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DISCUSSION PAPER SERIES

IZA DP No. 12496

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JULY 2019

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ABSTRACT

The Political Economy of a Northern Ireland Border Poll*

Given the increased prominence of a border poll in Ireland, particularly following the outcome of the Brexit referendum, this paper provides an initial assessment of some of the issues that are likely to become central in any debate on this issue. We examine the relative income and growth position of Northern Ireland within a UK and Irish regional framework over time. We further compare, and contrast, in detail aspects of the structure of both economies on the island of Ireland in the areas of educational attainment, trade orientation and the role of FDI. The paper goes on to analyse other relevant issues, such as the relative strength and weaknesses of the healthcare systems and the factors determining the potential economic cost of Irish unification. The objective of the research is to initiate an evidence-based approach to the question of a border poll and to provide an initial indication of the breadth of detail and analysis required for any debate to proceed in a meaningful manner.

JEL Classification: P52, J01, J10, R10

Keywords: border poll, Brexit, Northern Ireland

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1. Introduction

The Brexit referendum of 2016, and the subsequent decision by the United Kingdom (UK) to leave the European Union (EU), has led to substantial political and economic uncertainty related, primarily, to the UK's future relationship with the European Union and the implications of that relationship for future economic prosperity. The Brexit vote has also heightened tensions between the Westminster government and major political parties in both Scotland and Northern Ireland, as voters in these jurisdictions voted to remain within the EU. This disconnect between the UK wide decision to exit the EU and the referendum results in Scotland and Northern Ireland has led to increased calls for a second Scottish independence referendum and a border poll on the island of Ireland.

The opportunities and challenges around Scottish independence have previously been thoroughly set out in "Scotland's Future" (2013), a 670-page analysis outlining the then Scottish government's vision of how Scotland would transition to independence. The Scotland's Future (2013) report considers the implications of independence across a range of areas including monetary, fiscal, industrial and social policy and laid out a blueprint for approaches to these post-independence. The report also sets out the implications of independence for a variety of other areas including constitutional issues and defence policy. However, much less is known regarding the economic issues that need to be considered in the context of any Irish border poll. To date, debate around a border poll has tended to focus on broad issues, such as the relative value of factors such as retaining the NHS and the education system in Northern Ireland or the potential cost to the Irish tax payer of funding Northern Ireland subvention levels. The debate, to date, has largely ignored the wider economic context.

This paper examines the position of the Northern Irish economy within a British and Irish regional framework in terms of its relative performance and structure, before considering more closely the similarities and differences between the two economies on the island of Ireland. The research aims to inform, what is now likely to be an ongoing debate, on the pertinent economic issues relevant to any border poll on Irish unification. We begin by considering the extent to which the Northern Ireland economy is highly integrated with either other British or Irish regional economies to assess the likely cost or benefit to the Northern Ireland economy of Irish unification. Clearly, any finding of high levels of integration with regional British (Irish) economies will tend to increase (decrease) the costs of unification to Northern Ireland. Related to this issue, we also examine the degree of similarity over time in both the industrial structure and level of human capital accumulation of the Northern Ireland economy to those of British and Irish regions on the grounds that such differences will be relevant factors in explaining the existence, or absence, of long run economic relationships between Northern Ireland and British and Irish regions. The research then focusses on comparing the economies of Northern Ireland and the Republic of Ireland along a number of key dimensions including trade, industrial composition, FDI and the labour market in order to both understand existing gaps in productivity levels between both economies as these will be relevant both for determining the overall cost of Irish unification to the Irish tax payer and in identifying the potential key challenges for policymakers following a border poll. We then compare the health systems in the two countries of Ireland as this is likely to form a key part any border poll debate. Finally, we discuss the potential costs of unification to the Republic of Ireland taxpayer on the basis of certain assumptions given the findings of the research.

The remainder of the paper is structured as follows: section 2 discusses the relevant previous literature, section 3 outlines the research data and methods, section 4 examines the position of Northern Ireland (NI) relative to Great Britain (GB) regions and the Republic of Ireland (RoI) in terms of the evolution of per capita GDP, industrial composition and human capital, section 5 examines

additional factors relevant to the economies of NI and RoI and section 6 provides a summary and conclusions.

2. Existing literature

There is not an extensive literature on the performance of the NI economy, especially in the more recent period since the Good Friday Agreement; or how integrated the NI economy is with other GB regions or with the RoI economy. During the 1960s, the performance of the NI economy was relatively impressive with industrial production growing faster than the wider UK (Rowthorn, 1981). However, the 1970s saw a reversal of this trend, with the period being characterised by a rapid decline in the manufacturing base, very limited FDI and a rapid expansion in the services sector, predominately in the public sector (Rowthorn, 1981). In NI, employment in manufacturing and industrial production fell over the course of the 1970s, with the biggest losses in textiles, mechanical engineering and clothing and footwear (Rowthorn, 1981). This performance was much worse than the wider UK and contrasts with the experience of RoI where manufacturing and industrial employment expanded rapidly over the course of the decade (Rowthorn, 1981). Very few jobs were created by foreign multinationals investing in NI, which has largely been attributed to the Troubles (Bradley, 1996). Public sector employment expanded by 52% over the course of the 1970s, compared to just 22% in the UK as a whole, and while employment in police and prison services grew rapidly; there was also substantial increases in employment in health and education (Rowthorn, 1981). This reshaped the employment structure of the NI economy, so that by the early 1980s almost 40% of employment in NI was in the public sector (Teague, 2016). This expansion in public sector employment was facilitated by a large increase in the subvention to NI from the UK government, which helped in part to alleviate the impact of deindustrialisation; yet the underlying labour market prospects were poor (outside of the public sector) and the unemployment rate reached 20% in the early 1980s (Teague, 2016).

Michie and Sheehan (1998) investigated the extent to which the NI economy relates to that of GB and RoI by examining cointegration between the growth rates of NI, GB and RoI. Their findings lead the authors to conclude that the NI economy is in a 'somewhat anomalous' position as it was neither cointegrated with RoI nor with GB and also, at a regional level, not integrated with other parts in the UK. McGuinness and Sheehan (1998) examine the extent of regional convergence in the UK over the period 1970 to 1995. They show that despite growth in overall UK GDP per capita over the time period that that the ordering of regions' share of GDP per capita practically remained constant, with NI and Wales consistently having the lowest per capita income. Moreover, they find some limited evidence of regional convergence in the UK and little evidence that NI was closely integrated with GB regional economies.¹ Finally, there has been limited analysis of the hoped for 'peace dividend' following the signing of the Belfast Agreement. Teague (2016) concludes that the broad economic structure of the NI economy remains very similar to that of twenty years ago and is still heavily dependent on UK subvention with the public sector remaining the driver of the local economy.

A more recent and evolving aspect of the relevant literature relates to the potential impact of Brexit. Since before the 2016 Brexit referendum, there has been a surge in the number of studies examining the potential impact of Brexit on the UK and other economies, including RoI. There is some uncertainty as to the economic impact of Brexit, in whatever form it eventually takes, as there is no precedent of a country leaving a major trading block such as the EU. However, there is a strong consensus in the

¹ For the period 1970 to 1995, NI was found to have potentially had a long-run relationship with just one (the South West) of nine GB statistical regions that it was tested against.

literature that Brexit will reduce economic activity in the UK substantially below where it otherwise would have been (see, for example, Bank of England, 2018; HM Treasury, 2016; HM Government, 2018; IMF, 2018; Kierzenkowski et al., 2016; Hantzsche et al., 2018; Oxford Economics, 2016 and Vandenbussche et al., 2019). At the same time, existing evidence indicates that RoI will be hit relatively hard compared to other EU countries given the open nature of the economy and its close economic relationship with the UK (see, for example, Dhingra et al., 2016; Kierzenkowski et al., 2016; Vandenbussche et al., 2019; Bergin et al., 2019). At a regional level, a recent assessment (Hantzsche and Young, 2019) of the potential impact of a customs union between the UK and EU, found that NI is one of the regions likely to be adversely affected by Brexit (8th most negative impact out of 40 NUTS 2 regions considered). Within RoI, research has shown that the Border and South-West regions to be particularly vulnerable to the negative impact of Brexit (Department of Finance, 2017).

3. Data and Methods

The data for this study is drawn from a range of sources, however, in terms of our main empirical analysis we rely on regional and national per capita GDP time-series data published by the OECD and labour market data from the UK and European Labour Force Surveys (EULFS). We also use data from the statistical agencies in NI and RoI² to make relevant comparisons on the structure of trade and the relative influence of multinationals. The OECD data captures regional per capita GDP at constant 2010 prices and at constant Purchasing Power Parity. The analysis begins by examining how GDP per capita levels in NI have evolved over the period from 2000 to 2014 relative to those of regions of GB and RoI. The analysis of regional GDP per capita does not incorporate more recent data (from 2015 on) because of distortions in the RoI National Accounts, where the headline figure has been severely impacted by certain developments amongst a small number of multinational firms operating in the RoI jurisdiction (see FitzGerald (2015 and 2018) for more details). In our analysis we are interested in measuring the extent to which the gap between NI and RoI and GB regions has been increasing, or decreasing, over time. Such evidence of ongoing convergence, or divergence, will give an indication of the extent to which NI has benefitted from being an integral part of the UK over recent years and therefore, provide an indication of the potential costs associated with any border poll that could either maintain the status quo or re-orientate NI away from the UK and towards RoI. We also test for completed convergence, which measures the extent to which NI is cointegrated in a long-run sense with other GB or RoI regions, as this will inform the extent to which either Brexit or a border poll is likely to threaten, or enhance, established economic relationships and interdependencies.

We can test for ongoing convergence formally by applying a Barro equation to the GDP per capita data in the form of equation 1. The Barro model examines the relationship between the growth rate of per capita GDP and the initial level of per capita GDP using a regression model. If regions with lower initial levels of income tended to have higher growth over time, then the estimate of the coefficient of interest (β_1 in equation 1) would be negative and significant implying convergence. In contrast, a positive coefficient would point towards divergence in per capita GDP rates. We also check for convergence and divergence by plotting the variance in regional GDP per capita (the dispersion in per

² The Northern Ireland Statistical Research Agency (NISRA) for Northern Ireland and the Central Statistics Office (CSO) for the Republic of Ireland.

capita income levels) over time.

$$\frac{\ln(y_{it}) - \ln(y_{i0})}{t} = \beta_0 + \beta_1 \ln(y_{i0}) + \epsilon \quad (1)$$

where $\frac{\ln(y_{it}) - \ln(y_{i0})}{t}$ is the growth over time, t , in per capita GDP in region i and y_{i0} is the initial level of GDP per capita in region i .

In terms of completed convergence, which measures for the existence of long-run economic relationships between the regional economies, in order to overcome the problem of spurious regression in identifying causal relationships using time-series data, we run Augmented Dicky Fuller (ADF) tests for cointegration in the logged difference of pairwise per capita GDP series.³ Essentially, the approach tells us if the logged difference between two time series have a constant mean and variance (i.e. are stationary) and, if so, that the per capita GDP levels in both areas move together in a causal way over time. We estimate an ADF test in the form of equation 2:

$$\Delta d_t = \alpha + \beta T + \varphi d_{t-1} + \gamma \Delta d_{t-1} + \dots + \gamma_{p-1} \Delta d_{t-p+1} + \epsilon_t \quad (2)$$

where d_t is the difference in the log of per capita GDP levels of two areas, T is a time trend and ρ is the order of the autogressive process⁴. The test is carried out under a null hypothesis of non-stationarity $\phi = 0$.

