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Productivity on the Island of Ireland – A tale of three economies

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Productivity on the Island of Ireland – A tale of three economies*

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ABSTRACT
Northern Ireland (NI) and the Republic of Ireland (ROI) have experienced markedly different economic trajectories in the century since one part of the island gained independence from the United Kingdom. This paper seeks to examine the performance of both of these economies with regard to productivity. ROI began as the weaker of the two regions but a significant influx of FDI has radically changed that relationship. ROI has advanced in absolute and relative terms whereas productivity in NI has stagnated over the past several decades. There is substantial variation in the performance of sub regions within both economies; however, it is within sectoral performance where some of the largest gaps emerge.

In order to get some idea of the impact of FDI we isolate firms in ROI under foreign control from the rest of the economy. NI as a whole underperforms both the foreign and domestically controlled sectors of the ROI economy and looks similar to the average European domestic economy. The foreign controlled sector in ROI outperforms its European comparators, often dramatically so. However, there are questions as to how much of this performance can be attributed the behaviour of multi-national corporations particularly with regard to their tax arrangements. The domestic sector of ROI appears to perform relatively well in productivity terms against its European comparators but distortions appear to exist in particular sectors especially since 2014. Data are suggestive of a three-tier economy on the island, with an apparently high productivity foreign controlled sector in ROI likely providing some spill over into its modestly performing domestic economy, while NI is a comparative laggard.

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1. INTRODUCTION

In this paper we compare and contrast the two economies on the island of Ireland by examining the evolution of productivity in both regions. Northern Ireland (NI) and the Republic of Ireland (ROI) form two distinct economic entities on the island of Ireland. Despite their common origin and isolated geographical proximity, they have experienced markedly different economic trajectories in the century since one part of the island gained independence from the United Kingdom. We focus on the recent economic performance of both economies and in particular how economic performance has differed in the last 20 years. To this end we examine productivity in both economies, including how it has evolved and how such diverse experiences can be explained.

The scale of foreign direct investment (FDI) into ROI has dramatically altered economic output in recent years, and has opened a chasm between the two economies in terms of output per capita. The structure of output and employment has also changed significantly in ROI compared to both NI and the rest of the EU. We examine how much of the gap in productivity between NI and ROI can be explained by FDI and whether the scale of FDI also disguises weaknesses in the ROI economy. While FDI may be concealing weaknesses in the domestic economy in ROI, it is concealing very little in NI. The role of FDI in industrial and enterprise policies, both North and South is discussed in the light of these findings.

In Section 2 we give a brief overview of the intertwining economic history of both economies on the island of Ireland, and the last 20 years in particular. In Section 3 we examine these most recent trends in more detail, specifically with regard to regions and industries. In Section 4 we look at the role of foreign firms in ROI and how productivity differs from domestic firms, once again with regard to sectors. Section 5 is a discussion about the policy implications of these findings with regard to the role of FDI and the evolution of an all-island economy. Section 6 concludes.

2. HISTORICAL CONTEXT

The Government of Ireland Act of 1920 split Ireland into two distinct political entities existing within the United Kingdom of Great Britain and Ireland. Following the signing of the Anglo-Irish Treaty in 1922, the Irish Free State Constitution Act further partitioned the two political entities on the island with Southern Ireland becoming a dominion of the British Empire and Northern Ireland (NI) remaining as a self-governing region of the United Kingdom. The political partition of the Island of Ireland also had profound impacts for the two separate economies that were created and the subsequent interaction between them.

NI began life as the more prosperous of the two regions on the Island of Ireland and the centre of economic gravity was firmly located in and around Belfast with its large linen and ship-building industries (O'Gráda, 1999). The Irish Free State and the subsequent state of Ireland (which proclaimed itself a Republic in 1949) experienced a period of stagnation from the 1920s until the late 1950s. The Republic of Ireland (ROI) economy adopted a protectionist trade policy which impacted particularly on its trade relationship with the United Kingdom and, by extension NI. O'Rourke (2016), however, points out that the impact of ROI's trade policies in the 1930s can often be overstated. Following the Great Depression, governments around the world moved toward more insular trade policies and ROI was not an exception. The real difference between ROI and NI in this period was the absence of a significant scale of industry in ROI. ROI was still very dependent on agriculture and therefore did not benefit from the boom in output that accompanied the second World War, which provided a boost in NI.

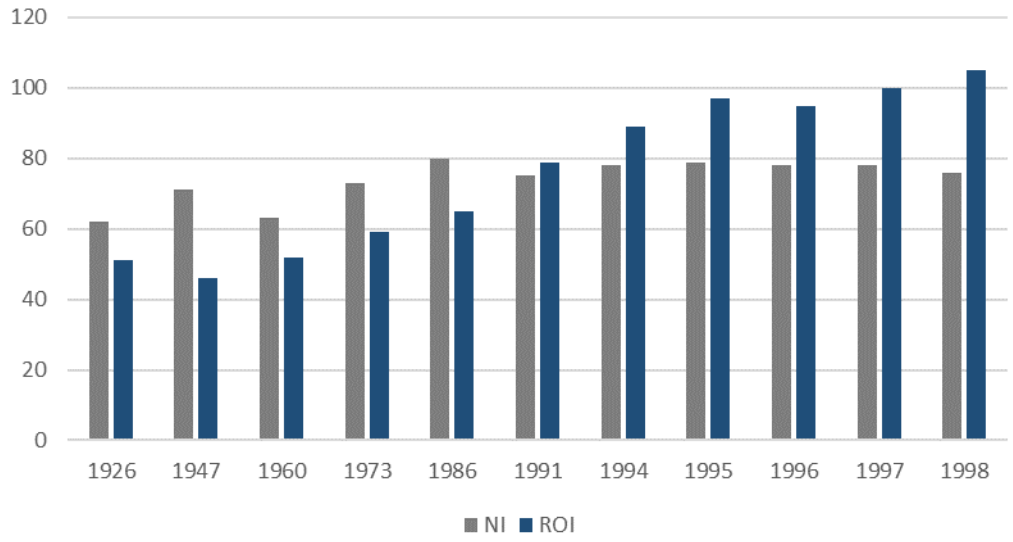
While output per head in NI exceeded that of ROI in the years following the creation of the Free State, as Brownlow (2012) points out there was still a significant gap in output per head between NI and the UK. As Chart 2.1 shows NI and ROI economies underperformed the UK average for most of the middle part of the last century. Brownlow (2007) attributes the under-performance of the NI economy up until the second world war to an industrial strategy that encouraged rent-seeking and stifled innovation. This included political interference in the disbursement of grants to the benefit of existing industries. A change of policy in the 1960s saw the NI economy become more dynamic and outward focused, yet this did little to close the gap with the rest of the UK as Chart 2.1 shows. This was because the reforms of the mid 1960s were quickly eclipsed by the onset of political conflict in the 1970s. Brownlow (2014) finds that policy post 1970 was shifted toward more generous

state subsidies in order to stem a tide of disinvestment related to the conflict.

However, Brownlow (2012) also points out that the impact of the conflict can often be overstated given that NI was in a comparatively weak position before the conflict took hold. Northern Ireland experienced deindustrialisation through the 1970s and 80s along with the rest of the UK and not disproportionately more so than any other UK regions. If anything, the figures would indicate that the period of conflict stunted NI's growth and prevented it from taking advantage of even some of the international investment which eventually played such a significant role in the ROI.

In ROI, the 1950s is commonly referred to as a 'lost decade' with the economy missing out on much of what is deemed to be western Europe's golden age of economic growth from 1950 to the early 1970s (Temin, 2002; Grafts, 1995). The ROI economy did begin to open up in the 1960s and this change of trade policy was coupled with significant investment by the state in the production and manufacturing sectors. While growth in output per head did pick up pace, convergence to European living standards would elude ROI for quite some time. O'Rourke & O'Gráda (1996) attribute ROI's underperformance from 1945-88 to the small size of the economy, an over-reliance on agriculture, rent-seeking in industrial relations and poor investment decisions. O'Rourke (2016) argues that recurrent crises in the balance of payments led to a series of boom and bust cycles in the ROI economy. ROI was also too slow to remove protectionist policies post-1950 and therefore remained too dependent on the health of the UK economy for growth. EEC membership in 1973 eventually began to unwind this relationship.

Chart 2.1: Gross Domestic Product per Capita ROI and NI 1926-97 as % of UK Average (selected years)

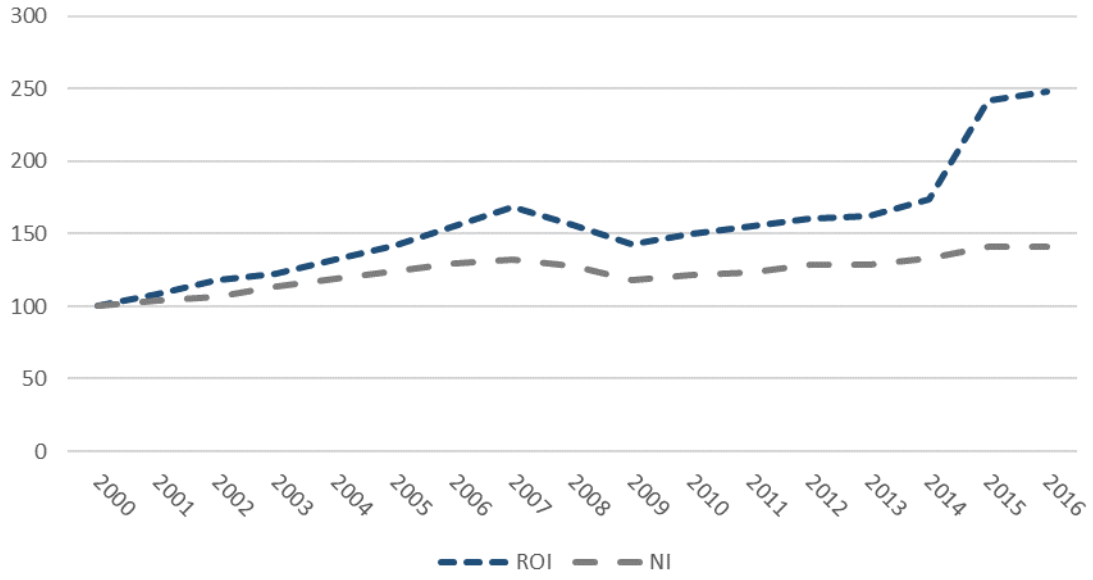


Source: Birnie & Hitchens (2001)

From the mid-1950s to the early 1980s NI was able to match the ROI's rate of growth and thus the gap between both economies remained constant. The late 1980s saw an eventual convergence of living standards between both economies due to a decline in NI and an upswing in ROI growth. The early 1990s saw ROI move beyond the UK average in output per head while NI began to recede and eventually stagnate relative to Great Britain.

The years following 1998 are often thought of as NI's 'golden years', but in fact all the NI economy managed to do was to keep pace with the growth of the UK average, which is, by historical standards, a comparatively weak performance. Brownlow (2012) points out that much of the perceived economic success in NI in the early part of this century was due to a significant demand side stimulus caused by increased UK public spending. What accounted for the significant upturn in growth in ROI output per head in the 1990s? In essence, an influx of Foreign Direct Investment (FDI) in ROI coinciding with a recovery in the US economy and the creation of the European Single Market played a dominant role in lifting Irish growth rates over that decade (Barry, 2003; Buckley & Ruane, 2006). This Celtic Tiger era is generally considered to have ended in or around 2002. After that the economy moved more towards domestically fuelled growth in the middle part of the 2000s.

