ireland's prosperity, with low productivity identified as central to explaining the region's persistently poor economic performance. Northern Ireland is the poorest performing UK region for productivity, almost 20% below the UK level, as shown in Table 1. Northern Ireland is therefore a region which is falling behind, with a lower level of productivity relative to the UK average, and a lower rate of growth.

Table 1: GVA per hour worked, NUTS1 UK regions (UK=100)

	GVA per hour worked in 2019	Change in real terms (%) 2008-2019
London	131.9	2.6
South East	109.1	3.8
UK	*100*	*4.1*
Scotland	98.0	13.1
East of England	94.9	0.7
South West	90.6	2.9
North West	90.4	-0.3
West Midlands	89.0	6.3
East Midlands	86.6	3.6
North East	86.1	2.8
Yorkshire & The Humber	85.0	-1.9
Wales	84.1	6.0
Northern Ireland	**81.8**	**3.2**

Source: ONS(2021a).

1.3. The productivity gap is not a new phenomenon: it was present before the Great Recession of 2008/09, the Troubles, and even the partition of Ireland. It is also not evenly spread within Northern Ireland: Belfast has the smallest productivity gap, only 6% below the UK level (when measured as output per filled job), while Derry City and Strabane has the largest gap, at 23% below the UK level.

1.4. A unique feature of Northern Ireland is its long history of devolved powers over economic policy, since Northern Ireland's inception in 1921. Today, the Northern Ireland Assembly at Stormont has key policy powers relevant to productivity, including education and skills, infrastructure, and economic and enterprise policy. Improving productivity is a feature of recent public policy, including both the Belfast City Region Deal and the Derry~Londonderry and Strabane City Region Deal, as well as the Department for the Economy's new strategic vision for the local economy, '10x Economy: Northern Ireland's Decade of Innovation'.

1.5. Research has identified a number of potential explanations for Northern Ireland's persistent productivity gap. The local economy has a relatively higher concentration of low productivity sectors. It is geographically peripheral, while an infrastructure gap within Northern Ireland may also exist. Levels of investment in research and development in Northern Ireland are below the UK average, while levels of human capital are particularly low. Finally, both public policy, and institutions and governance, may contribute to the productivity gap.

1.6. The evidence demonstrates there is no single explanation for the productivity gap. While Northern Ireland's productivity is affected by both structural and peripherality problems, neither mean the productivity gap is an inevitable outcome. Manufacturing no longer possesses the structural problems of the past, with service sectors now contributing more to the productivity gap. Problems of peripherality are also no longer simply geographic, but reflect a wider definition of connectivity, including access to networks and knowledge. The areas of investment, human capital, and infrastructure all display deficiencies, which suggests there is scope for policy to correct these failures.

1.7. To address Northern Ireland's productivity failings, policy needs to focus on a number of key areas. Firstly, Northern Ireland possesses a skills gap to the rest of the UK. Policy therefore needs to identify how to improve skills, alongside ways to attract firms and industries which can take advantage of a more highly skilled workforce. Secondly, Northern Ireland not only has a relatively higher concentration of low productivity sectors, it also has a long tail of low productivity firms within sectors. Policymakers need to understand what the drivers are of this underperformance, and what policies can be used to target these firms. Thirdly, policy interventions have been relatively ineffective at addressing the productivity gap over the long run. A greater understanding is needed of why this is the case, and the role of political institutions in shaping this.

1.8. Further research is required across a number of areas if Northern Ireland's productivity challenge is to be fully met. Analysis of the barriers to productivity growth is hampered by the lack of availability of detailed firm, sectoral, and intraregional data. The role of peripherality for networks and knowledge capital is not fully understood, while the consequences of Brexit for these connections requires further research. A managerial skills gap appears to be an important part of the productivity gap, but the causes, and how it is distributed across sectors, is relatively unknown. An infrastructure gap appears linked to the productivity gap, but is unproven. Finally, the effectiveness of Stormont's recent policies to improve productivity are unknown.

1.9. The ability to address Northern Ireland's productivity gap will be determined across a number of different areas. Northern Ireland's strengths include its ability to tailor economic policy through devolved powers, and a relatively younger population. Weaknesses include the areas where Northern Ireland possesses deficiencies to the rest of the UK, particularly in skills and investment. Opportunities include the digitalisation of the economy, the growth of the knowledge economy, and the development of green technologies within manufacturing. Threats include the prospect of further political instability, both at a local level within the devolved institutions, and as a consequence of Brexit.

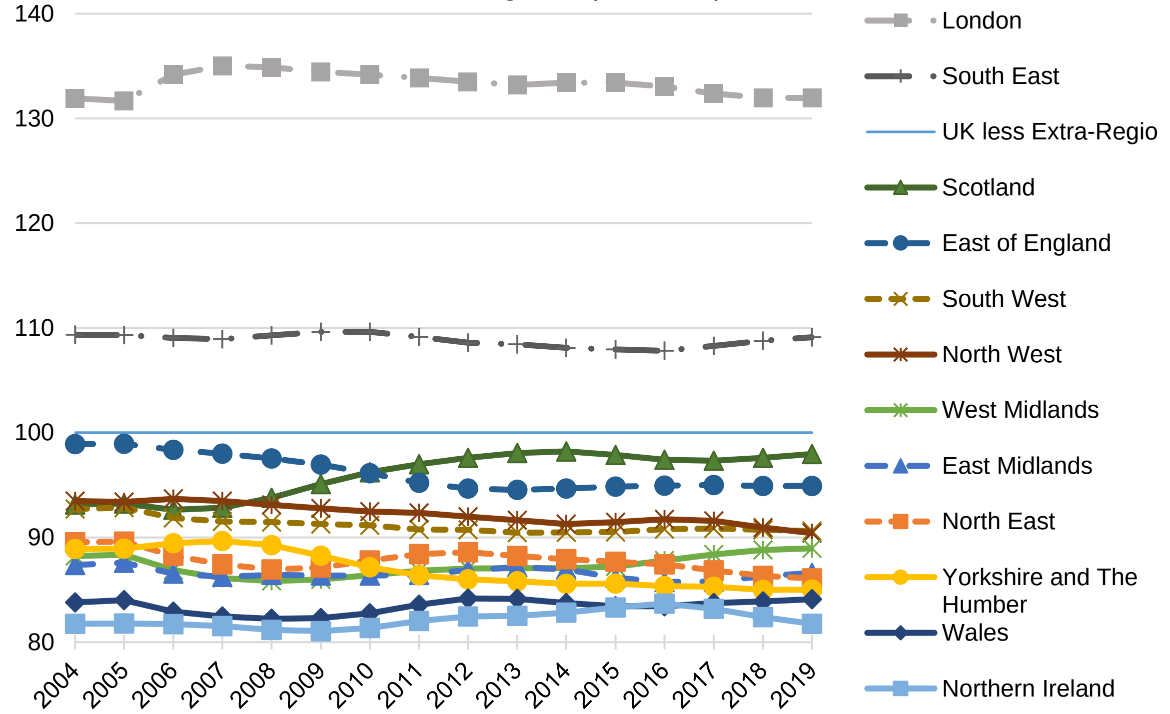
2. Northern Ireland's Productivity Gap

2.1. Addressing the UK's relatively poor productivity performance has moved to the forefront of research and public policy over the past decade. Covid-19 has increased the sense of urgency, as the nation's ability to grow its way out of recession, and pay down the huge public debts accumulated during the pandemic, requires productivity to increase. The UK's productivity performance has stagnated relative to its peers, and the reasons for this are unclear. Alongside potential explanations for this stagnation, the importance of the regional aspect to the UK's performance is increasingly being recognised. Northern Ireland is a region which has seen a persistent productivity gap to the rest of the UK. This green paper summarises the existing research on Northern Ireland's relatively poor productivity performance, highlights the areas we still know relatively little about, and identifies questions of interest for future research.

2.2. Northern Ireland's recent productivity performance can be seen in Figure 1, where productivity is measured as Gross Value Added (GVA) per hour worked.[1] Northern Ireland has the lowest level of productivity of any UK region, with an 18 per cent gap to the UK level. During 2015 and 2016, Northern Ireland's relative position improved slightly, pulling ahead of Wales. However, this improvement was temporary, and with Northern Ireland's productivity growth stagnating after 2016, it once again fell behind Wales, and further behind the UK level. Measuring productivity as GVA per job, rather than per hour worked, does see Northern Ireland's relative performance improve slightly, to 15 per cent below the UK level. This puts it level or just ahead of the other four worst performing regions. Yet this means that more hours must be worked per job in Northern Ireland to produce the same output as elsewhere in the UK.

[1] To measure labour productivity at a regional level, Gross Value Added (GVA) is more appropriate than GDP, as GVA is less dependent on the changes between intermediate inputs and labour (Goldrick-Kelly and Mac Flynn, 2018, p.9).

Figure 1: Nominal GVA per hour worked (smoothed), NUTS 1 UK regions (UK=100)



Source: ONS, 2021a.

