

National Accounts for a Global Economy: the Case of Ireland

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Abstract

Globalisation is affecting the way economic activity is reflected in the national accounts. Intellectual property, which is now part of the capital stock, interacts with the choice of global firms as to their legal structure, producing different national accounting outcomes for individual countries. This is but one manifestation of the challenges that a global economy presents for national accounting. Using the example of Ireland, consideration is given to the data needed to meet the needs of users of national accounts. In particular, more information is required to separately identify all the activity of multinational enterprises and domestically owned firms. This paper suggests a set of satellite accounts for Ireland that would show how changes in the economy affect the economic welfare of Irish residents.

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1. Introduction

This paper considers some of the problems for users of the current system of national accounts due to the globalisation process. The inclusion of intellectual capital in the capital stock in the latest System of National Accounts (SNA 2008) further complicates a situation that was already difficult. While this note concentrates on the problems using data for Ireland, many of the same problems affect users of national accounts for other economies, albeit to a lesser extent.

In the case of Ireland, the problems with the national accounts, especially the shift to SNA 2008 (ESA 2010), have manifested themselves in a particularly remarkable way, giving rise to a growth in real GDP in 2015 of over 25% that was clearly “incredible”. The fact that it was incredible reflects a problem with the underlying accounting framework, not with a failure to apply the appropriate accounting standards.

National accounts were developed to meet a range of needs of policy-makers in managing a modern economy. For example, national accounting data are required by those responsible for fiscal policy to understand what is happening on the domestic labour market and also the level of utilisation of physical capital located in Ireland. They also need to know how much of the output in Ireland represents a benefit to Irish residents.

A very important aggregate in the Irish national accounts has been the development of net factor income from abroad (or paid abroad). Since the early 1980s this includes the accrued profits of foreign Multinational Enterprises (MNEs) operating in Ireland. When this outflow of profits (and the other items in net factor income) is deducted from Gross Domestic Product (GDP), the resulting aggregate, Gross National Income (GNI), should represent the output and income produced in Ireland that is available to benefit those living in Ireland. However, recent developments have made even this key aggregate an unreliable indicator of what is happening to domestic economic welfare.

While many countries have standardised on SNA 2008 (ESA 2010), the failure to implement it globally may give rise to a mismeasurement of global GDP: the movement of major economic activity to Ireland in 2015, as measured by SNA 2008, does not appear to have been counterbalanced by a corresponding fall elsewhere. This lack of consistency poses problems for international comparisons outside the EU.

There are also special problems in interpreting the current account of the balance of payments as a result of the unfolding of the globalisation process. The current account of the balance of payments is a key indicator of the sustainability of the current level of economic activity in an economy, but the standard treatment under SNA 2008 renders it totally ineffective as an indicator for a country such as Ireland.

In seeking to find a solution to the Irish problems the best approach would be to modify the ESA / SNA to ensure that it provided appropriate data for policy-makers in all jurisdictions. However, this is clearly not going to happen. Instead Ireland and other countries affected in a similar manner will have to persevere in producing an appropriate supplementary framework of accounts that provides a sensible depiction of what is happening in the domestic economy. While most external users will continue to use GDP for international comparisons, if suitably explained, an alternative domestic framework, providing more appropriate indicators of domestic economic activity, could be used by those interested in economic policy in Ireland, and also by those abroad interested in the Irish

economy. However, it would be beneficial if a similar supplementary framework of accounts was adopted by other countries particularly affected by the problems discussed in this paper.

Where problems will arise will be with EU aggregates, such as Euro area GDP, which is affected by the discontinuities in the accounts for Ireland. In 2015 the exceptional growth in Irish GDP added 0.5 percentage points to the Euro area growth rate. International agencies such as the ECB, DG Ecfm, the IMF, etc., will need to adjust for such discontinuities.

Section 2 discusses the needs of major users of national accounts. Section 3 considers how we model output in a global world. Section 4 describes the National Accounting significance of the legal structures used by MNEs in operating in different economies. Section 5 describes how globalisation has affected the Irish national accounts and Section 6 sets out some possible solutions to the problems identified. Conclusions are reached in Section 7.

