The Irish Economy and its Tax System: Implications for Northern Ireland

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1. Introduction

This note sets out in Section 2 some high-level details about the Irish economy's recent history. Section deals with how output and income is measured in the Irish economy, and it considers its current structure. Section 4 describes some high-level details of the Irish tax system and how it interacts with the economy and, finally, Section 5 discusses some of the implications for Northern Ireland of the Irish tax system and of the recent experience of the Irish economy.

2. Ireland – the Economic Journey

Over the coming year Ireland and Northern Ireland will mark the centenary of their establishment. What had been a region of the wider UK economy in 1920, albeit a distinctive region, has evolved into two rather different economies with different structures reflecting their history over the last 100 years.

In the second half of the 19th century the standard of living in Ireland rose very significantly so that, having had a standard of living probably well below 50% of that of GB at the time of the Famine in the 1840s, by the early years of the 20th century Ireland had probably progressed to a standard of living up to 70% of that of Great Britain. This progress owed much to the massive emigration over the 19th century. By 1901 almost 40% of all those alive who had been born in Ireland were emigrants. The limited progress of agricultural output was shared by a dwindling population, making a major contribution to the rise in living standards.

While still enjoying a much lower standard of living than GB, at independence Ireland was significantly better off than many other European countries, such as Finland and Italy. O'Gráda and O'Rourke, 2021, look back at the last century of economic development in Ireland. While public discourse still considers the Celtic Tiger period of the Irish economy as being truly remarkable, O'Gráda and O'Rourke suggest that what was unusual about the Irish economy over the last century was not that relatively recent success, but rather its surprising failure, especially in the twenty years after the Second World War. In the period 1945 to 1970 Ireland was overtaken by a rapid rise in the standard of living of many other European countries, such as Finland and Italy.

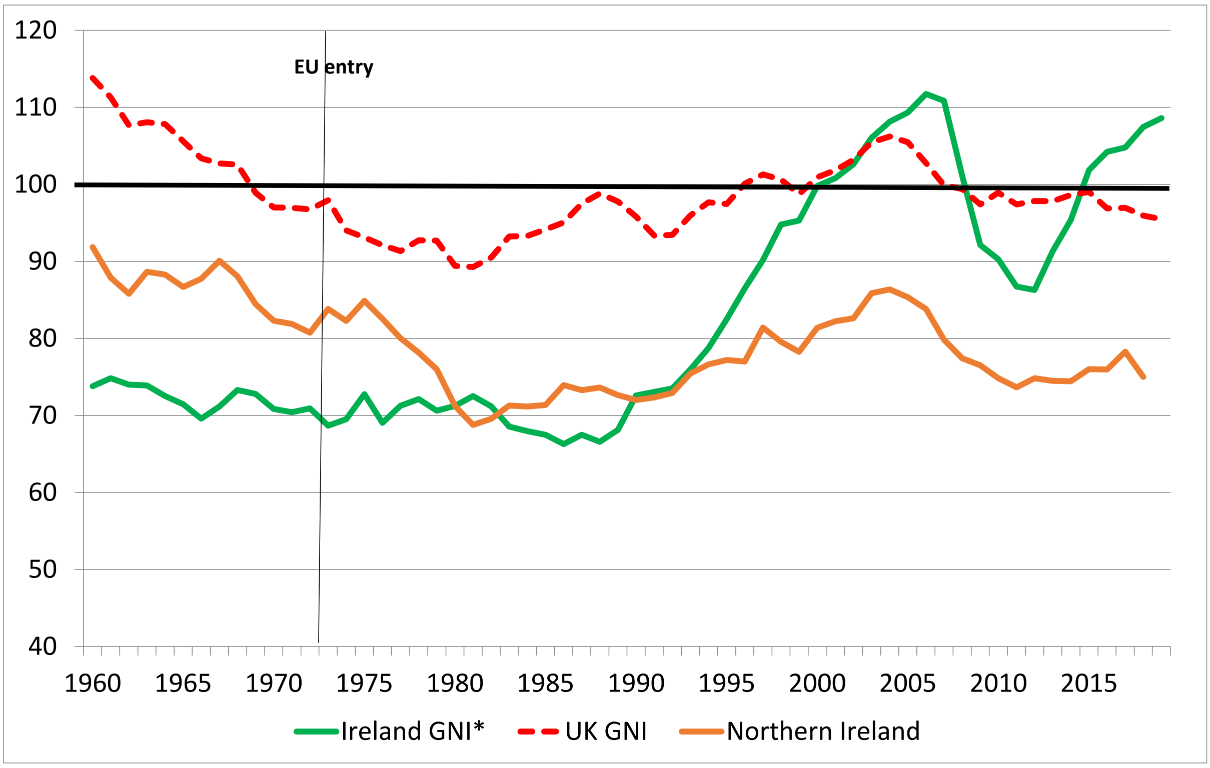
O'Gráda an O'Rourke argue that the position that the Irish economy has in the wider EU economy today is what might have been expected at the time of independence. However, the journey to where Ireland is today has been rather circuitous, and also rather different from that of its EU neighbours.

In the pre-War period both Northern Ireland and Ireland saw little economic progress (FitzGerald and Morgenroth, 2020). However, this was not particularly surprising given the wider difficulties of economies in Europe and the US. From an economic point of view Northern Ireland had a very "good" Second World War, reflecting its comparative advantage in mechanical engineering, especially shipbuilding. This carried over into the 1950s.

The Irish economy was effectively put into cold storage for the War and, while Ireland suffered no significant war damage, successive post-war governments made serious policy mistakes that left the economy suffering in the doldrums. Probably the two most serious strategic errors were the failure to move with the rest of western Europe towards free trade in the 1950s and the failure to follow the rest of Northern Europe in investing in education. It is the reversal of these mistakes that has restored the relative position of the Irish economy to where it should have been today according to Ó'Gráda and O'Rourke.

The full range of factors underlying Ireland's economic success after 1990 is discussed in Honohan and Walsh, 2002. A slightly different emphasis is given in Barry, 2003, placing more importance on the role of Foreign Direct Investment (FDI).

Figure 1: GDP /GNI* per head, adjusted for PPS, relative to EU 15



Source: EU commission AMECO database ; GNI* from CSO ; Northern Ireland is the ratio of GDP per head to GDP per head for the UK.

Figure 1 shows the path of Ireland's convergence to the EU-15[1] level of national income per head since 1960.[2] The Irish standard of living languished at around 70% of the EU-15 average between 1960 and 1990. Over the subsequent 15 years Ireland's national income rose to exceed the EU-15 average by 10%. The very serious impact of the financial crisis saw Ireland's relative position decline dramatically between 2008 and 2012. However, the subsequent recovery has largely restored the relative standard of living of the economy to its position before the financial crisis.

As shown in the Figure, the UK's standard of living was substantially above the EU-15 average in 1960. It fell below that average in the 1980s, but since 1990 it has remained close to the EU-15 average.
The comparative figures for Northern Ireland are derived by assuming that its position followed that of nominal GDP per head relative to that of the UK. In 1960 Northern Ireland began off with output per head substantially above that in Ireland, though below that in the EU-15. The impact of the

[1] As the data end in 2019 the UK is included in the EU-15.
[2] As discussed later, adjusted Gross National Income (GNI*) is used for Ireland instead of GDP as the most appropriate measure in a comparative context.

Troubles shows up in the 1970s in a substantial decline in Northern Ireland's relative position. Since then, its relative position has roughly tracked that of the UK, leaving its output per head at roughly 75% of the EU-15 average in 2019.