2.3. Increasing productivity in Northern Ireland has been identified as key to its future economic prosperity. Table 2 demonstrates that low productivity growth was to blame for Northern Ireland's slow growth in GDP per capita over the past two decades. Between 2000 and 2017, Northern Ireland's GDP per capita grew by only 0.7 per cent per year, the equal lowest of any UK region. While there were improvements in employment and participation rates, it was weak productivity growth, the lowest of any region, which led to Northern Ireland having one of the lowest levels of GDP growth in the UK. Productivity is therefore "the central problem of the Northern Ireland economy".[2]

2.4. Northern Ireland's productivity gap is not a new phenomenon. Figure 2 shows that throughout its history, Northern Ireland has had a productivity gap relative to the UK. Indeed, it is consistently the UK region with the largest productivity gap. The estimate of productivity in 1912, for the counties which would become Northern Ireland, demonstrates that the productivity problem existed before partition. That the productivity gap has existed for so long and showed signs of closing rather than widening during the 1970s and 1980s, also suggests the productivity gap was not due to the Troubles. Despite some evidence of the gap closing during the second half of the twentieth century, this progress has stalled during the past decade.

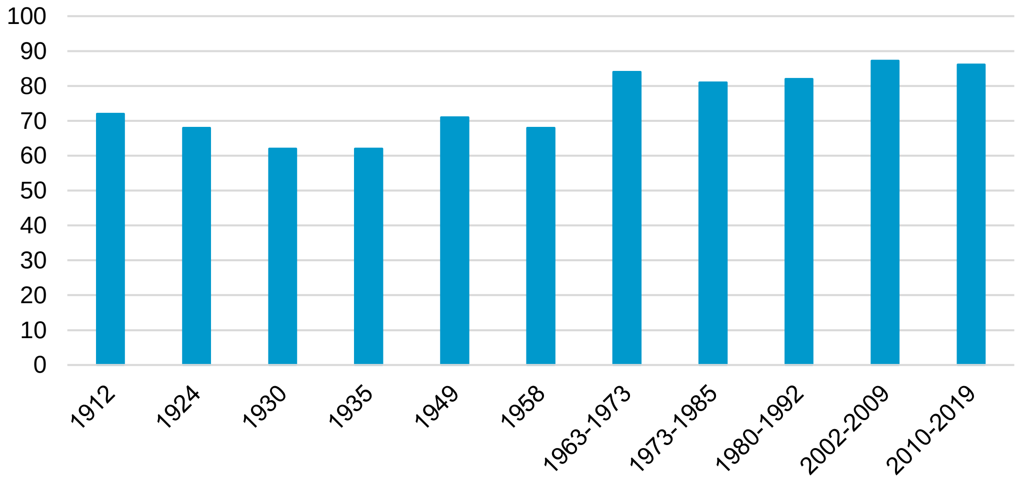
[2] FitzGerald and Morgenroth, 2020, p.24

Table 2: Decomposition of growth in GDP per capita, 2000-2017, percentage points

	GDP per capita growth	Productivity	Employment rate	Participation rate	Dependency
London	1.5	1.0	0.1	0.2	0.1
North West	1.4	1.2	0.1	0.3	-0.1
Scotland	1.4	1.1	0.2	0.2	-0.2
North East	1.3	0.7	0.2	0.5	-0.1
England	1.1	1.1	0.1	0.2	-0.1
UK	*1.0*	*0.9*	*0.1*	*0.2*	*-0.1*
Republic of Ireland	*1.0*	*0.9*	*-0.2*	*0.4*	*-0.2*
Wales	1.0	0.7	0.1	0.4	-0.2
West Midlands	0.9	1.0	0.0	0.1	-0.2
South East	0.9	1.0	0.0	0.1	-0.2
East of England	0.8	0.9	0.0	0.1	-0.2
East Midlands	0.8	1.0	0.1	0.0	-0.3
Yorkshire & Humber	0.8	0.7	0.1	0.1	-0.1
Northern Ireland	**0.7**	**0.2**	**0.1**	**0.4**	**0.0**
South West	0.7	0.8	0.0	0.1	-0.2

Source: FitzGerald and Morgenroth, 2020, p.9.

Figure 2: Northern Ireland's long-run productivity gap (UK=100)

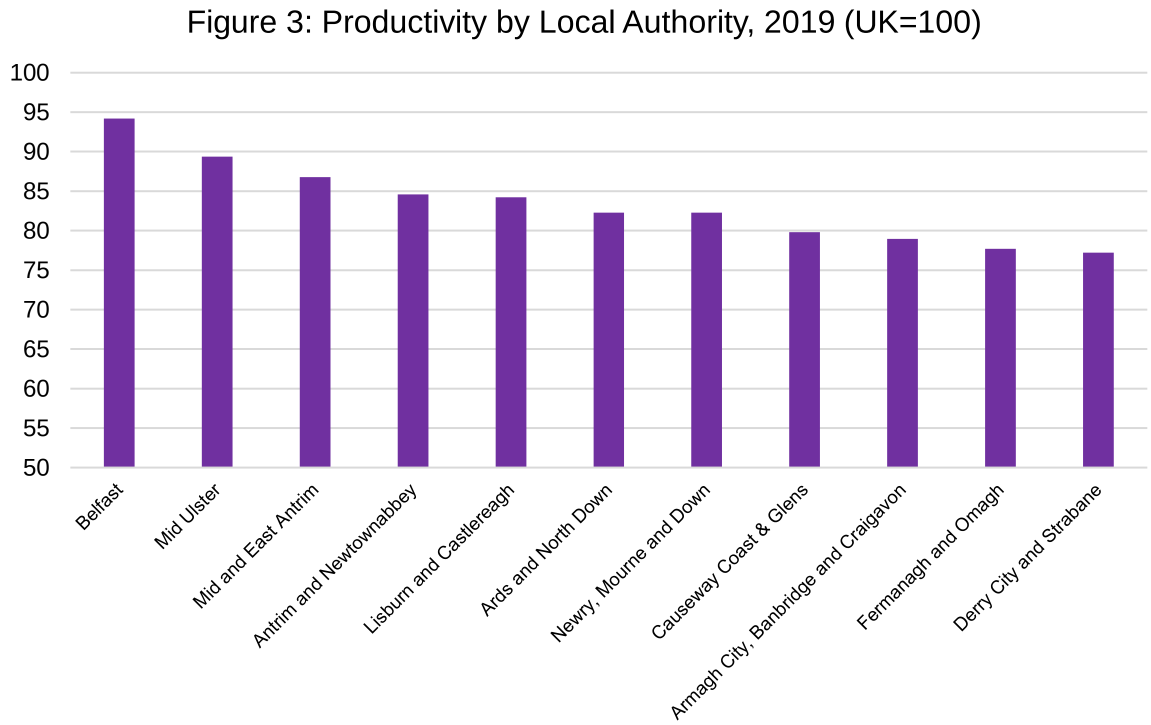


Notes: For 1912-1992: manufacturing productivity only, calculated as net output per head. For 2002-2019: productivity across all sectors, calculated as gross value added per job filled. Grouped years are averages per year.
Sources: For 1912-1992: Birnie and Hitchens, 1999, p.34. For 2002-2009 and 2010-2019: ONS, 2021a.

2.5. Northern Ireland's productivity performance looks even weaker when compared with its nearest neighbour, the Republic of Ireland.[3] Northern Ireland's productivity growth has taken a very different path from the Republic of Ireland over the last two decades. The Republic of Ireland has seen productivity growth in both absolute and relative terms, across both foreign and domestically controlled sectors, while Northern Ireland has seen productivity stagnate.[4] Thus, while the Republic of Ireland has seen its productivity gradually pull ahead of the EU15 since 2000, Northern Ireland has continued to lag, with the productivity gap widening since 2008.[5] Even when the effect of non-resident owned firms are removed from the Republic of Ireland's productivity figures, the remaining domestic sector still outperforms Northern Ireland, and equals the EU15 level in 2016, where Northern Ireland only reaches three-quarters of this level.[6]

2.6. While Northern Ireland's productivity performance has been far from impressive, Figure 3 shows the productivity gap is not evenly distributed across Northern Ireland's local authorities. Belfast and Mid Ulster both performed relatively well in 2019, being the only two local authorities to exceed the overall Northern Ireland level of 85.7 per cent, albeit still with a significant gap to the UK level. In contrast, there are several areas which are over 20 per cent below the UK level, with Derry City and Strabane performing particularly poorly, at around 23 per cent below. The biggest recent movement of any local authority has been Mid and East Antrim: it previously performed well, peaking at 23 per cent above the UK level in 2011, but experienced a sharp decline from 2016 onwards, and by 2019 was 13 per cent below the UK level. While the total number of jobs in Mid and East Antrim has changed little during this period, its falling productivity is likely the result of the closure of two large local employers in manufacturing, the JTI Gallaher tobacco factory in 2017, and the Michelin tyre factory in 2018, alongside job losses at bus manufacturer Wrightbus.

[3] Northern Ireland's productivity gap to the Republic of Ireland is similar whether measured by GVA per job or GVA per hour worked. See Goldrick-Kelly and Mac Flynn, 2018, p.10
[4] Goldrick-Kelly and Mac Flynn, 2018
[5] The EU15 comprises the 15 countries which were members of the European Union prior to 2004, and includes: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.
[6] Goldrick-Kelly and Mac Flynn, 2018, p.21



Notes: Local authorities correspond to ITL3 regions. Productivity measured as GVA per job filled, as GVA per hour worked is not available at a sub-regional level for Northern Ireland.
Sources: ONS, 2021a.