2. What is the purpose of collecting national accounts?

The National Accounts are designed to present a picture of an economy that can be useful to those managing that economy or working in that economy. The way the accounts are defined and presented should take account of the needs of users and the purpose for which they will be used.

2.1 Fiscal and monetary policy

Since the national accounting framework was first developed, the national accounts, in particular the key aggregates, have been an essential tool for those responsible for fiscal and monetary policy. In the case of fiscal and monetary policy it is very important to understand state of the economic cycle using national accounting data.

In addition, in preparing a Budget, governments need to understand, not just the overall level of output, but also what is happening on a range of other important national accounting aggregates. This is essential in assessing tax revenue for the coming year, and also in understanding the pressures on expenditure.

Both for fiscal and monetary policy it is, therefore, necessary to have at least one or two key aggregates that represent the level of real activity in the domestic economy – the economy for which the policy-makers are responsible.

To fulfil this role the national accounting aggregate (or aggregates) must be consistent over time. Discontinuities, for whatever reason, make it impossible to determine the growth rate at the point of discontinuity. In addition, to understand the behaviour of the economy and to calibrate policy interventions correctly it is essential to have consistent time series for the national accounts that can be used for research and related modelling.

A second requirement for the national accounts aggregates is that they reflect the level of physical activity in the economy being regulated by the fiscal or monetary policy authorities. The data must reflect developments in the domestic labour market and the domestic market for physical capital. The data could well prove misleading if they cover physical activity that takes place in other economies. SNA 2008 / ESA 2010 does not ensure that the output covered by the key aggregates, such as GDP, is appropriately aligned with the jurisdiction of individual fiscal or monetary policy authorities

2.2 Broader Economic Policies

A second major role for the national accounts is to provide appropriate information to governments on how an economy is behaving, where growth is coming from, where output is being sold etc. This information is needed to support governments in developing policy across a wide range of different fields.

Policy makers are primarily concerned with output and activity physically located in the country over which they have jurisdiction. If a significant part of the output attributed to, for example, Ireland is produced in Asia with Asian labour and physical capital, this will be of little concern to domestic policy makers. It is only in so far as the activities of such businesses directly affects those who are living in the country for which the accounts are prepared, that the accounts will be useful.

As discussed later, the accounts for Ireland, prepared under SNA 2008 / ESA 2010, do not meet either of these two requirements. In Ireland the problem arises in trying to identify what part of the activity being measured in the accounts directly benefits those living in Ireland.

In principle, GNI should meet this need. However, in practise it suffers from a range of defects.

- While GNI provides an appropriate single measure of activity, much more information is needed by policy-makers to understand what is driving change in this aggregate. Since the 1970s, with a large amount of activity by foreign MNEs, it has become increasingly difficult to understand which sectors are contributing to the growth in economic welfare of those living in Ireland. This gap in understanding has not been addressed in SNA 2008.
- The inclusion of Intellectual Property (IP) in the capital stock has resulted in some very strange results. For example, the relocation of activity by MNEs to Ireland in 2015 caused a big shift in depreciation, resulting in a major discontinuity in GNI.
- There is a problem in the asymmetry with which activities of different MNEs operating in Ireland are handled in the accounts. If an MNE in, for example, the manufacturing sector makes a profit but does not immediately remit it to its owners, that profit is still accrued and it flows out as factor income (and on the current account of the Balance of Payments). However, for certain MNEs engaged in financial activity (redomiciled PLCs.), which do not do any business in Ireland but just receive profits in Ireland, the treatment is different. Their retained profits are not accrued and do not flow back out as factor income. This distorts both the GNI figure and the current account of the BOP. (The retained profits appear as an increase in foreign owned assets on the financial account of the BOP.)

There is, thus, a need to separate the activity that is beneficial for those living in Ireland from the activity that benefits the owners of the foreign MNEs operating in Ireland. The accounts must elucidate what is physically happening in an individual economy as well as what is happening to companies located in a particular country. The data must also be available at a sufficiently detailed sectoral level to provide real understanding of the sectors where growth is, or is not, occurring.

The current account of the BOP was one of the key indicators showing that the growth in activity in Ireland (and a number of other EU economies) was unsustainable in the last decade. However, because of the effects of globalisation on the accounts today, the current account of the BOP no longer signals the gap between savings and investment of Irish agents. It is clear that such an indicator is essential to the safe management of a modern.