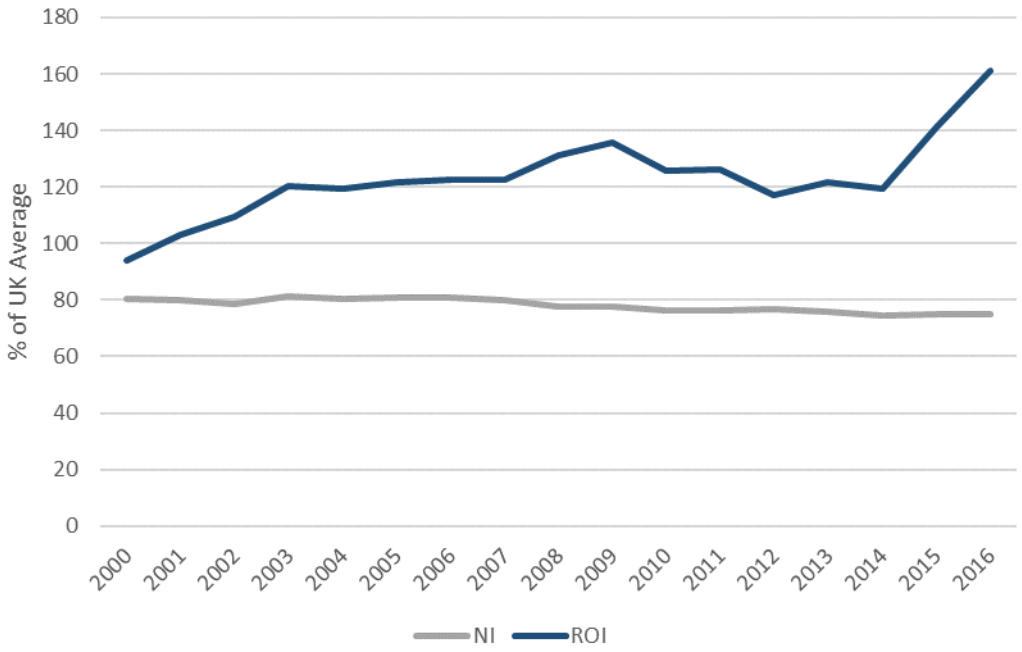
Chart 2.2: Nominal Gross Domestic Product ROI and NI 2000-2016



Source: Eurostat (2018a, 2018b)

The financial crash impacted on both economies quite significantly, but as chart 2.2 shows, both the experience of the crash and the recovery from it had markedly different impacts on the two economies. Both economies saw large declines in nominal output growth in addition to significant increases in unemployment although the ROI experienced a much greater scale of collapse in the latter. In NI much of the government expenditure stimulus that had sustained growth up to 2007 began to drain away and so it experienced a slow decline thereafter. Output per head began declining as a percentage of the UK average in 2007 and decreased marginally every year up until 2014. There has been no discernible increase in output per capita in NI since then. Up until 2009 output per head in the ROI continued to improve its position relative to the UK after which it suffered a relative decline up until 2014. Despite the post-crash reductions, output per head in ROI in 2013 was actually marginally higher than it had been in 2007 as a percentage of the UK average. The increases in output per head are magnified in 2015 and 2016 due to significant intellectual property related FDI inflows into the ROI national accounts (see NERI 2016).

Chart 2.3: Gross Domestic Product per Capita ROI and NI 2000-2016 as % of UK Average



Source: Eurostat (2018a, 2018b)

Overall, the historical context for both economies on the island for much of the 20th century is one of missed opportunities. The ROI arguably missed out on the golden age of European growth, particularly in the 1950s, due to domestic political decisions about trade and industrial policy. NI failed to use industrial policy to catch-up with other regions of the UK for the first half of its existence and then a period of conflict robbed it of the ability to take advantages of the same global opportunities which delivered such growth to ROI. However, the close of the last century saw ROI break way from both NI and the UK in terms of economic performance. In order to understand how the ROI and NI economies stand presently in terms of productivity we will examine the structure and make up of both economies. In particular, we need to understand how the structure of industry and the role of non-domestic enterprise can explain the scale of the gap that now exists between the two economies.

3. PRODUCTIVITY TRENDS

3.1 Productivity Measures

The previous section briefly described the recent progress of both economies in terms of Gross Domestic Product (GDP) per capita. This is a standard measure to compare productivity levels internationally and there is also greater access to historical data for

GDP. However, if we want to assess more recent productivity performance then indicators that are more useful are available. Firstly, GDP at market prices provides an appropriate measure for output in the economy as a whole; however, in measuring labour productivity, Gross Value Added (GVA) is more appropriate. Productivity measures based on GVA are less dependent on changes in the ratio between intermediate inputs and labour. GDP measures of productivity can misattribute changes in the structure of production to changes in the performance of production. The OECD (2001) uses the example of outsourcing, whereby a GDP based labour productivity measure "rises as a consequence of outsourcing and falls when in-house production replaces purchases of intermediate inputs".

GVA like GDP can be adjusted for scale either by population, workforce or the number of hours worked. The last of these, GVA per hour, is considered the most relevant measure of productivity. Per population, measures are widely used but they can obscure differences related to demographic and labour force participation issues. Measures of output adjusted for employment levels or number of jobs, allow for sectoral or industry-based comparisons of productivity but they do not take account of differing work and employment practices in territories. Output per hour worked therefore represents the most accurate picture of comparative economic performance. However, accurate measures of hours worked by industry are not always available, particularly when analysing sectors and industries beyond the basic level. Therefore, in the analysis that follows output per hour will be used as the preferred measure of productivity, but per capital and per employment measures will be used where such data are not available.

In making comparisons between NI and ROI, one of the most obvious difficulties to overcome is currency. This is especially relevant given the significant fluctuations in the exchange rate between the Euro (EUR) and the Great British Pound (GBP). For example, a steep devaluation of GBP occurred in 2008, followed by a slow decrease in 2012/13 and then another sharp drop in 2016. Such swings in currency values do represent market sentiment, but they not account for changes in the level of inflation. While the value of GBP to EUR may fall, the value of what 1GBP can buy in the UK may still be greater that the value of what 1 converted GBP can buy in ROI. Owing to this, international comparisons of productivity rely on a Purchasing Power Parity (PPP) adjustment, which accounts for currency differences based on the resources each currency can draw.

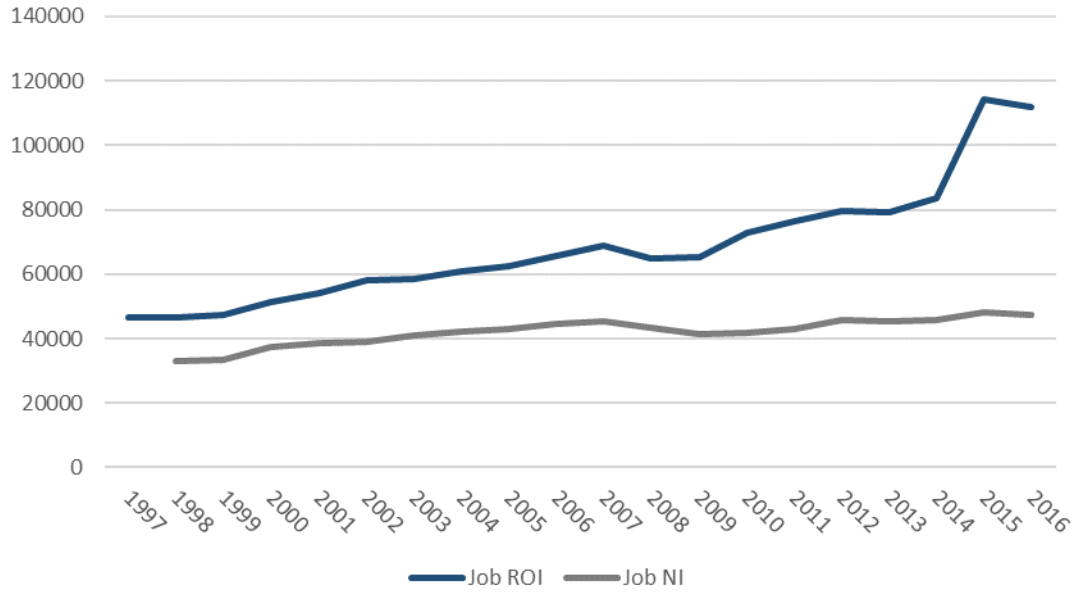
Eurostat provides a PPP framework for European comparisons of living standards in the

form of the Purchasing Power Standard (PPS). PPS is an artificial currency, which allows for cross-country analysis and we will use this currency to adjust the value of output levels between ROI and NI. Ideally, the PPS would be specific to NI but such regional price indices are not available so a UK PPS conversion is used. Furthermore, the PPS is a PPP adjustment, gleaned from the expenditure side of GDP, which uses consumer prices to make a comparison of living standards. The Office for National Statistics (2017), on the recommendation of Eurostat and the OECD, advise that a PPP adjustment 'from the *production side* – is recognised as being more appropriate for analysis of labour productivity at the industry level'. However, the ONS also notes that such Production PPPs are currently only in development and that for now an expenditure-based PPP adjustment is appropriate, if imprecise.

3.2 Recent Trends

Looking at Gross Value Added per job, Chart 3.1 shows a significant labour productivity gap between NI and ROI at the turn of century, which gently widens up to 2008. From 2008 onwards, the gap increases substantially before a level jump in output in ROI in 2015.

Chart 3.1: Gross Value Added per Job ROI and NI 1997-2016 (PPS)

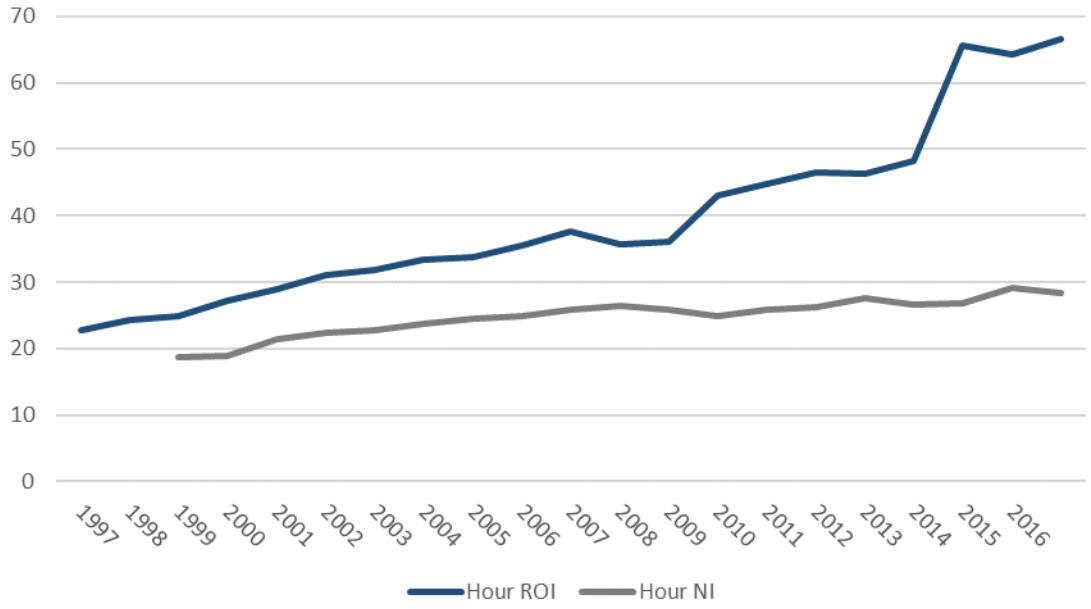


Source: Eurostat (2018a, 2018c) & ONS (2018a)

Chart 3.2 shows the same time series for GVA per hour worked and a very similar pattern emerges. It is worth noting that the gaps between NI and ROI in GVA per job and GVA per hour are smaller than that for GDP per capita shown in Chart 2.2. The smaller gap is not due to any substantial scale differences between GDP and GVA for NI and ROI. It is the

effect of using employment or hours worked rather than population that favours NI's performance.

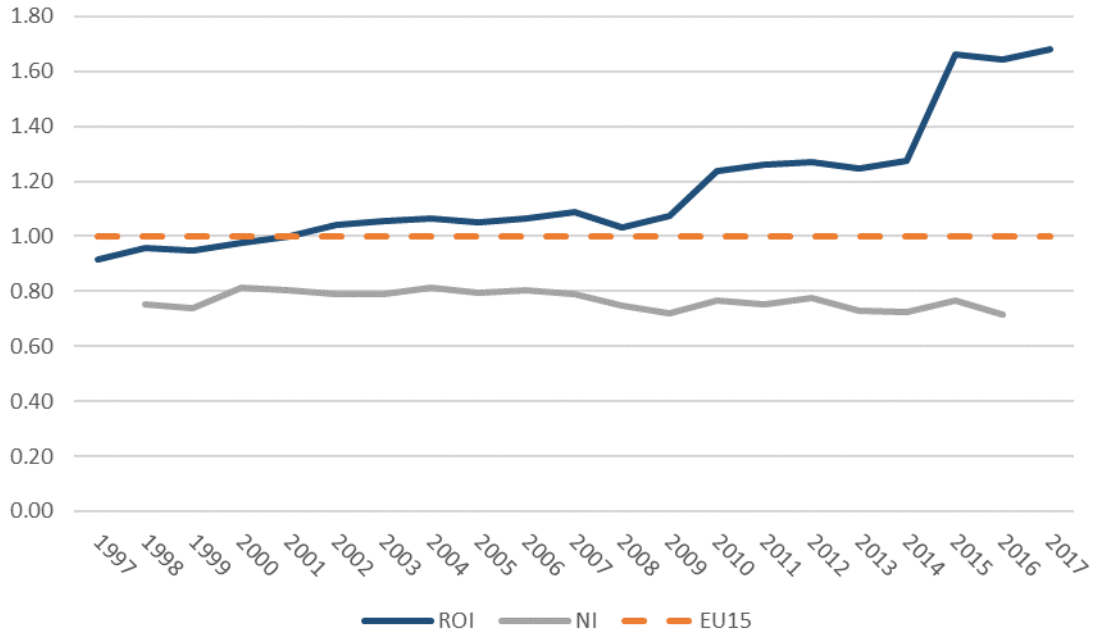
Chart 3.2: Gross Value Added per Hour ROI and NI 1997-2016 (PPS)



Source: Eurostat (2018a, 2018c) & ONS (2018a)

Chart 3.3 outlines GVA per hour worked in both NI and ROI as a percentage of the EU 15. This shows that the gap between NI and the EU remains relatively stable over the time with NI entering into slow decline in relative terms post 2008. However, ROI shows gradual improvement relative to the EU 15 up until 2007. Following a small blip in 2008, the rate of growth in labour productivity substantially increases even before the 2015 level jump in output occurs.