2.7. Using different geographic boundaries, the divergence of productivity performance for regions within Northern Ireland is evident when comparisons are made at a European and an all-island level. While Northern Ireland was only 75 per cent of the EU15 level in 2014, as measured by GVA per capita, Belfast performed particularly well, at 37 per cent above the EU15 average.[7] This placed Belfast behind only Dublin and the South West on the island of Ireland, although these regions were 109 per cent and 57 per cent above the EU15 level respectively. The remaining sub regions of Northern Ireland all lagged behind the EU15 average, with the north of Northern Ireland only reaching 58 per cent of this level.[8]

[7] Goldrick-Kelly and Mac Flynn, 2018, p.14
[8] Goldrick-Kelly and Mac Flynn, 2018, p.14

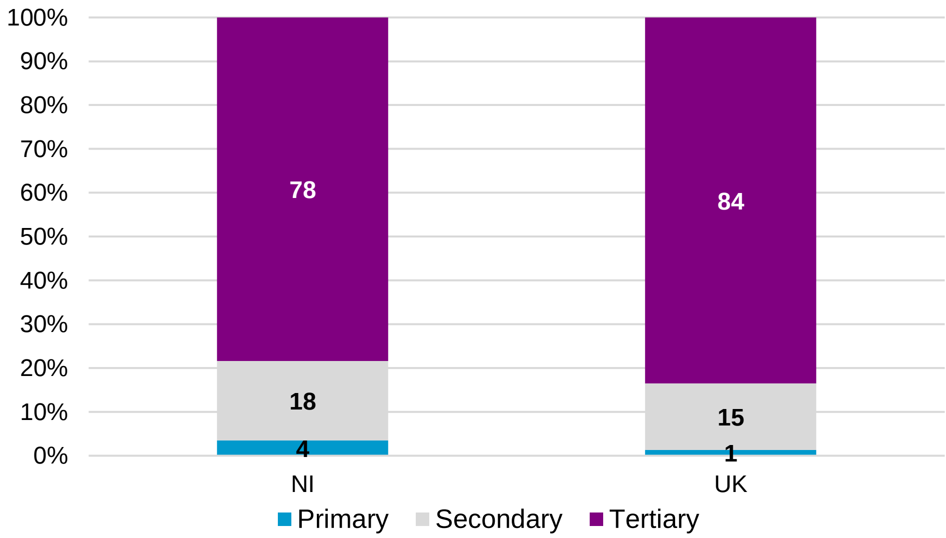
3. Potential Explanations

3.0. The complexity of Northern Ireland's productivity challenge is reflected in the research which has examined it. This research, which stretches over many decades, has taken a variety of approaches to identifying the causes of the productivity gap, with differing emphasis placed on different areas and explanations. The following sections group this research into seven common themes, where a particular cause of the productivity gap has been identified.

3.1 Economic Structure

3.1.1 Northern Ireland's economic structure is often highlighted as responsible for its lower productivity. As Figure 4 shows, relative to the UK, Northern Ireland has a higher share of primary and secondary employment, and a lower share in tertiary. When this is broken down by industry in Table 3, it is clear that Northern Ireland has an industrial structure which differs from the UK. The structural view suggests that lower levels of productivity simply reflect a regional economy more highly concentrated in low productivity industries. The productivity gap is therefore not the result of any productivity failings within particular industries, but rather if Northern Ireland had the same structure as the UK, the productivity gap would disappear. This view remains current amongst policymakers, with H.M. Treasury stating that the productivity gap "is largely due to the under-representation of high productivity sectors in Northern Ireland".[9]

Figure 4: Employment share by sector, 2019, percent



Notes: Calculated as an average for 2019. Primary employment includes: Agriculture, forestry & fishing, and Mining & quarrying. Secondary employment includes: Electricity & gas, Water & sewerage, and Construction. Tertiary employment includes: Wholesale & retail, Transport, Accommodation & food services, Communications, Financial services, Real estate, Professional services, Administrative services, Public administration, Education, Health, Arts, People employed by households, and Other service activities.
Sources: ONS, 2020a.

[9] H.M. Treasury, 2011, p.8

Table 3: Employment by industry, 2019, percent

	UK	NI
Agriculture, forestry & fishing	1.1	3.3
Mining & quarrying	0.2	0.2
Manufacturing	7.6	10.5
Electricity & gas	0.4	0.2
Water supply, sewerage, & waste	0.6	0.8
Construction	6.6	6.5
Wholesale & retail trade	14.1	15.9
Transport & storage	5.1	4.0
Accommodation & food services	7.0	5.9
Information & communication	4.2	2.8
Financial & insurance activities	3.2	2.2
Real estate activities	1.7	1.2
Professional scientific & technical activities	9.0	4.9
Administrative & support service activities	8.5	6.7
Public admin & defence; Social security	4.3	5.8
Education	8.3	8.5
Human health & social work activities	12.4	15.1
Arts, entertainment & recreation	2.9	2.2
Other service activities	2.7	3.1
People employed by households, etc.	0.2	0.0

Notes: Calculated as an average for 2019. Figures rounded to one decimal place.
Sources: ONS, 2020a.

3.1.2 This structural problem can be thought of in the context of Northern Ireland's economic history. During the first half of the twentieth century, Northern Ireland's economy was highly concentrated in the staple industries of shipbuilding, textiles, and agriculture.[10] As the regional economy remained relatively more concentrated in these and other industries experiencing decline, this contributed to Northern Ireland's persistent productivity gap. It might therefore be expected that structure was the main reason for lower levels of productivity. Yet the evidence shows that the relative importance of structure has diminished over time, and within-sector productivity failings have become increasingly important.

3.1.3 Given the limited availability of regional output data, most studies testing the structural argument do so using data available for the manufacturing sector. One of the first was by Isles and Cuthbert, who found that structure accounted for 55 per cent of Northern Ireland's productivity gap to the UK in 1935.[11] Hitchens and Birnie applied this method

[10] Johnson, 1985

[11] This was calculated using a shift-share method, where Northern Ireland is artificially given the same industrial structure as the UK, but retains its existing productivity levels for each industry. How much of the productivity gap this closes can therefore be assigned to a structural effect, while the remaining gap reflects the productivity gap within specific sectors. See Isles and Cuthbert, 1957, p.273

to post-war Northern Ireland, demonstrating that the contribution of structure to Northern Ireland's productivity gap decreased over time: from 27 per cent in 1968, to 15 per cent in 1979, to only 7 per cent in 1984.[12] Therefore by the 1990s, structure had become a much less important driver of the productivity gap in manufacturing. Indeed, relative to the South East of England, the structure of manufacturing in Northern Ireland was actually contributing positively to productivity, rather than being a drag.[13]

3.1.4 The most recent evidence reinforces that the productivity gap is not simply the result of structure when considering sectors beyond manufacturing. Mac Flynn uses employment data for 2014 to ask what Northern Ireland's Gross Value Added (GVA) per job would be if its employment across sectors were identical to Great Britain.[14] This data covers all sectors of the Northern Ireland economy, including services, and demonstrates that if Northern Ireland had the same employment structure as Great Britain, Northern Ireland's productivity gap would still be 7 per cent, compared to an existing gap of 13.7 per cent.[15]

3.1.5 While productivity in manufacturing has previously received the most attention, this sector is no longer the source of Northern Ireland's productivity gap, and instead contributed positively to the productivity gap in 2014.[16] The sectors with the greatest productivity gap to Great Britain are: Agriculture (-52%); Finance (-34%); Construction (-23%); Administration (-20%); Information and Communication (-20%); Transportation (-15%); Accommodation and Food (-13%); and Professional and Scientific (-9%).[17] This confirms that Northern Ireland's productivity gap is not simply a structural problem.

3.1.6 That within-sector productivity failings exist is clear when comparisons are made with the Republic of Ireland. Goldrick-Kelly and Mac Flynn show that the majority of Northern Ireland's productivity gap to the Republic of Ireland is concentrated in four out of a possible ten sectors: Manufacturing; Information and Communication; Professional, scientific and technical activities; and Financial and insurance activities.[18] While productivity in Northern Ireland manufacturing may not lag behind Great Britain, it does lag significantly behind the Republic of Ireland. This productivity gap is mainly driven by the foreign-owned sector in the Republic of Ireland, which Northern Ireland manufacturing lags by 83 per cent; but it also has a productivity gap to the Republic of Ireland's domestically owned sector, of 8 per cent.[19]

3.1.7 While within-sector productivity failings have become increasingly important for explaining Northern Ireland's productivity gap, it is not clear how this productivity gap is distributed across firms within each sector. Within manufacturing, Northern Ireland has been shown to possess high productivity plants, but these were few in number and

[12] Hitchens and Birnie, 1989a, p.450
[13] Harris, 2001, p.526-527
[14] Mac Flynn, 2016
[15] Mac Flynn, 2016, p.6,8
[16] Mac Flynn, 2016, p.9
[17] Mac Flynn, 2016, p.9
[18] Goldrick-Kelly and Mac Flynn, 2018, p.17
[19] Goldrick-Kelly and Mac Flynn, 2018, p.35

did not match the best performers in other UK regions, while there was a long tail of inefficient plants dragging down overall productivity.[20] In agriculture, certain types of farm have been identified as contributing to this sector's relatively low productivity. Northern Ireland has a much higher number of small farms relative to Great Britain, which are less productive, while larger farms in Northern Ireland also have a large productivity gap to those in England.[21] In the other sectors with a relatively poor productivity performance, including Finance, Information and Communication, and Construction, there are some differences in the types of activity Northern Ireland firms engage in relative to those in Great Britain, but these appear to be unable to explain all of the productivity gap.[22] The conclusions that can be drawn are limited though, due to a lack of sectoral level productivity data for Northern Ireland, which makes analysis of within-sector differences difficult.[23]

3.2 Peripherality

3.2.1 One of the earliest explanations for Northern Ireland's productivity problem is its geographic peripherality. Firms in Northern Ireland may face higher direct and indirect transport costs, both for importing raw materials, and due to being further away from the markets they serve.[24] This may in turn limit which industries or sectors can profitably establish, leading to lower investment.[25] Northern Ireland's relatively small population may also inhibit firms' growth because they must rely more heavily on exports to reach a larger market, and incur the associated costs.[26] Together, this could mean that firms which are least disadvantaged by peripherality may concentrate in Northern Ireland, with no guarantee that these will be high productivity, while those that do establish may see lower levels of investment, as opportunities are less profitable due to higher transport costs.[27] The UK's departure from the EU, and the trade barriers that have resulted, raise the prospect of increased transport costs for firms based in Northern Ireland, adding to any existing peripherality problem.