4. The Relative Position of Northern Ireland in a Regional Context

The objective of this analysis is to measure the potential costs or benefits to Northern Ireland of a border poll. We are interested in the extent to which the NI economy has been benefitting from the status quo in terms of per capita income growth and also the extent to which a border poll could potentially disrupt, or enhance, existing economic relationships with other regions in either GB or RoI.

4.1 Spatial Variations in per capita GDP over time

Table 1 shows GDP per capita in NI and in both GB and RoI regions in 2000 and 2014. Some observations are immediately clear from the data. Firstly, the relative positions of the areas have remained relatively unchanged between 2000 and 2014 when ranked by level of GDP per capita. Secondly, the gap between the richest and poorest areas appears not to have closed over the period. With respect to NI, GDP per capita grew by 7 per cent between 2000 and 2014, which was the second lowest rate observed across all the areas in the data, and its relative rank remained at eleventh out of the fourteen regions considered. The relatively low growth of NI per capita income over the period is particularly concerning, given that the data captures most of the immediate post Good Friday

³ In a first step, we establish if each respective series is stationary or non-stationary through the application of ADF tests. The results (available on request from the authors) indicate that each series is non-stationary. Then, in a second step, we examine the difference in each of the pairwise logged per capita series to see if the difference is stationary or non-stationary.

⁴ We have estimated the test with $\rho = 2$.

Agreement period, during which any peace dividend might have been expected to become apparent. Between 2000 and 2014, the growth rate in NI was less than one quarter of that observed in the Southern and Eastern region in RoI, with the gap in income levels increasing to over \$27k per capita by 2014. This is despite RoI experiencing a financial crisis that resulted in it entering an economic adjustment programme during the observation period.⁵ However, the growth rate in GDP per capita in NI and its relative ranking over the period is very close to that observed in the Border, Midlands and Western (BMW) region in RoI. The Southern & Eastern region contains approximately 75 per cent of the Irish population with the BMW region holding the balance.

The results from the Barro equation are reported in Table 2 and while the β coefficient for the 2000 to 2014 period is only significant at the 10% level, the positive estimate points towards divergence between high and low income areas. When we estimate the Barro equation separately for the 2000 to 2008 and 2008 to 2014 periods separately, the results suggest that the gap between low and high income regions has accelerated in the period following the global recession. This is confirmed by Figure 1 which shows the variance in logged GDP per capita over the period and it is clear that the dispersion in spatial income levels has been increasing in recent years. The results are at odds with the findings of McGuinness & Sheehan (1998) who measured convergence in per capita GDP levels for the period 1971 to 1995 and concluded that the distribution of incomes remained relatively stable over the period. However, regional policy was still being operationalised during much of the 1971 to 1995 period and McGuinness & Sheehan (1998) conclude that regional income levels may well have widened in the absence of regional policy. The results here suggest that declines in regional policy as a prominent instrument used to minimise spatial disparities by successive recent UK governments, is likely to be a factor in the observed widening of regional per capita incomes over the period 2000 to 2014. The disparity between the Southern & Eastern and BMW regions also indicated that the absence of any effective regional policy has led to increased spatial inequality in Ireland over the 2000 to 2014 period.

The results of our ADF tests for completed convergence are reported in Table 3. Perhaps not surprisingly, giving our finding of ongoing divergence in per capita incomes, we find limited evidence of long-run convergence between the GDP per capita series. The vast majority of the pairwise differences contain a unit root, i.e. are non-stationary, meaning that there is no long-run relationship between them. From 91 pairwise possibilities, just four (Wales and the East of England, Wales and London, Wales and the South-West and the East of England and the South-East) were found to be cointegrated beyond a 5 per cent level of confidence. This is in contrast with McGuinness & Sheehan (1998) who reported 11 cointegrating relationships from 55 pairwise regional regressions for the UK during the 1991 to 1975 period. Taken together, these results point to a decline in UK regional integration since 2000, which again is likely to be related to declines in active regional policy over the period which, prior to this, had tended to stabilise regional disparities within the UK. With respect to NI, there is no evidence that it is strongly integrated with either GB or RoI regional economies, suggesting that any change in its constitutional position following any border poll is unlikely to threaten any existing long-run economic relationships at a GB regional level. However, the absence of any strong linkages between NI and the RoI is also a challenge that policy makers advocating a border poll would have to address, as a failure to do so could result in NI income levels continuing to lag, and possibly diverge, from those in the rest of Ireland.

⁵ Ireland entered the Bailout programme on 16 December 2010 and exited it on 15 December 2013.

Table 1: Per capita GDP in US dollars, constant 2010 prices, constant PPP

| | 2000 | 2014 | % Growth | 2000 Rank | 2014 Rank |
|--------------------------------|--------|--------|----------|-----------|-----------|
| UK: London | 53,806 | 66,176 | 23 | 1 | 1 |
| Rol: Southern & Eastern | 42,979 | 55,991 | 30 | 2 | 2 |
| UK: South East | 36,360 | 40,656 | 12 | 3 | 3 |
| UK: Scotland | 28,654 | 35,830 | 25 | 6 | 4 |
| UK: East of England | 31,183 | 33,883 | 9 | 4 | 5 |
| UK: South West | 29,090 | 33,045 | 14 | 5 | 6 |
| UK: North West | 27,194 | 32,289 | 19 | 9 | 7 |
| UK: West Midlands | 28,017 | 30,740 | 10 | 7 | 8 |
| UK: East midlands | 27,255 | 30,362 | 11 | 8 | 9 |
| UK: Yorkshire and The Humber | 26,404 | 29,280 | 11 | 10 | 10 |
| UK: Northern Ireland | 26,217 | 28,159 | 7 | 11 | 11 |
| UK: North East | 23,328 | 27,753 | 19 | 14 | 12 |
| Rol: Border, Midlands and West | 25,931 | 27,369 | 6 | 12 | 13 |
| UK: Wales | 23,592 | 26,484 | 12 | 13 | 14 |

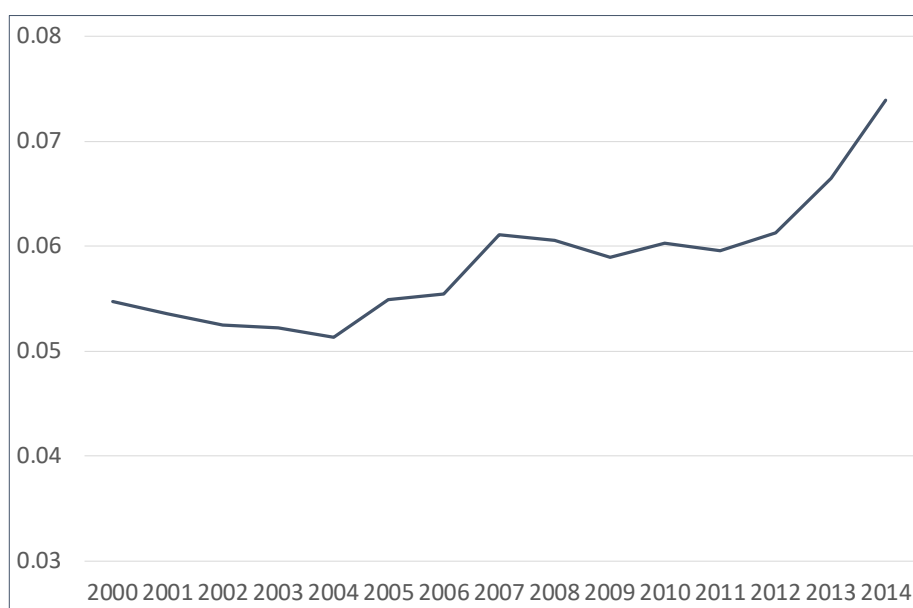
Source: OECD Regional Database

Table 2: Barro Regression Results

| Time Periods | β Coefficients |
|--------------|----------------------|
| 2000 to 2014 | 0.01* (0.005) |
| 2000 to 2008 | 0.004 (0.007) |
| 2008 to 2014 | 0.017* (0.009) |

Source: Authors own estimates based on OECD data

Figure 1: Variance in (ln) GDP per capita, 2000 to 2014



Source: Authors own estimates based on OECD data

Table 3: Augmented Dickey-Fuller tests for regional cointegration of GDP per capita, 1999 to 2014

| | Lon | E of E | EM | NE | NW | Rol - BMW | Rol - S&E | Scot | SE | SW | Wales | WM | YH |
|-----------|-------|--------|-------|-------|-------|-----------|-----------|--------|---------|--------|----------|-------|--------|
| NI | -2.95 | -1.57 | -2.89 | -2.18 | -3.00 | -0.72 | -0.71 | -3.05 | -3.09 | -2.64 | -2.42 | -0.69 | -1.53 |
| Lond | | -1.95 | -2.56 | -2.10 | -2.00 | -1.22 | -1.09 | -2.63 | -2.49 | -3.16* | -3.57** | -2.29 | -1.24 |
| E of E | | | -2.95 | -0.86 | 0.15 | -0.91 | -1.74 | -0.34 | -3.70** | -2.14 | -4.00*** | -1.87 | 0.09 |
| EM | | | | -1.30 | -0.98 | -1.21 | -1.53 | -1.33 | -2.41 | -2.59 | -3.14* | -0.72 | -1.49 |
| NE | | | | | -1.87 | -1.25 | -1.18 | -3.32* | -1.91 | -1.72 | -1.12 | 0.50 | -3.26* |
| NW | | | | | | -1.29 | -1.14 | -2.02 | -1.58 | -1.49 | -2.26 | -0.05 | -1.71 |
| Rol - BMW | | | | | | | 0.46 | -1.37 | -1.36 | -1.32 | -0.73 | -0.54 | -1.26 |
| Rol - S&E | | | | | | | | -1.19 | -1.83 | -1.82 | -1.64 | -1.86 | -0.29 |
| Scot | | | | | | | | | -1.88 | -1.90 | -2.09 | -1.00 | -2.40 |
| SE | | | | | | | | | | -1.75 | -3.25* | -1.39 | -1.66 |
| SW | | | | | | | | | | | -3.76** | -1.67 | -1.62 |
| Wales | | | | | | | | | | | | -0.60 | -1.47 |
| WM | | | | | | | | | | | | | -0.14 |

Source: Authors own estimates based on OECD data

4.2 The Composition of Employment over time

Having examined relationships at the macro-level, our next step is to compare the industrial composition of NI with that of GB and Rol regions, in order to both help understand the regions' relative performance within a UK context and identify potential barriers with respect to integration with Rol. Table 4 uses data from both the UKLFS and EULFS to give the sectoral breakdown of total employment by area in 2000. Compared to GB regions, some marked differences were apparent with NI having the lowest regional employment share in sectors such as Transport, Storage and Communications; Financial Intermediation; Real Estate, Renting and Business Services; and Personal

& Other services. NI's employment share in manufacturing was also relatively low, exceeding only those of London and the South-East in 2000. Conversely, NI had higher employment shares in Public Administration, Construction and Agriculture than any GB region in 2000, which seems consistent with the view of the region as being more reliant on the public sector and relatively low value-added industries as a source of employment. In 2000, Public Administration accounted for 12.9 percent of total employment in NI compared to a range of between 5 and 7.8 percent across all GB regions. Most of the compositional disparities observed between NI and the GB regions in 2000 also held with respect to the RoI regions and, if anything, the gap in reliance on public sector as a source of employment was much greater; 25.1 per cent of NI employment was concentrated in Public Administration and Health and Health and Social Services, compared to around 13 per cent in the RoI regions. In contrast to the NI GB comparison, agricultural employment was higher in the RoI regions compared to NI in 2000, while the employment share in Construction was broadly comparable.