Chart 3.3: Gross Value Added per Hour ROI and NI 1997-2016 as % of EU Average



Source: Eurostat (2018a, 2018c) & ONS (2018a)

3.3 Regional Trends

Within both economies, there is a large variation in the performance of the sub-regions. Table 3.1 outlines the level of GVA per head of population for each of the NUTS 3 regions of ROI and NI adjusted to PPS. Data for 2014 is the latest available for both ROI and NI as the 2015 results for the Dublin and South West (which contains Cork city) regions of ROI are still considered to have anonymity issues. Table 3.1 shows that the best performing region has a level output per head over three and a half times that of the worst performing region. It is perhaps no surprise that Dublin is the best performing region on the island but the scale of its performance compared to many of the other regions, particularly those in NI, is noteworthy.

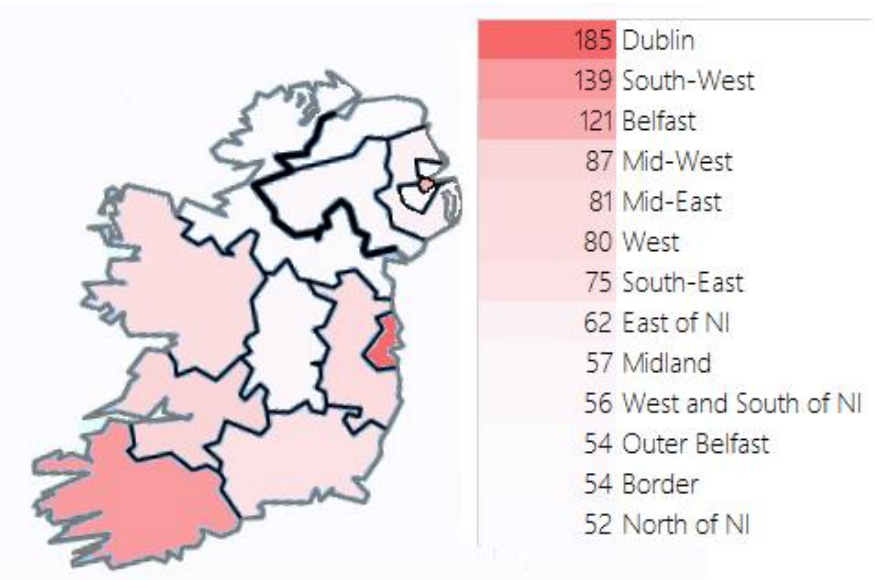
Table 3.1: Gross Value Added per Capita by ROI and NI Subregion 2014 (PPS)

Region/State	GVA/head
Dublin	56325
South-West	42301
Belfast	36950
ROI	**34551**
Mid-West	26434
Mid-East	24636
West	24475
South-East	22946
NI	**20245**
East of Northern Ireland	18898
Midland	17218
West and South of Northern Ireland	17120
Outer Belfast	16500
Border	16349
North of Northern Ireland	15706

Source: CSO (2018a) & ONS (2017b)

Of the 13 sub-regions on the island, Belfast is the only NI sub-region to make the top half of the table and the only NI sub-region which has a productivity level higher than that of the ROI average. Chart 3.4 shows how each region compares to the regional average on the island of Ireland. It also shows that the north, border and midlands areas of both NI and ROI have the lowest productivity levels. Without the Belfast sub-region, the productivity divide on the island would look much like the North/South division in prosperity that is frequently referred to in the UK.

Chart 3.4: Gross Value Added per Capita by ROI and NI Sub-region 2014 as % of All-Island Regional Average



Source: CSO (2018a) & ONS (2017b)

As Table 3.2 shows, Belfast is also the only sub-region of NI to have a productivity level higher than that of the EU15 average.

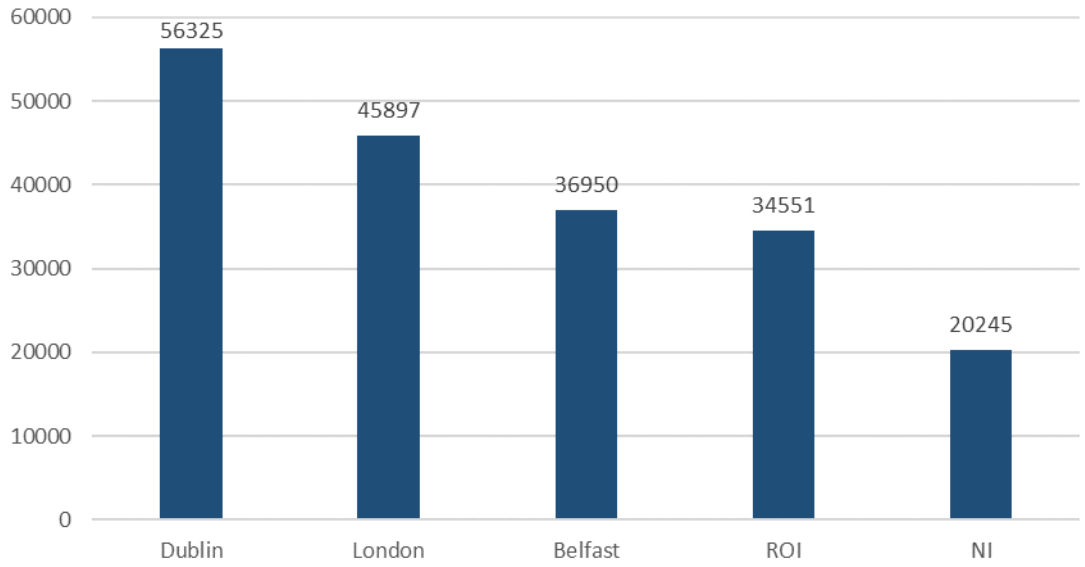
Table 3.2: Gross Value Added per Capita by ROI and NI Sub-region 2014 as % of EU Average

Region/State	% of EU15 Average
Dublin	208.6
South-West	156.8
Belfast	136.8
ROI	**128.0**
Mid-West	97.9
Mid-East	91.3
West	90.6
South-East	85.0
NI	**75.0**
East of Northern Ireland	70.0
Midland	63.8
West and South of Northern Ireland	63.4
Outer Belfast	61.1
Border	60.5
North of Northern Ireland	58.2

Source: CSO (2018a) & ONS (2017b)

As mentioned already, per head of population measures are not ideal for assessing true productivity levels, but they do give some indication of regional performance. The output of city regions tends to be over-stated as populations are calculated on a residence basis and output is measured at the workplace level. As cities tend to have larger populations of workers than residents, productivity performance measured by head of population is often over-stated. In Table 3.1 the Dublin region has an output per head of population one and a half times that of the Belfast region. Looking at equivalent data for the UK, the most recent figures show that the London region has an output per head of population only 1.2 times that of the Belfast region. While Dublin would be expected to have a greater level of productivity, the scale of the advantage it enjoys over Belfast is not matched within the UK regions.

Chart 3.5 Gross Value Added per Capita by selected ROI and UK Sub-region 2014 (PPS)

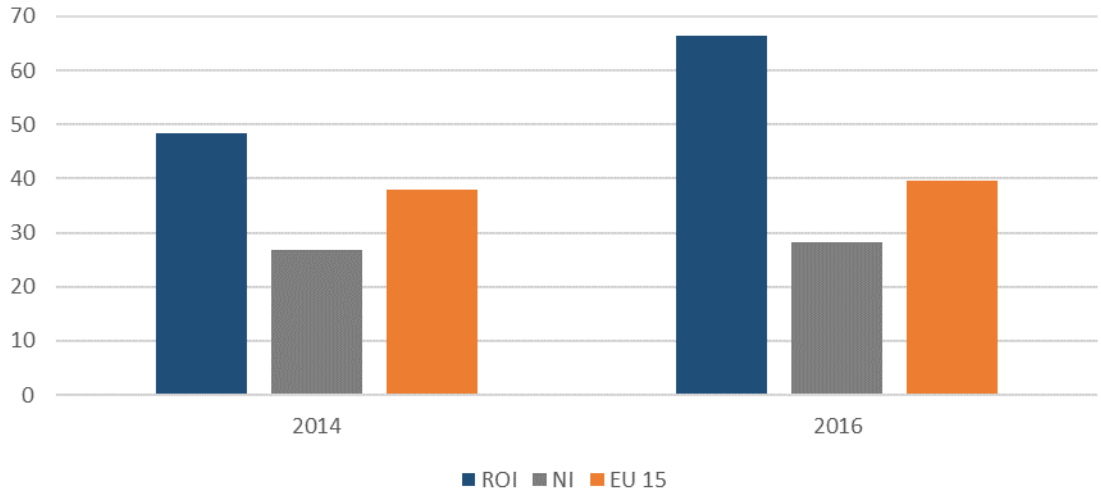


Source: CSO (2018a) & ONS (2017b)

3.4 Sectors

As Chart 3.6 shows, ROI had a significantly higher level of labour productivity in 2014 than both NI and the EU15, even before the effects of the level jump in output in 2015. However, labour productivity is not uniform across sectors and there is varying performance across the economy. The structure of both the NI and ROI economies will feed into these aggregate results and in that respect, there are a few important differences between the economies.

Chart 3.6 Gross Value Added per Hour ROI, NI and EU 15, 2014 and 2016 (PPS)



Source: Eurostat (2018a, 2018c) & ONS (2018a, 2018b)

As Table 3.3 shows, NI is far closer to the EU 15 than it is to ROI in terms of the structure of output by sector. The main area of difference between NI and the EU 15 is a comparatively smaller *Information and Communication* and *Financial and Insurance* sector and a comparatively larger state sector in NI. ROI stands out from both NI and the EU 15 in having a *Manufacturing* sector almost twice the size of either region. The *Construction* sector and *Wholesale and Retail* sector are also comparatively small while *Information and Communication* is almost double the level of the EU 15 and over three times that of NI.

Table 3.3: Share of Gross Value Added by Sector ROI, NI and EU 15, 2016

	NI	ROI	EU15
Agriculture, forestry and fishing	1.0	1.0	1.3
Industry	3.4	1.9	3.1
Manufacturing	15.4	34.7	15.7
Construction	6.3	2.8	5.3
Wholesale and retail trade, transport, accommodation and food	19.8	12.6	18.7
Information and communication	3.2	9.8	5.0
Financial and insurance activities	3.7	6.8	5.1
Professional, scientific and technical; administrative and support	7.2	11.5	11.3
Public administration, education, human health and social work	26.2	11.6	19.1
Other Service Activities	3.6	1.2	3.6

Source: Eurostat (2018a, 2018c) & ONS (2018a, 2018b)

However, when the share of output by sector is compared with the share of employment by sector in Table 3.4, several important differences emerge. Firstly, despite having a *Manufacturing* sector twice the proportion of output of that in NI and the EU 15, ROI has a smaller share of employment in this sector than either region. Similarly, the proportionately larger share of output devoted to *Information and Communication* and proportionately smaller share devoted to *Wholesale and Retail* in ROI are not reflected in employment shares. Similar results are also observed in *Agriculture* and *Construction* which favour a larger share of employment than output in ROI.