Figure 2: Educational attainment 1951-55 birth cohort

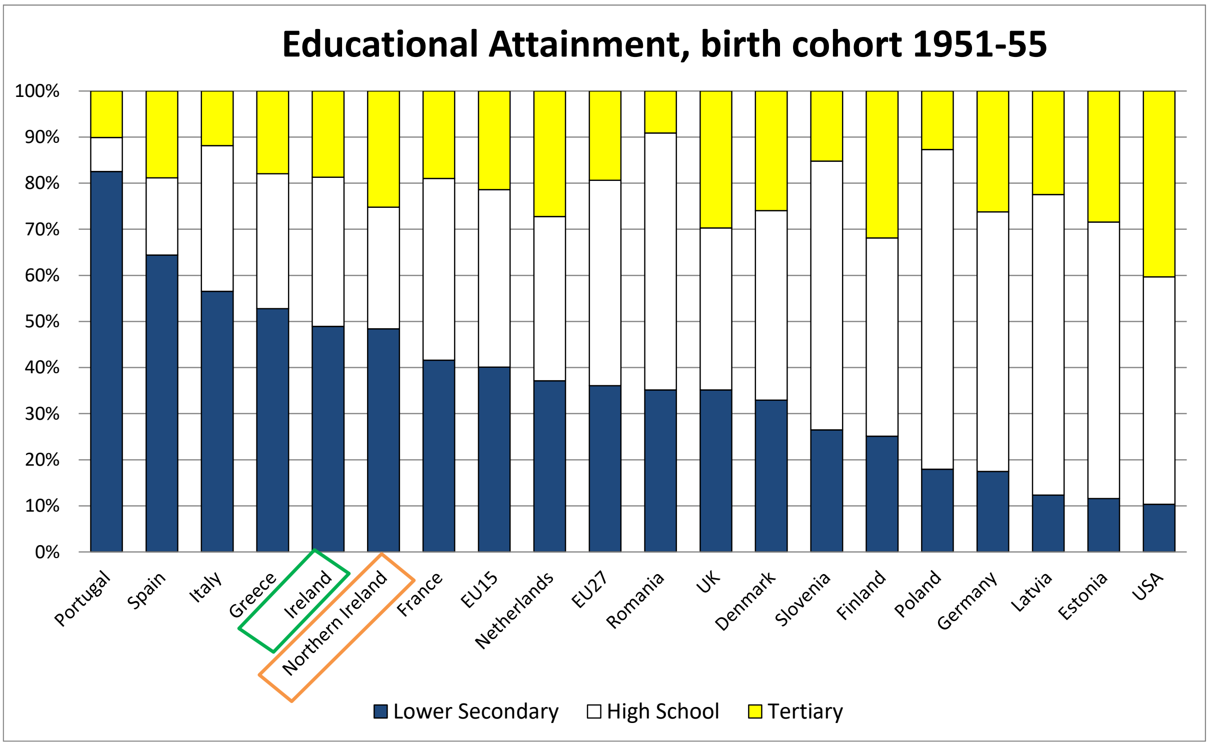
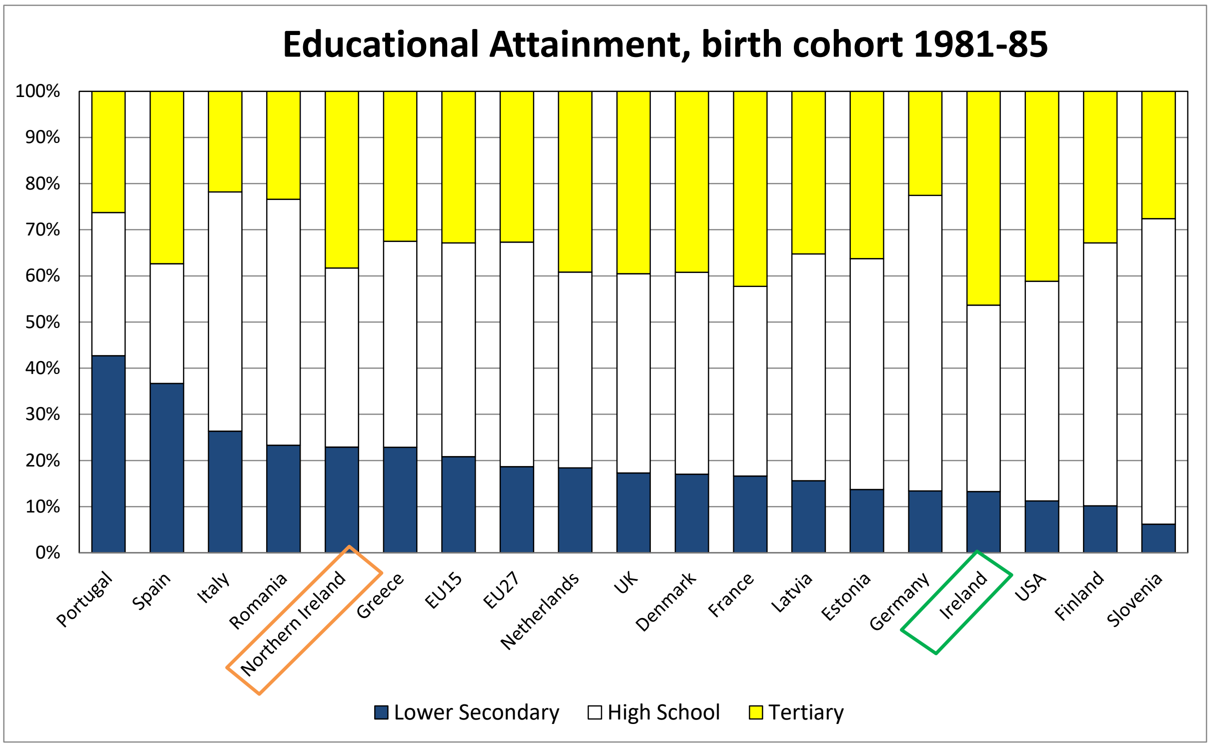


Figure 3: Educational attainment 1981-85 birth cohort



As a regional economy Northern Ireland's standard of living is also affected by net transfers from central government. In the case of Northern Ireland in recent years these have amounted to roughly

20% of regional GDP. The effect of these transfers on relative living standards is considered in FitzGerald and Morgenroth, 2020, Bergin and McGuinness, 2021, FitzGerald 2021 and Honohan 2021.

The single most serious failure by Irish governments after 1945 was the decision not to invest in upgrading the educational system, like the rest of Northern Europe from the Urals through to Snowdonia. Great Britain had the education act 1944 and in Northern Ireland the Education Act was 1947. Ireland only introduced free secondary education twenty years later in 1967. The result was that, as shown in Figure 2, A very high proportion of those born in Ireland in the early 1950s left school with only lower secondary education and the proportion of graduates was very low. As a result, Ireland was similar to a number of Southern European countries in its low level of educational attainment. However, in the 1980s and the 1990s there was a dramatic increase in educational participation. The result was that, as shown in Figure 3, for those born in the early 1980s a very high proportion of people in Ireland went on to acquire a third level education and the proportion leaving school early was very low. The financial crisis saw a further improvement in participation, especially for males, with the early school leaving rate falling well below 10%.

By contrast, for those born in Northern Ireland in the early 1980s, a relatively high proportion still left school early and the proportion achieving a third level education was low. (The low proportion of graduates is partly due to exceptional emigration of third-level students.) On these criteria the educational attainment of the Northern Ireland population is the lowest of any UK region (FitzGerald and Morgenroth, 2020).

The second major mistake by Irish governments was that they maintained a very closed economy twenty years after the rest of Europe had discovered the benefits of free trade and economic integration. It was only in the early 1960s that the government began to dismantle the very high tariff barriers. This process was reflected in the signing in 1965 of the Anglo-Irish Free Trade Agreement.[3]

While Ireland introduced a low corporation tax on exports in 1956 to encourage Foreign Direct Investment (FDI), Ireland remained a relatively unattractive location for foreign firms given its poor market access. However, as EU entry approached in 1973, this situation changed. Thus, EU entry firstly gave Irish firms full access to the huge EU market, but it also made Ireland much more attractive for foreign investors.[4]

As discussed later, by the early 1980s it was clear that Ireland was becoming a relatively high labour cost destination and the Industrial Development Agency (IDA) concentrated on attracting firms in the pharmaceutical sector and computer hardware which were seen as having better long-term prospects than firms in, for example, the clothing sector. It had been hoped that the computer hardware sector would turn into a mini silicon valley. In the case of computer hardware the reality was rather different with Ireland eventually establishing a comparative advantage in IT services.

The EU Single Market of 1993 has proved hugely important to the Irish economy. The opening up of public procurement and the market for services has facilitated the development of the

[3] This Agreement had a special protocol that allowed the Irish government to reduce tariffs on goods manufactured in Northern Ireland more rapidly than for GB goods. However, this protocol was not operationalised.

[4] The Anglo-Irish Free Trade Agreement of 1965 also had a provision that the zero rate of corporation tax would end in the early 1970s. However, this was superseded by EU entry and the corporation tax policy has continued ever since in a greatly modified form.

pharmaceutical sector, the manufacture of health care equipment (both generally sold to the public sector) and IT and business services. The Irish economy has, as a result, become one of the most globalised depending on the free access to the EU market, as well as good access to other markets round the world.

A January 2021 study by the Department of Finance highlighted the fact that exports of Covid-19 related pharmaceutical products were a major source of growth. Over the course of 2020, these pharmaceutical exports, going to the EU and the US, rose by €9bn. Along with products used to treat patients with Covid, they also included products for sterilisation, testing, and diagnosis. Materials for testing kits were particularly significant.

The tradable goods and services produced in the Irish economy today have a high-income elasticity of demand. Partly as a result of this, these sectors were not badly affected by the financial crisis and, as mentioned above, some of them have even benefitted from the current pandemic related recession.

Figure 4: Decomposition of growth in GNI* per capita

$$\underbrace{\frac{GNI*}{Pop}}_{\text{GNI* per capita}} = \underbrace{\frac{GNI*}{Emp}}_{\text{Productivity}} \cdot \underbrace{\frac{Emp}{LForce}}_{\text{Employment Rate}} \cdot \underbrace{\frac{LForce}{Pop1564}}_{\text{Participation Rate}} \cdot \underbrace{\frac{Pop1564}{Pop}}_{\text{Dependency Ratio (inverse)}}$$

Pop1564 refers to population aged 15 to 64 years.

Table 1: Contribution to growth in GNI* per capita, percentage points

	1970-1990			1990-2005		
	Ireland	UK	Northern Ireland	Ireland	UK	Northern Ireland
GDP/GNI*	2.8	2.5	2.0	5.7	2.6	3.3
Population	0.9	0.1	0.2	1.1	0.4	0.5
GDP/GNI* per capita	1.9	2.4	1.8	4.5	2.3	2.8
Components of Growth in GNI* per capita:						
GNI*/Employment = Productivity	2.4	2.1	1.5	2.2	2.1	1.8
Employment/Labour Force = Employment rate	-0.4	-0.2	-0.1	0.5	0.2	0.6
Labour Force/ population 15-64 = Participation rate	-0.3	0.3	0.1	1.0	-0.1	0.0
Population 15-64/Population = inverse of Dependency rate	0.3	0.2	0.2	0.7	0.1	0.3

	2005-2019		
	Ireland	UK	Northern Ireland
GDP/GNI*	1.6	1.3	0.8
Population	1.3	0.7	0.7
GDP/GNI* per capita	0.3	0.6	0.1
Components of Growth in GNI* per capita:			
GNI*/Employment = Productivity	0.7	0.4	0.1
Employment/Labour Force = Employment rate	0.0	0.1	0.0
Labour Force/ population 15-64 = Participation rate	0.0	0.4	0.3
Population 15-64/Population = inverse of Dependency rate	-0.3	-0.3	-0.2

Source: Ireland: CSO. UK: Eurostat and ONS. Northern Ireland: NISRA and GDP from ONS.

To better understand the trajectory of the Irish economy over the last 50 years Figure 4 shows how we can decompose the growth in national income / output per head into a series of components.

Table 1 implements this breakdown considering three different periods: 1970-90, 1990-2005 and 2005-2019.[5] The first twenty years, 1970-90, covers the period from EU entry to the end of the fiscal crisis of the 1980s. The second period, covering 1990-2005, includes the very rapid catch up by the Irish economy and the third period covers the financial crisis and the subsequent recovery.