3.2.2 There is evidence that transport costs were higher in the past for firms in Northern Ireland. In particular, there were higher costs for importing raw materials,[28] preventing manufacturing firms from competing with those located in Great Britain.[29] While transport costs have continued to be slightly higher, it has been rejected as the main cause of the productivity gap,[30] as any higher costs would be more than compensated by substantially lower wages than in Great Britain.[31] That geographic peripherality, or

[20] Harris, 2001
[21] Mac Flynn, 2016, p.10-11
[22] Mac Flynn, 2016
[23] Mac Flynn, 2016
[24] Isles and Cuthbert, 1957, p.48; Buckland, 1979, p.128
[25] Isles and Cuthbert, 1957, p.48
[26] Harris, 1990, p.67
[27] Isles and Cuthbert, 1957, p.265
[28] Isles and Cuthbert, 1957
[29] Buckland, 1979
[30] Hitchens and Birnie, 1989b
[31] Birnie and Hitchens, 1999, p.81-82

‘hard peripherality’, is not to solely blame for the productivity gap, is supported by Ulster’s successful industrialisation during the late nineteenth and early twentieth centuries, alongside wider evidence that geographically remote economies do not automatically perform relatively poorly.[32] The high levels of productivity achieved by the Republic of Ireland, despite similar geographic challenges, further suggests that geographic peripherality is not the main cause of Northern Ireland’s productivity gap.

3.2.3 Where peripherality may have a greater effect on Northern Ireland’s productivity is through more indirect channels, where geographic peripherality interacts with other economic issues to hinder competitiveness.[33] For example, being relatively less prosperous means fewer resources available to invest in cutting edge products and services, which is exacerbated by remoteness from the markets where these developments are taking place.[34] This ‘soft peripherality’ argument is supported by previous research, where Northern Ireland’s persistent failure to attract its ‘fair share’ of research and development facilities has led to it being on the periphery of new information and technologies, with this ‘ideas gap’ contributing to the productivity gap.[35] Thus, Northern Ireland’s relatively small size and geographic peripherality, when combined with distance from networks relating to knowledge and innovation, may reduce the opportunities to benefit from economies of agglomeration.

3.2.4 The existing evidence does not support Northern Ireland’s productivity gap being purely the result of geographic peripherality. Instead, it is when peripherality is combined with other factors that part of the productivity shortfall can be explained. This appears particularly linked to levels of investment in research and development, the role of which is discussed later. While transport costs have not previously been shown to be the cause of low productivity, there is little up-to-date evidence on whether these may pose a barrier to productivity improvements in particular sectors today. This has the potential to become an increasingly important issue, given the additional barriers to trade following the completion of the UK’s exit from the EU. How the service sector is affected by geographic peripherality and the ideas gap also requires further research: is this sector more or less disadvantaged than manufacturing when it is located remotely from areas where particular sectors are concentrated, or has this problem been increasingly mitigated by technology?

3.3 Capital and Investment

3.3.1 The level of capital and investment are potential areas which may drive Northern Ireland’s productivity gap. If capital and investment are lower for firms in Northern Ireland, this may impose a limit on the value of output than can be produced. This has been a major focus of policymakers throughout Northern Ireland’s history, although the focus has primarily been on manufacturing, due to a lack of data for other sectors.

[32] Brownlow, 2013, p.293
[33] Brownlow, 2013, p.293
[34] Birnie and Hitchens, 1999, p.82
[35] Crafts, 1995, p.23

3.3.2 Evidence for the mid-twentieth century showed that capital per worker was lower in Northern Ireland than Great Britain, as were levels of investment,[36] and that Northern Ireland had a low level of both technological sophistication and productivity.[37] Post-war industrial policy addressed this by primarily focusing on capital grants over other interventions.[38] Northern Ireland therefore saw capital in manufacturing grow more rapidly than in the UK during the 1960s and 1970s, but saw lower levels of growth in total factor productivity (TFP).[39] By the 1980s, capital per worker was at least as high in Northern Ireland as in Great Britain, and this capital was of similar if not greater technological sophistication in Northern Ireland.[40] That increasing the level of capital did not close the productivity gap, suggests that a shortfall in capital was no longer to blame,[41] and that a failure to efficiently utilise the capital stock was lowering total factor productivity (TFP) growth.[42]

3.3.3 With Northern Ireland's capital deficit having been addressed, but the productivity gap persisting, this has led to a focus on the lower level of investment, particularly in research and development (R&D), as an explanation for the productivity problem. Northern Ireland has previously failed to attract its 'fair share' of R&D facilities relative to the rest of the UK, with inward investment being less R&D intensive.[43] Throughout the post-war period, Northern Ireland had an extremely poor record for innovation, underperforming even the worst regions of Great Britain.[44] This problem has persisted into the 21st century, and Northern Ireland has been identified as one of the UK regions with low R&D intensity, particularly from public sector investment.[45] In a European context, Northern Ireland saw productivity grow just below the EU average between 1995 and 2007, with only modest progress in catching up with the technological frontier of leading regions.[46] This failure to invest in R&D has led to it being identified as one of the main weaknesses of the Northern Ireland economy.[47]

3.3.4 While underinvestment in R&D has been a persistent feature of the Northern Ireland economy, the most recent evidence suggests there is not a straightforward relationship between the overall level of R&D expenditure and Northern Ireland's productivity gap. UK regions with the lowest levels of productivity have been shown to have the lowest levels of R&D expenditure when measured per capita.[48] However, measuring R&D expenditure on a per capita basis can give a false picture for Northern Ireland, given it has higher levels of economic inactivity and a relatively smaller working age population. Figure 5 instead measures R&D expenditure on a per job basis. This shows that despite being the poorest performing region for productivity, Northern Ireland has slightly higher levels of R&D expenditure than other poorly performing regions,

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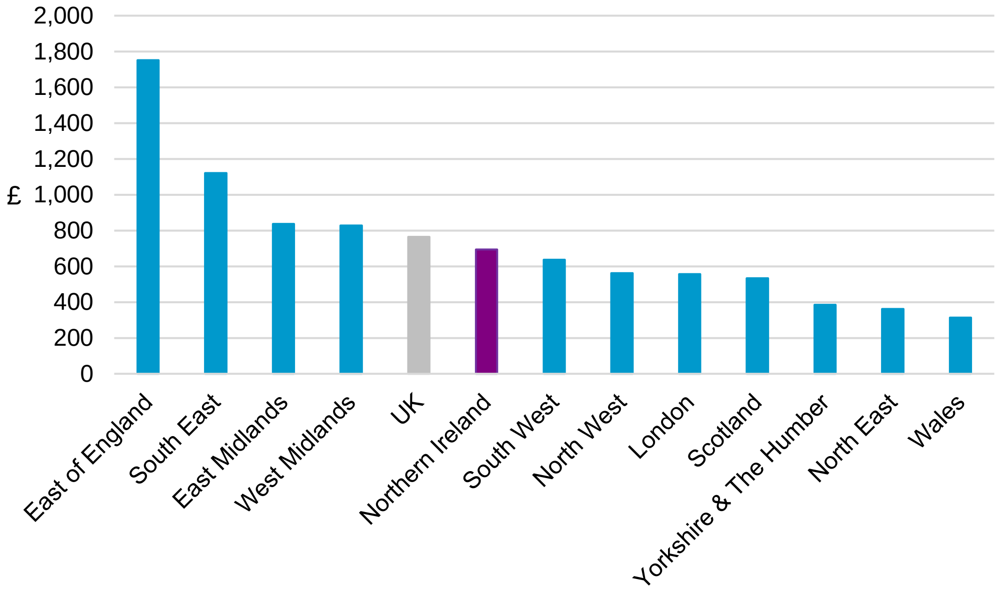
36 Isles and Cuthbert, 1957, p.289-290
37 Harris, 1991, p.35
38 Harris, 1991, p.36; Brownlow, 2020, p.409
39 Borooah and Lee, 1991, p.221
40 Hitchens and Birnie, 1994, p.105
41 Borooah and Lee, 1991, p.226
42 Harris, 1991, p.149
43 Crafts, 1995, p.23
44 Harris, 1991, p.139-140
45 Forth and Jones, 2020
46 Filippetti and Peyrache, 2015
47 Brownlow, 2013
48 Forth and Jones, 2020