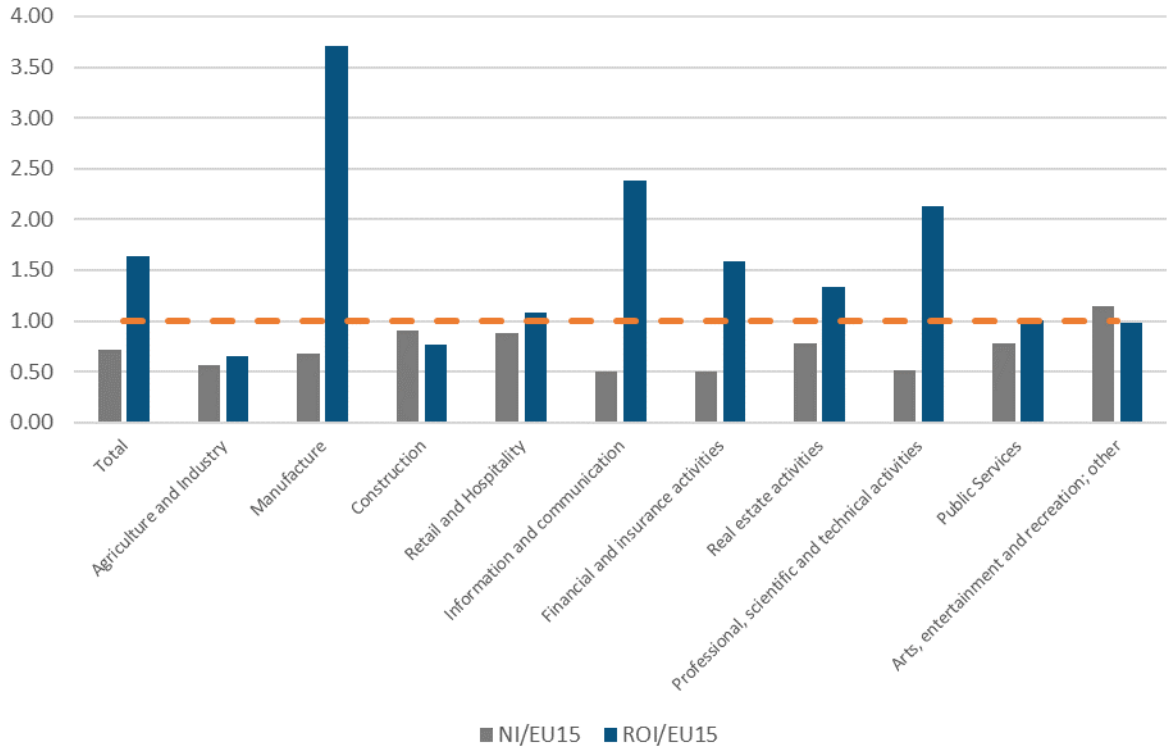
Table 3.4: Share of Employment by Sector ROI, NI and EU 15, 2016

	NI	ROI	EU15
Agriculture, forestry and fishing	1.7	5.5	2.8
Industry	1.3	1.1	1.2
Manufacturing	11.1	10.4	12.3
Construction	4.2	7.3	6.1
Wholesale and retail trade, transport, accommodation and food	27.4	28.5	25.0
Information and communication	2.6	3.6	3.0
Financial and insurance activities	2.5	3.9	2.7
Professional, scientific and technical; administrative and support	11.5	10.2	14.1
Public administration, education, human health and social work	32.7	24.5	24.8
Other Service activities	4.1	4.2	6.8

Source: Eurostat (2018) & ONS (2018a)

Chart 3.7 shows labour productivity levels across the same sectors for NI and ROI in GVA per hour. While NI falls behind ROI in all but 2 of the sectors outlined (*Construction* and *Other Services*), the majority of the overall productivity gap appears to be concentrated in four sectors, *Manufacturing*, *Information and Communication*, *Professional, scientific and technical; administrative and support* and *Financial and Insurance*. These are also the same four sectors where ROI significantly exceeds the average output per hour in the EU 15.

Chart 3.7 Gross Value Added per Hour ROI and NI as % of EU 15 average 2016



Source: Eurostat (2018a, 2018c) & ONS (2018a, 2018b)

These four sectors are considered to be high-productivity in much of the literature but they are also areas where ROI has had a significant influx of Foreign Direct Investment (FDI). NI has performed well in terms of FDI compared to the EU 15, particularly in recent years, but the scale and composition of that investment has been of a different order. The role of foreign controlled firms is where the focus of this analysis shifts to.

4. FOREIGN AND DOMESTIC

4.1 The Role of Foreign Firms

Aggregated measures of labour productivity reflect averages across and within sectors. As such, a relatively small number of highly productive firms often disproportionately influence these measures. While this effect is generally present across countries, it poses significant challenges in a context where a relatively small state experiences a preponderance of investment by some of the world's most productive companies. This is particularly the case where the Republic of Ireland is concerned. The Republic of Ireland's openness to international investment affects measures of national output, which are, in turn, related to measures of labour productivity. Further bias occurs due to practices of tax planning on the part of multinationals in the Republic of Ireland.

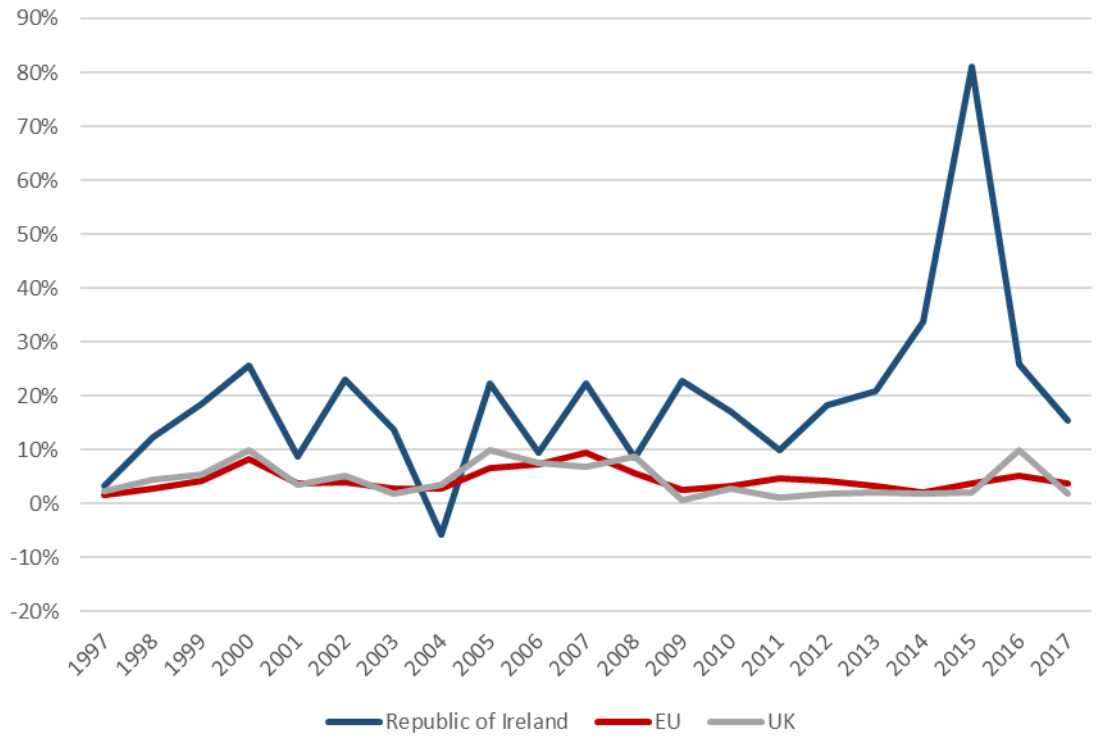
Investment is a key component of measured economic output. It is commonly recognised as the dynamic element in Gross Domestic Product (GDP), represents a channel through which innovation and growth can occur (Encinas-Ferrer & Villegas-Zermeno, 2015) (Barro, 1991) and is a complement to technological progress. In the case of the Republic of Ireland, Foreign Direct Investment (FDI) has played an increasingly large role in aggregate investment over time.

Foreign Direct Investment (FDI) refers to a situation of cross-border investment associated with a resident or resident controlled institution (e.g. in the United States) exercising control or influence over a non-resident firm in another jurisdiction (e.g. in the Republic of Ireland). Inward FDI represents foreign investor ownership/control over a resident firm in a reporting country by a non-resident individual or organisation. This can be measured by way of stocks and flows. Inward FDI stocks represent the total accumulated value of investor equity and net loans to enterprises in a reporting economy by non-residents. Inward FDI flows, in contrast, refer to the changes over a given period (OECD, 2008).

Chart 4.1 displays net FDI inflows for ROI, the UK and the EU as a whole as a percentage of GDP. In all cases, inward FDI flows are non-trivial as a proportion of total output. Measured inflows in

the EU and UK are relatively constant compared to the Irish case, varying between approximately 1.0 and 10.0 per cent of GDP between 1997 and 2017. Irish rates, in contrast, tend to be relatively elevated (in excess of 10 per cent in most cases) and relatively erratic, ranging from -5.7 and 81 per cent of GDP. This later result, however, corresponds with the level change in measure GDP measured in the national accounts in 2015.

Chart 4.1: Net inflows of Foreign Direct Investment as a percentage of GDP



Source: World Bank (2018)

Note: Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP.

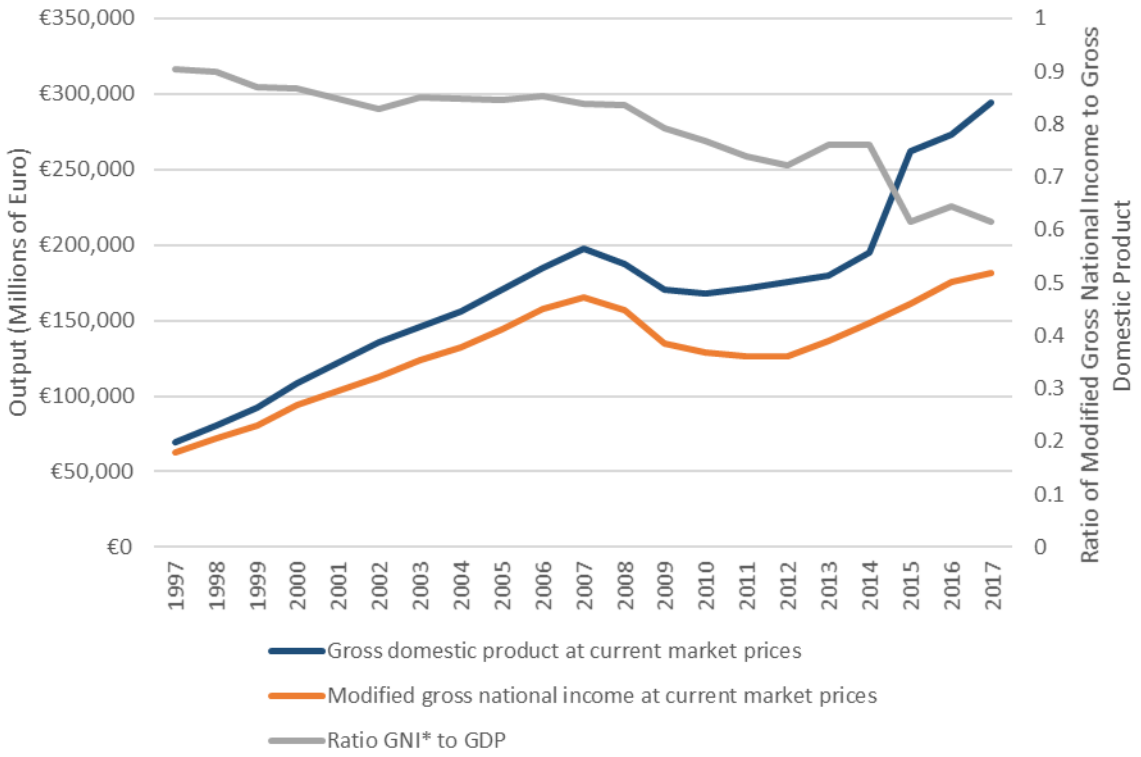
The relatively large impact of FDI inflows in the ROI has spurred the production of a new series of statistics, designed to account for the effects of globalisation, by the Central Statistics Office (CSO). Traditionally, Gross National Income (GNI) was seen as a superior measure of output performance given negative net factor incomes related to the relatively high levels of FDI in the Republic (OECD, 2005).[1] However, in light of further distortions, reaching a new extreme in

[1] Gross National Income is equal to Gross Domestic Product plus net factor incomes. Net factor incomes reflect the difference between the amount earned abroad by residents and earnings of non-residents in a reporting country. In most cases internationally, net factor incomes are minimal, resulting in a close

2015, a new Modified Gross National Income (GNI*) measure was produced. GNI* accounts for the effects of re-domiciled firm profits as well as depreciation of intellectual property and aircraft leasing companies (CSO, 2017).

Chart 4.2 displays the extent of the gap between GDP and GNI* over time in ROI. In 1997, this gap amounted to less than 10 per cent of measured GDP. The ratio of GNI* to GDP fell somewhat between 1997 and 2008, with the gap growing to around 15 per cent. The period after the financial crisis saw a steady expansion in the difference between GDP and GNI*, with GNI* falling to some three quarters of GDP. 2015 saw a significant expansion of the gap to nearly 40 per cent, with GDP at current prices amounting to nearly €300 billion, with GNI* measuring at just over €180 billion.