The distribution of employment in 2015 is presented in Table 5 and, while NI still had the highest (lowest) employment share relative to other GB regions in Agriculture, Construction and Public administration (real estate), the gap relative to GB regions appears to have narrowed. NI's manufacturing employment share was also more in line with those of GB regions in 2015, with the sectors employment share having declined substantially across all regions since 2000. The distribution of NI employment also appears to have converged somewhat with that of RoI between 2000 and 2015. The gap in the percentage employed in Public administration and Health in the Northern and Southern labour markets fell by around 6 percentage points, almost entirely as a consequence of a growth in the employment share of the Health sector in RoI between 2000 and 2015.

Table 4: Sectoral Distribution of Employment, 2000

| | NE | NW | Y&H | EM | WM | EE | Lon | SE | SW | Wales | Scot | NI | ROI-BMW | RoI-S&E |
|--------------------------|------|------|------|------|------|------|------|------|------|-------|------|------|---------|---------|
| Ag., Fish & Mining | 1.3 | 0.9 | 1.5 | 2.2 | 1.5 | 1.8 | 0.4 | 1.6 | 2.2 | 2.7 | 4.1 | 5.0 | 12.3 | 5.8 |
| Manufacturing | 19.1 | 19.3 | 20.0 | 22.7 | 23.7 | 16.3 | 8.4 | 14.2 | 16.3 | 18.2 | 14.7 | 16.2 | 19.6 | 16.9 |
| Elect, Gas & Water | 1.2 | 0.8 | 0.7 | 0.8 | 0.6 | 0.5 | 0.3 | 0.7 | 0.7 | 1.1 | 1.0 | 0.8 | 0.9 | 0.7 |
| Construction | 6.7 | 6.7 | 6.8 | 6.7 | 6.8 | 7.7 | 5.8 | 7.1 | 7.3 | 7.6 | 7.8 | 10.3 | 11.8 | 9.5 |
| Wsale & Retail | 15.3 | 16.1 | 16.3 | 15.9 | 15.7 | 15.7 | 14.0 | 15.6 | 16.5 | 14.4 | 13.7 | 14.6 | 13.1 | 14.5 |
| Accom. & Rest. | 4.1 | 4.4 | 4.4 | 4.0 | 3.8 | 3.1 | 4.3 | 3.8 | 4.8 | 4.7 | 5.5 | 4.0 | 6.4 | 6.6 |
| Trans, Stor. & Com | 7.4 | 7.0 | 6.3 | 6.8 | 6.3 | 7.8 | 8.5 | 7.6 | 5.3 | 5.6 | 6.7 | 4.9 | 4.5 | 6.7 |
| Fin Intermediation | 2.7 | 3.7 | 3.9 | 3.2 | 3.0 | 5.4 | 7.4 | 5.0 | 4.2 | 2.9 | 4.4 | 2.4 | 2.1 | 4.8 |
| R Est, Rent & Bus | 7.7 | 8.9 | 8.6 | 8.9 | 9.4 | 12.1 | 18.1 | 13.7 | 10.5 | 7.1 | 8.1 | 5.3 | 5.0 | 9.6 |
| Public Admin | 7.8 | 6.9 | 6.1 | 5.1 | 5.0 | 5.6 | 5.3 | 6.2 | 7.4 | 6.7 | 7.4 | 12.9 | 4.6 | 4.9 |
| Education | 8.1 | 8.8 | 8.7 | 7.9 | 8.7 | 7.6 | 8.1 | 8.1 | 7.8 | 10.1 | 8.2 | 7.9 | 6.2 | 6.3 |
| Health & Social | 12.5 | 11.3 | 11.6 | 11.0 | 10.4 | 10.4 | 10.5 | 10.4 | 12.0 | 13.4 | 12.7 | 12.2 | 8.9 | 7.9 |
| Pers. & Other Serv. etc. | 6.1 | 5.3 | 5.1 | 4.9 | 5.2 | 6.1 | 8.9 | 6.1 | 5.2 | 5.6 | 5.8 | 3.6 | 4.7 | 5.8 |

Source: UK and EU Labour Force Surveys

Table 5: Sectoral Distribution of Employment, 2015

| | NE | NW | Y&H | EM | WM | EE | Lon | SE | SW | Wales | Scot | NI | ROI-BMW | ROI-S&E |
|--------------------------|------|------|------|------|------|------|------|------|------|-------|------|------|---------|---------|
| Ag., Fish & Mining | 1.8 | 0.7 | 1.3 | 1.5 | 1.3 | 2.4 | 0.6 | 1.2 | 1.7 | 2.4 | 3.7 | 2.9 | 8.2 | 4.1 |
| Manufacturing | 11.2 | 10.4 | 11.5 | 14.6 | 13.5 | 12.0 | 4.0 | 8.3 | 9.6 | 10.8 | 8.5 | 10.5 | 13.3 | 10.6 |
| Elect, Gas & Water | 2.1 | 1.4 | 1.2 | 1.4 | 1.5 | 1.1 | 0.6 | 1.0 | 1.5 | 2.1 | 1.6 | 1.5 | 1.2 | 1.0 |
| Construction | 7.6 | 6.7 | 7.0 | 7.1 | 6.7 | 5.9 | 6.9 | 7.5 | 7.5 | 7.3 | 6.3 | 8.1 | 7.4 | 6.1 |
| Wsale & Retail | 13.5 | 13.5 | 15.3 | 14.1 | 13.9 | 13.5 | 11.0 | 12.7 | 12.4 | 12.8 | 12.1 | 14.6 | 14.1 | 14.0 |
| Accom. & Rest. | 5.5 | 5.4 | 5.2 | 4.6 | 4.6 | 5.9 | 5.5 | 4.3 | 5.5 | 5.5 | 5.5 | 4.7 | 6.3 | 7.0 |
| Trans, Stor. & Com | 7.8 | 8.5 | 7.6 | 8.4 | 8.3 | 7.7 | 12.2 | 10.7 | 7.8 | 6.6 | 7.3 | 7.1 | 6.3 | 9.9 |
| Fin Intermediation | 2.5 | 3.7 | 3.2 | 2.7 | 2.9 | 2.7 | 6.7 | 4.4 | 3.8 | 3.0 | 4.1 | 3.1 | 2.7 | 5.2 |
| R Est, Rent & Bus | 8.7 | 12.2 | 10.3 | 11.1 | 11.3 | 12.9 | 18.5 | 14.4 | 12.6 | 9.0 | 11.6 | 7.4 | 7.2 | 10.7 |
| Public Admin | 7.2 | 6.1 | 5.5 | 5.2 | 6.2 | 5.2 | 5.2 | 5.9 | 6.9 | 7.3 | 7.3 | 9.6 | 5.6 | 5.3 |
| Education | 10.7 | 11.4 | 11.4 | 11.2 | 11.1 | 11.5 | 10.3 | 11.7 | 10.8 | 11.2 | 9.7 | 11.1 | 8.5 | 7.9 |
| Health & Social | 16.7 | 15.3 | 15.7 | 13.6 | 12.8 | 14.0 | 11.6 | 11.8 | 14.5 | 17.5 | 16.3 | 14.7 | 14.5 | 12.7 |
| Pers. & Other Serv. etc. | 4.8 | 4.8 | 5.1 | 4.6 | 5.8 | 5.5 | 7.2 | 6.1 | 5.4 | 4.7 | 6.1 | 4.9 | 4.7 | 5.4 |

Source: UK and EU Labour Force Surveys

We can measure, more formally, the similarity of the industrial composition of employment between NI and other labour markets, and the degree to which these have been converging over time, by estimating the Krugman Similarity Index (KSI). The KSI index for region A (in our case Northern Ireland) and region B is calculated using equation 3, where employment in industry i in region A is X_{iA} , employment in industry i in region B is X_{iB} , total employment in region A is X_A and total employment in region B is X_B . The index takes a value in the range of 0 to 2, where 0 denotes absolute similarity in both regions industrial composition and 2 indicated absolute dissimilarity⁶. The KSI's for 2000 and 2015 are given in Table 6. NI was most dissimilar to London, the region with the highest income level, and most similar to the North East, a region with one of the lowest income levels. The Southern and Eastern region in ROI, Scotland and the South East tend to have some of the highest KSI's, however, the degree of dissimilarity to Northern Ireland employment composition is much lower than that for London in both 2000 and 2015. The KSI values for all regions fell between 2001 and 2015, supporting the descriptive analysis that Northern Ireland's industrial employment composition has been converging with those of the other labour markets over the period. The tendency towards convergence is confirmed by Figure 2 which shows that the KSI's of NI and all other labour markets fell steadily between 2000 and 2015. Generally, the analysis would not support the view that Northern Ireland's poor relative growth performance over the period is due to disproportionately high, and increasing, shares of employment in low value-added sectors. The explanation is more likely to relate to differences in value added activity within sectors, something that we will explore in more detail later.

⁶ For example take two regions A and B with two sectors 1 and 2. If all region A's employment was in sector 1 with zero in sector 2 and all of region B's employment was in sector 2 with zero in sector 1, then the absolute sum of the ratios under equation 3 is 2, which denotes absolute dissimilarity.

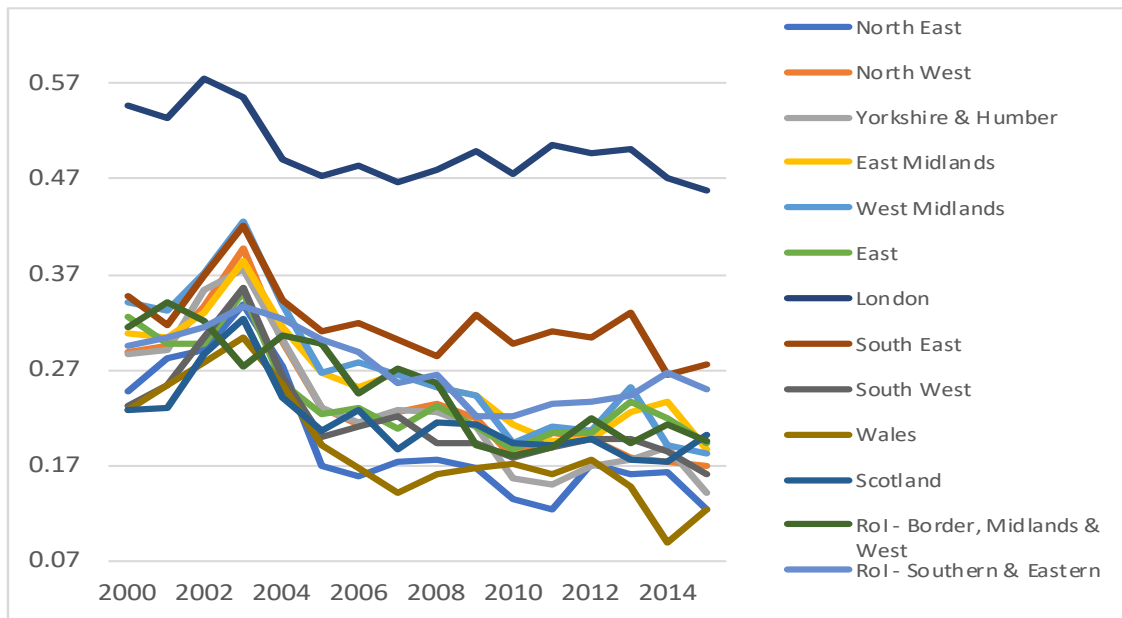
$$KSI_{AB} = \sum_i \left[\left(\frac{X_{iA}}{X_A} \right) - \left(\frac{X_{iB}}{X_B} \right) \right] \quad (3)$$