A shown in Table 1, a significant factor in Ireland's higher growth rate than the UK or Northern Ireland over the last 50 years has been a more rapid growth in population. In the first two periods this was due to a much higher rate of natural increase. The birth rate peaked in Ireland in 1980 (nine months after the Pope visited Ireland) and fell steadily over the subsequent 15 years. Since the early 1990s the Total Fertility Rate, which was around 2 in 1990, has been between 1.8 and 1.9 in recent years. The rapid growth in population in between 1990 and 2005 owed much to a very big influx of people, mainly from EU countries. This reversed the traditional migration flows of two centuries. In recent years there has even been a low level of immigration from the US, greater than the flow of Irish emigrants in the opposite direction.[6]

Over the period from 1970 to 2005 the rate of growth in output per person employed (productivity) ranged between 2% and 2.5% a year, slightly higher than in the UK and significantly higher than in Northern Ireland. In the latest period, the effects of the financial saw the rise in productivity in Ireland fall to 0.7% a year. However, this may prove to be temporary as there was a very strong growth in productivity in the recovery phase of the cycle.

Because of a fiscal crisis that persisted over the 1980s, the unemployment rate rose dramatically. Thus, the fall in the employment rate over the period to 1990 contributed significantly to an overall poor economic performance. A return to full employment in the second period to 2005 more than reversed this process, contributing 0.5 percentage points a year to growth. The final period of the financial crisis and its aftermath saw unemployment reach a new peak in 2012, but by 2019 full employment had been restored.

While traditionally Irish women were better educated than Irish men, female participation rates were very low by EU standards. However, cultural changes combined with market forces saw a very big rise in labour force participation between 1990 and 2005. Rising labour force participation, primarily by women, contributed 1 percentage point a year to growth. The economy had a rapidly rising demand for graduate employees, and this attracted many women back into the labour market, and also discouraged others from leaving it.

The period 1990-2005 also saw a major contribution to growth from a falling dependency rate. The birth rate having fallen off from 1980, the burden of supporting a youth population began to reverse. There was also a very low level of old age dependency as many of those who had been born in Ireland and were in the older age groups had emigrated and were living in GB. However, from the late 2010s the rate of old age dependency has begun to rise, as in most other developed economies.

FitzGerald 2012 shows that a major factor in the high rate of productivity growth, in the period from 1990-2005 was the rising educational attainment of the population. It also played a major role in the rise in labour force participation, as women with third level education were much more likely to be

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[5] See Wycherley and FitzGerald, 2021.

[6] When Nancy Pelosi addressed the Oireachtas three years ago she remarked on the fact that she had no Irish ancestors but she does have Irish grandchildren.

in the labour force. Finally, it also helped solve the unemployment problem of the late 1980s as the labour market demand for early school leavers was falling continuously. The rising educational attainment better matched the supply of labour, by level of education, to the demand.

3. Measuring Output

Because of the growing importance of foreign multinationals in the Irish economy since the 1960s, their profits have grown in significance. While GDP measures the output in Ireland, a growing proportion of that output has been profits of multinationals, which flowed back out of the country and were not available to those living in Ireland. Gross National Income (GNI) takes this into account by deducting the net flow out of Ireland of profits attributable to Multi-National enterprises (MNEs). Since the late 1970s this outflow of profits has grown steadily. Having been roughly equal to GDP in the late 1970s, by 2019 GNI was just over 70% of GDP. This has meant that the growth rate of GDP over the period since 1970 has exaggerated the growth in the income of those living in Ireland measured by GNI. Until the last decade the growth in GNI represented a better measure of living standards.

However, in the modern economy US companies have been able to divorce their intellectual property (IP) from where they produce goods and services. This has greatly complicated things. The last decade has seen a major influx of such intellectual property to Ireland, owned by US companies. There was a massive relocation of such IP to Ireland in 2015. This intellectual property is used, for example, to produce phones and computers in Asia.

Because this production in Asia is on contract for the Irish holder of the IP, this output, less Asian inputs including labour, is credited as Irish output. If the output in Asia were undertaken by a subsidiary of the Irish holder of the IP, then the output would be attributed to Asia and the profits would be treated as being remitted to the Irish domiciled owner. Thus, this contract manufacturing massively distorts the figures for Irish manufacturing output.

Because the owners of the IP (and the goods produced in Asia) are US companies domiciled in Ireland, the profits of those companies flow back out of the country to the US owners. That is the difference between GDP and GNI. However, the major complication is that the depreciation on the huge IP is part of Irish depreciation. This dramatically raises GNI, while the depreciation is reducing the value of a foreign owned asset and it has no direct implications for the Irish standard of living.

Table 2: Alternative Measures of Growth Rate, %

	2014	2015	2016	2017	2018	2019	Average Annual 2013-2019
NNP adjusted for redomiciled PLCs	8	3.7	5.5	2.3	7.1	3.9	5.1
NNP	7.8	1.5	6.2	1.3	7.3	3.2	4.5
GNI* from NIE	8.8	-0.3	5.9	4.6	6.8	1.7	4.6
GNI from NIE	8.8	13.7	7.5	6.3	7.3	3.4	7.8
GDP from NIE	8.6	25.2	2	9.1	8.5	5.6	9.6
Modified Domestic Demand	6.2	5.4	6.1	3	2.5	3.5	4.4
Employment	2.6	3.4	3.6	2.9	2.9	2.9	3.1

To deal with this problem the Irish CSO have developed an indicator referred to as adjusted Gross National Income or GNI*, which excludes the depreciation on this IP, as well as the depreciation on aircraft that are owned in Ireland but leased abroad.[7] In 2019 GNI* was 60% of GDP and under 80% of GNI. This measure, GNI*, is designed to be broadly comparable to GNI for most other countries, greatly facilitating cross-country comparisons. It is being adopted for this purpose by international institutions, such as the IMF, OECD and the EU when they look at the Irish economy.

In turn GNI* suffers from some defects: in particular, it does not facilitate a breakdown of Irish output by industrial sector, and it is also not a measure used in other countries. A more appropriate measure of national economic welfare is Net National Product (NNP) because it excludes all depreciation and it is possible break it down by industrial sector (see FitzGerald, 2020 and 2021).

The contribution to NNP from MNEs is easily measured – it is their wage bill and the corporation tax they pay in Ireland. For Irish-owned companies it is their net value added. Table 2 compares the real growth rate for Ireland since 2013 using a range of these different measures.

Probably the best measure of the growth in living standards is NNP adjusted for redomiciled plcs. (The latter are flows into Ireland to entities that undertake no activity in Ireland and then flow back out on the capital account. These entities pay tax elsewhere, where they actually operate, such as the UK.) Over the 6 years to 2019 the growth rate, indicated by this measure (NNP), averaged just over 5%. GNI* shows a growth rate of 4.6%. However, it also shows much greater volatility, and a fall in volume in 2015, when GDP rose by 25%. The volatility in this measure and the implausible number for 2015 make it less useful for considering growth in individual years.

A further measure often used by official bodies in Ireland is modified domestic demand. This is an expenditure side measures which excludes investment in IP and aircraft for leasing and excludes trade. However, because it does not capture changes in the balance of payments, which may have real implications for Irish welfare it is not as satisfactory as NNP. However, it is readily available each quarter whereas NNP is only available in a suitable form on an annual basis almost a year after the end of a particular year. Finally, over the relevant years employment growth averaged just over 3% a year implying a growth in productivity of 2% a year using NNP.

Table 3: Contribution to growth, 2013-2019

	Total	Foreign	Domestic
Agriculture, forestry and fishing	3.2	0	3.2
Industry	8.4	3.8	4.5
Construction	9	0	9.1
Distribution, transport, hotels and restaurants	18.3	6.1	12.2
Information and communication	14.3	6.6	7.7
Financial and insurance activities	3.6	0.3	3.3
Real estate activities	6	-0.1	6.1
Professional, admin and support services	19.2	5.8	13.4
Public Admin, Education and Health	9.8	0.1	9.7
Arts, entertainment and other services	2.5	0	2.6
NNP after profit repatriations	94.4	22.5	71.8
Factor Income - other, excluding Redomiciled PLCs	-5.6	1.1	-6.8
NNP adjusted for redomiciled PLCs	100	21.4	78.6

[7] Up to 10% of the world's civil aircraft are owned by leasing companies located in Ireland.

Using NNP, Table 3 breaks the growth in the economy between 2013 and 2019 down by industrial sector, cross-classified by ownership. (This cannot be done using GNI*.) It shows that about 20% of the growth over that period came from foreign MNEs and that the bulk of the economic recovery, 80%, was fuelled by domestic business and the public sector.

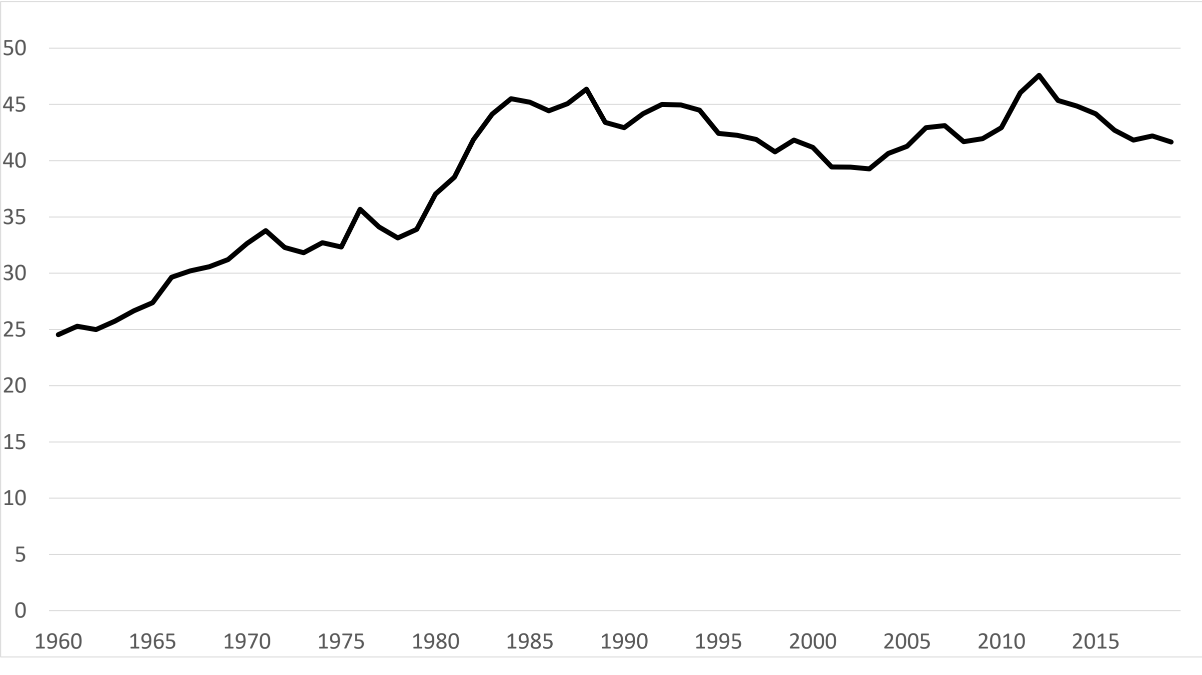
Even with the big foreign-owned pharmaceutical sector, more than half of the contribution to growth from manufacturing came from Irish-owned firms. More surprising is that the same is true of the IT services sector. While everyone knows about Facebook, Google and Microsoft's contribution to the Irish economy, the generally small Irish firms receive less attention, but are equally important.