Chart 4.2: Gross Domestic Product and Adjusted Gross National Income Republic of Ireland



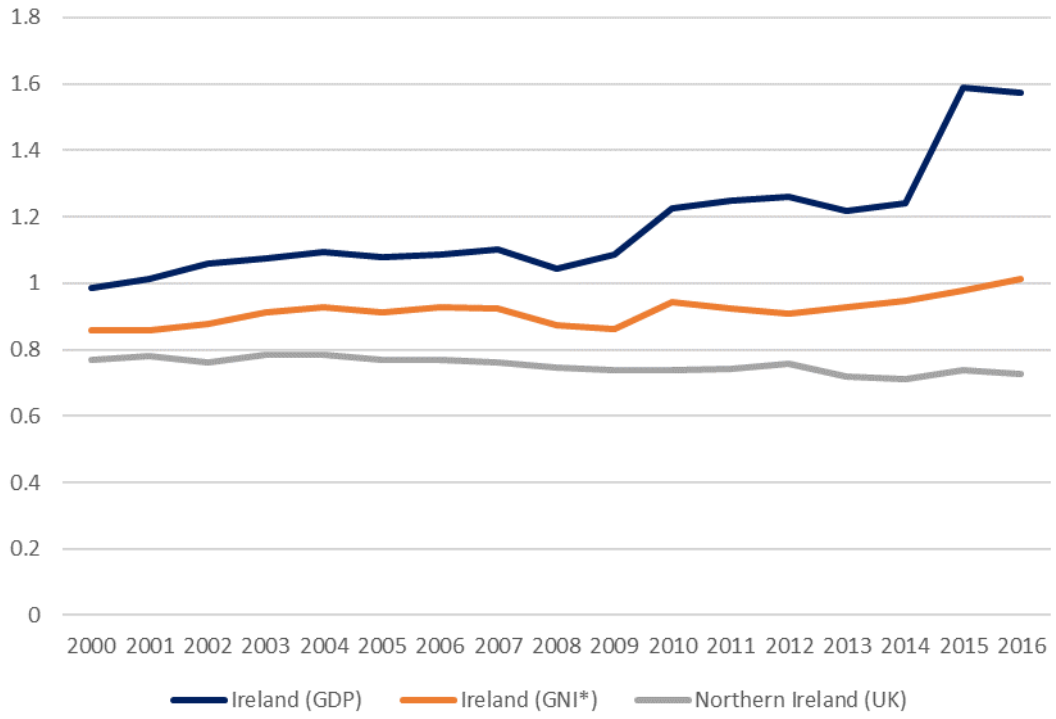
Source: CSO (2018b)

correspondence between GNI and GDP. The scale of factor incomes to non-residents in the republic of Ireland, however, results in a large discrepancy between GDP and GNI measures of output.

The implication is that measures of productivity related to aggregate output are particularly distorted in the case of ROI. GDP per hour worked was just below EU15 levels in 2000 in ROI (Chart 4.3). This rose to close to 10 per cent above EU15 levels in 2007. In contrast, GDP per hour remained relatively constant in NI at approximately 75 per cent of the EU15 average. Although the NI ratio fell modestly following the financial crisis, the ROI tended to improve relative to the EU15, reaching over 20 per cent above EU15 averages between 2010 and 2014. The step change in GDP in ROI from 2015 results in a substantially elevated relative position, climbing to close to 60 per cent above EU15 levels. On the other hand, NI saw a gradual relative fall in measured labour productivity to about 70 per cent of EU15 levels.

Hourly output in ROI looks less impressive when measured in terms of GNI*. For most of the time series, PPS adjusted labour productivity in the EU15 exceeds ROI, remaining relatively constant in relation to that average until the recovery period after 2012. In 2016, GNI* per hour worked in ROI just exceeded EU15 levels.

Chart 4.3: GDP per Hour Worked Ratio to EU15 Current PPS 2000-2016



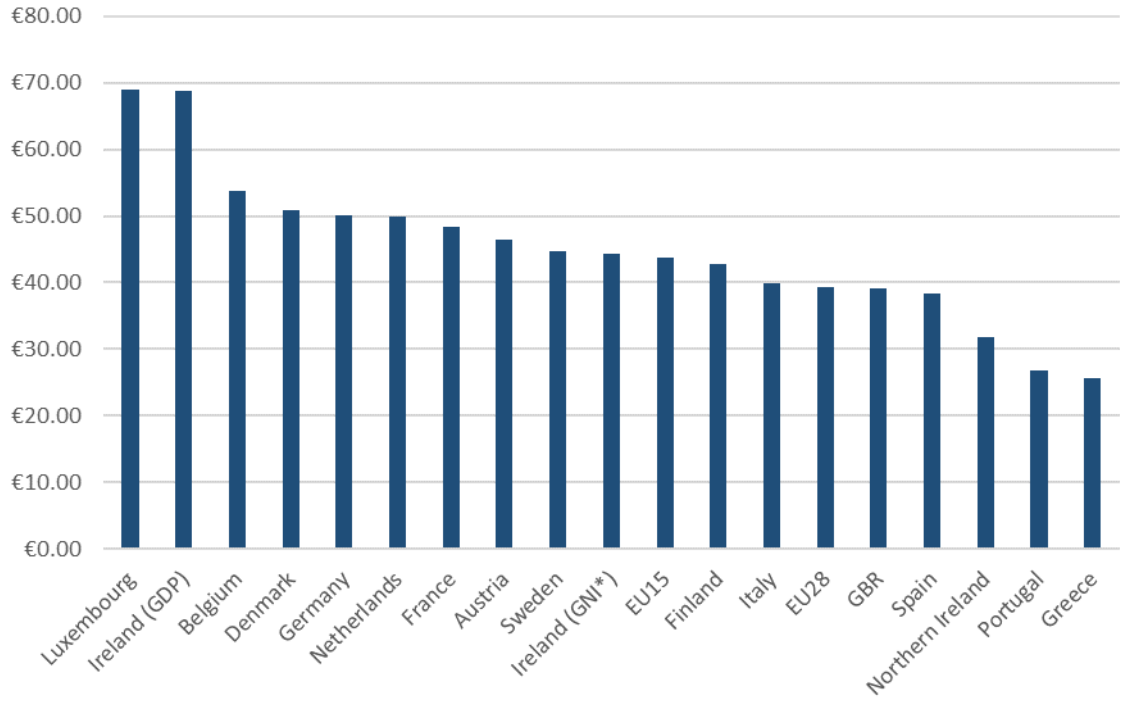
Sources: Eurostat (2018a, 2018b, 2018c, 2018d), CSO (2018b), ONS (2018c)

In rank terms, at current PPS levels, the ROI was the second most productive jurisdiction in the EU15 comparator group, just behind Luxembourg in 2016 when measured by GDP (Chart 4.4).

In contrast, GNI* per hour worked sees ROI fall down the pecking order to ninth out of sixteen.[2] NI, on the other hand, is among the least productive jurisdictions in the comparator group, only exceeding Portugal and Greece in output per hour worked.

This is suggestive of a three-tier economy on the island of Ireland, a Europe leading ROI greatly influenced by a large non-resident owned sector, a middling European economy where those effects are stripped out in the "domestic" ROI economy and a relatively poor Northern Ireland.

Chart 4.4: GDP per Hour Worked 2016 Current PPS



Sources: Eurostat (2018a, 2018b, 2018c, 2018d), CSO (2018b), ONS (2018c)

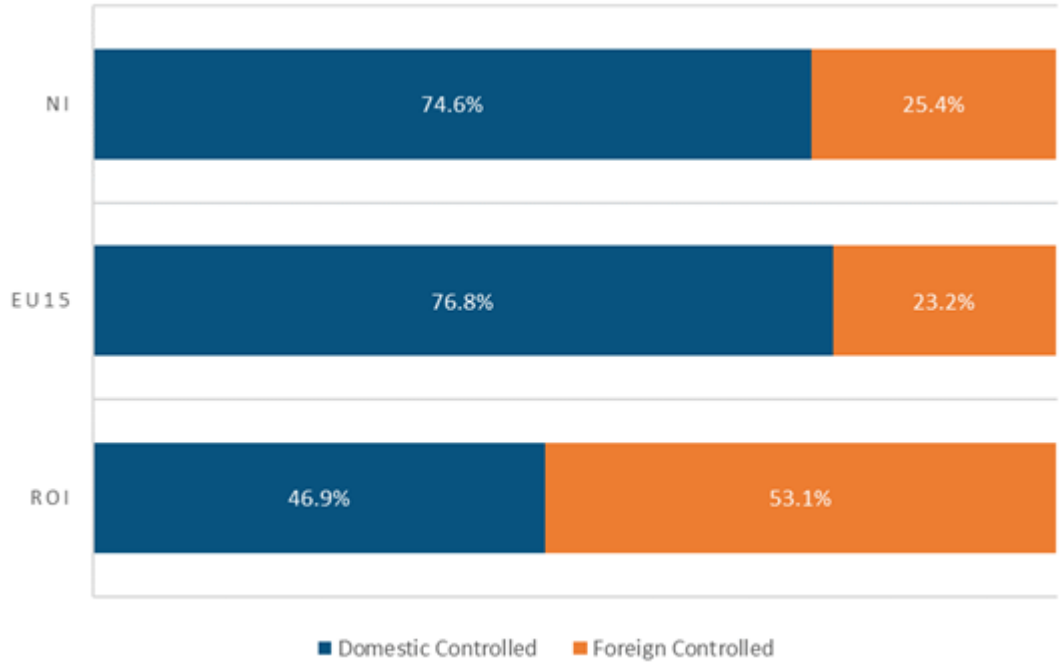
As outlined in section 3.1, however, measures of labour productivity are more reliable where Gross Value Added is used. Restricting measured GVA to the non-financial business economy, chart 4.5 further demonstrates that ROI is an exceptional case.[3] When GVA is divided by enterprise ownership, we see that unlike the EU15 and NI cases, where about three quarters of GVA was produced by the domestic sector in 2014, the majority (53.1 per cent) of GVA in ROI

[2] We display sixteen jurisdictions here as the UK is broken into NI and Great Britain for comparative purposes.

[3] The Business economy refers to industry (NACE REV.2 Sectors B-E), Construction (NACE Rev.2 Sector F) and Services (NACE REV.2 Sectors G-J and L to N). This aggregate excludes Agriculture Forestry and Fishing (NACE REV.2 Sector A), Financial and Insurance Activities (NACE REV.2 Sector K) and Public Sector/non-market activities (NACE REV.2 Sectors O-U). See Eurostat Glossary (2018).

was generated by the foreign controlled sector. This points to a divide in labour productivity in ROI hidden in aggregate statistics. It is to that issue we now turn.

Chart 4.5: Gross Value Added by firm control 2014



Sources: Eurostat (2018e).
Notes: 2014 data is used here as SBS statistics for that year offer more complete sectoral data and because 2014 predates the major step change that likely biases GVA results in both the foreign and domestic sectors.

4.2 Productivity performance in the Foreign and Domestic Sectors in the Republic of Ireland

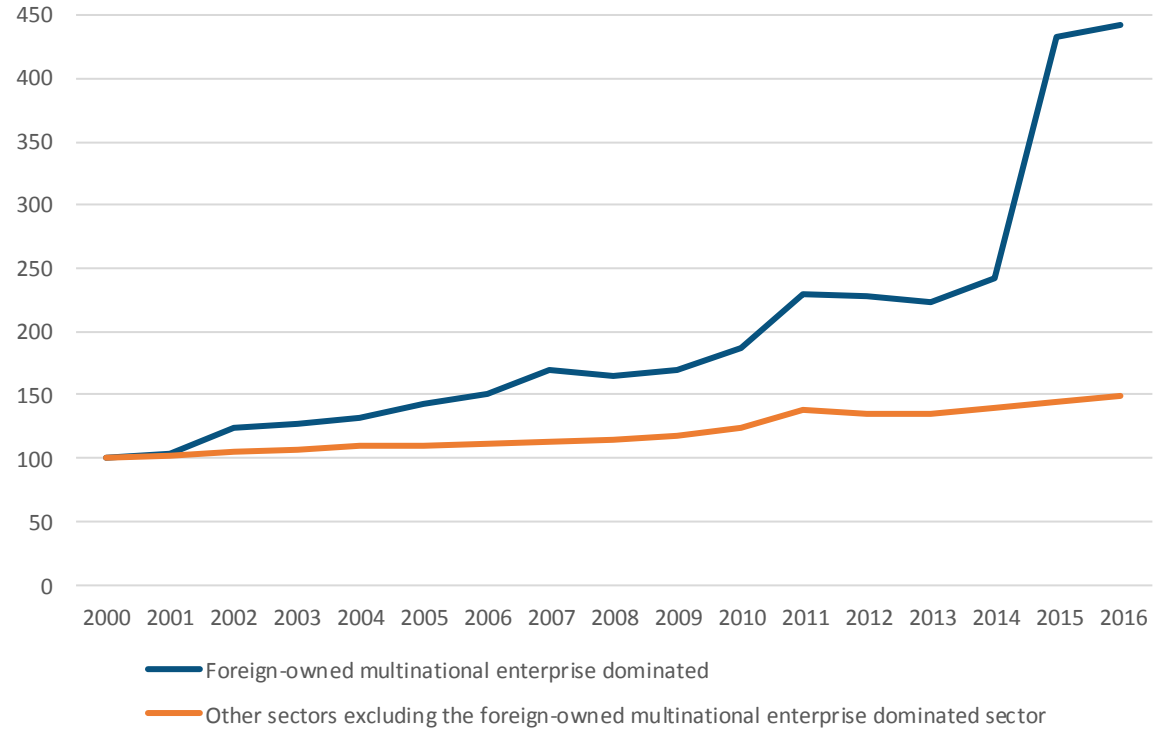
The contrast between GDP and GNI* performance over time in the Republic of Ireland is suggestive of relatively distinct productivity dynamics within the foreign and domestic owned sectors: an extremely high growth foreign controlled sector tied to FDI alongside a more modest growth domestic sector.[4] Chart 4.6 displays GVA per hour worked between 2000 and 2016 for two sectors which broadly reflect the foreign/domestic divide. The *Foreign Controlled Multinational Enterprise dominated sector* refers to NACE sectors where multinationals make up over 85 per cent of turnover.[5] All other sectors encompass the *Domestic and Other sector* (CSO, 2018).