2.3 Informing citizens and companies in the economy about what is happening

The considerations here are very similar to those for other policy makers. Citizens and companies need information on what is happening in an economy in so far as it will affect them. In an economy with large foreign MNE activity this means that the attention should be more focussed on GNI and Net National Income (NNI) rather than on GDP.

For this broader audience it is even more important that the development of the economy, as manifested in the accounts, is clearly explained. There will also be a need to concentrate on one or two key aggregates when communicating with a very wide audience.

2.4 Tax base

The national accounts data, in particular GNI, is used as a tax base in calculating Budgetary Contributions to the EU. For this purpose it should include activity that benefits those living in a country, even if much of the related activity does not take place in that country. Because Ireland benefits from the corporation tax paid by foreign MNEs operating in Ireland it would be appropriate that their profits it should be included in the base for EU taxation. This should inform the choice of appropriate national aggregate to form the tax base.

2.5 International comparability

A further very important use of national accounts data is to provide international comparisons between economies. For this purpose it is essential that the data are prepared on the same accounting basis across countries. Currently all EU countries use SNA 2008 / ESA 2010, which facilitates comparisons within the EU. However, because countries are affected in different ways by the process of globalisation, if there are anomalies in how the accounting standards treat certain items, it may affect the usefulness of the data for comparative purposes.

Where the inadequacies of SNA 2008 require the development of satellite accounts, as discussed in this paper it would be better that they were done on a consistent basis across countries. If each country develops policy its own system of satellite accounts policy-making at an EU level would be less transparent. To the extent that SNA 2008 is not fully implemented in some non-EU countries this makes international comparisons with non-EU countries more difficult.

3. Modelling Output

When national accounts were first developed in the 1930s it was not unreasonable to consider the world as being made up of a series of national economies which undertook limited trade in final goods. However, since the Second World War, a series of major changes in the world economy, especially the freeing of trade, has changed this situation so that for some purposes national economies, in the sense of the 1930s, have been transformed into subsectors of a global economy.

It can be useful to consider these and other changes within an encompassing model of world production. In this model the choice of the location for production by a stylised world firm (or myriad of firms) is made so as to minimise the world firm's cost of production. In the 1930s each firm chose capital, labour and materials in each separate national economy to minimise the cost of production of national output. Domestic production was primarily directed at satisfying domestic demand.

However, with the freeing of trade, the world firm(s) can choose to locate some of the production process of a good in one country and then combine the components produced in one country with labour and capital in another location to produce a final good. In this case the production of the final good in a relevant country will be undertaken using domestic capital and labour, combined with materials for further production that are produced in another location. Where final products consist of components from many countries, the cost of production in an individual country can influence domestic value added (GDP) in two ways:

First the relative cost of production in one country compared to the rest of the world will affect the location where the final good will be produced, hence affecting domestic value added (GDP). Secondly, changes in relative factor prices within a country can also affect domestic value added by causing the world firm to produce more or less of that final good in the relevant country by varying the share of material inputs, many of which may be imported – the substitution effect of changes in relative prices.

Thus this model encompasses behaviour such as outsourcing, modelling it as a function of the changes in the cost of domestic inputs relative to the cost of materials produced abroad. As a result, as discussed below, the effect of changes in the relative cost of domestic inputs on domestic value added must include both the substitution of gross output in a particular economy for similar output elsewhere, and also the substitution of domestic inputs (labour and capital) by material inputs, which are generally imported.

$$C_w = f(c_I, c_R, t) \quad (1)$$

The approach taken in the traditional national accounts of the 1930s assumed a model where the production of goods on a worldwide scale can be characterised by a cost function (1) where the cost of world output, C_w , is a function of the unit cost of production in an individual country c_i relative to the rest of the world, c_R , and technical progress, t .² Then the share of world output Q_w that is located in the individual country i , Q_i , (2) is a function of the unit cost of production in country i , c_i , relative to the unit cost of production in the rest of the world, c_R , and technical progress, t .

$$\frac{Q_i}{Q_w} = f\left(\frac{c_i}{c_R}, t\right) \quad (2)$$

$$c_i = \frac{c_i}{Q_i} = f(p_l, p_k, p_m, t) \quad (3)$$

The unit cost of production in country i is defined in Equation (3) as a function of the price of labour, p_l , the cost of capital, p_k , the price of inputs of goods and services, p_m , and technical progress, t . From this equation the share of each of the factors of production –labour, capital and materials – in domestic output can be determined.