The distribution sector also has major foreign involvement, especially with UK firms such as Tesco and M&S. The other sector with substantial foreign involvement is the professional and admin sector, which includes some back-office operations for the financial sector. Despite a significant number of foreign financial sector companies relocating to Ireland because of Brexit, they have not made a significant contribution to growth.

4. The Irish Tax System

Figure 5 shows Irish government revenue as a percentage of GNI* since 1960. In 1960 the size of the Irish state was very small, with revenue accounting for 25% of GNI*. However. The 1960s and the 1970s saw rapid growth in the size of the state as a modern welfare system was put in place and major necessary investment took place in education.

Figure 5: Government Revenue as % of GNI*



Revenue peaked in the 1980s at over 45% of GNI* as the state dealt with a major fiscal crisis caused by unwise borrowing and spending in the late 1970s. To deal with the crisis, initially marginal income tax rates peaked at very high levels and indirect taxes were also ramped up. From 1987 emphasis was put on cutting expenditure to right the fiscal imbalance rather than further raising taxation. From 1990 the tax burden gradually fell as the rapid growth in the economy resulted in buoyant tax revenue.

Once again in the financial crisis, which began in 2008, tax rates were dramatically raised, pushing government revenue back above 45% of GNI*. The subsequent economic recovery has again seen revenue fall back closer to 40% of GNI*.

Table 4: Government Revenue as % of GNI*

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Direct taxes	22.6	25.1	26.0	24.8	24.6	24.7	24.1	23.9	24.8	24.6
Income tax	7.1	7.8	8.3	8.1	10.9	10.5	10.6	10.3	10.4	10.4
Social insurance contributions	7.4	8.6	8.4	8.1	7.9	7.6	7.5	7.5	7.5	7.4
Taxes on personal income	14.5	16.4	16.7	16.2	18.8	18.1	18.1	17.8	17.9	17.8
Corporation tax	3.1	2.8	3.3	3.1	3.1	4.2	4.2	4.4	5.2	5.1
Indirect taxes	14.0	14.1	14.5	14.1	14.3	13.8	13.4	13.2	12.9	12.8
VAT	7.8	7.7	8.0	7.5	7.5	7.3	7.1	7.1	7.1	7.1
Excise	3.8	3.9	3.8	3.6	3.4	3.4	3.3	3.2	2.7	2.7
Total taxes	36.6	39.2	40.5	38.9	38.9	38.5	37.5	37.1	37.7	37.4
Total revenue	42.9	46.0	47.6	45.4	44.9	44.2	42.7	41.8	42.2	41.7

In the boom years the government came to rely heavily on property related sources of tax revenue: stamp duty, VAT on new dwellings and corporation tax revenue from the financial sector. These sources of revenue were wiped out in 2008 and 2009 as a result of the financial crisis. To close the funding gap there was a major increase in taxes on personal income. By 2014 they amounted to almost 19% of GNI*. They have only fallen back to a limited extent since then.

Corporation tax has recovered very strongly but it now emanates from different sources, in particular the MNE sector. Indirect taxes, especially excise taxes, have accounted for a diminishing share of government funding over the recovery period.

A comparison of current tax rates in Northern Ireland and Ireland is given in Appendix 1.

Corporation Tax

When Ireland's low corporation tax strategy was conceived in the 1950s, it was aimed at stimulating employment growth at the expense of tax revenue. Today it has, instead, been transformed into a huge source of tax revenue for the government, while it has a relatively minor role in driving employment growth. Last year revenue from corporation tax amounted to around 6% of national income, with about 80% of it coming from foreign multinationals, and around half of that from US companies. This income is very important to Ireland, so that future changes in the international environment that seriously reduce corporation tax receipts could have a longer lasting impact on the economy than the pandemic.

While the low corporation tax regime had been in place since 1956, it had not been particularly effective in attracting foreign firms until the 1970s. It was the advent of EU membership that combined with the low tax rate to make Ireland an attractive location for foreign direct investment (FDI). Over the 1980s and the early 1990s the influx of FDI proved important in turning the economy round.

However, over the last 20 years the low tax rate has not been particularly important in attracting FDI to Ireland to provide extensive employment. The attraction for foreign firms to come to Ireland to employ people has become divorced from the low tax rate. Where the low tax rate is important is in attracting US firms' intellectual property and the accompanying profits, but with very little other related economic activity. The foreign MNEs that employ a few hundred thousand people in Ireland are here for other reasons, particularly factors related to the labour market and regulation.

The Irish corporation tax regime has caused friction with Ireland's international partners and friends since it began. Recent years have seen a step up in international pressures to reform the global corporation tax system. In the Department of Finance's Stability Programme Update, published in April, they provided for a €2bn drop in corporation tax revenue by 2025 as a possible result of the OECD process and the Biden tax changes. (Corporation tax revenue in 2020 was almost €12 billion.)

Table 5: Profit rate of foreign MNEs operating in Ireland

	Profits as % of GVA		Share of Corporation Tax
	2008-2012	2014-2018	2017
Germany	40.3	50.5	2.5
France	54.0	59.3	2.3
Other EU		63.8	9.4
UK	39.0	50.1	4.0
US	81.3	91.6	56.8
Japan	68.0	83.5	1.9
Domestic	32.5	45.4	20.2
Total	71.6	84.5	100.0

The fundamental factor in Ireland's burgeoning corporation tax revenues has been the unusual nature of US tax law.[8] In most cases, domestic tax authorities do not allow their firms to separate their intellectual property (IP) from where they produce their goods and services, to move it to low tax locations. Thus, the profit rate of UK and German firms in Ireland (Table 5) is similar to firms in their home countries - they have not shifted profits to Ireland to enjoy a lower tax rate. They do business in Ireland because of the other attractions available.

The exception is US firms (and Japanese firms[9]) that have a very high average profit rate in Ireland. This is because US tax law allows them to separate their IP from real activity. Up to 2015 much of this IP was located in jurisdictions where they paid zero tax. In anticipation of changes in US law, a substantial amount of this IP moved to Ireland in 2015 and more has moved in subsequent years.

[8] See Barry, 2019.

[9] There are only a relatively small number of Japanese companies. The high profit rate may be driven by Japanese companies operating in the aircraft leasing sector. These companies are essentially financial companies that are highly leveraged with very few employees.

The Trump regime changed things by introducing a minimum rate of 10.5% that US firms have to pay on foreign profits. This helped shift a lot of profit to Ireland, because the Irish rate was 12.5%, which was deemed acceptable compared to a zero rate in some jurisdictions. Thus, Trump's changes probably raised Irish tax revenue.

The Biden regime is talking about raising the minimum rate internationally to 15%. If that were the only change, there would be no incentive for US firms to move their IP from Ireland provided Ireland raised its tax rate to 15%. This could actually raise tax revenue in Ireland. However, there is a concern that a coherent US tax policy would see other measures that could wrest some of the tax revenue paid in Ireland by US firms back to the US.

However, an OECD agreement could change the basis for levying tax on companies, especially those selling IT services, also posing a threat to Irish corporation tax revenue.

The business model of companies like Facebook and Google is very different from normal companies that produce butter, or computer chips. There is a good argument that the profits of internet companies should be treated differently and that the resulting tax revenue should accrue in countries where they do business. A proposed OECD agreement on such a change could cost Ireland €2 billion, something the Department of Finance has already provided for.

A great benefit of Ireland's current tax regime for firms is the certainty that it has provided. The rules have not changed much over the decade and this provides reassurance to investors. While some other EU countries have introduced a low corporation tax rate they do not have a long track record of such a tax regime. Thus, Ireland needs the outcome to the current international tax debate to be something which is seen as a permanent and fair settlement. Ireland may have to pay a price, but winning a suitable long-term deal would be worth the sacrifice of a pawn or two. Ireland needs to be seen to be part of the solution, not the problem.

Whatever happens, it is clear that the 320,000 jobs in foreign MNEs in Ireland, 15% of total employment, are reasonably secure. These firms have chosen to locate in Ireland because of the availability of graduates, especially English-speaking graduates, a suitable regulatory regime and a degree of certainty about the tax and other factors that are important to their activity.

Indirect Taxes and Taxes on Property

As shown in Table 4, the two main indirect taxes are excise taxes and VAT. Together they account for around 10% of GNI*. There has been some fine tuning of the VAT regime affecting the hospitality sector in recent years, but the basic rates and regime has changed little in recent decades. As in the UK most food is exempt from tax.

In the 1980s, as Ireland was going through a fiscal crisis with very high levels of borrowing. To try and close the funding gap there was a major increase in taxes, including excise taxes and VAT. This gave rise to considerable concerns about tax leakages due to cross-border shopping.

A large-scale study of cross-border shopping was carried out by the ESRI in 1987 and 1988 at a time when there were substantial differences in the tax inclusive prices of goods subject to excise taxes (FitzGerald *et al.*, 1988). This showed that the price savings would need to be substantial to travel more than 10 kilometres, as shown in Table 6. The one case where the leakage of tax revenue through cross-border shopping was really significant was whiskey. The results suggested that a reduction in the excise tax on whiskey would see an increase in revenue. The excise tax was subsequently reduced.