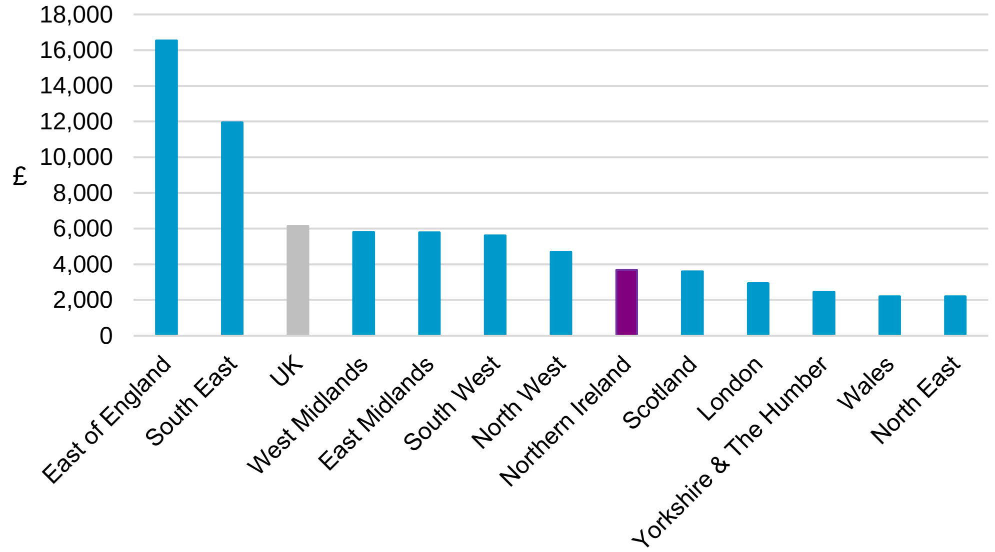
although it is still below the UK average. Disaggregated figures show that while R&D expenditure per employee in manufacturing is below the UK average, this still exceeds some of the regions with the lowest expenditure, and R&D expenditure per employee in services is actually above the UK average, significantly exceeding other low productivity regions.

Figure 5: R&D expenditure per job, 2019



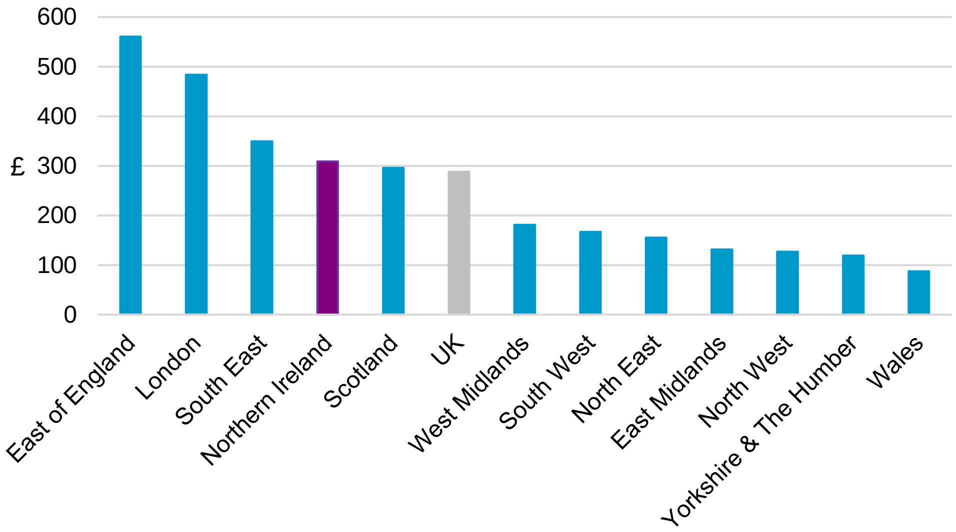
Notes: Calculated as total R&D expenditure in region divided by total number of jobs in region. Expenditure on R&D performed in UK businesses by sector of performance.
Source: For R&D expenditure by region, ONS, 2021b. For jobs by region, ONS, 2021a.

Figure 6: R&D expenditure per employee in Manufacturing, 2019



Notes: Calculated as total R&D expenditure in manufacturing divided by total number of employees in manufacturing sector. Expenditure on R&D performed in UK businesses by sector of performance. Number of employees by sector calculated as an average of quarterly employment totals during 2019.
Source: For R&D expenditure by region, ONS, 2021b. For employment, ONS, 2021c.

Figure 7: R&D expenditure per employee in Services, 2019



Notes: Calculated as total R&D expenditure in services divided by total number of employees in services sector. Expenditure on R&D performed in UK businesses by sector of performance. Number of employees by sector calculated as an average of quarterly employment totals during 2019.
Source: For R&D expenditure by region, ONS, 2021b. For employment, ONS, 2021c.

3.3.5 This evidence suggests that the links between capital, investment, and productivity are not straightforward. While manufacturing firms in Northern Ireland were able to bridge their historical shortfall in capital, this has not addressed the productivity gap, which continues to be linked to low levels of investment. However, Northern Ireland sees higher levels of R&D expenditure compared to other regions with poor productivity, albeit still significantly below the UK's leading regions. A possible explanation is that R&D expenditure is more concentrated in a small number of large firms: Northern Ireland has been identified as having the lowest proportion of innovative firms, placing a drag on productivity.[49]

3.3.6 It is not clear why low levels of investment have been such a persistent feature of the Northern Ireland economy. Research suggests that for firms that do not engage in innovation activity, it is because prevailing market conditions do not necessitate it.[50] Greater foreign direct investment (FDI) may not provide a solution, as Northern Ireland suppliers have been shown to possess a greater knowledge gap to multinational firms than those in the Republic of Ireland, with these local firms failing to benefit from transfers of knowledge from multinationals.[51] There is also the potential for a vicious circle to establish within the regional economy, where poor productivity reduces the availability of resources for investment in innovation, which in turn leads to poor productivity.[52]

[49] Mac Flynn, 2016, p.27
[50] Mac Flynn, 2016
[51] Hewitt-Dundas *et al*., 2005
[52] Birnie and Hichens, 1999, p.82

3.3.7 Further research is therefore required on why this investment gap persists, how large a problem it currently is, and what the drivers of it are, for example whether there is a lack of access to finance for SMEs. It also raises the question of how effective public policy has been in addressing this issue: previous research suggests public policy which targeted improved investment in R&D by small businesses had a negative effect on productivity.[53] Finally, there is very little examination of how non-manufacturing firms have fared in terms of investment in knowledge capital. The knowledge economy in Northern Ireland has experienced recent growth, although it remains small relative to other UK regions,[54] and the extent to which a knowledge gap may contribute to the service sector's productivity gap is unclear.

3.4 Human Capital

3.4.1 Human capital, as measured by educational achievement and skills, has been identified as a major long-run issue for the Northern Ireland economy, particularly for productivity. Lower human capital was one of the main factors that contributed to Northern Ireland's poor productivity growth immediately post-war.[55] There is also evidence that this human capital deficit persisted,[56] and that even by the 1990s, Northern Ireland had a worse case of the 'British disease', with lower levels of vocational qualifications, and fewer 16 year olds reaching a minimum level of qualification, even if school leavers at A-level performed slightly better than in England, albeit still poorly by international standards.[57]

3.4.2 A deficit in human capital has been identified as one of the main sources of Northern Ireland's current productivity gap.[58] This deficit is evident in the share of the population who do not have a tertiary education, and the share who left secondary education early, relative to the UK and Republic of Ireland (see Figure 8). Even compared to other UK regions, Northern Ireland has the highest proportion of lower secondary, and lowest proportion of tertiary educated within the working population.[59] This feeds through to the workforce, where Northern Ireland also has the highest proportion with no basic qualifications, at almost double the UK average, shown in Table 4.[60]

3.4.3 Two main reasons for Northern Ireland's poor educational achievement have been provided. The first is an attainment gap, where too many individuals leave school early without the skills they need.[61] There is evidence that this lack of basic skills in literacy and numeracy amongst school leavers, harms the productivity of small and medium-sized enterprises in Northern Ireland.[62] The second is the emigration, or 'brain drain',

[53] Roper and Hewitt-Dundas, 2001
[54] Johnston *et al.*, 2015; Catalyst Inc, 2018
[55] Crafts, 1995
[56] Hitchens, Wagner and Birnie, 1990
[57] Birnie and Hitchens, 1999, p.91-93
[58] FitzGerald and Morgenroth, 2020
[59] FitzGerald, 2019, p.2020
[60] Mac Flynn, 2016, p.23
[61] FitzGerald, 2019; FitzGerald and Morgenroth, 2020
[62] McGuiness, Bennett and McCausland, 2008

of tertiary educated individuals, with almost one third of graduates born in Northern Ireland subsequently living in Great Britain.[63] That most graduates do not return, unlike the Republic of Ireland, where around one third do return, suggests Northern Ireland misses out on the potential productivity benefit of retaining these graduates.[64]

Figure 8: Educational Achievement, Population Aged 30-34, 2017

Source: FitzGerald and Morgenroth, 2020, p.16.

Table 4: Percentage of 16-64 with no NVQ level Qualifications by UK Region, 2015

	Percentage with no NVQ
Northern Ireland	**16.3**
West Midlands	13.0
Wales	10.5
North East	10.4
North West	9.8
Yorkshire & Humber	9.8
Scotland	9.0
UK	*8.8*
East Midlands	8.0
East of England	8.0
London	7.4
South East	6.3
South West	5.5

Source: Mac Flynn, 2016, p.23.