Table 6: Krugman Similarity Index to Northern Ireland Sectoral Employment in 2000 and 2015

| | 2000 | 2015 |
|-------------------------------|-------|-------|
| North East | 0.247 | 0.123 |
| North West | 0.289 | 0.169 |
| York & Humberside | 0.287 | 0.142 |
| East Midlands | 0.308 | 0.186 |
| West Midlands | 0.341 | 0.182 |
| East of England | 0.326 | 0.193 |
| London | 0.547 | 0.457 |
| South-East | 0.347 | 0.275 |
| South-West | 0.233 | 0.161 |
| Wales | 0.228 | 0.124 |
| Scotland | 0.228 | 0.203 |
| Rol - Border, Midlands & West | 0.316 | 0.195 |
| Rol - Southern & Eastern | 0.296 | 0.249 |

Source: Authors own calculations based on European Labour Force Survey

Figure 2: Krugman Similarity Index 2000 to 2015



Source: Authors own calculations based on European Labour Force Survey

4.3 *The Distribution of Human Capital*

Another relevant factor to the debate around a border poll are the levels of educational attainment in NI relative to both RoI and GB regions. Clearly, human capital is a key determinant in any region or country's growth rate and assessing differences in educational attainment in NI relative to British and RoI regions is important for understanding some of the observed differences in income levels and growth rates. The assessment is also important for identifying any potential challenges for policy following a border poll. Table 7 examines the distribution of educational attainment at population level across the NI, GB and ROI regions in 2000. Education is measured in terms of the highest ISCED level attained and, while these relate to different qualifications in the UK and RoI, they are directly comparable.⁷ Relative to the GB regions, NI was one of the poorest, if not the poorest, performers in terms educational attainment in 2000. At 30.5 percent, NI had by far the largest population share with basic, or no, qualifications and compares to an average across other GB regions of 20.1 percent. At the upper end of the spectrum, NI also had the lowest share of individuals holding post-secondary qualifications and only the North-East had a lower share of graduates. Compared to the RoI in 2000, NI's population share with basic or no qualifications was over 10 percentage points higher than the Southern and Eastern region but was relatively close to that in the BMW region. While NI had a slightly higher graduate share, the RoI had a much higher share of population qualified to post-secondary level. By 2015, although the level of education attainment rose across the board (Table 8) NI's relative position remained unchanged compared to GB regions; NI still had the highest population share of individuals with basic or no qualifications and was also now the poorest performer in terms of graduates. Relative to the RoI, 2015 also saw a substantial deterioration, with NI far exceeding the population share with basic or no qualifications and, relative to 2000, a large deficit in the share of population holding post-secondary qualifications. By 2015, the Southern and Eastern region had also overtaken Northern Ireland in terms of the share of graduates in the population.

It is possible that demographic factors may drive some of the trends evident in Tables 7 and 8, for example, NI may simply have had a higher share of older people within its population and the figures may not, in fact, reflect genuine differences in educational attainment. To provide a more accurate assessment, we also estimated the proportion of 24 to 30 years olds educated to various levels in 2015, as this will provide a more genuine reflection of the relative performance of the various educational systems. This age group was chosen as the vast majority of young people will have left formal education by the age of 24. NI's relative position improves only slightly compared to GB regions, it is now the second worst performer in terms of young people with only basic or no qualifications but it has the highest share educated to lower secondary only. In terms of young persons educated to tertiary level, NI only exceeds the rates recorded for Wales and the North East. With respect to RoI, the gap in educational attainment is starker, over a third of young people in Northern Ireland were educated to lower secondary level or below in 2015, this was between 3 to 4 times higher than the incidences found in RoI. At the upper end of the spectrum, the proportion of young people holding degrees or post-secondary qualifications was between 12 and 16 percentage points higher in the RoI (Table 9).

It is clear that there is much to concern policy makers in NI with regard to levels of educational attainment both compared to GB regions and, in particular, the large performance gap that has developed with respect to the RoI. It is undoubtedly the case that the relatively poor performance of

⁷ In terms of the ISCED 2011 classification, Primary refers to ISCED Levels 0 1n 1 (early childhood education and primary education), Lower-secondary to ISCED level 2, Upper-secondary to ISCED level 3, Post-Secondary to ISCED levels 4 and 5 (post-secondary non-tertiary education and short-cycle tertiary education) and Graduate to ISCED levels 6, 7 and 8 (bachelor or equivalent; master or equivalent and doctoral or equivalent).

the education system in NI will have contributed to its poor relative growth performance with respect to most GB regions and RoI. The very substantial gap that exists with respect to RoI also means that NI productivity levels will continue to lag those of the RoI even in circumstances where the structures of both economies converge. The planning for any border poll must give serious consideration as to how educational standards in NI can be improved to match those of the RoI, in order to help close the gap in productivity and per capita income levels that exists with respect to the majority of RoI.

Table 7: Distribution of educational attainment for individuals aged 16 to 65 in 2000

| | NE | NW | Y&H | EM | WM | EE | Lon | SE | SW | Wales | Scot | NI | ROI - BMW | RoI - S&E |
|-----------------|------|------|------|------|------|------|------|------|------|-------|------|------|-----------|-----------|
| Primary | 24.8 | 20.3 | 21.0 | 21.1 | 23.8 | 18.6 | 19.0 | 13.6 | 15.2 | 23.2 | 20.1 | 30.5 | 27.3 | 19.9 |
| Lower-secondary | 27.2 | 26.6 | 26.6 | 27.5 | 27.0 | 28.9 | 22.0 | 27.7 | 28.6 | 28.8 | 17.4 | 23.3 | 24.5 | 22.6 |
| Upper-secondary | 28.2 | 28.6 | 28.8 | 27.3 | 24.9 | 27.1 | 23.0 | 28.3 | 28.0 | 23.3 | 33.7 | 26.1 | 35.1 | 37.6 |
| Post-secondary | 9.2 | 10.1 | 9.7 | 9.3 | 9.7 | 8.9 | 8.1 | 10.2 | 11.1 | 11.0 | 13.9 | 7.0 | 5.5 | 7.6 |
| Graduate | 10.7 | 14.4 | 13.9 | 14.8 | 14.5 | 16.6 | 28.0 | 20.2 | 17.0 | 13.6 | 14.9 | 13.0 | 7.5 | 12.3 |

Source: UK and EU Labour Force Surveys

Table 8: Distribution of educational attainment for individuals aged 16 to 65 in 2015

| | NE | NW | Y&H | EM | WM | EE | Lon | SE | SW | Wales | Scot | NI | ROI - BMW | RoI - S&E |
|-----------------|------|------|------|------|------|------|------|------|------|-------|------|------|-----------|-----------|
| Primary | 11.5 | 11.7 | 11.4 | 9.3 | 14.6 | 9.7 | 9.1 | 7.4 | 6.4 | 12.0 | 10.5 | 18.7 | 11.8 | 8.6 |
| Lower-secondary | 26.8 | 26.1 | 25.5 | 27.5 | 25.7 | 26.9 | 17.0 | 24.9 | 25.8 | 25.1 | 18.1 | 25.4 | 18.5 | 16.3 |
| Upper-secondary | 27.9 | 25.2 | 27.2 | 26.9 | 23.5 | 26.3 | 20.0 | 25.1 | 27.2 | 24.5 | 25.6 | 23.8 | 26.2 | 26.1 |
| Post-secondary | 10.1 | 9.3 | 9.7 | 10.9 | 10.0 | 9.8 | 8.2 | 10.0 | 10.9 | 11.7 | 16.5 | 9.0 | 23.5 | 22.2 |
| Graduate | 23.8 | 27.7 | 26.2 | 25.3 | 26.2 | 27.3 | 46.0 | 32.6 | 29.7 | 26.8 | 29.3 | 23.0 | 20.0 | 26.9 |

Source: UK and EU Labour Force Surveys

Table 9: Distribution of educational attainment for individuals aged 24 to 30 in 2015

| | NE | NW | Y&H | EM | WM | EE | Lon | SE | SW | Wales | Scot | NI | ROI - BMW | RoI - S&E |
|-----------------|------|------|------|------|------|------|------|------|------|-------|------|------|-----------|-----------|
| Primary | 6.6 | 7.5 | 7.8 | 5.1 | 11.2 | 6.0 | 4.0 | 4.6 | 3.8 | 7.9 | 5.6 | 10.4 | 3.0 | 2.1 |
| Lower-secondary | 24.5 | 21.2 | 22.3 | 21.3 | 21.3 | 24.7 | 11.0 | 21.7 | 20.3 | 21.9 | 16.9 | 25.0 | 7.8 | 6.2 |
| Upper-secondary | 28.1 | 24.8 | 28.0 | 28.9 | 24.3 | 25.8 | 15.0 | 27.5 | 32.5 | 27.9 | 22.5 | 24.8 | 30.1 | 26.1 |
| Post-secondary | 8.6 | 6.0 | 6.1 | 8.2 | 7.2 | 6.2 | 5.5 | 6.2 | 7.2 | 8.1 | 17.3 | 5.4 | 24.8 | 22.5 |
| Graduate | 32.1 | 40.5 | 35.8 | 36.5 | 36.0 | 37.2 | 64.0 | 39.9 | 36.2 | 34.2 | 37.7 | 34.4 | 34.3 | 43.0 |

Source: UK and EU Labour Force Surveys

5. A Closer comparison of Northern Ireland and the Republic of Ireland

In order to understand differences in the growth trajectories and also the potential opportunities or barriers that are relevant to any debate around a border poll, we next contrast and compare key aspects of both economies in terms of factors such as trade, FDI and the labour market. The objective of this section is to better understand the reasons behind NI's much poorer productivity performance

compared to RoI and, again, to highlight potential areas where there is scope for policy to attempt to raise NI productivity levels following a border poll.

5.1 *The relative importance and composition of trade North and South*

It is difficult to get comparable trade statistics for NI and RoI, however, a report published by Intertrade Ireland (2018) drew together available data sources to allow a direct comparison of the relative openness of both economies. In 2016, total NI exports were £10,126m, of which goods exports accounted for 82 percent of the total and services exports for 18 percent. Exports accounted for 15 percent of total business turnover. Taking account of sales to GB, total external trade was £23,143 million of which goods accounted for 78 percent, with external trade accounting for 35 percent of the regions total business turnover. With respect RoI, the latest comparable statistics were for 2015 and indicated total export sales of £234,012m of which goods exports accounted for 48 percent and services exports for 52 percent. In 2015 exports accounted for 54 percent of total business turnover in the Republic of Ireland. Therefore, it is immediately obvious, even when taking account of NI's trade-flows with GB, that the RoI economy is much more open relative to that of NI, and its export led nature is widely attributed as a key source of the country's growth in recent decades. Another key difference between the two economies is the relative importance of the services sector, with services accounting for 52 per cent of exports in the RoI compared to just 18 percent in NI. The high relative openness of the Irish economy does, however, leave it more exposed to changes and shocks in global demand compared to Northern Ireland, where 65 percent of turnover is accounted for by local sales and, as we shall see, this openness has important implications for relative labour market volatility.

Important differences also exist in terms of the composition of exports between both parts of Ireland. In NI over 70 percent of its 2017 exports were in manufactured goods with service sector exports more evenly spread across Information and communication (26%), Transport & storage (18%), Professional & scientific (16%), with Manufacturing and Administrative services accounting for a further 10 percent each respectively⁸. For RoI, three sectors dominate good exports Pharmaceuticals (44%), Other manufacturing (25%), and Agrifood (15%). For services, Computer services accounted for 43 percent of exports in 2017 with Business services accounting for a further 23 percent⁹. Figures 3 to 5 plot exports of goods by destination. For RoI, the Rest of the World (RoW) accounted for 49 percent of total exports in 2017, followed by sales to the Rest of the EU (RoEU) and GB at 38 and 12 percent respectively; NI accounted for just over 1 percent of Irish goods exports in 2017. For NI, over half of sales are to GB, with RoW and the RoI accounting for a further roughly 20% share each.