Kanbur and Keen, 1993, modelled competitive behaviour by countries in setting rates of indirect taxes. They showed that it could pay countries to respond to lower tax rates in neighbours. However, using data from the earlier study, FitzGerald, 1996 revisited the issue in the light of the Kanbur and Keen paper. The Irish data suggested that, because consumers were not prepared to travel significant differences to save money on their shopping, a country would have to be very small to benefit from competition in setting indirect taxes. Andorra is one such country which is sufficiently small that it benefits from setting very low rates of indirect taxes, attracting shoppers, especially from France.

Table 6: Maximum Distance Irish Shoppers Travelled to save money, Kilometres.

	Price Difference, %			
Size of Shopping Bundle, ECU's	2.5	5	7.5	10
80				
100				5
120			5	10
140			5	20
160			10	20
180		5	10	30
200		5	20	30
220		10	20	40
240		10	30	50

FitzGerald, 1996 examined some other studies of cross-border shopping in the EU, as shown in Table 7. The other studies for Denmark and the Netherlands also showed that the extent of cross-border shopping was also small in those economies, so that in setting rates of indirect taxes national administrations are probably not constrained by what happens in their neighbours.

Table 7: Extent of Cross-Border Shopping in EU countries 1986-1991

Country	Border Region	Year	Proportion of Expenditure	
			Regional	National
			%	%
Ireland	Border Counties	1986	10	2
Denmark	<50 kms	1985	3	1
Denmark	Sonderjylland	1991	5.7	0.9
Netherlands	Zuid-Limburg	1991	8.5	0.6

Since the 1980s, excise taxes, with the exception of tobacco and now carbon taxes, have tended to fall in real terms over time. However, there remain concerns that where excise taxes remain high, and may climb because of rising carbon taxes, problems may arise. Using data for the period 2013 to 2015, Kennedy et al. 2018, examined the extent of “fuel tourism” from Northern Ireland to Ireland driven by the higher rates of tax on motor fuels in Northern Ireland. The combined Excise Duty, Carbon Tax and VAT contribution to the Irish Exchequer associated with fuel tourism is estimated at €202 million for diesel and €28 million for petrol based on 2015 levels. CO2 emissions from these cross-border sales are about 1.17 million tonnes per annum, or 2% of Ireland’s national GHG emissions.

Finally, the combined excise and VAT levied on cars in Ireland is high, significantly higher than in Northern Ireland and the rest of the UK. While there is no real concern about smuggling of cars, there are concerns that a mismatch between how taxes are levied on importing new cars and second-hand cars into Ireland may cause problems. Also, there is the possibility that regulatory changes, for example banning fossil fuel cars from cities, could have overflow effects with dirty cars being "dumped" on neighbouring markets. (If such bans were introduced in GB and not introduced in Northern Ireland it could also result in "dumping" in Northern Ireland.) Because Ireland and the UK are the only left-hand drive countries in Europe this is a particular concern in for Ireland. Finally, Brexit has also affected this market in second-hand cars and its full effects are yet to be analysed.

Earlier in the 2010s the UK imposed a tax on fossil fuels used in generating electricity. This topped up the unduly low EU ETS price for carbon. The effect of this tax was to incentivise a very rapid decarbonisation of electricity generation in GB. This tax was not applied in Northern Ireland. Research by Curtis and di Cosmo, 2013, showed that, as a result of the Single Electricity Market (SEM) on the island, if it had been imposed in Northern Ireland it would have resulted in a rise in electricity prices on the whole island with a significant part of the revenue from the higher price in the Republic accruing to the UK Treasury. This meant that if the tax had been implemented in Northern Ireland it would have pushed the Irish government to impose a similar tax. This would have had desirable environmental effects across the island.

Direct Taxation and the Labour Market

The Irish labour market has been part of a wider British Isles labour market for two centuries. For most of the last 70 years migration between Ireland and GB has been driven by differentials in the unemployment rate and differentials in the real after-tax wage rate (Honohan 1992 and Bergin et al., 2014). These studies imply a very high elasticity of labour supply in Ireland because of the potential for large movements to and from the GB labour market. This has meant that there has generally been a close relationship between wage rates in Ireland and the UK.

Figure 6: Ratio of Irish wage rates relative to UK, manufacturing

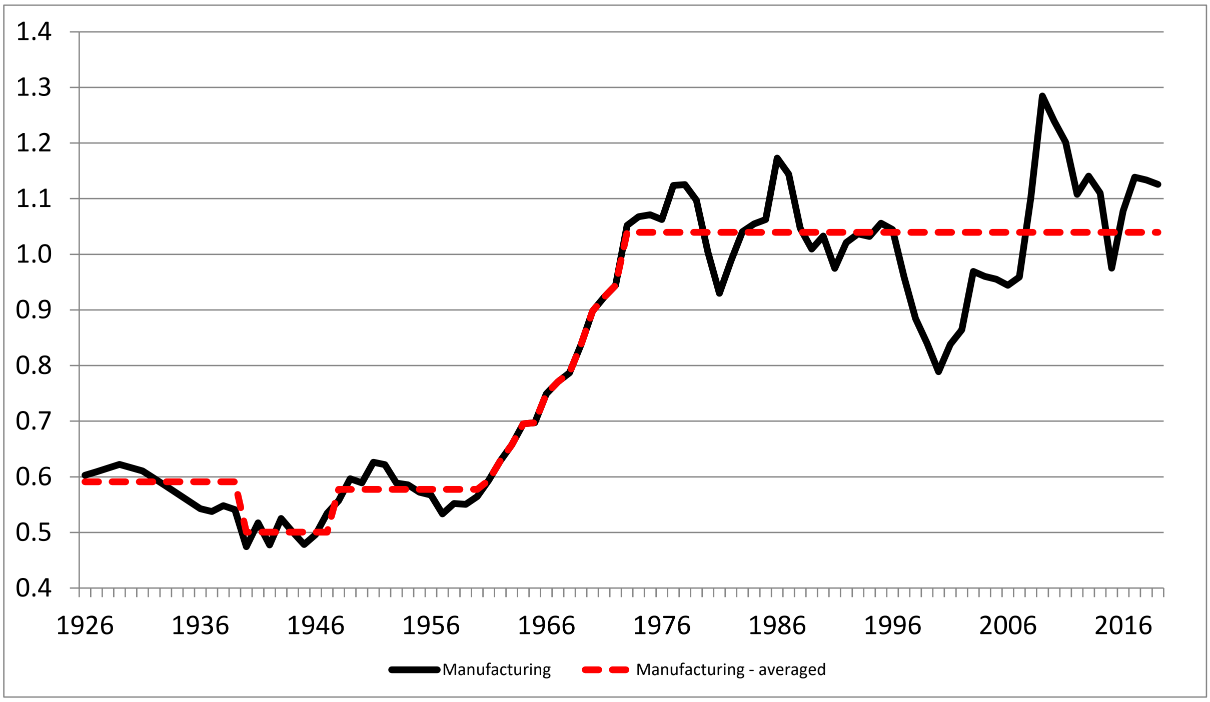


Figure 6 shows Irish manufacturing wage rates relative to GB rates since 1926. With the exception of the War years, between 1926 and 1960 wage rates in Ireland were roughly 60% of rates in GB. However, there was a rapid convergence of wage rates in the 1960s driven by a reduction in the cost of migration. Emigration came to be seen as less definitive a break with Ireland than it was in the past and those who moved found it easy to keep in contact with their families. Also, while emigrants had traditionally been badly educated, graduates began to play a bigger role in migration flows. By the 1980s the vast bulk of those moving had good educational qualifications.

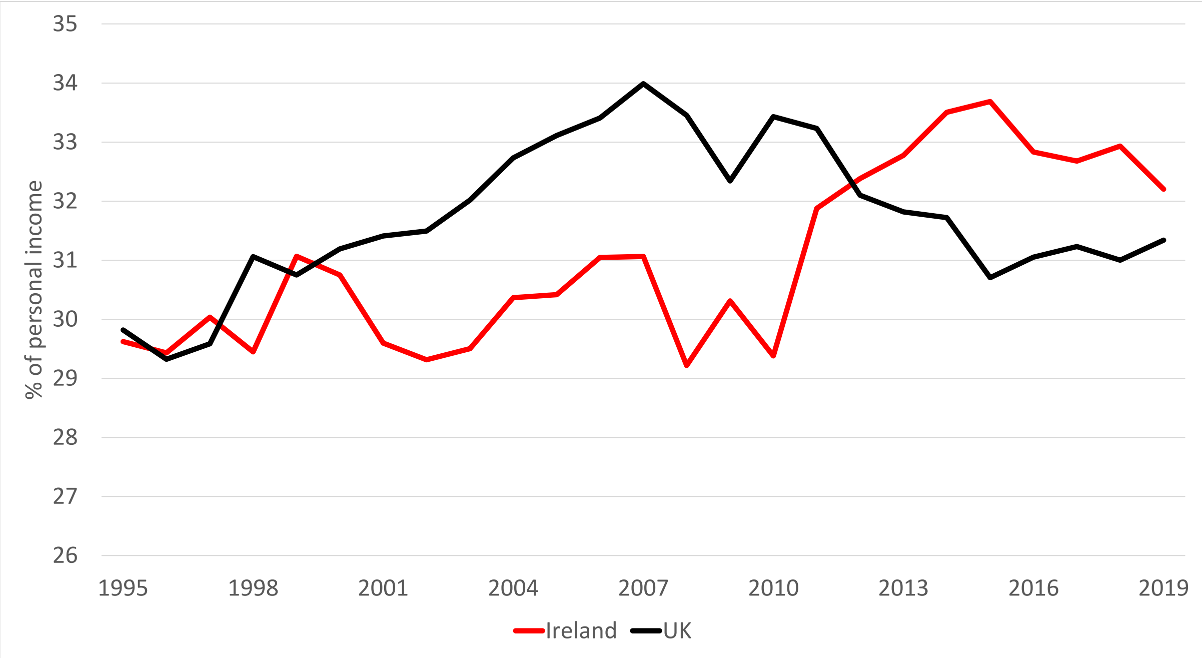
Between 1973 when Ireland and the UK joined the EU and 2019 wage rates in Ireland have averaged just above 100% of UK rates though fluctuations in exchange rates provide quite a lot of noise. However, continuing migration in both directions helped anchor this relationship over much of the last 50 years.