[63] FitzGerald, 2019, p.204
[64] FitzGerald, 2019, p.204

3.4.4 This human capital deficit could have important implications for closing Northern Ireland's productivity gap. The low level of skills has been linked to the problem of a low skills equilibrium, where the Northern Ireland economy is locked into a situation where there is both a supply and demand problem for skills, resulting in low value-added output.[65] It has been estimated that if educational attainment in Northern Ireland was at the same level as in Scotland (a lower proportion of lower secondary educated, and a higher proportion of tertiary educated), the benefits accruing through increased productivity would equal an additional 0.25 per cent added onto Northern Ireland's average annual growth in GDP.[66]

3.4.5 Addressing this problem may be particularly important for attracting foreign direct investment (FDI) to Northern Ireland, which has been central to raising productivity in the Republic of Ireland. Lower levels of human capital has been highlighted as a key factor in reducing Northern Ireland's ability to attract FDI.[67] Even if Northern Ireland were able to attract higher levels of FDI, it may not have the absorptive capacity to allow domestic firms to benefit from spillover effects from this, due to the relatively low level of skills in the regional economy.[68]

3.4.6 An area where it is more difficult to measure differences in human capital is the quality of management in Northern Ireland.[69] A previous international comparison found that management in Northern Ireland scores more poorly than in Great Britain when measured against best practice.[70] Across the global sample, higher human capital is associated with better quality management, which in turn is associated with better firm performance. Family owned and managed firms score more poorly, with there being a 'long tail' of badly managed family firms.[71] This suggests a managerial skills gap is a further area where firms in Northern Ireland are missing out, harming productivity.

3.4.7 Deficiencies in management may not simply be limited to skills: culture may also play a significant role in low productivity.[72] Past evidence suggests Northern Ireland management was relatively cautious in product and corporate strategies.[73] This can be linked to the issue of satisficing, where firms set themselves a minimum acceptable level of achievement, rather than seeking to maximise profits.[74] There is evidence that satisficing has been a long-run problem for productivity in the Northern Ireland economy.[75] More recently, a shortage of "productive entrepreneurship" has been identified, with a lower rate of business start-ups than the UK average.[76] This may reflect a lack of ambition, with firms and citizens in Northern Ireland being content with relatively lower levels of productivity, due to relatively higher levels of happiness.[77]

65 Mac Flynn, 2017
66 FitzGerald, 2019, p.207
67 Siedschlag and Koecklin, 2019
68 Goldrick-Kelly and Mac Flynn, 2018
69 Isles and Curthbert, 1957; Hitchens, Wagner and Birnie, 1990
70 Bloom and Van Reenen, 2010
71 Bloom and Van Reenen, 2010
72 Hitchens, Wagner and Birnie, 1990
73 Birnie and Hitchens, 1999, p.44
74 Simon, 1959
75 Jordan, 2020
76 Brownlow, 2013, p.305
77 Hitchens, Wagner and Birnie, 1990, p.245-246

Together, this raises the question of whether improving skills alone is enough to address the productivity gap, or if other areas related to human capital must also be addressed.

3.4.8 The evidence presented for the role of human capital in Northern Ireland's productivity problem is strong. Northern Ireland's workforce appears weak in both basic skills, and its share of higher skills. That management also lags behind best practice may exacerbate the deficiencies of the workforce, while a lack of ambition may create further barriers to productivity improvements. Yet there has been relatively little work demonstrating where in the regional economy this lack of skills is most detrimental. Furthermore, it has been highlighted that even if policymakers are able to raise educational achievement, the high exodus rate of young people, and their failure to return, may mean that the benefits accrued from investment may fail to be experienced by Northern Ireland.[78] Further research is therefore needed on which types of firms and sectors have the greatest managerial skills gap, and which sectors are hurt most by Northern Ireland's brain drain, alongside the role of culture.

3.5 Infrastructure

3.5.1 Compared to other areas, the role of infrastructure in closing Northern Ireland's productivity gap has received less emphasis. Yet physical connectivity has been shown to be an important driver of productivity growth across the UK's regions.[79] A recent CBI report highlighted some of the issues surrounding UK infrastructure and regional productivity, including the importance of transport links between regions and cities outside of London, as well as other infrastructure and connectivity priorities, such as mobile connectivity.[80] Northern Ireland is highlighted as a region needing greater investment in infrastructure and connectivity to help drive productivity growth, although the lack of available data means comparisons with other UK regions are limited.[81]

3.5.2 Transport is the area of infrastructure which has been directly linked to Northern Ireland's productivity gap. Relatively low public capital expenditure on transport infrastructure has been highlighted as contributing to Northern Ireland's poor productivity performance.[82] While 1.0 per cent of the UK's GDP was spent on transport infrastructure in 2016, the equivalent figure for Northern Ireland was only 0.6 per cent.[83] It is argued this infrastructure gap reflects a long-run pattern,[84] which can be traced back to Northern Ireland's earliest days.[85] This raises the question of whether a transport infrastructure gap continues to contribute to productivity shortfalls, particularly in sectors which are most reliant on this physical form of connectivity.

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78 FitzGerald and Morgenroth, 2020
79 PwC, 2019
80 CBI, 2017
81 CBI, 2017, p.51
82 Fitzgerald and Morgenroth, 2020
83 Fitzgerald and Morgenroth, 2020, p.14
84 Harris, 1991, p.94; Fitzgerald and Morgenroth, 2020, p.15
85 Jordan, 2020

3.5.3 While transport infrastructure has received the most attention, there is evidence to suggest other utilities, such as internet connectivity, energy, and water and sewerage, may play a role in Northern Ireland's productivity gap. An example is water and sewerage infrastructure. In its 2020 Annual Report, Northern Ireland Water highlighted that a lack of investment meant there were 116 towns and cities across Northern Ireland, including Belfast and Derry~Londonderry, where the water and sewerage system was operating beyond its designed capacity, placing a constraint on economic development and growth.[86] The extent of constraints in other utilities is unclear. There is evidence that recent improvements have been made in areas such as internet connectivity, improving Northern Ireland's competitiveness.[87] Whether this will help address the productivity problem is unknown.

3.5.4 As the discussion of Northern Ireland's geographic peripherality highlighted, higher transport costs can be a drag on the region's productivity. Any deficiencies in infrastructure, whether transport or utilities, can be seen as magnifying any existing peripherality disadvantage. The link between infrastructure and productivity has not been investigated in detail for Northern Ireland. Transport infrastructure has received some attention, but further research is needed on which other areas of infrastructure may pose a constraint on productivity growth, and which sectors of the economy would benefit most from infrastructure improvements. Identifying and solving infrastructure problems provides the opportunity for regional catch-up, but still requires firms and individuals to take advantage of this, which may be constrained by other productivity issues. Any discussion of infrastructure will also take place within the context of addressing climate change, a central issue in the Northern Ireland Executive's forthcoming Programme for Government.[88]

3.6 Public Policy

3.6.1 Public policy is an important part of explaining the persistence of Northern Ireland's productivity gap. Northern Ireland has a regional government based at Stormont, the Northern Ireland Executive, which has a wide range of policy areas devolved to it from the UK government at Westminster. Table 5 shows the policy landscape for Northern Ireland, including the non-governmental and business organisations that interact with policy. At a regional level, there are 8 government departments within the Northern Ireland Executive, with the Department for the Economy (DfE) having primary responsibility for devolved economic policy. DfE replicates most of the policymaking powers held by the Department for Business, Energy and Industrial Strategy (BEIS) of the UK government. It includes economic strategy, enterprise policy, innovation and R&D, higher education, and employment and skills programmes. It also has responsibility for administering schemes such as the European Social Fund and European Regional Development Fund in Northern Ireland.

[86] Northern Ireland Water, 2020, p.43
[87] Johnston, McCausland and Stewart, 2020
[88] Northern Ireland Executive, 2021

Table 5: Northern Ireland's policy landscape

Regional	**Northern Ireland Executive** Devolved NI government, with 8 departments *Department for the Economy (DfE)* • Primary responsibility for policy relating to the local economy *Other government departments:* • Executive Office • Dept. of Agriculture, Environment & Rural Affairs (DAERA) • Department for Communities (DfC) • Department of Education (DE) • Department of Finance (DoF) • Department of Health (DoH) • Department for Infrastructure (DfI)	**Non-departmental public bodies** *Invest NI* • Regional business development agency and a non-departmental public body *InterTradeIreland* • Cross-border trade and business development body ***Non-governmental organisations*** *Trade Bodies and Associations* • CBI NI • NI Chamber of Commerce and Industry • Manufacturing NI • Retail NI • Federation of Small Businesses NI *Entrepreneurship* • Enterprise NI • Women in Business NI • Social Enterprise NI • Catalyst Inc.
Sub-regional	**Local Government** *11 Local Councils* • Responsible for local economic development	***Non-governmental organisations*** • Local Enterprise Agencies • Local Chambers of Commerce

3.6.2 DfE oversees the work of Invest NI, which is Northern Ireland's economic development agency. Invest NI was created in 2002 as a single organisation to replace the Industrial Development Board, the Local Enterprise Development Unit, and the Industrial Research and Technology Unit.[89] Invest NI's purpose is to deliver the Executive's economic development strategies, and its overall aims include increasing productivity and export levels, attracting inward investment, and stimulating a culture of entrepreneurship and innovation.[90] A further relevant non-departmental public body is InterTradeIreland, co-sponsored by DfE and the Republic of Ireland's Department of Enterprise, Trade and Employment, which focuses on helping SMEs grow and engage in cross-border trade.