⁸ Source: Northern Ireland broad economy sales and exports data (NISRA).

⁹ Source: International Trade in Services 2017 (CSO).

Figure 3: Northern Ireland External Sales of Goods by Destination (%)

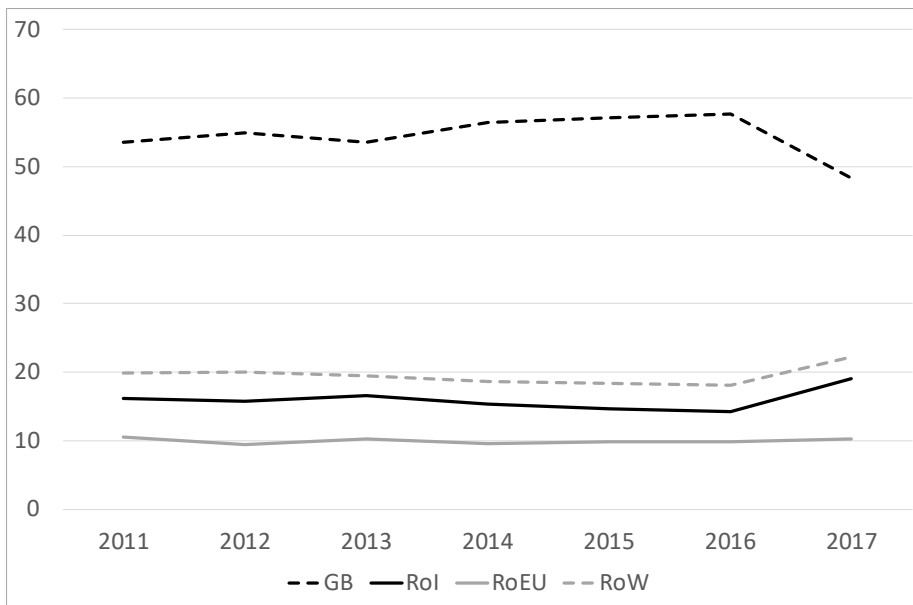


Figure 4: Republic of Ireland, Exports of Goods by Destination (%)

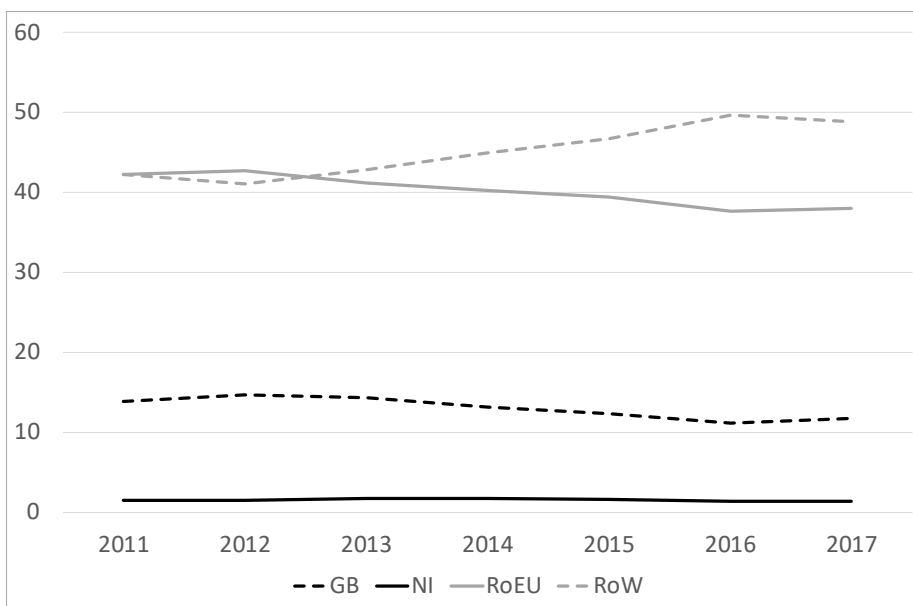
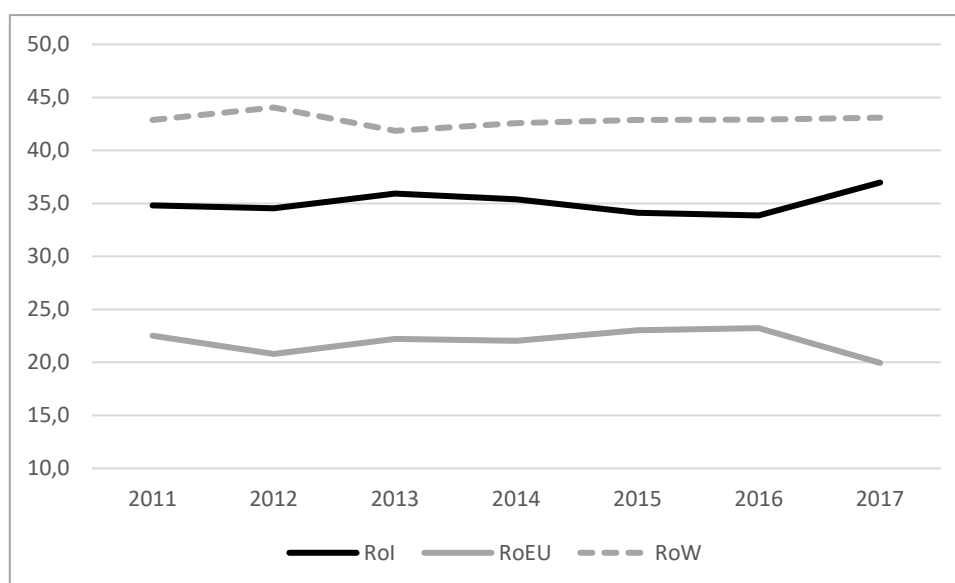


Figure 5: Northern Ireland Exports of Goods by Destination (%)



5.2 The importance of the Multinational Sector

The UK is a leading destination for FDI and it has the largest inward FDI stock in the EU. At the same time, the RoI is arguably more FDI intensive with the stock of inward FDI accounting for over 240% of GDP in 2018 compared to 67% of GDP in the UK (UNCTAD, Country Factsheets). Within the UK, NI attracts around 2% of new FDI projects; however, despite this apparent low rate these FDI projects tend to create more jobs relative to other UK regions.¹⁰ Table 10 shows the share and distribution of foreign-owned businesses in NI and RoI. Compared to the RoI, NI has a similar share of foreign-owned businesses, however their share in total employment is around 8 percentage points below that of the RoI. Furthermore, the data suggests that productivity in the foreign sector (proxied by turnover per worker) in NI is far below that of the RoI. To some extent, the data for the RoI are overly flattering as the high implied productivity in the foreign-owned sector is due to transfer-pricing practices of multinationals; however ONS data show that turnover per worker in NI in the foreign-owned sector is around half that of the UK average. The gap in implied productivity between NI and the RoI could be driven by NI FDI being more heavily concentrated in low productivity sectors. Relative to the RoI, NI has a much lower share of foreign-owned businesses in the services sector and higher shares of foreign-owned businesses in distribution and construction. When examined by employment shares, which is a better measure of the scale of foreign-ownership as it accounts for firm size, NI has higher employment shares in industry and construction and lower employment shares in services compared to the Republic of Ireland. Goldrick-Kelly and Mac Flynn (2018) examine productivity on the island of Ireland and their results are highly consistent with the patterns described here. Goldrick-Kelly and Mac Flynn (2018) find NI 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. Furthermore, they find substantial variation in the performance of sub regions within NI and RoI and find it is in the area of sectoral performance that some of the largest gaps emerge.

¹⁰ For example, in 2018 the number of jobs created per new FDI project in Northern Ireland was 42, compared to the UK average of 32 new jobs (Department for International Trade).

There is some uncertainty about the exact implications of Brexit for FDI into NI and RoI. Ultimately, FDI decisions are a complex interplay of factors such as the presence of a highly educated labour force, limited barriers to trade and investment, a business friendly regulatory environment, a simple corporate tax system with relatively low tax rates etc. However, factors such as reduced access to the EU single market and uncertainty about the UK's future relationship with the EU mean it is likely that inward FDI to the GB and NI will be lower in the long-run (see, for example, Ebell and Warren, 2016; Dhingra et al. 2017).¹¹ For the RoI, given that it is already an attractive destination for FDI, Brexit could lead to an opportunity for firms to relocate investment in order to remain within the EU with full access to the EU single market or some FDI that otherwise would have gone to the UK (in the absence of Brexit) may be diverted to the RoI (Lawless and Morgenroth, 2016; Bergin et al 2019).

Table 10: Share and Distribution of Foreign-Owned Business^a, 2015

| | Northern Ireland ^b | Republic of Ireland |
|---|-------------------------------|---------------------|
| % of Businesses | 1.3 ¹² | 1.3 |
| % of Employment | 14.0 ¹³ | 22.2 |
| Turnover per worker ^c (in '000s per unit of currency) | £202.5 [~ €231] | €1,114.4 |
| Foreign ownership by sector ^d , % | | |
| Industry | 19.5 | 19.2 |
| Construction | 6.1 | 3.4 |
| Distribution | 36.0 | 24.0 |
| Services excl. finance and insurance | 37.2 | 53.4 |
| Total | 99 | 100 |
| Foreign ownership by employment ^d , % | | |
| Industry | 35.3 | 30.4 |
| Construction | 3.4 | 0.7 |
| Distribution | 27.1 | 27.8 |
| Services excl. finance and insurance | 34.0 | 41.0 |
| Total | 100 | 100 |

Sources: Northern Ireland: Inter-Departmental Business Register for Northern Ireland and Office for National Statistics for turnover data; RoI: CSO Business in Ireland 2016.

Notes: ^aThe data for RoI excludes the finance and insurance industry. This sector is included in the data for Northern Ireland and in 2015 its share in foreign-owned businesses was 5.6% and its share in foreign-owned employment was 8%.

^bThe foreign-owned sector in Northern Ireland is defined as non-UK businesses operating in Northern Ireland. In 2015, businesses from Great Britain comprised 1.1% of businesses and 10.4% of employment in Northern Ireland.

^cThe data for turnover for Northern Ireland refer to 2017.

^dIn the table, the finance and insurance industry has been excluded from the calculations of the foreign-owned sectoral and employment distributions in NI to allow for greater comparability with the Republic of Ireland data, where the comparable information is not available.

¹¹ In fact, Serwicka and Tamberi (2018) find that since the Brexit referendum, the number of FDI projects in the UK has fallen by 16 to 20 per cent.