Table 8: Relative wage rates, Ireland relative to UK

	2002	2018
All Employees	94	115
Lower Secondary	99	97
Upper Secondary	98	101
Third level	80	114

Source: Eurostat

Figure 7: Average personal tax rate



As shown in Table 8, for those with lower secondary or upper secondary education in Ireland and the UK in 2002 wage rates were very similar and the situation had not changed much by 2018. However, while graduates in Ireland in 2002 earned 80% of what they could earn in the UK, the situation had reversed by 2018 with graduates earning substantially more than in the UK. This change in relative earnings occurred despite a very big increase in the supply of graduates in Ireland in the intervening years. This suggests a significant outward shift in the demand curve for skilled labour.

Comparable data on earnings by level of education are not available for Northern Ireland. Using average hourly earnings across the economy, wage rates in Northern Ireland were 80% of the UK average in 2002 and 86% in 2018. However, the average educational attainment of the labour force in Northern Ireland was below the UK average which may explain much of this difference.

Because of the high level of integration of the Irish and UK labour markets, changes in the direct tax system in either jurisdiction affects the real after-tax wage rate. In turn, this affects labour supply in Ireland impacting on wage rates. The cuts to direct taxation in the UK in the late 1980s put significant pressure on the Irish authorities to respond. There was a widespread perception at the time, especially by the Industrial Development Authority, that this was putting adverse pressure on Irish competitiveness. As shown in Figure 7, the average personal tax rate (including social insurance contributions) came broadly into line with that in the UK in the early 1990s. From the mid-1990s the UK rate rose while the Irish rate remained fairly constant. This remained the case until the financial crisis when the tax rate in Ireland rose substantially above the UK rate. Today, it is still significantly higher than in the UK.

The higher tax rate in Ireland in recent years has not given rise to the same concerns as it did in the 1980s. As discussed below, this is probably because the higher burden of taxation falls on those on higher incomes who predominantly have third level qualifications. This may help explain why graduate wage rates in Ireland are now significantly higher than in the UK, partly compensating for the higher tax burden. The shape of the demand curve for skilled labour may also mean that more of the incidence of the higher tax rate falls on employers of graduate labour in Ireland.

In the early 1960s a relatively small proportion of the population was subject to taxes on personal income. However, in line with the growth in the size of the state, by the 1970s it had become a major source of revenue. During the first half of the 1980s marginal rates on higher incomes were raised to an exceptional level. However, Honohan and Irvine, 1987, showed that this was very inefficient and, partly as a result of this insight, there were major reforms over subsequent years rationalising the system.

One might have expected that, given the integration of the GB and Irish labour markets, a similar result would be found for Northern Ireland. A cursory look at the more recent data does suggest a similar long-term relationship between wage rates in Northern Ireland and GB, as one might expect.

However, Ahrens, FitzGerald and Lyons, 2020, using pre-Brexit data, found a significant border discontinuity in commuting between Ireland and Northern Ireland, so that there were significantly fewer cross-border commuters in either direction than one might have expected, controlling for other relevant factors. Since average weekly earnings in the Republic were significantly higher than in Northern Ireland, one might have expected to see a higher propensity to commute from North to South than vice versa. The opposite was the case, with more cross-border commuting by Irish residents. The study also found that the propensity to commute from North to South was significantly lower for residents in predominantly Protestant wards.

The Irish income tax system allows couples to aggregate their income, maximising the benefit to the taxable unit from allowances. Twenty years ago, an attempt was made to move to a system where individuals were taxed separately, referred to as individualisation. However, in the face of strong opposition, the small initial changes to put this into effect have not been extended. As Schundeln, 2019, shows the taxation of family units rather than individuals in Ireland, and Germany has a significant negative effect on female labour force participation compared to the individualised systems in other countries, for example in Scandinavia.

Over the last 25 years the Irish personal tax system has evolved so that today relatively little income tax or Universal Social Charge[10] is paid by those on below average incomes. Average annual earnings in 2018 were €36,500. As shown in Table 9 those at or below average earnings paid only 10% of total tax revenue and their average tax rate was 11%. The Table also shows that 50% of the tax revenue was collected from tax units with a combined income of €100,000 or more.

Table 0: Ireland tax paid[11], classified by income of taxpayer unit, 2018

Tax unit income	% of total tax units	% of Tax	Cumulative % of total units	Cumulative % of total tax	Average tax rate
0 - 10000	16.7	0.1	16.7	0.1	0.6
10000 - 12000	3.3	0.0	19.9	0.1	0.5
12000 - 15000	5.0	0.1	25.0	0.1	0.7
15000 - 17000	3.4	0.1	28.4	0.2	1.0
17000 - 20000	5.2	0.3	33.6	0.5	2.5
20000 - 25000	8.6	1.2	42.1	1.8	5.1
25000 - 27000	3.5	0.7	45.6	2.5	6.5
27000 - 30000	4.9	1.3	50.5	3.8	7.5
30000 - 35000	7.5	2.7	58.0	6.5	8.9
35000 - 40000	6.6	3.4	64.6	9.9	11.0
40000 - 50000	9.4	7.5	73.9	17.4	14.1
50000 - 60000	6.7	7.8	80.6	25.2	16.9
60000 - 70000	4.8	7.4	85.4	32.6	18.7
70000 - 75000	1.9	3.5	87.3	36.1	20.0
75000 - 80000	1.6	3.3	89.0	39.4	21.1
80000 - 90000	2.5	6.1	91.5	45.5	22.4
90000 - 100000	1.9	5.5	93.4	50.9	24.3
100000 - 150000	4.2	17.8	97.6	68.8	28.1
150000 - 200000	1.2	8.5	98.8	77.3	33.3
200000 - 275000	0.6	6.5	99.4	83.8	36.6
Over - 275000	0.6	16.2	100.0	100.0	41.2

The nature of the tax system, where the bulk of the tax is paid by tax units with high incomes and high levels of education, made income tax revenue over the last year resilient to the pandemic related recession. The bulk of those units who pay most of the tax continued to work through the lockdowns and income tax revenue actually rose in 2020.

Studies show that incomes in Ireland, before tax and welfare payments, are quite unequal by EU standards. This reflects a number of related factors. The high proportion of those in employment with third level qualifications, conferring higher earning power. Also, the public sector, which employs a high proportion of graduates, has traditionally paid well. Finally, multi-nationals, who employ many graduates, also pay well. In 2017 average earnings for the 120,000+ working in US MNEs were around €63,000 whereas in Irish firms average earnings were closer to €35,000.

[10] This is an income tax introduced during the financial crisis using a slightly different base than income tax. In particular, it is levied on gross income before deduction of pension contributions.

[11] This includes revenue from USC but does not include social insurance contributions.

The design of the tax system means that it contributes to a significant role by the state in redistributing income. In addition, the welfare system, with many benefits means tested rather than granted on a universal basis, is also relatively generous and well targeted.

Figure 8: Income distribution after tax and welfare, Gini coefficient

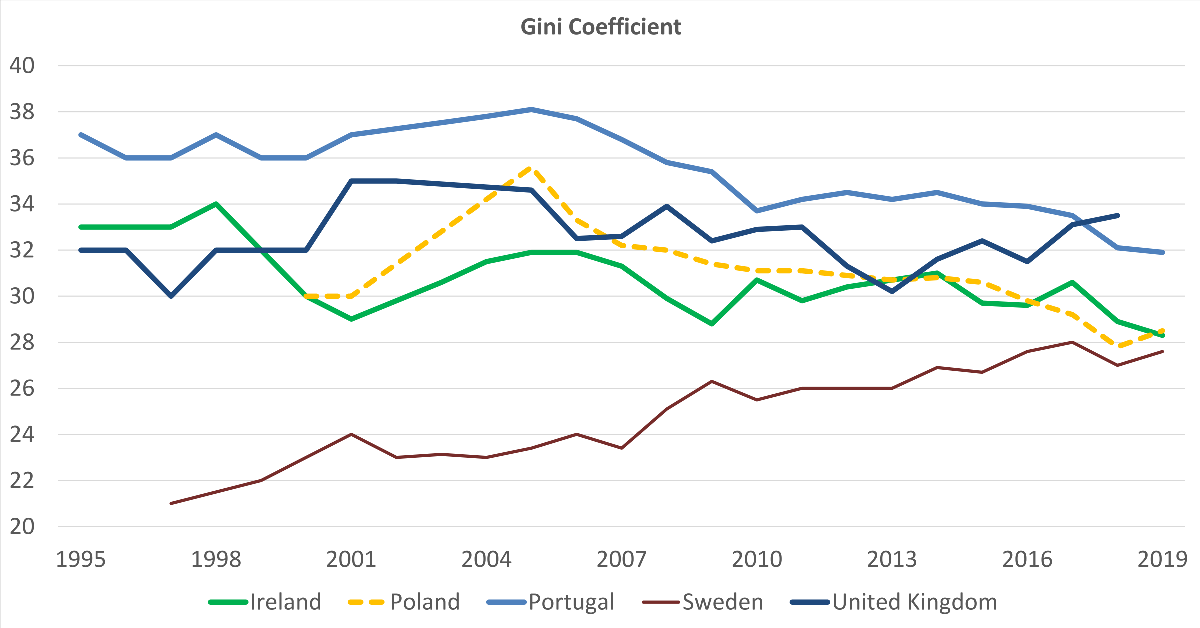


Figure 8 shows the gini coefficient for the distribution of incomes after tax and welfare payments. This is a measure of inequality: the higher the number the more unequal is the distribution of income. This shows that inequality in Ireland has fallen since the late 1990s, with a particularly big reduction in 2009. A recent paper by Roantree *et al.*¸2021, shows that inequality in Ireland has actually been falling from the late 1980s. Comparable data are shown for the UK, where there has not been a major change since the late 1990s, Portugal and Poland where inequality has been falling for the last decade, and Sweden where it has risen pretty continuously since the late 1990s, though it is still marginally lower than in Ireland and Poland.