3.6.3 While productivity is directly within the DfE's remit, other NI Executive departments are responsible for areas of policy relevant to Northern Ireland's productivity problem, such as the Department for Education (DE), Department for Communities (DfC), and the

[89] Brownlow, 2020, p.416
[90] Invest NI, 2021

Department for Infrastructure (DfI). There are also a number of non-governmental organisations that operate at a regional level within Northern Ireland, including several which focus on promoting entrepreneurship, while there are a number of trade bodies and associations that represent the interests of different local sectors. At a sub-regional level, the 11 local councils within Northern Ireland have recently received policy powers relating to local economic development. Also at this level, there are 28 Local Enterprise Agencies that provide information and financial support to small businesses, and deliver publicly funded programmes. Finally, the most local level of business representation comes from local Chambers of Commerce that operate throughout Northern Ireland.

3.6.4 Improving Northern Ireland's relatively poor productivity has been placed at the centre of improving the economic wellbeing of its inhabitants by policymakers. Even prior to the recognition of the UK's current productivity puzzle, H.M. Treasury had already identified improving productivity as key to rebalancing the Northern Ireland economy.[91] The Northern Ireland Executive recently identified the need to improve the regional economy's competitiveness as a key priority area in its outcomes for its forthcoming Programme for Government,[92] although productivity receives little mention. Improving productivity is a central objective of the Department for the Economy's new strategic vision for the local economy, 'A 10X Economy – Northern Ireland's decade of innovation',[93] and is also an aim of the Belfast Region City Deal.[94] Yet policy interventions have so far been ineffective at addressing the productivity gap, with economic strategy documents having a poor track record for improving Northern Ireland's economic performance and productivity.[95]

3.6.5 For many decades, public policy in Northern Ireland focused predominately on manufacturing, and prioritised employment levels over productivity. Interwar industrial policy of the devolved Northern Ireland government at Stormont was heavily geared towards aiding the staple industries to stave off unemployment; but this hampered its ability to promote new, higher productivity industries.[96] Support for industry increased in scale post-war, but it was not until the 1960s that this translated into better economic outcomes, due to institutional changes which reduced conflict of interest problems, and saw more efficient allocation of public subsidies.[97]

3.6.6 Despite these improvements, the productivity gap in manufacturing remained for the rest of the twentieth century. Public expenditure per manufacturing employee was already three times higher in Northern Ireland than similarly supported areas in Great Britain by 1969.[98] Yet generous subsidies promoted less efficient use of factors of production, and primarily subsidised physical capital formation.[99] This created a

91 H.M. Treasury, 2011
92 Northern Ireland Executive, 2021
93 Department for the Economy, 2021
94 Northern Ireland Office, 2019
95 Birnie and Hitchens, 2001
96 Jordan, 2020
97 Brownlow, 2007, 2020
98 Harris, 1991, p.46
99 Crafts, 1995, p.24

situation where manufacturing in Northern Ireland in effect had "too much capital", with lower rates of capital utilisation and labour productivity.[100] This led to lower value added goods being produced with a relatively lower skilled workforce,[101] while high levels of government subsidy allowed low productivity firms to remain profitable, removing the incentive to change.[102]

3.6.7 During the 1990s and early 2000s, there was a movement away from capital subsidies for manufacturing, with government policy instead focusing on entrepreneurship and innovation, but competitiveness problems remained.[103] Attracting foreign direct investment (FDI) received greater emphasis, but Northern Ireland has failed to emulate the Republic of Ireland's success.[104] Foreign-controlled firms have driven the Republic of Ireland's high levels of productivity relative to the EU15, with foreign-controlled firms having a positive spill over effect on domestic firms, and the sectors which experienced high levels of FDI being those which outperform Northern Ireland by the greatest margin.[105] It has been the policy of successive Stormont Executives to reduce corporation tax in Northern Ireland, to compete with the Republic of Ireland in attracting FDI.[106] This has yet to take place, and there are questions over its feasibility and potential effectiveness in improving regional competitiveness.[107]

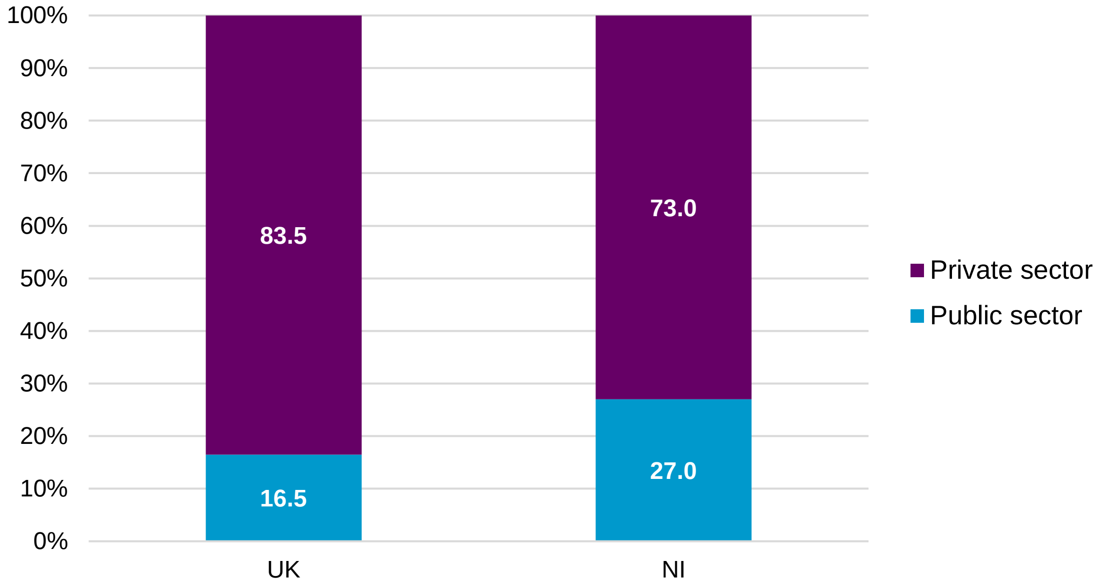
3.6.8 How successful existing policies have been in attracting FDI to Northern Ireland, and the effect on productivity, is unclear, as there is limited data available to judge the relative performance of domestic and foreign controlled firms in Northern Ireland.[108] As previously mentioned, Northern Ireland's skills gap may also limit the benefits from further FDI.[109] During recent decades, Northern Ireland has also been a recipient of EU funding, which has been used to assist business competitiveness and employment opportunities, including the European Social Fund and European Regional Development Fund, [110] but again it is not clear what effect this has had on productivity.

3.6.9 Northern Ireland's relatively large public sector, shown in Figure 9, is often viewed as contributing to the productivity gap. The public sector in Northern Ireland is relatively larger than elsewhere within the UK and Ireland,[111] although there are difficulties in measuring public sector output,[112] meaning its productivity performance is uncertain. The scale of this public expenditure, particularly from fiscal transfers made by central government, is suggested as harming productivity, by artificially raising wages, reducing the incentive to improve competitiveness, and absorbing skilled labour.[113]

[100] Hitchens, Wagner and Birnie, 1990, p.63-65
[101] Hitchens and Birnie, 1994, p.105-106
[102] Hitchens, Wagner and Birnie, 1990, p.178
[103] Brownlow, 2020
[104] Brownlow, 2013, 2020
[105] Goldrick-Kelly and Mac Flynn, 2018
[106] Goldrick-Kelly and Mac Flynn, 2018, p.36
[107] Birnie and Brownlow, 2017
[108] Goldrick-Kelly and Mac Flynn, 2018, p.35
[109] Goldrick-Kelly and Mac Flynn, 2018; Siedschlag and Koecklin, 2019
[110] Murphy, 2011; Nice *et al*., 2021
[111] Goldrick-Kelly and Mac Flynn, 2018
[112] Mac Flynn, 2016
[113] FitzGerald and Morgenroth, 2020

This has led to the view that public expenditure is 'crowding out' private investment in Northern Ireland.[114] An alternative view is that Northern Ireland's large public sector is not necessarily harmful for economic performance, given the relative success of the Nordic economies where public spending is high.[115] It is therefore the effectiveness of public policy, and the ability to build a successful private sector, which has a greater influence on competitiveness, rather than simply the size of the public sector.[116]

Figure 9: Public and private sector employment, 2019, percent



Notes: Figures for Northern Ireland calculated as an average for 2019. Figures rounded to one decimal place.
Sources: For UK: ONS, 2020b. For Northern Ireland, NISRA, 2020.

3.6.10 While improving the competitiveness of the Northern Ireland economy has been a central aim of policymakers for many decades, there is little evidence to suggest policy interventions have been successful in closing the productivity gap. Part of the explanation may be that, while improving productivity is often included as an aspiration within economic strategy documents, it is rarely used as a means to evaluate the success of policies or measure outcomes. Another part of the explanation may be that the problems faced by the Northern Ireland economy were incorrectly diagnosed in the past,[117] which reinforces the need for a wide evidence base on the productivity problem to inform policy. The policymaking process may also suffer from an institutional bias towards thinking in terms of policy silos, which prevents opportunities for joined-up

[114] CBI, 2017
[115] Brownlow and Birnie, 2018
[116] Brownlow and Birnie, 2018
[117] Brownlow, 2020

policies to address productivity.[118] Finally, the wider institutional context that policies develop and operate within may determine their ultimate success.[119]

3.7 Institutions and Governance

3.7.1 Institutions are the "humanly devised constraints that shape human interaction", have been described as "the underlying determinant of the long-run performance of economies",[120] and are seen as central to explaining Northern Ireland's long-run economic backwardness.[121] Northern Ireland has a unique history within the UK of possessing a devolved government for the majority of the past 100 years. These devolved institutions, and how they interact with other local institutions and governance structures, play an important role in understanding the persistence of Northern Ireland's productivity gap. Throughout the past century, there is evidence that institutions have limited the effectiveness of efforts to improve the competitiveness of the local economy, although direct evidence of how institutions have affected productivity is more limited.