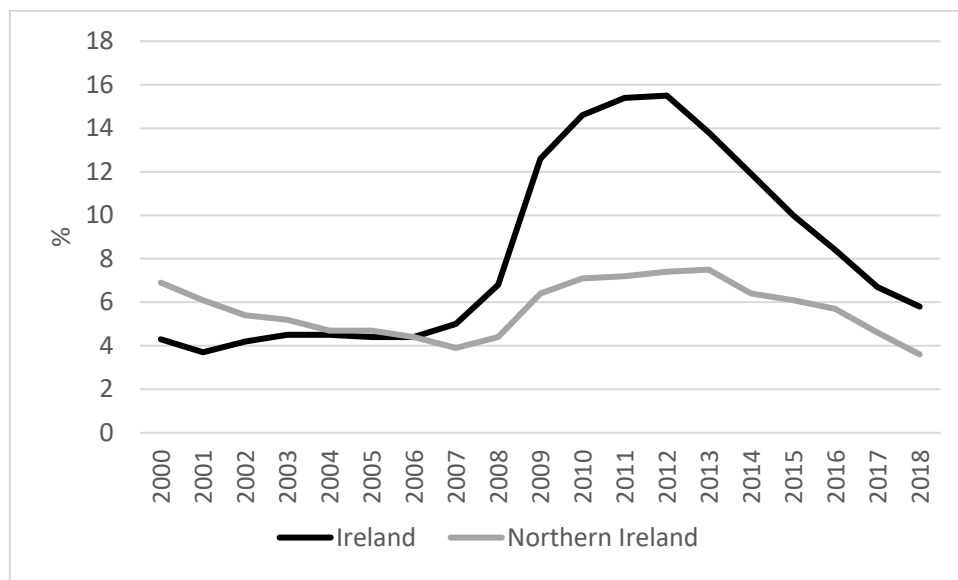
¹² Republic of Ireland firms account for one third of this figure.

¹³ Republic of Ireland owned business account for 17.5 per cent of this figure.

5.3 The Labour Market in Northern Ireland and the Republic of Ireland

The exceptional openness to trade and factor flows means that the business cycle is particularly pronounced in the Republic of Ireland. This volatility is also reflected in several key indicators of the labour market. Figure 6 shows the unemployment rate in RoI and NI over the past twenty years. In the period up to 2007, the unemployment rate in NI exceeded that in RoI although it was on a downwards trajectory. When the global financial crisis hit, the economy in RoI was particularly exposed and while the unemployment rate increased in both jurisdictions, the scale of the increase was particularly severe in the RoI. The unemployment rate began to fall back in 2012 in the RoI and in 2013 in NI and the gap between the rates has been reducing in recent years. Another aspect of the openness of both economies is in relation to the openness of the labour market with migration playing an important role in determining labour supply and acting as a shock absorber to prevailing economic conditions. In relation to migration, Figure 7 shows the labour market in RoI again displays much more volatility than that in NI. There is an element of a common cycle between unemployment and net migration that is very distinct in the RoI, where outflows tend to increase in periods when the unemployment rate is high and vice versa.

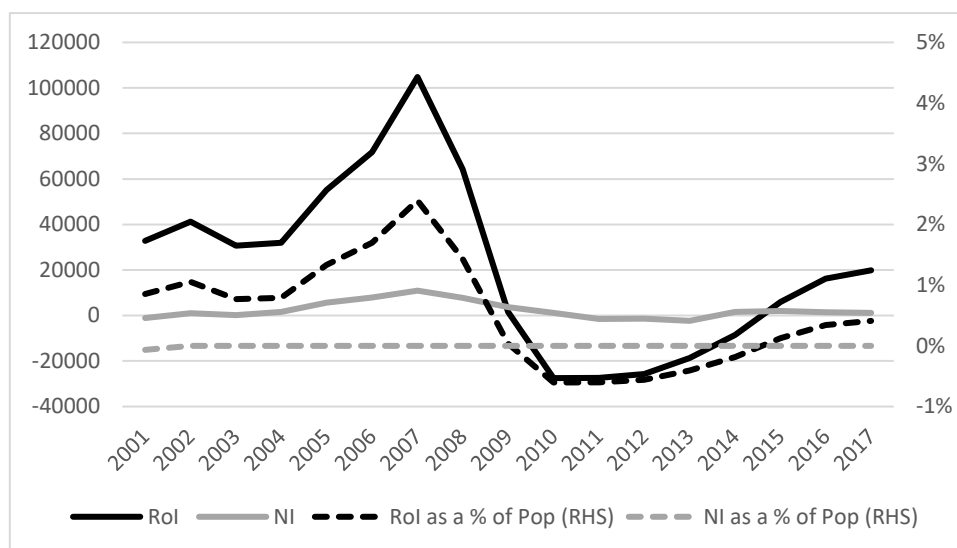
Figure 6: Unemployment Rates in the Republic of Ireland and Northern Ireland



Source: Eurostat

Note: The unemployment rate is expressed as a % of the labour force aged 15-74.

Figure 7: Net Migration in the Republic of Ireland and Northern Ireland



Source: NISRA and CSO

The evidence from this section suggests that lower levels of productivity in NI relative to RoI are driven by a number of interrelated factors including a lower concentration of high valued added export-orientated MNEs. The success of RoI in raising educational attainment over recent years has been a key factor in both attracting high value-added FDI and in generating export-led growth; the very substantial educational gap which has emerged between NI and RoI in recent years will potentially be a key barrier to successful industrial policy following a border poll. However, it is also true that the RoI labour market experiences much more volatility than that of NI suggesting that any movement to the RoI model post-unification could lead to more volatility in NI unemployment and migration rates.

5.4 Healthcare systems contrasted

The issue of access to the National Health Service (NHS) is often perceived as a key benefit of NI's attachment to the UK. While the NHS differs slightly across each country in the UK, with devolution of decision making on allocation of services, medicines and expenditure at the country level, the central tenants of the NHS span the UK including free universal access to primary, community, and hospital care. While in both NI and RoI, health and social care (i.e. home care and long-term residential care) are funded and governed by one body¹⁴, the most obvious difference between the health systems in NI and the RoI is that free universal access to healthcare exists in NI.

In RoI, although 78 percent of the healthcare system is funded by the State through general taxation, universal access to primary, community, and hospital care is limited to the 31.8 percent of the population who are medical card holders. In general, access to a medical card is based on being below an income threshold. Charges in the RoI include €100 for a visit to A&E without a referral letter from a GP and public hospital inpatient charges of a flat fee of €80 per day up to a maximum of €800 in a 12 month period. There are no set charges for GP services in RoI, although a visit will typically cost in

¹⁴ In England, while health care is funded and coordinated by NHS England, social care is under the remit of local authorities.

the region of €50 (Connolly et al, 2018). In addition to individuals covered by medical cards, many individuals who are above the income-threshold for a medical card are GP visit card holders, and are entitled to free GP services. In addition to means-tested GP visit cards¹⁵, in 2015, GP visit cards were introduced for all individuals aged over 70 and all children aged under 6 irrespective of means. Wren et al. (2015) estimate that the proportion of the population covered by either medical or GP visit cards increased from 29 to 47 percent between 2005 and 2015, with more recent data from the Primary Care Reimbursement Service (PCRS) showing the proportion has fallen to 43 percent in 2018.¹⁶ On April 6th 2019, it was announced that free GP care would be extended to children aged under the age of 12 over the period 2019 to 2022. The Sláintecare (2017) report, outlines the Irish governments strategy for healthcare reform, and includes the movement towards universal GP services that are free at the point of delivery (or at the lowest possible cost) as a government objective. For social care services such as home care and long-term residential care, in both ROI and NI (and the UK as a whole), many services are provided by private or voluntary agency providers. Universal free access is not available for these services across both countries, though public home care is currently provided without co-payment requirements in ROI¹⁷.

In 2015, 45 percent of the Irish population were covered by private health insurance (OECD, 2017), and while this rate was substantially higher than the comparable figure of 11 percent for the UK as a whole, it was also substantially lower than that for other European countries such as Belgium and the Netherlands, who operate mixed public/private systems, where private health insurance coverage rates exceeded 80 percent of the population¹⁸. OECD (2018) provides some comparable indicators for the Irish and UK health systems (Table 11). ROI had the 5th highest level of per capita health expenditure in the EU 28 (behind Luxemburg, Germany, Sweden and Austria) at €3,930 in 2017, compared to the UK which ranked 9th with a per capita spend of €3,045; although the share of this expenditure that is attributable to Government is lower in ROI at 73 percent compare to 78 percent in the UK. OECD (2018) also provide a broad composite measure of entitlement to public healthcare, described as healthcare coverage¹⁹, which shows that at just 63 per cent hospital care coverage in ROI is substantially lower than the both the UK rate and the EU average which stood at 93 and 94 per cent respectively. Outpatient coverage in ROI was much closer to the EU average but was lower than the coverage rate in the UK by 11 percentage points. Finally, pharmaceutical care coverage in ROI exceeded both the UK rate and EU average by 7 and 13 percentage points respectively in 2016.

Interestingly, the share of total healthcare spending financed by out of pocket expenses²⁰ was two percentage points higher in the UK relative to ROI in 2017, with the share in both countries lying below

¹⁵ To be eligible for a GP visit card a single person aged under 66 should have a net income not exceeding €304 per week. For single persons aged 66 to 69 the qualifying limit is €333 per week (www.citizeninformation.ie).

¹⁶ In terms of medicine prescription charges, which are not charged within the NHS, these are set at €2 per item for medical card holders up to a limit of €20 per family per month. Non-medical card holders are charged for the full prescription, but this is capped at €134 per month (reduced from €144 in 2018) per family under the Drugs Payment Scheme. Tax relief is available at the standard rate (20 percent) for all medical expenses (including prescription and dental charges) not refunded by healthcare bodies or private medical insurance.

¹⁷ This is likely to change in ROI in 2021 with the proposed Sláintecare home care plans.

¹⁸ Tax relief at the standard rate is also available on private insurance premium payments.

¹⁹ This is defined by “the share of the population entitled to services (“breadth of coverage”), the range of services included in a benefit package (“depth of coverage”) and the proportion of costs covered (“height of coverage”) by government schemes and compulsory insurance schemes. Financial coverage provided by voluntary health insurance is not considered” (OECD, 2018).

²⁰ This is defined as “expenditures borne directly by a patient where neither public nor private insurance cover the full cost of the health good or service” (OECD, 2018).

the EU average of 18 percent. RoI performed marginally better than the UK in terms of practicing doctors, hospital beds and hospital discharges per 1000 population in 2016, however, both RoI and the UK fell well below the EU average on all of these indicators. RoI was estimated to have 11.6 nurses per 1000 population in 2016, which exceeded the rates for both the UK and EU average which stood at 7.9 and 8.4 per 1000 population respectively. In this context, capacity issues and waiting lists for care are worrying issues in both countries. Both RoI and the UK had acute care bed occupancy rates of over 90 percent in 2016, amongst the highest in OECD countries, and compared to an EU average rate of 77 percent. Such high rates of bed occupancy indicate that, relative other EU countries, neither RoI or the UK has sufficient spare capacity within their hospital systems to adequately cope with variations in demand, with the data also suggesting that hospital patients tend not to flow easily through either system. Capacity issues in non-hospital care also exist with delayed discharges²¹ from hospital in both RoI and UK being severe. Waiting lists for elective inpatient and outpatient care are also long, especially in RoI, with private health insurance to a large extent used to circumvent long waiting times in the public system. Waiting times in NI are generally longer than the UK as whole. For example, NI Department of Health figures (as of September 2018) showed 94,222 people waiting longer than 52 weeks for their first consultant led outpatient appointment while equivalent statistics for England showed 3,464 waiting, from a much larger population (Griffin, 2019). Similarly, while GP care may require an out of pocket payment in RoI, access is speedier than in NI where average wait for an appointment is days. This has led to the establishment of a number of private GP practices in NI who offer quicker access to a GP, but where an out of pocket payment is required.

Therefore, in summary, the comparative health analysis shows a somewhat mixed set of results. The RoI system does have more up-front charges; however, it also contains balances to ensure that healthcare remains free at the point of use for the most vulnerable in society. Sláintecare priorities will also potentially expand universal access to primary care, at a minimum, to a large proportion of the RoI population in coming years. The OECD data suggests that out of pocket expenses accounts for a slightly higher share of health spending in the UK. Free access to hospital care is superior in the UK, where waiting times for care are also shorter, while RoI has somewhat higher rates of doctors, nurses, hospital beds and hospital discharges per 10,000 population. Finally, both systems have issues with acute capacity, and both appear to be outlying poor performers in terms of acute care bed occupancy rates, indicating that neither health service has sufficient spare capacity to deal with fluctuations in demand; a high acute bed occupancy rate is also consistent with ineffective processes for moving patients efficiently through the hospital system, which points towards serious shortfalls in social care provision within both health systems.