Other Taxes and Related Issues

Each year the Revenue Commissioners show the tax foregone as a result of special allowances across the range of taxes. There is a wide range of such allowances. However, many of them have little or no cost with very low take up – such as "Favoured nephew relief" from Capital Acquisitions Tax. Table 10 shows the more significant tax expenditures in terms of revenue foregone.

Table 10: Selected Tax Expenditures, tax foregone, € million

		2018	% of GNI*
Research & Development Tax Credit	Corporation Tax	355	0.18
Agricultural Relief	Capital Acquisitions Tax	166	0.08
Business Relief (11)	Capital Acquisitions Tax	190	0.10
Dwelling House Exemption	Capital Acquisitions Tax	45	0.02
Employees' Contributions To Superannuation Schemes	Income Tax	678	0.34
Exemption of employers' contributions from employee Benefit In Kind	Income Tax	658	0.33
Health expenses	Income Tax	380	0.19

Property tax on domestic dwellings was abolished in 1977. However, as a result of the financial crisis a property tax was introduced in 2013. In 2014 the revenue raised amounted to 0.3% of GNI*. However, dwellings have not been revalued and new dwellings built since the tax was introduced are exempt from the tax. As a result, revenue has been fairly static since the tax was introduced. However, the government have decided that owners should revalue their property this autumn and that this revised valuation, together with the inclusion of all new dwellings, will form the basis for the tax next year. However, the rate of the tax will be reduced so that in 2022 the revenue should not be very different from this year. However, the reforms would allow the tax rate to be raised in future years.

One of the financial crisis measures introduced by the government was a charge for water use. (Some rural areas always had charges for water.) Water charges were commenced in 2015. However, as a result of very vocal opposition from a small left-wing party, People Before Profit, supported by Sinn Féin, the water charges were abandoned in 2016.[12] (The Independent Water Review Panel, Northern Ireland, reported in 2007, recommending water charges in Northern Ireland. However, the Executive decided not to proceed with them.)

Ireland has a carbon tax, originally calibrated at €20 a tonne of carbon dioxide, through initially with limited coverage. However, from October 2019 it was raised to €26.5 a tonne with broader coverage. Also, the Oireachtas committee on climate change recommended that it be raised by a similar amount each year to reach €100 a tonne by 2030. This approach has been adopted by the government and the tax is currently €33 a tonne.[13]

The revenue from the increase in the carbon tax is hypothecated for use in tackling climate change and compensating those who are adversely affected by climate change policy. To date approximately a third of the revenue has gone to increasing welfare payments to ensure that those on low incomes, who spend a higher share of their income on fuel, do not suffer any reduction in living standards. Some of the revenue has also been used to help redeploy those previously working on harvesting peat to alternative employment.

In the Public Expenditure Guidelines a carbon price of €265 a tonne is assumed for 2050. Using the rate of discount mandated in the Guidelines, the price today would be over €80 a tonne, significantly higher than the current rate of tax. Also, indications are that the marginal abatement cost will rise to a multiple of the expected tax by 2030 if the government's emissions reduction target is to be reached.[14] To date there has been no suggestion of reflecting this cost in a much higher carbon tax.

The Irish government faces major fiscal challenges over the coming decade. As is normal elsewhere in Europe, the ageing of the population will now put continual upward pressure on expenditure on pensions and health care. While the pension age has already been raised to 66, a planned increase to 67 has been postponed. The result will be that the government will see pressures to raise taxes over the coming decade from this source.

Following on the rapid growth in the population, the country has "outgrown its clothes". There is an urgent need to build more dwellings and the current shortage means that house prices and rents are very high and rising. While in Germany the number of people dying each year, freeing up dwellings,

[12] These two parties also oppose property taxes.
[13] This tax is also opposed by Sinn Féin and People Before Profit but supported by the other opposition parties.
[14] The scenarios published by the CCC for the UK also suggest a high marginal abatement cost if the legislated UK targets for reducing greenhouse gas emissions by 2030 are to be realised.

is over 80% of the population aged 25, in Ireland it is around 60%, so that many additional dwellings are needed. This high price of accommodation is adversely affecting the economy (Duffy *et al.*, 2005). To date the supply response has been very slow. While much of the burden of funding new investment in dwellings will fall to the private sector, the government has committed to investing a significant amount in social housing, which will also require new revenue sources.

Finally, if the government's ambitious targets on reducing greenhouse gas emissions by 2030 are to be met, there will have to be a very large investment programme. While the IMF in June 2021 suggested that it would require special investment / expenditure each year in the 2020s amounting to around 10% of GNI*, this is likely to be too high by between 200% and 300%. Nonetheless, the cost of meeting the targets could run to between 3% and 4% of GNI* late in the decade. While some of this will be funded by the private sector, in the case of decarbonising heat in dwellings, savings on fuel costs will be very much smaller than the cost of the necessary investment, even at the expected higher carbon tax.[15] This gap may have to be filled by government. The government's economic service (IGEES) has also estimated that to meet the existing targets for deployment of electric vehicles by 2030 would cost the government €10 billion (5% of GNI*) in lost revenue or subsidies over the decade at existing tax and subsidy rates. The more ambitious targets of the current government can only increase this potential cost.

The combined effects of these different challenges for government over the decade will almost certainly require increased revenue sources. It is not clear where they will be found.

Probably the least costly way of raising the additional revenue would be to substantially raise the property tax rate (helping support investment in housing) (O'Connor, 2013), accelerate the rise in the carbon tax (helping fund investment in decarbonisation) and introduce public service charges to cover the cost of decarbonising electricity and water. A failure to index tax bands and allowances in the direct tax system may also help raise revenue with more limited political consequences. However, what may seem like the least costly approach may well not be politically acceptable.

5. Implications for Northern Ireland

While some of the contrasting performance of the two economies on this island over the last fifty years can be explained by the effects of the Troubles, a more fundamental factor is the differences in educational attainment. The obvious implication is that Northern Ireland needs to reform its educational system to better meet the needs of its population (Borooah and Knox, 2015). Without such a reform it will not be possible to close the productivity gap between Northern Ireland and GB or Ireland.

Siedschlag and Koecklin, 2019, examined decisions on location of FDI across European regions. Their research showed that a key factor was the availability of young graduates. Thus, the encouragement of FDI as a means of raising productivity is crucially dependent on a reform of the educational system, it cannot substitute for it.

One option for Northern Ireland, which could produce a more rapid turnaround in the availability of skilled labour, would be to attract back many of the Northern Ireland born graduates living and working elsewhere, especially in GB. Studies on the Irish economy have shown that those who emigrated and returned to Ireland earn 10% more and are hence 10% more "productive" as a result of their experience working abroad (Barrett and Goggin, 2010). This return flow of graduates has been an important channel in raising productivity in Ireland since 1990. Most of the top

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[15] The scenarios published by the CCC for Northern Ireland also suggest a major cost for households in undertaking the necessary investment to meet the UK targets for 2030.

management of foreign MNEs in Ireland are Irish who have returned from working abroad. If Northern Ireland could emulate this process, it could provide a quick win.

While the low rate of corporation tax played a significant role in attracting employment in foreign MNEs to Ireland in the 1970s and 1980s, today it no longer plays that role. The jobs in MNEs are located in Ireland for other reasons, in particular the availability of skilled labour.

Over the last 15 years the low rate of corporation tax in Ireland has attracted profits arising from the IP of US firms. Today, a significant part of this revenue is at risk from changes in US tax law and the OECD tax reform project.

For Northern Ireland, if a low rate of corporation tax had been introduced in the 1980s, it might have helped attract FDI and related employment in the 1990s. However, such a change could have taken a decade to bed down as it is clear that, in addition to the low tax rate, firms seek certainty that tax laws will not change after they have invested. Such certainty can only be earned by the application of a consistent policy over an extended time period. This partly explains why other EU countries with low tax rate have not seen a boom in FDI.

With the changing environment for the taxation of profits from internet companies and the IP of US MNEs, it seems most unlikely that Northern Ireland could wrest some of these exceptional profits from Ireland. Even if it did so with a low tax rate, it would not bring additional jobs directly. Thus, having a lower than GB rate of corporation tax in Northern Ireland would be most unlikely to confer any benefit on Northern Ireland.

The extensive research on the border effects of differences in indirect taxes suggests that, while such differences may lead to some leakage of revenue (and greenhouse gas emissions), this leakage should not be so large as to determine domestic policy. However, the devolved administration has no power to vary rates of most indirect taxes. The one exception to this may be environment related taxes and charges.

Responsibility for the environment is a devolved responsibility. Setting and meeting emissions reduction targets for Northern Ireland should involve applying the polluter pays principle. However, moving environmental charges and taxes too far out of line with GB (or Irish) charges and taxes could see some leakage of emissions in either direction. However, unlike in the Republic, if Northern Ireland imposed environmental taxes / charges, it does not have the power to offset their regressive effects through changes in the welfare system in the way that happens in Ireland.

On direct taxation, while not within the remit of the Northern Ireland executive to make changes, Scotland can and has varied rates to a limited extent. The evidence is weak on how higher (or lower) direct tax rates in Northern Ireland would affect the labour market. The evidence suggests that differentials in after tax earnings have not resulted in many additional people in Northern Ireland seeking employment south of the border by daily commuting. Also, there is limited evidence on the motivation for Northern Ireland born graduates pursuing their careers in England. Thus, the effects of differences in direct tax rates, even if permitted, on flows of skilled labour between Northern Ireland and GB is uncertain.

As in Ireland, property taxes can and are levied separately in Northern Ireland. In Ireland the property tax is a progressive tax, weighing more heavily on those in the upper half of the wealth distribution. No doubt the same would apply in Northern Ireland.

References:

Ahrens, Achim, John FitzGerald, Seán Lyons, 2020 "Commuting across the Irish border*", Economic Letters*, Volume 190, May 2020.