[4] It should be noted here that, insofar as measured GVA is affected by the same activities that have come to be recorded in the broader GDP figures, foreign-owned labour productivity likely reflects tax planning activity. As such, productivity measures in these sectors may not reflect activity undertaken in Ireland and be inflated as a result.
[5] This sector includes Chemicals and chemical products, Software and Communications, Reproduction of recorded media, Pharmaceutical products, Pharmaceutical preparations, computer, electronic and optical products, electrical equipment, medical and dental instruments and supplies (CSO, 2018).

Labour productivity in the *Foreign Controlled Multinational Enterprise dominated sector* grows quickly up to 2014, expanding by close to 2 and a half times over the period 2000 to 2014. In spite of negative growth in 2008 and again in 2012-2013, labour productivity in the sector grew by an average of close to 6.8 per cent annually. The 2015 statistical change sees productivity skyrocket within this sector to over 440 per cent of 2000 levels by 2016, implying an average growth rate over the period of 11 per cent per year.

The *Domestic and Other sector* grows at a more modest (though not insignificant) rate between 2000 and 2016, though it is subject to more fluctuation. Between 2000 and 2004, growth averages at just less than 2.5 per cent per annum. Growth stagnates, however, from that point until 2008, with average annual growth of just 0.8 per cent. After 2008 (with the exception of 2012-2013) labour productivity growth picks up in this sector, though the fastest growth occurs in 2009-2010. Labour productivity rates are close to 50 per cent higher in 2016 than they were in 2000 in real terms.

Chart 4.6: Labour Productivity (Base 2000=100) by Domestic and Foreign Sectors 2000-2016

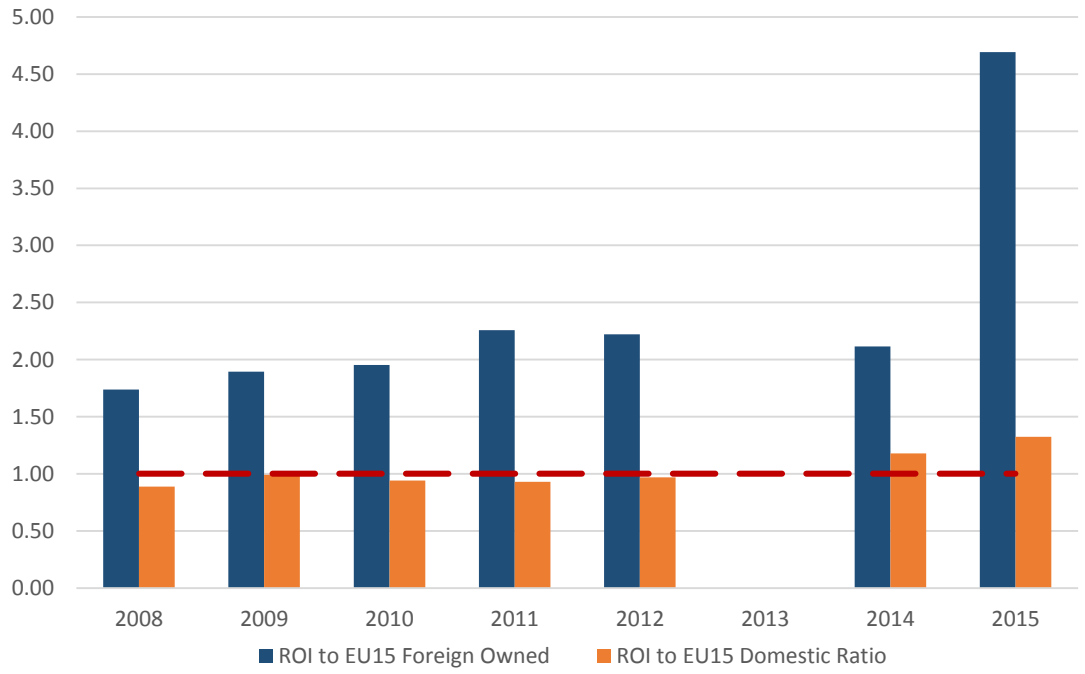


Source: PIA02: Productivity Indicators by Domestic and Foreign Sectors, Year and Statistic (CSO, 2018)

Chart 4.7 displays labour productivity, measured as GVA per person employed, in ROI as a function of the EU15 average in PPS. We see that foreign-owned firms are consistently much more productive than their counterparts in the EU15. Foreign firms in ROI are 75 per cent more productive than foreign controlled firms in the EU 15 in all cases. While relative growth is negative in 2012 and 2014, where the ratio between foreign controlled firms in ROI and the EU15 falls, they remain over twice as productive. 2015 sees a massive change in relative labour productivity nearly 5 times the EU15 average, in line with activity observed elsewhere.

The domestic owned sector, on the other hand, is slightly below EU15 averages for most of the period, only exceeding that level from 2014, where measured labour productivity was some 18 per cent higher than the EU15 average in current PPS terms.

Chart 4.7: Ratio of GVA per person Employed (Current PPS) to EU15, Domestic and Foreign Controlled 2008-2015



Sources: Eurostat (2018d, 2018e)

Aggregate measures of productivity, however, can mask sectoral weaknesses and strengths. We now turn to examine comparative labour productivity by broad sector using the available data for both the foreign and domestic sector in the Republic of Ireland. In many years data is either missing or withheld so we use the latest and most complete data available.

4.3 Structure of the Foreign and Domestics Economy

The scale of FDI in ROI clearly has an impact on the size of output in the economy but also on the resulting levels of labour productivity. As we previously highlighted, productivity levels vary considerably across the economy and if anything, the split between foreign and domestic firms is likely to be even larger when broken out by sector given the concentration of FDI.

Table 4.1: Share of Output by Sector ROI Domestic, EU 15 Domestic and NI 2012 and 2014

	ROI Domestic		EU 15 Domestic		NI	
Sector	2012	2014	2012	2014	2012	2014
Manufacturing	12.7	13.6	23.3	23.0	23.3	24.5
Wholesale and retail	21.5	19.4	18.0	17.9	28.4	26.1
Transportation and storage	11.8	11.1	8.7	8.5	7.5	7.7
Accommodation and food	7.3	5.9	4.1	4.0	3.7	4.0
Information and communication	5.5	6.2	7.5	7.3	5.3	5.6
Real estate activities	2.0	2.1	4.9	4.8	3.0	2.6
Professional, scientific and technical	13.0	12.8	11.1	11.5	6.3	7.0
Administrative and support service	6.8	13.9	7.1	7.8	5.8	6.5
Other	19.4	15.0	15.3	15.2	16.8	16

Source: Eurostat (2018e) & NISRA (2017)

Comparing the domestic economy of ROI with that of the NI and the EU15 domestic economy there are some interesting similarities and differences. In terms of output, Table 4.1 shows that the Manufacturing sector in domestic ROI is significantly smaller than in NI and compared to the EU 15 average. Given the results in table 3.1, it would appear that foreign controlled firms not only account for the large share of manufacturing in ROI, they also disguise a very small domestic sector. The domestic Accommodations and Food sector in ROI also accounts for a much larger share of output than in the whole of NI. Given that NI figure includes foreign and domestic, such a large difference might be expected. However, the domestic ROI accommodation and Food sector is also significantly larger than the average for EU 15 domestic firms, and so the NI figure appears to be more conventional than the ROI figure. There is a large increase in the share of output in Administration between 2012 and 2014 and a full explanation of this shift is explained in section 4.5.

Table 4.2: Share of Employment by Sector ROI Domestic, EU 15 Domestic and NI 2012 and 2014

Sector	ROI Domestic		EU 15 Domestic		NI	
	2012	2014	2012	2014	2012	2014
Manufacturing	9.5	11.8	19.1	18.6	17.6	18.3
Wholesale and retail	29.3	27	24.5	23.9	31.1	29.9
Transportation and storage	7.9	8.7	7.9	7.7	5.8	6.1
Accommodation and food	17.1	14.7	9.1	9.3	10	10.6
Information and communication	4.3	4.7	4.3	4.5	4.0	4.3
Real estate activities	2.6	2.0	2.3	2.5	2.0	2.1
Professional, scientific and technical	10.7	10.8	9.7	10.0	6.3	6.2
Administrative and support service	8.6	7.9	10.3	10.9	11.2	11.0
Other	10.0	12.3	12.7	12.6	12.0	11.3

Source: Eurostat (2018e) & NISRA (2017)

Table 4.2 shows the same breakdown for employment structure and many of the gaps in output share between the ROI domestic economy and the EU 15 are reflected in the structure of employment. The smaller share of output for Manufacturing in the ROI domestic economy is also matched by a similar share of employment, which is not the case for the economy at large (See tables 3.2 & 3.2). Overall, it would appear that the ROI domestic sector underrepresented in some high productivity industries and stronger in some lower productivity sectors.

Table 4.3: Share of Output by Sector ROI and EU 15 Foreign 2012 and 2014

Sector	ROI Foreign		EU 15 Foreign	
	2012	2014	2012	2014
Manufacturing	56.4	47.0	33.9	33.2
Wholesale and retail	14.6	11.8	20.6	22.0
Transportation and storage	1.2	1.3	4.9	5.4
Accommodation and food	0.4	1.1	1.6	1.7
Information and communication	20.2	30.7	12.0	12.5
Real estate activities	0.2	0.5	1.8	1.0
Professional, scientific and technical	2.1	2.5	6.6	7.5
Administrative and support service	3.4	3.4	7.2	7.6
Other	1.4	1.8	11.4	9.1

Source: Eurostat (2018e)

Looking at how the foreign sector in ROI compares with its EU 15 equivalent, Table 4.3 shows that ROI has a considerably larger share of output devoted to manufacturing and *Information and Communication*. In terms of employment, Table 4.4 shows that ROI Manufacturing employment in foreign firms is much the same as it is in the EU 15. ROI has a large gap with the EU 15 when it comes to the share of foreign output in the Information sector, but this gap is also present in the share of employment in the same sector.

Table 4.4: Share of Employment by Sector ROI and EU 15 Foreign 2012 and 2014

	ROI Foreign		EU 15 Foreign	
Sector	2012	2014	2012	2014
Manufacturing	31	25.6	33.3	32.4
Wholesale and retail	31.2	27.6	25.5	25.6
Transportation and storage	3.5	3.5	6.3	6.5
Accommodation and food	2.5	8.0	4.6	4.8
Information and communication	13.4	12.2	7.3	7.5
Real estate activities	0.4	1.3	0.7	1.0
Professional, scientific and technical	5.6	6.4	5.8	6.2
Administrative and support service	10.8	12.5	11.2	11.0
Other	1.6	2.9	5.3	5.0

Source: Eurostat (2018e)

Overall it would appear that Northern Ireland looks quite similar to a domestic EU 15 economy while the domestic economy in ROI looks significantly different to both of the others. The gaps in the ROI domestic economy look to be more than compensated for in the foreign sector, particularly in Manufacturing.