²¹ Patient remaining in hospital despite being medically cleared for discharge, but unable to leave to lack of formal or informal care.

Table 11: Healthcare Indicators Republic of Ireland and UK

| | UK | Ireland | EU Average |
|---|--------------------|---------|------------|
| Health spending per capita 2017 (€ PPP) | 3045 | 3930 | 2773 |
| Healthcare coverage/ Entitlement to public healthcare, 2016 (%) | | | |
| Hospital care | 94 | 69 | 93 |
| Outpatient care | 84 | 73 | 77 |
| Pharmaceutical care | 70 | 77 | 64 |
| Share of health care financed by out of pocket | 15 | 13 | 18 |
| Practicing doctors per 1000 population, 2016 | 2.8 | 2.9 | 3.6 |
| Practicing nurses per 1000 population, 2016 | 7.9 | 11.6 | 8.4 |
| Inpatient hospital beds per 1000 population, 2016 | 2.6 | 2.9 | 5.1 |
| Inpatient hospital discharges per 1000 population, 2016 | 131 | 136 | 172 |
| Occupancy rate of acute care beds, 2016 ^a | 90.5 ²² | 94 | 77 |

Source: OECD Healthcare at a Glance

Notes: ^a The occupancy rate in hospitals in NI was much lower than the UK average at 84 per cent (Northern Ireland, Department of Health)

5.5 Subvention levels in Northern Ireland

Subvention refers to the gap between government spending allocated to NI and the amount raised in taxes paid to the UK government by NI residents and businesses. The issue of subvention is often raised in the context of the Irish unity debate as the cost of administering NI institutions and services that is likely to be transferred to the Irish tax payer in the event of Irish unification. Rowthorn (1981) points out that until the 1930s NI was a net contributor to the British Treasury, with subvention becoming a permanent feature of NI's public administration thereafter. Figure 8 plots the level of subvention between 1966 and 1996 (in 2014 prices) and shows that the level increased sharply in the early 1970s, a period which coincided with the beginning of what is commonly termed the Troubles. Subvention levels remained relatively stable at under £4bn per year between 1974 and 1991, before rising sharply to over £5bn for most of the 1992 to 1996 period (Figure 8). Subvention levels continued to rise in the period following the Good Friday Agreement, to approximately £8bn between 2002 and 2007, increasing to over £10bn in 2008 before falling steadily to just over £9bn in 2014. The level of subvention in 2014 was £9.16bn, which equated to 27.9 per cent of financial year Gross Value Added in NI (Northern Ireland Net Fiscal Balance Report).

²² This estimate was sourced from the Nuffield Trust and relates to the occupancy rate of general & acute beds between Q3 2016 and Q3 2017. We therefore cannot guarantee that the UK figure will be directly comparable with the OECD estimate for Ireland. <https://www.nuffieldtrust.org.uk/resource/hospital-bed-occupancy#background>

Figure 8: Northern Ireland Subvention Levels 1966-1996, £ million (2014 prices)

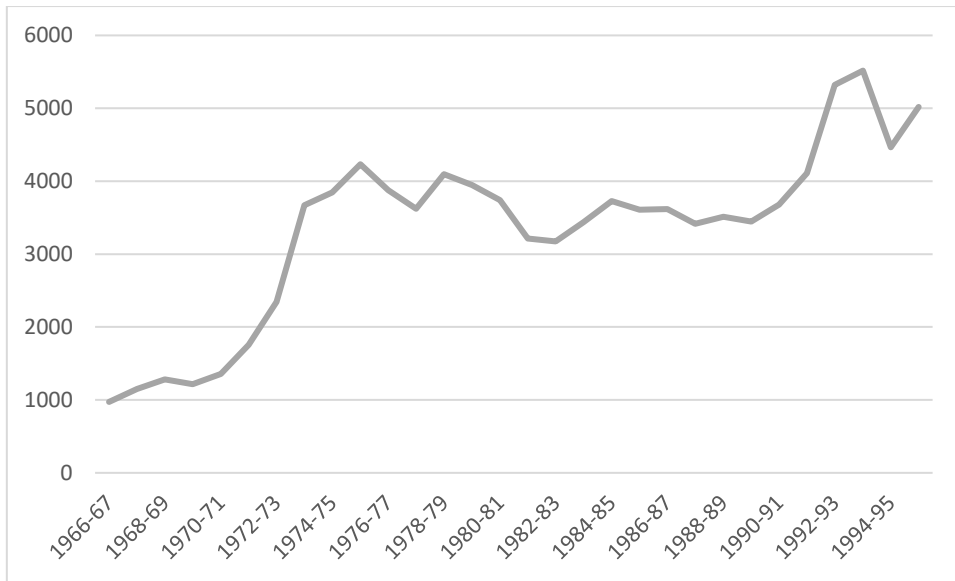
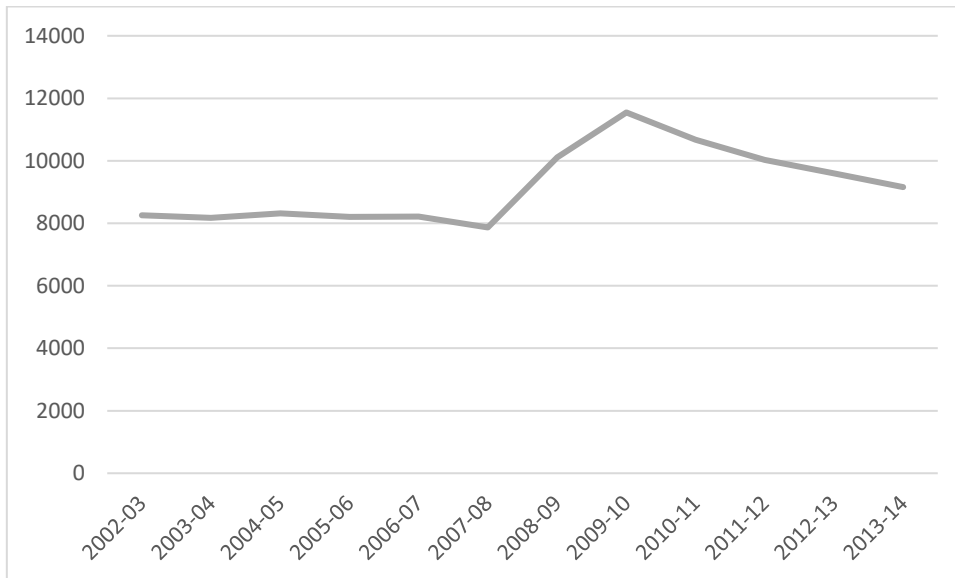


Figure 9: Northern Ireland Subvention Levels 2002-2014, £ million (2014 prices)



The view that in the event of a united Ireland that the total level of current subvention would become an overnight liability for the Irish tax payer is challengeable on two grounds. Firstly, subvention requirements are likely to fall, as there are aspects of current NI expenditure that would no longer be relevant under a unification scenario. Specifically, Non-identifiable expenditures, which are those that cannot be identified as benefiting a particular region and are more reflective of estimates of regional contributions towards UK wide expenditures, will not constitute part of the costs of administering NI under unification. These non-identifiable expenditures include, NI’s contribution to UK Defence

spending which was £1,038m in 2014, debt interest²³, which amounted to £1,059m in 2014 and international services which totalled £284m in 2014. Non-identifiable expenditures totalled £2,381m in 2014 which equated to 26 percent of total subvention. Furthermore, there will undoubtedly be some loss of public sector jobs in administering functions that would no longer exist in a post-unification scenario, e.g. HMRC, which will reduce subvention costs further, although the net effect will be dependent on the success of former public sector workers finding re-employment.

Secondly, NI's high subvention requirements largely reflect the region's low productivity levels, which, in turn, are related to issues such as poor relative human capital accumulation and a relatively low share of high value added, export orientated production. The long-term solution to the subvention issue lies in the adoption of policies aimed at raising productivity levels in NI by addressing some of the structural issues raised in this study. Advocates of a border poll must outline strategies that can reduce the subvention requirement, through increased productivity, and provide an honest assessment of the time-period over which this can be achieved. In all likelihood, any re-unification will require a transition period during which both operational and fiscal responsibilities will be gradually transferred from the UK to the RoI. It is unclear how long any transition period should last as there are few insights available from a historical perspective. One potential indicator is the transfer of sovereignty of Hong Kong from the UK to China, which occurred in 1997, some 13 years following the signing of the Sino-British Joint Declaration in 1984. Arguably, a negotiated transition period would allow both the UK and Irish governments' an opportunity to co-ordinate policy to allow for a gradual re-integration which should also involve the introduction of new education, regional and industrial policies aimed at increasing productivity levels in NI. Furthermore, presuming that the UK has left the EU by that stage, Irish re-unification will also involve NI re-entering the EU, which opens the possibility of EU involvement in the transition process. In summary, it is extremely difficult to be definitive around the costs of re-unification to the RoI tax payer, as this will be dependant upon a number of unknowns including negotiations around debt interest, the length of any transition period, the relative role and contributions of the UK, RoI and EU in managing such a transition and the success of any policies aimed at improving NI productivity levels.

6. Summary and Conclusions

The result of the Brexit referendum, which saw both Scotland and Northern Ireland vote to remain in the EU, has led to increased demands for both a second independence referendum in Scotland and a border poll in Northern Ireland. The disconnect between the UK governments' decision to leave the EU and majority opinion in Northern Ireland has undoubtedly increased the likelihood of a border poll taking place. It is also likely that the momentum towards a border poll will continue to build in the wake of subsequent political developments related to Brexit. Given this context, plus the lack of precise analysis in the run up to the Brexit vote and the subsequent political fall-out surrounding the accuracy of the claims made during that debate, it is crucial that any border poll is accompanied by accurate information regarding the likely costs and benefits of Irish unification. This paper seeks to initiate the development of an evidence base related to some of the principal economic factors

²³ The issue of debt payments is, of course, complex as ultimately it will depend in the share of UK debt that is assigned to Northern Ireland. However, it would be reasonable to expect that Northern Ireland would be entitled to a share of UK assets if it were expected to take on a share of UK liabilities.

relevant to a border poll, in the hope of improving the likelihood that any subsequent debate on the issue will be fact based.

We examine the relative position of Northern Ireland within both a UK and Irish regional context, before providing a more detailed comparison of Northern Ireland and the Republic of Ireland in the areas of education, trade, FDI, labour market behaviour and Healthcare. The paper concludes by discussing some of the complexities around measuring the ultimate financial cost of Irish unification. With respect to per capita incomes, there is no evidence to suggest that Northern Ireland has benefited from any peace dividend as the regions position in terms of GDP per capita has altered little over the 2000 to 2014 period and it remains one of the poorest UK regions. Our analysis indicates that the gap between wealthy and poorer UK regions has been widening, which is not surprising given the absence of any consistent regional policy in the UK over the 2000 to 2014 period. With respect to the Republic of Ireland, the gap in incomes between Northern Ireland and the Southern & Eastern region of the Ireland, which contains 76 percent of the Irish population, stood at USD27,832 per person in real terms in 2014, with Northern Ireland per capita income approximately 50 percent lower than that of the Southern & Eastern region. However, as is the case for the UK, wealth generation has not been evenly spread in the Republic of Ireland and the Border, Midlands & Western region, which contains the remaining 24 percent of the Irish population, had per capita income levels that remained slightly below those of Northern Ireland in both 2000 and 2014.