Barrett, Alan and Jean Goggin, 2010, "Returning to the Question of a Wage Premium for Returning Migrants", National Institute Economic Review, Vol. 213 No. 1, July 2010, pp. R43-R51

Barry, F., 2002, 'The Celtic Tiger Era: Delayed Convergence or Regional Boom?', ESRI Quarterly Economic Commentary, pp. 84-91.

Barry, F., 2019, "Aggressive Tax Planning Practices and Inward-FDI Implications for Ireland of the New US Corporate Tax Regime", *Economic and Social Review*, Vol. 50, No. 2.

Bergin, A. and S. McGuinness, 2021, "Who is better off? Measuring cross-border differences in living standards, opportunities and quality of life on the island of Ireland", Irish Studies in International Affairs, 2021, Vol. 32, No. 2, Analysing and Researching Ireland, North and South, pp. 143-160

Borooah Vani, and Colin Knox, 2015, The Economics of Schooling in a Divided Society: The Case for Shared Education, London: Palgrave Macmillan

Conefrey, Thomas, FitzGerald, John, "The Macro-economic Impact of Changing the Rate of Corporation Tax", Economic Modelling, Vol 28, Issue 3, May 2011, pp.991–999.

Curtis, John, Valeria di Cosmo, and Paul Deane, 2014, "Climate Policy, Interconnection and Carbon Leakage: The Effect of Unilateral UK Policy on Electricity and GHG Emissions in Ireland", Economics of Energy & Environmental Policy, Vol. 3, No. 2.
http://www.iaee.org/en/publications/eeeparticle.aspx?id=65

Duffy D., J. Fitz Gerald, and I. Kearney, "Rising House Prices in an Open Labour Market", *The Economic and Social Review* Vol. 36, No. 3, Winter

Fitz Gerald, J., T. Quinn, B. Whelan and J. Williams, 1988, *Analysis of Cross-Border Shopping*, General Research Series No. 137, The Economic and Social Research Institute, Dublin.

FitzGerald, J., 1992, "The Distortionary Effects of Taxes on Trade in Border Areas: the Republic of Ireland/UK Border", in G. Winckler ed. *Tax Harmonisation and Financial Liberalization in Europe,* Macmillan, London.

FitzGerald, J. Johnston and J. Williams, 1995, "Indirect Tax Distortions in a Europe of Shopkeepers", ESRI Working Paper No. 56

FitzGerald J., and Transport Research Group, University of Ulster, 1996, *Cross-Border Shopping on the Island of Ireland* , General Consumer Council in Northern Ireland, Belfast.

FitzGerald, J., 2012, "To Convergence and Beyond? Human Capital, Economic Adjustment and a Return to Growth", The Economic and Social Research Institute, Working Paper No. 419.

FitzGerald J., 2019, "Investment in Education and Economic Growth on the Island of Ireland", Dublin: Journal of the Statistical and Social Inquiry Society of Ireland, 2018/2019, Vol XLVIII, pp. 195-210.

John FitzGerald, 2020a, "National Accounts for a Global Economy: The Case of Ireland", in Nadim Ahmad, Brent Moulton, J. David Richardson and Peter van de Ven, editors, The Challenges of Globalization in the Measurement of National Accounts, Forthcoming from University of Chicago

Press. https://www.nber.org/books-and-chapters/challenges-globalization-measurement-national-accounts.

John FitzGerald, 2020b, “Understanding recent trends in the Irish economy”, in Kieran McQuinn, Conor O’Toole, Matthew Allen-Coghlan, Cathal Coffey eds. *Quarterly Economic Commentary”*, The Economic and Social Research Institute, Autumn.

John Fitzgerald and Edgar Morgenroth, 2020, “The Northern Ireland Economy: Problems and Prospects”, Journal of the Statistical and Social Inquiry Society of Ireland, Vol. XLIX.

FitzGerald, John, 2021, “Thoughts on Quality of Life, North and South: A Response to ‘Who is Better off’ by Adele Bergin and Seamus McGuinness”, Irish Studies in International Affairs, 2021, Vol. 32, No. 2, Analysing and Researching Ireland, North and South, pp. 161-3.

Honohan P. and I. Irvine, 1987, “The Marginal Cost of Taxation in Ireland”, *Economic and Social Review*, Vol. 19, No. 1.

Honohan, P., 1992. “The Link Between Irish and UK Unemployment”, Quarterly Economic Commentary, Spring, pp. 33-44.

Honohan, P. and Walsh, B. 2002, 'Catching up with the Leaders: The Irish Hare', Brookings Papers on Economic Activity, no. 1 (2002), pp. 1-57.

Honohan, Patrick, 2021, “Is Ireland really the most prosperous country in Europe?”, Central Bank of Ireland, Economic Letter, Vol 2021, No. 1

Kanbur, R. and M. Keen, 1993, “Jeux sans frontières : Tax competition and tax coordination when countries differ in size”, *American Economic Review*, Vol. 83, pp. 877-892.

Kennedy, Seán, Sean Lyons, Edgar L. W. Morgenroth, and Keith Walsh, “Assessing the level of cross-border fuel tourism”, *Irish Journal of Social, Economic and Environmental Sustainability*, Volume 1 Issue 2 January 2018

Fuchs-Schundeln, , Nicola, 2019, “Hours Worked Across the World: Facts and Driving Forces”, National Institute Economic Review, No. 247, February 2019.

O’Connor, Brendan, 2013, “The Structure of Ireland’s Tax System and Options for Growth Enhancing Reform”, *The Economic and Social Review*, Vol. 44 No. 4, Winter.

Ó Gráda, C., 2002, 'Is the Celtic Tiger a Paper Tiger?', ESRI Quarterly Economic Commentary, pp. 51-62.

Ó’Gráda, Cormac, and Kevin Hjortshøj O’Rourke, 2021, “The Irish economy during the century after Partition”, Oxford Economic and Social History Working Papers, Number 189, April 2021.

Roantree, Barra, Bertrand Maître, Alyvia McTague and Ivan Privalko, 2021, *Poverty, income inequality and living standards in Ireland*, Dublin: he Economic and Social Research Institute, https://doi.org/10.26504/bkmnext412

Siedschlag, I. and M. T. Koecklin, 2019, “The Impact of the UK’s EU Exit on the Attractiveness of Northern Ireland to FDI and Associated Job Creation Effects”, Belfast: Northern Ireland Department for the Economy, March.

Wycherley, M. and J. FitzGerald, "Growth in Output and Living Standards", Chapter 8 in O'Hagan John, Francis O'Toole and Ciara Whelan (editors), *The Economy of Ireland: Policy Making in a Global Context* (14th edition), Red Globe Press/Macmillan, London 2021.

Appendix 1: Comparison of Tax Rates

The comparison her is for tax rates in 201. Relative rates of taxes, especially indirect taxes, have varied considerably over time due to fluctuations in exchange rates. This Table has been prepared by the Independent Fiscal Commission, Northern Ireland.

Tax rates UK versus RoI

Taxes	UK rates	RoI rates
Income tax	20% basic rate (£12,571 to £50,270) 40% higher rate (£50,271 to £150,000) 45% additional rate (£150,000+)	20% lower rate and 40% higher rate. Single and widowed person: no dependent children- up to €35,300 @20%, balance @ 40% Single and widowed person: up to €39,300 @20%, balance @ 40% Married couple: one income - up to €44,300 @20%, balance @ 40% Married couple: two incomes - up to €44,300 with an increase of €26,300 max[16] @20%, balance @ 40%
National insurance contributions	Employers contribution – 13.8% typically Employees contribution – 12% typically	Pay Related Social Insurance (PRSI) – typically 4% Universal Social Charge (USC) - From 2021 - First €12,012 - 0.5%; Next €8,675 - 2%; Next €49,357 - 4.5%; remainder - 8%
Value added tax	Standard rate – 20% Reduced rate – 5% Zero rate for children's clothes/food	From 1 March 2021 Standard rate -23% Reduced rate -13.5% Second reduced rate – 9%
Corporation tax	Currently 19% but will rise to 25% by April 2023	12.5%
Fuel duty	57.95 pence per litre for petrol/diesel	59c per litre of petrol and 48c per litre of diesel.
Alcohol and tobacco excise duties	Cigarettes - 16.5% of the retail price plus £4.90 on a packet of 20	Cigarettes - €356.39 per thousand together with an amount equal to 10.06% of the price at which the

[16] In 2021 the standard (20%) rate band for couples in a marriage or civil partnership is €44,300. If both people are working it is increased by the lower amount of either: €26,300 or the income of the lower earner. This means that the maximum standard rate band a couple can have is €70,600 (€44,300 + €26,300). It is not possible for one person to use the full amount of €70,600.

	Beer duty- typically 19.08 pence per litre for each % of alcohol. Spirits - £28.74 of Spirit Duty per litre of pure alcohol.	cigarettes are sold (alternatively €414.24 per thousand) Typical €22.55 per hectolitre per cent of alcohol in the beer and €42.57 per litre of alcohol in the spirits
Vehicle excise duty	Various based on emissions/fuel type	Various based on emissions/fuel type
Stamp duty	From October 2021 £125,001 to £250,000 - 2% £250,001 to £925,000 - 5% £925,001 to £1.5 million - 10% above £1.5 million - 12%	1% on the first €1 million 2% on excess over €1 million. transfer of non-residential property (other than policies of insurance) is 7.5%.
Capital gains tax	Typically 28% on residential property and 20% on other assets	33% for most gains
Betting and gaming duties	Typically 15%	2% (nil for On-course or tote bets) or 25% for Betting Intermediary Duty
Inheritance tax	40%	33%
Insurance premium tax	Standard rate is 12%, higher rate of 20%	Typical 3% levy
Landfill tax	£94.15/tonne standard rate or lower rate of £3/tonne	€75 per tonne
Climate change levy	Various	Various environmental taxes, e.g. plastic bag levy 22c per bag
Aggregates levy	Typically £2 per tonne	n/a –no similar levy
Air passenger duty	From April 2022 Short haul rates are Reduced – £13 Standard – £26 Higher - £78 Long haul rates are Reduced – £84 Standard – £185 Higher - £554 Long haul rates in NI are zero. Flights from Scottish Highlands and Islands are exempt.	Air Travel tax abolished in 2014