For this model to be a valid representation of the economy of country i , a number of assumptions are necessary, including the assumption of constant returns to scale.

For a national output aggregate to be valid, output in any country it must be weakly homothetically separable from output in all other countries (Denny and Fuss, 1977 and Pindyck, 1979). This allows a

² The exposition here is based on Bradley and FitzGerald, 1988.

two stage optimisation procedure where firms in individual countries choose the optimal mix of inputs to use to produce national output. Then the share of world output to be produced in country i is a function of the unit cost of production in country i relative to the unit cost of production in all other countries.

The assumption of weak homothetic separability means that changes in relative prices of factors of production within one country, which do not affect the overall cost of production in that country, will not affect the mix of inputs used to produce a good in another country. In other words, in producing a good or service it is not possible to freely mix factor inputs from different countries in different proportions to produce a final good or service. This is a world where the supply chain does not spread across different countries but all inputs, including materials and services, are sourced nationally. While this restriction may have seemed realistic in the 1930s, in a modern world the restrictions are no longer valid.

The freeing of trade in the post-war world saw trade expanding rapidly, not just in final goods and services, but also in inputs used in the production process. This has gradually resulted in the complex supply chains which underpin modern production. This change gives rise to many of the problems with the national accounts for countries such as Ireland, which are small but fully integrated into the global supply chain.

Because of the ability to shift production between countries, the effects of reaching full employment or full utilisation of fixed capital in a particular economy can be rather different from that in a closed economy world. Instead of factor prices rising rapidly in the face of high levels of capacity utilisation, it is possible to shift some of the production process elsewhere. This has implications for fiscal and monetary policy

A second assumption of the standard production model is that capital is located in a particular country and used for production in that country. It also assumes that the marginal product of capital (and of other factors) is diminishing. However, intellectual property, which is now, appropriately, included as an element of the capital stock, has rather different characteristics. It may be technically located in one country (and receive its returns in that country), while it may be used to produce output world-wide. As Haskel and Westlake, 2017, emphasise, intellectual property (IP) is highly scalable: the same IP can be used to produce a million or a billion smart phones. As a result, this type of capital does not fit easily into the traditional model of production or into the traditional national accounts framework; the marginal product of IP is not diminishing. Also it can be used across many different countries.

$$C = f(K_p, p_{il}, p_{ik}, p_{jl}, p_{jk} \dots \dots p_r, t) \quad (4)$$

Today the choice facing the world firm(s) may be better represented by equation 4 which relaxes the assumption of weak homothetic separability between factors in individual countries. Instead the world firm(s) can choose to mix the factors from different countries i, j , etc. in a complicated supply chain. Raw materials p_r are located independently of where the production takes place. Also, in the modern world the stock of IP, K_p is increasingly separable from all other factors of production. It can be located anywhere in the world.

The returns on IP are separable from the returns to the other factors. This means that the inclusion of the returns to IP in a particular economy may not reflect the returns to that factor as used in that economy. National output, as understood when the national accounts were first developed, no longer exists as a separable aggregate. The attribution to Ireland of the returns to IP owned by foreign MNEs in Ireland is very seriously distorting the traditional measure of national output. That is because the returns arise from the use of the IP to produce goods in Asia, not Ireland.

However, while such a model better represents a global world, it has been necessary to impose significant restrictions to make it tractable. Nonetheless it is important that the data provided by the national accounts reflects the complex decision making process which determines the global location of output and the utilisation of factors in individual countries

4. Legal Distinctions Matter

Two legal issues have a significant effect on how the operations of MNEs are reflected in national accounts. The first concerns the legal form used by an MNE operating in a country other than its home location. The second is how the company is affected by tax law, in particular how US companies are affected by US tax law.