In terms of a border poll debate, while unification would involve the integration of a relatively poor region into the Irish economy, it would not be particularly out of sync with Ireland's current poorest performing region. Our study also emphasises the lack of effective regional policy in the Republic of Ireland and the need for policies to ensure that the benefits of high rates of Irish macroeconomic growth are more evenly spread. It is also important to point out that two of the poorest regions in both the UK and Ireland will almost certainly be disproportionately hit by any trade barriers erected as a consequence of Brexit, given that they share a land border and have a relatively high reliance on agriculture, which will be potentially subject to some of the highest tariffs in the event of the UK assuming third country status. We find no evidence that growth rates in Northern Ireland follow a similar long-run path of any British or Irish regions, suggesting that a move towards Irish unification is unlikely to either disrupt, or enhance, existing long-run equilibrium relationships. We do not find any strong evidence to support the view that Northern Irelands relatively poor economic performance over the 2000 to 2014 period is heavily related to its industrial structure; in fact, we find that Northern Ireland income levels have continued to fall behind wealthier regions in both Great Britain and Ireland during a period when differences between its industrial structure and those of other UK and Irish regions have been declining.

Our analysis does highlight some substantial gaps in Northern Irelands educational system that are likely to be contributory factors to its low relative growth rate and the associated productivity and income gaps. In 2000, Northern Ireland had the highest proportion of the population educated to primary level or below in the UK and the second lowest share of graduates. By 2015, Northern Ireland had the highest rate of primary educational level attainment and the lowest share of graduates in the UK. We show that Northern Irelands poor educational performance within the UK context is not driven by demographic factors, with the pattern remaining broadly similar when we restrict the sample to 24 to 30 year olds. Compared to the Republic of Ireland in 2015, and focusing on attainment levels of 24 to 30 year olds, over 35 percent of young people in Northern Ireland were educated to primary or lower secondary level compared to under 11 percent in the Republic of Ireland regions; at the other end of the educational spectrum, just under 40 percent of Northern Ireland young people held post-secondary or third-level qualifications, compared to between 59 and 65 percent in the

Republic of Ireland regions. Such large gaps in educational attainment, and their implications for productivity, are a major concern and should form a key part of any border poll discourse given that reforms to the education system aimed at improving NI productivity are likely to take time to design and implement.

With respect to trade-flows and the relative importance of FDI, it is clear from the data that, compared to Northern Ireland, the Republic of Ireland has much higher proportions of activity centred around high-value added exports to the Rest of the World and a stronger FDI employment base; both factors are known to be key determinants of the high growth rates observed in the Republic both prior and subsequent to the great recession. The latest figures indicate that exports account for 15 percent of total business turnover in Northern Ireland compared to 54 percent in the Republic of Ireland; foreign owned business accounted for 14.0 percent of total employment in Northern Ireland in 2014 compared to 22.2 percent in the Republic of Ireland. Enhancing FDI flows to Northern Ireland is likely to be a key policy target for any post-unification scenario, nevertheless, this will be more difficult to address in the absence of substantial improvements in NI's educational attainment. Furthermore, the adoption of an FDI centred export-led growth model in NI is not without its risks for workers. The extreme openness of the Irish economy means that it is particularly susceptible to changes in world demand and vulnerable to global shocks; this exposure, in turn, leads to much more volatile fluctuations in unemployment and migration compared to more closed economies.

With regard to the relative strengths of the health systems in Northern Ireland and the Republic of Ireland, this is likely to be a key feature of any border poll debate as it is often claimed by commentators that losing access to the UK National Health Service will be a key factor preventing voters in Northern Ireland from supporting a united Ireland. However, our analysis suggests that the gap between the Irish and UK health systems has narrowed, presumably as a consequence of much higher levels of per capita health expenditure by the Irish government and the impacts of austerity policies in the UK. We find that the Irish system does have more up-front charges; however, it also contains balances to ensure that healthcare remains free at the point of use for the most vulnerable in society. Using data from the OECD Healthcare at a Glance report, we show hospital care coverage is substantially superior in the UK, while Ireland has somewhat higher rates of doctors, nurses, hospital beds and hospital discharges per 10,000 population. Both health systems appear to be outlying poor performers among OECD countries in terms of acute care bed occupancy rates, indicating that neither health service has enough spare capacity to deal with seasonal fluctuations in demand. A high acute bed occupancy rate is also consistent with ineffective processes for moving patients efficiently through the hospital system, which also points towards serious shortfalls in social care provision within both health systems.

A key aspect of the current and future debate around a border poll relates to the potential cost of Irish unification. We conclude that it is difficult to be specific about this as it is determined by a number of unknowns including (a) the length and nature of any adjustment or transition period (b) the relative role of both governments during any transition period in addressing some of the key issues outlined above in reforming educational, industrial and regional policy (c) the relative success of such policies in raising Northern Ireland productivity levels (d) the role and significance of both the EU and USA in potentially reintegrating a post-Brexit Northern Ireland into the EU and assisting in promoting FDI to the region, and (e) the outcome of discussion on the issue of debt obligations. In addition to being the determinants of the costs of transition, these five areas also represent, in our view, some of the principle challenges for policy associated with any unification process. Other areas for consideration not discussed here include issues such as welfare entitlements, approaches to taxation etc. Following the example of the Scottish government, which provided detailed planning on the policy framework

that was to be adopted across a range of areas in an independent Scotland, any border poll in Ireland should also be accompanied with detailed and accessible documentation outlining the opportunities and challenges associated with Irish unification. The documentation should also include proposals for the policies to be adopted in order achieve a successful transition.

Finally, the existing evidence base suggests that Northern Ireland may be more adversely affected by any form of Brexit than either the Republic of Ireland and most UK regions. As such, Brexit is likely to generate a further widening of the gap between Northern Ireland and both GB regions and the Republic of Ireland in many of the policy areas examined in this paper. Therefore, Brexit is likely to further shift regional relativities in a way that will also have a bearing on the relative costs and opportunities of Irish unification.

References

- Bank of England (2018). 'EU Withdrawal Scenarios and Monetary Financial Stability', Response to the House of Commons Treasury Committee, November 2018.
- Bergin, A., P. Economides, A. Garcia-Rodriguez and G. Murphy (2019). 'Ireland and Brexit: modelling the impact of deal and no-deal scenarios', *ESRI Quarterly Economic Commentary*, Spring 2019: Special Articles.
- Bradley, J. (1996). 'An island economy: exploring long-term consequences of peace and reconciliation in the island of Ireland'. Dublin: Forum for Peace and Reconciliation.
- Connolly, S., A. Nolan, B. Walsh and Wren, M.A. (2018). 'GP Care in Ireland: Potential Cost Implications.' *The Economic and Social Review*, 49(1) Spring, p. 93-109, Available at: <<https://www.esr.ie/article/view/871/182>>.
- Department of Finance (2017). 'UK EU exit – An exposure analysis of sectors of the Irish economy', Dublin: Department of Finance.
- Dhingra, S., H. Huang, G. Ottaviano, J.P. Pessoa, T. Sampson and J. Van Reenen (2016). 'The Costs and Benefits of Leaving the EU: Trade Effects', Centre for Economic Performance Technical Report.
- Dhingra, S., G. Ottaviano, T. Sampson, T. and J. van Reenen (2017). 'The impact of Brexit on foreign direct investment in the UK', CEP Brexit Analysis, 3.
- Ebell, M. and J. Warren (2016). 'The long-term economic impact of leaving the EU', *National Institute Economic Review*, 236, pp. 121–38.
- Eurobarometer special survey (2014). 'Patient Safety and Quality of Care' Report 411, available at: http://ec.europa.eu/commfrontoffice/publicopinion/archives/ebs/ebs_411_en.pdf
- FitzGerald, J. (2015). 'Problems Interpreting the National Accounts in a Globalised Economy – Ireland,' *ESRI Quarterly Economic Commentary*, Summer 2015: Special Articles.
- FitzGerald, J. (2018). 'National Accounts for a global economy: the case of Ireland', *ESRI Quarterly Economic Commentary*, Summer 2018: Special Articles.
- Goldrick-Kelly, P. and P. Mac Flynn (2018). 'Productivity on the Island of Ireland – A tale of three economies', NERI Working Paper 2018, No. 57.
- Griffin, N. (2019). 'How the lack of government is affecting healthcare in Northern Ireland', *BMJ* 2019; 364:l72, doi: <https://doi.org/10.1136/bmj.l72>
- Hantsche, A., A. Kara and G. Young (2018). 'The Economic Effects of the Government's Proposed Brexit Deal', London: National Institute of Economic and Social Research.
- Houses of the Oireachtas Committee on the Future of Healthcare. Sláintecare Report. Dublin: Houses of the Oireachtas, 2017.
- HM Government (2018). 'EU Exit, Long-Term Economic Analysis'. London: HM Government.
- HM Treasury (2016). 'HM Treasury Analysis: The Long-Term Economic Impact of EU Membership and the Alternatives', London: HM Treasury.
- International Monetary Fund (2018). 'United Kingdom; Selected Issues', IMF Staff Country Report, No. 18/317, Washington D.C.: International Monetary Fund.

- Kierzenkowski, R., N. Pain, E. Rusticelli and S. Zwart (2016). 'The Economic Consequences of Brexit: A Taxing Decision', OECD Economic Policy Paper, No. 16. Paris: OECD.
- Lawless, M. and E. Morgenroth (2016). 'Opportunities and Risks for Foreign Direct Investment', in Bergin, A., E. Morgenroth and K. McQuinn (eds.), *Ireland's Economic Outlook: Perspectives and Policy Challenges*, ESRI Forecasting Series EO1.
- McGuinness, S. and M. Sheehan (1998). 'Regional convergence in the UK, 1970-1995', *Applied Economic Letters*, 5: 653-658.
- Michie, J. and M. Sheehan (1998). 'The political economy of a divided Ireland', *Cambridge Journal of Economics*, 22: 243-259.
- OECD (2017). 'Health at a Glance 2017: OECD Indicators', OECD Publishing, Paris. Available at: http://dx.doi.org/10.1787/health_glance-2017-en
- OECD/EU (2018). 'Health at a Glance: Europe 2018: State of Health in the EU Cycle', OECD Publishing, Paris. Available at: https://doi.org/10.1787/health_glance_eur-2018-en
- Oxford Economics (2016). 'Assessing the Economic Implications of Brexit', London: Oxford Economics.
- Rowthorn, R.E. (1981). 'Northern Ireland: an economy in crisis', *Cambridge Journal of Economics*, 5: 1: 1-31.
- Scottish Government White Paper on Independence, (2013), 'Scotland's Future: Your Guide to an Independent Scotland' available at: <http://www.scotland.gov.uk/Publications/2013/11/9348/downloads>
- Serwicka, I. and N. Tamberi (2018). 'Not backing Britain: FDI inflows since the Brexit referendum', UK Trade Policy Observatory Briefing Paper, no. 23.
- Teague, P. (2016). 'Northern Ireland: The Political Economy of Peace'. The Senator George J Mitchell Institute for Global Peace Security and Justice, Working Paper Series, ISSN 2399-5130.
- Vandenbussche, H., W. Connell and W. Simmons (2019). 'Global Value Chains Trade Shocks and Jobs: an Application to Brexit', CESifo Working Paper Series, Working Paper No. 7473.
- Wren, M.A., S. Connolly and N. Cunningham (2015). 'An Examination of the Potential Costs of Universal Health Insurance in Ireland'. ESRI Research Series. Dublin, ESRI. 45.