4.4 Two Economies

4.4.1 The Domestic Economy

Labour Productivity in the domestic non-financial business economy was comparable to EU15 levels in 2012 and 2014. These aggregate statistics, however, obscure differences in sectoral performance (Table 4.5). ROI performs well in comparative terms in *Manufacturing*, *Transportation and Storage*, *Professional, Scientific and technical activities* and *Administrative and support service activities* in both years. These sectors account for 44.3 and 51.4 per cent of domestic GVA output in 2012 and 2014, comparable to their relative weight in the EU15 economy. The domestic economy sees relative underperformance, however, in *Information and Communication* and *Real Estate Activities* in both years, despite improvement in their relative position.

Some sectors such as *Wholesale and retail trade; repair of motor vehicles and motorcycles, Accommodation and food service activities* go from relative underperformers to over performers between 2012 and 2014, likely reflecting broader demand side improvement in the economy of ROI as growth occurred. Relative changes are more clearly visible in Chart 4.8. We see a relative improvement in all sectors (likely reflecting strong growth in the Irish recovery and possible stagnation elsewhere) but relative improvement is most noticeable in the *Information and Communication*, *Real Estate Activities* and *Administrative and support service activities* sectors. In the absence of sub-sectoral data to decompose change in the *Information and Communication*

sector and the difficulty interpreting productivity statistics in the *Real Estate Activities* sector, we turn to investigate the dramatic change that occurs in the *Administrative and support service activities* sector (MacFlynn, 2016).

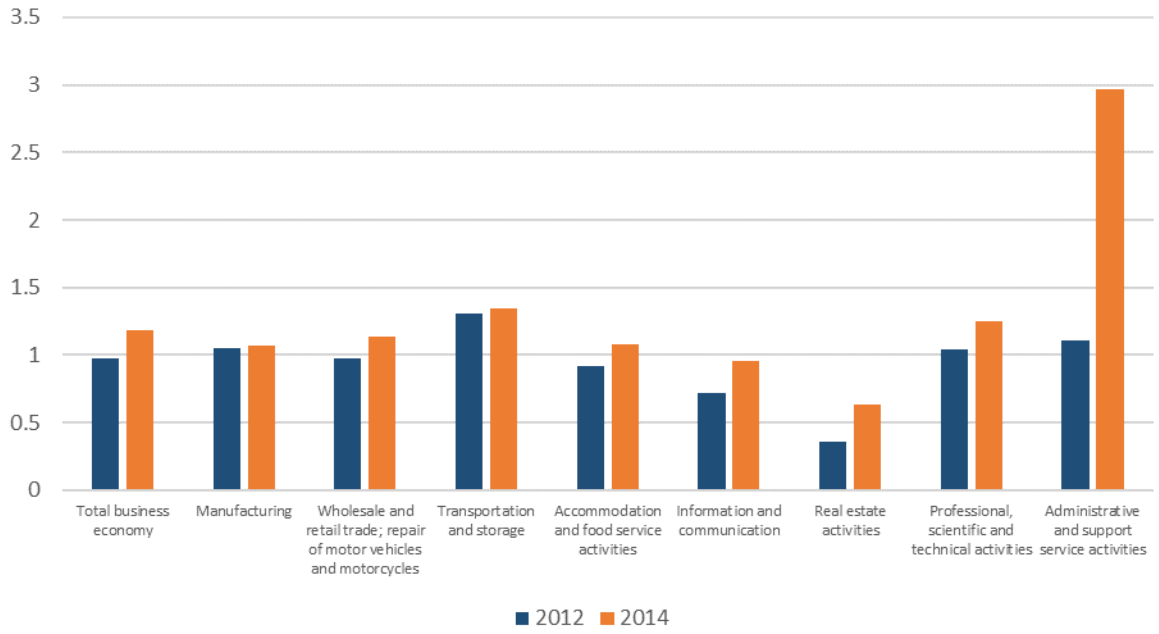
The relative position of this sector moved from approximately 10 per cent above the EU15 average to nearly 3 times EU15 productivity between 2012 and 2014. The domestic *non-financial business economy* moved from 0.97 times the EU15 value in 2012, to 1.18 times in 2014. This amounts to a relative move of 21.6 per cent. *Administrative and support service activities,* on the other hand, moved from 1.11 times its EU15 counterpart in 2012 to 2.97 times in 2014. The relative move here is some 168.3 per cent. This represents an increase in the sectors relative position as measured by the annual ratios displayed in Chart 4.8 nearly eight times that of the non-financial business economy as a whole.

Table 4.5: GVA per person Employed (Current PPS) Domestic Sector 2012 and 2014

	2012		2014	
Sector	ROI	EU 15	ROI	EU 15
Total	42,067	43,355	53,527	45,357
Manufacturing	56,429	53,780	61,492	57,252
Wholesale and retail	30,865	31,758	38,474	33,956
Transportation and storage	62,532	47,971	67,887	50,603
Accommodation and food	18,052	19,755	21,576	19,974
Information and communication	53,700	74,698	69,726	72,920
Real estate activities	32,636	90,863	55,137	87,446
Professional, scientific and technical	50,795	48,745	63,576	50,940
Administrative and support service	33,123	29,926	94,595	31,857

Sources: Eurostat (2018d, 2018e)

Chart 4.8: Ratio of GVA per person employed (Current PPS) ROI to EU15 Domestic Owned 2012 and 2014

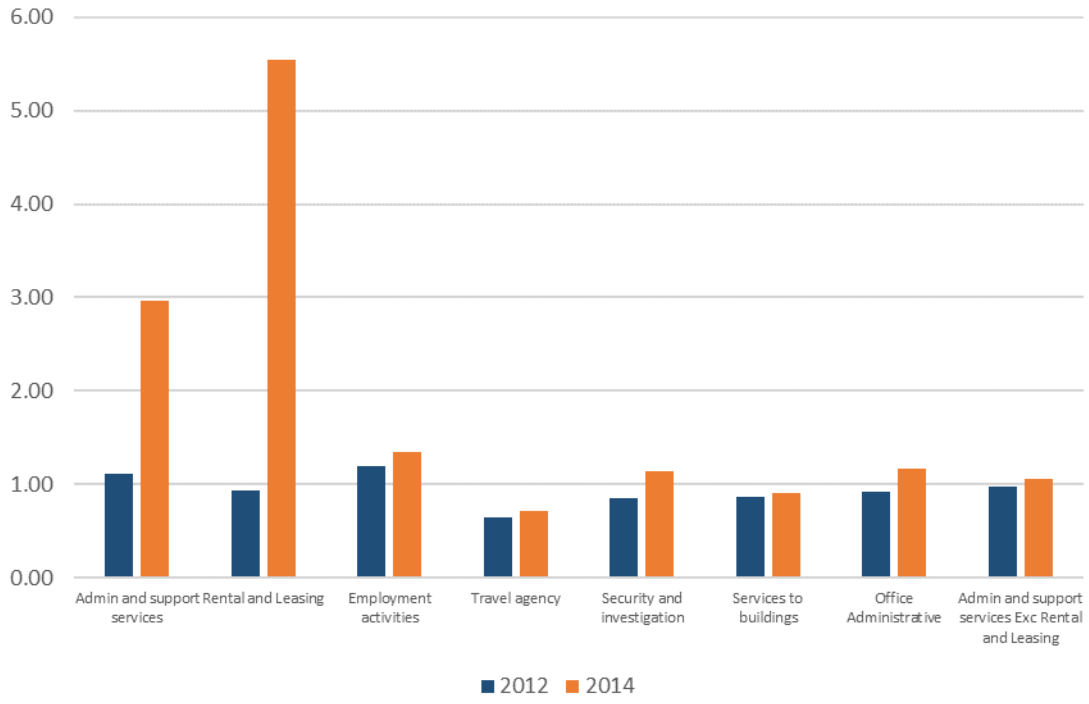


Sources: Eurostat (2018d, 2018e)

Chart 4.9 decomposes *Administrative and support service activities* to investigate this drastic level change in ratio terms. We see relative improvement in performance vs the EU15 in all subsectors, though, for the most part, labour productivity is not vastly different from comparator levels. The chart makes clear, however, that the drastic shift between 2012 and 2014 is explained by growth in measured labour productivity in the *Rental and Leasing* subsector. This accounts for 93.9 per cent of the change in measured GVA between the two years while in employment terms the subsector represented a drag on employment numbers, witnessing a fall of 140 individuals.

While this sector represented a relatively high productivity component of the overall sector compared to other subsectors in 2012, labour productivity was over 6 per cent below EU15 levels in 2012. In 2014, productivity climbs precipitously to 583,544 PPS per person employed in ROI compared to an EU15 average of 105,302. Therefore by 2014, output per person employed in this sector in ROI is more than 5.5 times as high as it is in the EU 15. While further decompositional data are unavailable to determine what within this sub-sector drove this increase, this is likely consistent with phenomena noted in the development of GNI* in the aircraft leasing sector.

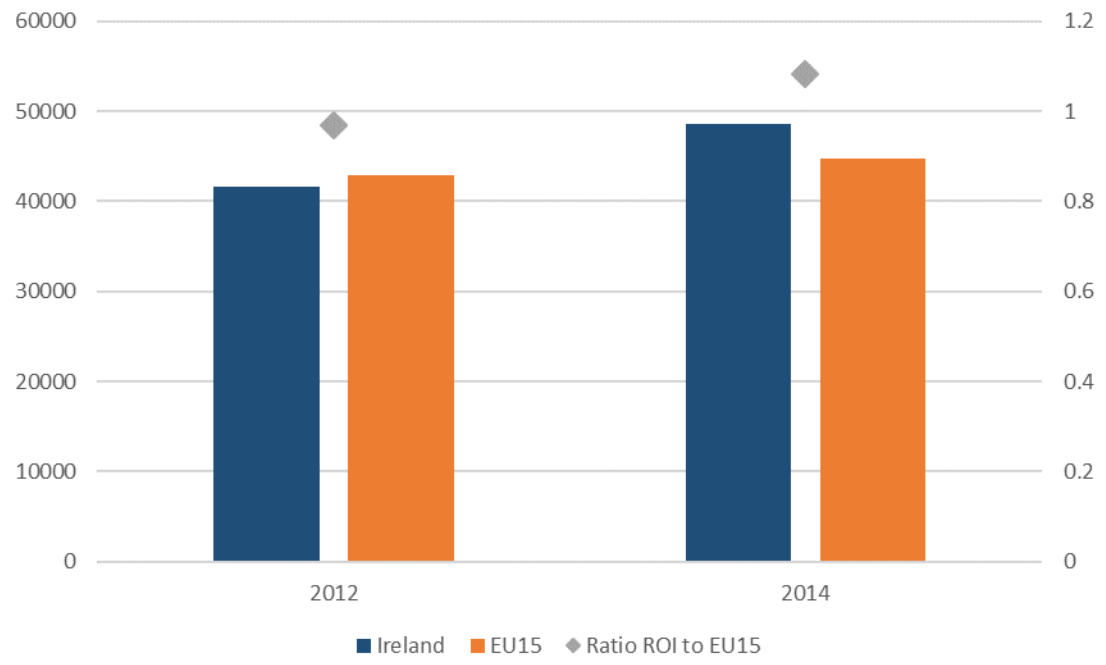
Chart 4.9 Ratio of GVA per person employed (Current PPS) ROI to EU15 Domestic Owned Administrative and Support Service Activities 2012 and 2014



Sources: Eurostat (2018d, 2018e)

This effect is so large that it has broader implications for measured aggregate non-financial business sector productivity. Chart 4.10 displays aggregate labour productivity in the domestic non-financial business economy if the *Rental and Leasing* subsector is excluded. We see that this exclusion has marginal effects in 2012 in relative terms with productivity remaining approximately 3 per cent below EU15 levels in the ROI. The year 2014, however, sees a much more significant change. The domestic sector in ROI still improves relative the domestic EU15 comparator moving to a ratio of 1.08. This, however, is substantially below the relative position observed in Chart 4.8. Measured productivity in the domestic economy in ROI falls by over 10 per cent compared to a decline of just 1.2 per cent in the EU15 case.

Chart 4.10 GVA per person employed ROI and EU15 2012 and 2014 excluding rental and leasing



Sources: Eurostat (2018d, 2018e)

4.4.1 The Non-Domestic Economy

The foreign controlled sector of the ROI economy is, common to the EU15 as a whole, substantially more productive generally than the domestic economy. In comparative terms, ROI's foreign sector performs considerably better in aggregate than the EU15 in both years in aggregate, with measured rates double those observed in the EU15.

This performance is not uniform across all sectors however, a number of sectors, while generally more productive than their domestic counterparts, display productivity rates beneath EU15 averages. Labour productivity in the *Accommodation and food service activities, Real estate activities* and *Professional, scientific and technical activities* sectors is below EU15 averages.