3.7.2 During the first period of devolution, from 1920-1972, there is evidence that the nature of regional institutions did affect productivity, with financial support being directed towards better politically connected firms, rather than those which might increase productivity.[122] Even with the introduction of Direct-Rule, there is evidence that the effectiveness of industrial policy interventions continued to be limited by the institutions present.[123] While devolution was restored following the Good Friday Agreement, institutions have continued to influence policy interventions, most notably in the recent Renewable Heat Incentives scheme, where institutional and governance failures contributed to policy failures.[124] The OECD has also raised the issue of strengthening governance arrangements as central to tackling Northern Ireland's skills problem.[125] While the effect of institutions is difficult to measure, it is clear they continue to play a crucial role in determining the trajectory of Northern Ireland's long-run economic performance.

3.7.3 The legacy of the Troubles, and the interaction between institutions and political stability in Northern Ireland, may also pose a constraint on closing the productivity gap. The Troubles saw public expenditure used to stabilise the regional economy, with policymakers attempting to balance economic and non-economic considerations, rather than maximising productivity.[126] Legacy issues relating to a divided society have been linked to the emigration of high skilled labour, and the failure to attract these

[118] Nelles *et al*., 2020
[119] Brownlow, 2020
[120] North, 1990, p.3 & p.107
[121] Brownlow, 2013, p.306
[122] Brownlow, 2007; Jordan, 2020
[123] Brownlow, 2016
[124] McBride, 2019; Brownlow, 2020, p.417-418
[125] OECD, 2020
[126] Brownlow, 2013, p.296

emigrants back.[127] There is also evidence that higher levels of long-run health problems in Northern Ireland, such as post-traumatic stress disorder, are linked to the Troubles, and that these lower individuals' productivity while at work.[128] While Northern Ireland's productivity gap was not a direct consequence of the Troubles,[129] its long-lasting effects pose a challenge in addressing it.

3.7.4 Labour relations is a further area where institutions can affect productivity. These have been historically poor in Northern Ireland, with a greater propensity for strikes relative to Great Britain, when the differing industrial structure is adjusted for.[130] There is evidence that wages in manufacturing were historically high relative to Great Britain, despite the lower level of productivity, suggesting a weak link between the demand for labour and wages.[131] Northern Ireland has an institutional framework for labour relations shaped by both its British and Irish foundations, but the Troubles meant that labour reforms carried out by the UK government during the 1980s did not extend to Northern Ireland.[132] More recent research suggests a link between labour market deregulation, which promotes flexible employment, and a slowdown in productivity growth across certain sectors in Northern Ireland.[133] It is therefore unclear how labour institutions affect productivity in Northern Ireland: this issue requires further investigation.

3.7.5 Institutions are the most difficult aspect of Northern Ireland's productivity problem to measure. Direct links to the productivity gap can be difficult to make, due to the mainly qualitative evidence available for how institutions function and affect outcomes. The available evidence does suggest that institutions are one of the most important long-run explanations of Northern Ireland's productivity gap. Fully understanding institutions, and how they may link to different causes of the productivity gap, therefore presents a challenge to addressing the productivity gap, and confirms that further research is needed on their role in the regional economy.

[127] Fitzgerald and Morgenroth, 2019, 2020
[128] Ferry *et al.*, 2015
[129] Brownlow, 2013
[130] Black, 1987
[131] Borooah and Lee, 1991
[132] Brownlow, 2013
[133] Mac Flynn and Wilson, 2018

4. Key Issues

4.1. It is clear from the preceding discussion that there is no single explanation for Northern Ireland's productivity gap. It has several causes, which are interlinked, but which existing research has predominately examined in isolation. This means there remain unanswered questions as to how these causes of the productivity gap interact, and how they should be addressed, including where policy interventions could be most effective. Further research is therefore required to fully understand the productivity challenge faced in Northern Ireland.

4.2. How each of the eight themes of the Productivity Institute are linked to Northern Ireland's productivity challenge is outlined below, with Box 4.1 providing the key areas of focus for the Northern Ireland Productivity Forum, and Box 4.2 providing questions for future research.

4.3. **Macroeconomic Trends and Policy** – Northern Ireland's poor productivity is not a new phenomenon, and reflects a long-run trend, with it persistently being one of the poorest performing regions within the UK. Improving productivity has continued to be an aspiration of policymakers, but the reasons why policy interventions have persistently been ineffective are unclear, although are likely linked to institutions. That there is no single cause of the productivity gap means there is scope for policy to address Northern Ireland's weaknesses, but their interlinked nature means any policy interventions will need to be coordinated.

4.4. **Geography and Place** – Peripherality plays a role in Northern Ireland's productivity performance. While the importance of 'hard' peripherality has decreased over time, the consequences arising from Brexit may see this take on renewed importance. There is also little known about how peripherality combines with other economic issues to hinder competitiveness, and particularly whether it contributes to an ideas gap. The productivity gap is not evenly spread within Northern Ireland: most areas perform poorly, with the highest levels of productivity found in Belfast and Mid Ulster, but still below the UK level. What factors drive this geographic distribution have not been fully explored, with more detailed data at local authority level needed to address this.

4.5. **Human Capital –** Issues related to human capital are very strongly linked to Northern Ireland's productivity problem. An attainment gap clearly exists, where too many individuals leave school without the skills they need. There is also a brain drain, which leaves Northern Ireland with a lower proportion of the population with tertiary education. Finally, there is evidence to suggest a managerial skills gap, which may be exacerbated by issues around culture, leadership, and ambition. Together these deficiencies in skills pose a major challenge for policymakers when addressing productivity, but include aspects which are under-researched and require further examination.

4.6. **Organisational Capital** – There is relatively little evidence available on organisational capital and the local business base, particularly at a sectoral and firm level. This is exacerbated by the lack of data collected for individual sectors, and a lack of detail on how productivity is distributed across firms within these. As economic structure only accounts for around half of Northern Ireland's productivity gap, it suggests a greater understanding is needed of within-sector productivity gaps, and to what extent organisational capital may contribute to this. Part of the explanation may be related to the managerial skills gap, where management practices of some firms are creating a barrier to productivity growth.

4.7. **Knowledge Capital –** The level of knowledge capital in local firms has been identified as a particular weakness, particularly investment in R&D, and potentially exacerbated by low levels of human capital. Increasing investment in innovation has been the focus of more recent public policy, but the effectiveness of policy interventions, and why certain firms continue to underinvest, is unclear. There is also a need to better understand how lower productivity firms can benefit from the growth in Northern Ireland's knowledge economy.

4.8. **Social, Environmental and Technological Transitions –** There has been little research linking productivity in Northern Ireland to major transitions, such as an ageing population or climate change. The digitalisation of the economy has been linked to Northern Ireland's competitiveness, but the implications for productivity in particular sectors have not been explored. The Covid-19 pandemic, with the rapid adoption of technology and potential for working patterns to permanently change as a result, poses further questions of how productivity will be affected.

4.9. **Institutions and Governance –** Local institutions have been suggested as key to explaining Northern Ireland's long-run productivity gap, and why public policy interventions have been ineffective. Institutions provide a link between the different explanations of the productivity gap, suggesting policy must address their role if other policy interventions are to be successful. Further evidence is required to understand the causal mechanism between institutions and productivity, in order to design appropriate policy responses, while a renewed emphasis on productivity as a policy priority is needed.

4.10. **Measurement and Methods –** While in the past Northern Ireland had a greater availability of data compared to other UK regions to measure productivity, the lack of disaggregated sectoral and firm level data restricts our ability to understand the complex nature of the productivity problem in Northern Ireland. This is a major issue, if well-designed policies to address the productivity gap are to be implemented and their effectiveness measured.

Box 4.1: Key areas of focus for the Northern Ireland Productivity Forum

1. Articulating the importance of productivity to government and wider society, including challenging existing misconceptions about what improving productivity means for jobs and businesses.
2. Exploring the role of skills, culture, leadership and ambition in improving productivity at an individual and firm level.
3. Identifying the potential impacts on productivity of the Covid-19 pandemic, Brexit, environmental targets, and other major transitions.
4. Identifying the main barriers faced by business in raising productivity levels.

Box 4.2: Research questions

1. The collection of disaggregated data to measure productivity at both sectoral and firm levels within Northern Ireland.
2. How does the 'managerial skills gap' vary by sector within the Northern Ireland economy, and how important is this for explaining the productivity gap?
3. How do the key issues that create barriers to productivity growth vary by sector?
4. How does peripherality interact with knowledge capital, and to what extent does this contribute to Northern Ireland's productivity gap?
5. Is productivity growth affected by an infrastructure gap, and if so, which sectors are most affected?
6. How effective have Stormont's recent policy interventions been at promoting productivity growth, and do institutions pose a barrier?

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