While a number of other sectors display comparatively high productivity rates, aggregate performance appears to be driven by two principal sectors: *Manufacturing* and *Information and communication.* Aggregate *Manufacturing* is approximately 4 times as productive as the EU15 average in 2012, though this fall slightly to 3.8 in 2014. The foreign controlled *Manufacturing* sector in Ireland is dominated by the exceptionally productive subsectors *Manufacturing of Chemicals* and *Chemical Products and Manufacture of basic pharmaceutical products and*

pharmaceutical preparations. Measured productivity in ROI in these subsectors was between 2.7 and 3.3 as large as the second ranked jurisdiction in current PPS terms.

Information and Communication is also the sector that most improved its level of GVA per person employed relative the EU15 average. It moved from just over double the level in 2012 (278,522 vs 133,680) to 3.5 times the level in 2014 (452,418 vs 132,395) in 2014. While aggregate non-financial business sector productivity fell by 4.8 per cent in ratio terms, *Information and Communication* improved its relative ratio position by 64 per cent.

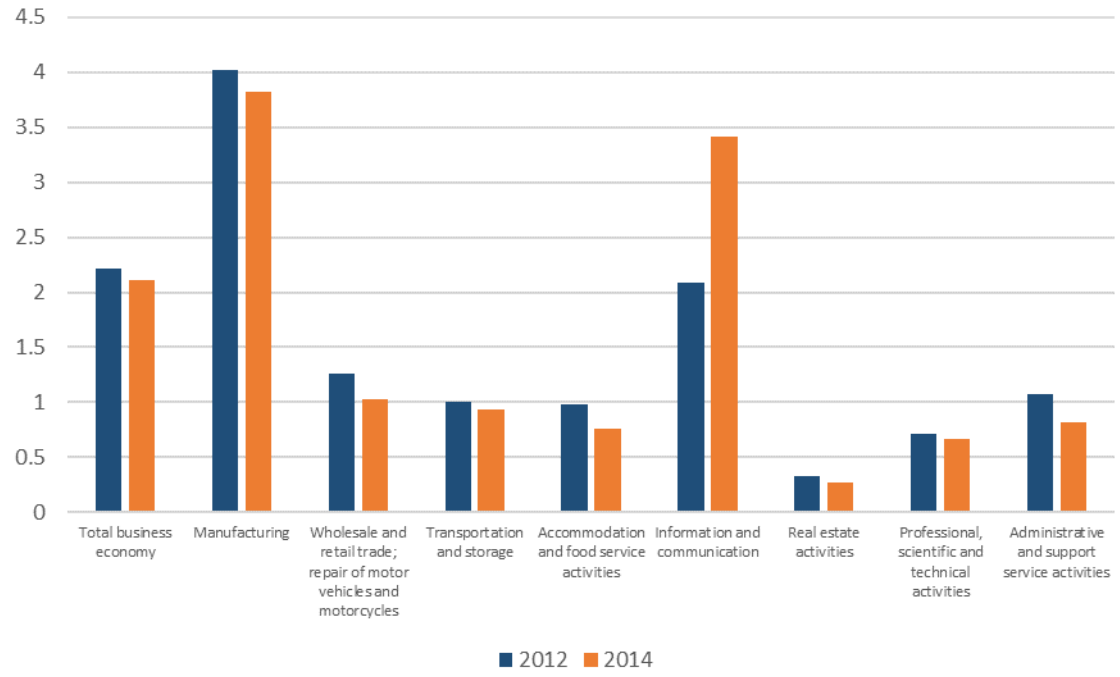
Table 4.6 GVA per person employed (Current PPS) Foreign Controlled sector 2012 and 2014

	2012		2014	
Sector	ROI	EU 15	ROI	EU 15
Total	184,591	83,083	179,603	84,911
Manufacturing	335,545	83,427	330,220	86,480
Wholesale and retail	86,264	68,250	76,555	74,408
Transportation and storage	65,294	65,034	67,289	72,265
Accommodation and food	29,200	29,847	23,856	31,470
Information and communication	278,522	133,680	452,418	132,395
Real estate activities	69,951	213,006	62,488	227,178
Professional, scientific and technical	69,766	97,383	69,880	104,101
Administrative and support service	58,852	54,612	48,866	60,145

Sources: Eurostat (2018d, 2018e)

Comparatively high productivity levels and large relative changes are likely partially tied to the accounting practices of a relatively small number of large multinational firms availing of tax advantages offered in the Republic of Ireland. As such, measures of productivity are biased upwards due to the on shoring of intangible assets, contract manufacturing and other accounting practices to an extent not observed elsewhere.

Chart 4.11 Ratio of GVA per person employed (Current PPS) ROI to EU15 Foreign Controlled



Sources: Eurostat (2018d, 2018e)

4.5 Three Economies

Making comparisons between the foreign and domestic economies in ROI and the whole economy for NI is inexact but it does show some interesting results. The NI economy comes behind both sectors of the ROI economy in all but one industry, Wholesale and Retail. High levels of productivity are clearly driven by the Foreign sector in ROI with two exceptions. Transportation and Storage is more productive in the ROI domestics sector, but only marginally so. In Administration and Support Services, it has already been shown that the ROI domestic sector's advantage here is due almost entirely to Rental and Leasing services.

Table 4.7: GVA per Employment ROI, Domestic and Foreign, and NI 2014

Sector	Domestic ROI	ROI Foreign	NI
Total	53,527	179,603	45,357
Manufacturing	61,492	330,220	56,331
Wholesale and retail	38,474	76,555	40,193
Transportation and storage	67,887	67,289	56,855
Accommodation and food	21,576	23,856	16,748
Information and communication	69,726	452,418	50,654
Real estate activities	55,137	62,488	54,103
Professional, scientific and technical	63,576	69,880	51,252
Administrative and support service	94,595	48,866	23,213

Source: Eurostat (2018d, 2018e)) & NISRA (2017)

Note: Sectoral productivity in the Republic of Ireland and EU15 was compiled using Factor GVA. In the case of Northern Ireland, the matching structural business statistics data set reports GVA data in basic terms. GVA at Factor cost+ (Production Taxes – Production subsidies) = GVA at basic prices. As a result, relative comparisons are imperfect, though they point to the relative scale of productivity differentials.

It is the case then that higher levels of labour productivity in ROI are driven by foreign controlled firms but there has been some positive spill over into the domestic economy. The spill over has not been as large as could be expected particularly so in Information and Communication and less so in Manufacturing. For Northern Ireland, a higher level of FDI than the EU 15 has not resulted in a higher level of productivity overall. We do not have any indication of how much more productive the foreign sector is to the domestic sector in NI, but either the productivity profile of foreign firms in NI is lower than expected or the degree of spill over from foreign to domestic is lower than expected. Either scenario raises serious questions for policy in NI.

5. POLICY IMPLICATIONS

As mentioned in the introduction FDI has been a key plank of industrial strategy in ROI since as early as 1949. ROI has used its Corporation Tax as a means of attracting significant foreign investment beginning with the exemption for export profits in 1956 and culminating in the European Commission State Aid case taken against Ireland with regard to its tax treatment of Apple Inc.[6] This was also coupled with an aggressive programme of financial grants and assistance made available by the Industrial Development Agency (IDA). The apparent success of this strategy drove attempts in NI to replicate many of these policies. Invest Northern Ireland and its precursor organisations have sought to imitate the IDA strategy particularly during the years that NI also enjoyed Assisted Status. Similarly, since 2007/08 it has also been the policy of successive Northern Ireland Executives to

[6] See http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_38373

reduce corporation tax in NI to the same level as ROI, specifically in order to compete in attracting FDI.

The motivation for such policies in NI is understandable given the history between both economies as set out in section 2. ROI surged ahead of NI in the years in which it seemed to attract the most FDI and its recovery after the financial crash appears to be inextricably linked to the performance of foreign dominated industries. However, the range of policy levers available to the ROI government and state agencies is far greater than anything that would ever be available to NI. Attempting to use the limited policy tools available to a Northern Ireland Executive in order to replicate seemingly successful policies in ROI would likely be futile. However, when assessing the success of FDI in ROI it is also necessary to look beyond scale. FDI bolsters ROI's productivity because of the presence of foreign firms, but it also has an effect on the productivity of domestic firms.

Measuring the success of FDI by the proportion of output or the number of firms or employment that is accounted for by foreign controlled firms is to partially miss the point of FDI. The goal of attracting FDI is not simply to lure in more productive firms. It is also to attract foreign firms in particular industries which will either lift the performance of existing domestic firms within that industry or create a new set of domestic firms within that industry. Ideally, FDI must add more to the economy than simply the value of foreign firms, their employees and output. In essence the true value of FDI includes the spill-over effect generated.

The success of FDI is very much tied to the initial conditions within an economy. Bitzer & Gorg (2005) look at the experience of 17 OECD countries and find that inward FDI can be negatively associated with host country productivity. Kelley & Yeaple (2005) highlight the heterogenous nature of FDI effects and that the impacts can vary significantly by sector and industry. The effect of FDI from one sector is very much tied to the state of that sector in the host economy. Pessoa (2006) finds that the impacts of FDI are strongly determined by the degree to which existing local firms are integrated with the production process that FDI is concerned with.

Girma (2008) looked at the spill over effect of FDI in the UK for a large sample of firms. It found that many issues such as geography and the technological intensity of the investment were determinants of the extent of spill over. The most important factor, however, was the absorptive capacity of the domestic economy, in essence whether existing firms were able

to take advantage of the growth opportunities that FDI brought. Absorptive capacity is theme which is present in nearly all evaluations of FDI spill overs, yet it is one of the most under examined in terms of FDI policy. Xu (2000) finds that for FDI to positively impact productivity levels, the host country needs to reach a human capital threshold which enables the transfer of technology.

On absorptive capacity, there is evidence that NI is underperforming in skills and that the economy may be incapable of coordinating skills demand and supply to meet the opportunities of FDI (Mac Flynn, 2017). Human capital investment is a necessary precondition for FDI to add value to the economy and a new skills framework is required to address this shortcoming in NI.

For ROI, the results from the productivity performance of the domestic side of some sectors also point to significant policy issues. In particular, the underperformance of the *Information and Communications* sector at the domestic level in 2014 is striking. This sector has seen some of the most intensive and high value FDI in recent years, yet domestic performance is still below that of the EU15 average. Furthermore, the underperformance of the Retail sector in ROI compared to NI shows that in terms of the largest sector in the domestic economy, ROI is actually the weaker region. Greater levels of competition in the UK and NI may be a factor in this regard.

Recent firm level work by the Department of Finance suggests that averages may understate the extent of the productivity problem, given the divergence between the best and worst performing firms, something that appears relatively pronounced in ROI. Indeed, their data indicate that the median firm in the broad *Manufacturing* or *Services* have experienced a decline in productivity since 2006 (Department of Finance, 2018). Changes in measured productivity in *Administrative and support service activities* between 2012 and 2014 are suggestive of bias in measured productivity in the domestic sector. The domestic sector may be considerably less productive than apparent labour productivity indicates.

In addition to this the relative preponderance of economic activity in sectors such as *Accommodation and food service activities* in the ROI puts into question continued policy support in these areas by way of tax inducements or other incentives. A developmental policy for ROI might be better constructed by focusing on industries where the domestic economy has a productive edge, or has the potential to gain one, particularly where such a

sector remains relatively underdeveloped in output or employment terms. The relative opportunity costs of directing (or forgoing) resources towards lower productivity areas suggest the state could attain better outcomes in other sectors. These sectors could, in turn, support employment with higher wages and long-term growth prospects, helping address issues such as low pay in ROI.

In setting the historical context for this analysis in Section 2, it was noted that the ROI economy failed to take advantage of the 'Golden Age' of western European economic growth largely because it remained to wedded to an underperforming UK economy. The role of EEC and later EU membership is seen as a key factor in reversing this dynamic. As the UK prepares to leave the EU, the implications for NI are significant. It is clear that the all-island economy has failed to bring the scale of economic convergence that many had hoped for at the turn of the century. However, there is now a clear danger that NI will repeat the mistakes of ROI in the post-war period and become tied to the UK economy for growth opportunities. This may prevent NI from breaking out of its current and persistent productivity underperformance.

6. CONCLUSIONS

NI began as the more prosperous region on the Island of Ireland and remained so for much of the 20th century. As ROI began to integrate its economy with the rest of the EU and open itself up to increased FDI the dynamic between both economies changed dramatically. While NI has had some success in attracting foreign investment, both the scale and depth of such investment has not matched that in ROI.

There needs to be a more nuanced understanding of the role of FDI particularly in NI and a recognition of weaknesses within the ROI economy that are hidden under FDI over performance. There are many parallels between the type of policies that are required in ROI and NI and in the context of an all-island economy these actions should complement one another. Building capacity within domestic industries should be examined on an all-island basis and all domestic firms on the island benefit should be assisted to benefit from FDI wherever it occurs. However, the departure of the UK from the EU is likely to make such coordinated action more difficult.

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