4.1 Legal Structure

For over a century many companies have moved from operating on a purely national scale to operating in two or more different countries. This “globalisation” can occur in different ways. Initially a company may buy services or inputs from firms in other countries. A second stage may involve the establishment of a subsidiary in one or more foreign countries making the company a Multi-National Enterprise (MNE). A third approach, which has become more popular in recent decades, is to contract with foreign firms to manufacture goods on behalf of the MNE in factories owned by independent companies in foreign locations.

Where firms buy goods or services abroad this appears in the national accounts as imports and exports in a straightforward manner. The output in the foreign location is included in that country’s GDP.

Before the freeing of trade the establishment of a foreign subsidiary was often the only way to move into a new market, bypassing tariff barriers. It allowed companies to exploit their intellectual property on a wider scale in the face of major restrictions on trade.

Today, for many MNEs this approach remains a vital stage in establishing an integrated supply chain. Whereas initially the production process may have been replicated in different locations to avoid tariffs, today the different stages in the supply chain may be undertaken by subsidiaries located in different countries around the world.

In setting up a subsidiary in a country the MNE establishes a legal presence there. The physical capital and labour used by the subsidiary is clearly part of the stock of physical capital and labour force in the country where the subsidiary is located. As a result, the activity of the subsidiary is recorded as part of the activity in the country where it is located: the GVA, physical investment, employment, wage bill, profit and depreciation are all included in the detailed national accounts for the country where the subsidiary resides.

The relationship of a subsidiary in another country with the parent MNE, wherever it is located, is reflected in a transfer of the after tax profits earned by the subsidiary to the parent, flows of factor income which represents a wedge between GDP and GNI. Even if temporarily retained in the origin country, this payment is treated as being accrued to the MNE parent. There may also be other intracompany transfers which affect the national accounts. For example, royalties may be paid for use of the parent company's IP. Also parts or services may pass from one subsidiary to another appearing as exports and imports.

A third approach to operating on a global scale involves an MNE contracting with a company in another country to have goods or services produced for it. In this case the MNE provides the IP but the local company owns the capital and employs local labour. Because the work is done on contract for the MNE the goods or services produced by the local company are owned by the MNE from the initiation of the production process³. The goods (or services) are recorded as an export from the country where the MNE that owns the goods resides, not from the country where they were manufactured. The operating surplus, over and above the payments to the local producer, are recorded as output in the country where the MNE that owns the IP is located.⁴

Thus there is a very different national accounting treatment for goods or services physically produced in a country depending on the legal arrangements between the MNE and the local company.

The decision by MNEs to go the contract manufacturing route may be due to uncertainty about how well a subsidiary company may be treated in the host country's legal system or by its administration. Local entrepreneurs may be favoured in many ways. Also the MNE may be concerned that, if IP is transferred to a subsidiary, it might not be protected by the host country legal system.

For whatever reason, contract manufacturing tends to be used by IT companies with large IP having goods manufactured in countries such as China. The subsidiary route is favoured in cross border activities by MNEs, such as German or Japanese MNEs, in particular where the subsidiaries are located in OECD countries.

The fact that the distinction between manufacture by a subsidiary and manufacture on contract makes a big difference to the national accounting treatment of MNE activity leaves open the possibility of future big discontinuities in the National Accounts for individual countries. If the legal framework changed to make establishing a subsidiary preferable in certain major Asian economies, such as China, the MNEs currently operating contract arrangements could suddenly change their legal form. This could result in a large amount of what is treated as output in Ireland, or elsewhere, suddenly being included in the national accounts for the Asian country where the physical manufacturing takes place. The relocation of output in the accounts would be replaced by a transfer to the MNE, wherever it is headquartered, of after tax profits as part of factor income. Similarly, a shift of production from China to a country, such as India, where establishment of subsidiaries is preferred, could also see a major change in output in the country where the MNE's head office is

³ For example, there has been significant contract manufacturing work done in Ireland for foreign pharmaceutical companies. The drug is shipped in powder form to an Irish company to be pressed into tablet form. The powdered drug is, at all times, owned by the foreign company contracting with the Irish company.

⁴ Thus the operating surplus on manufacturing Donald Trump ties in China in 2015 would have been treated as US GDP, in spite of the fact that they were manufactured in China on contract.

located, such as Ireland. While these cases would give rise to significant discontinuities in GDP, they should not affect GNI. However, as discussed later, they would, in fact, change GNI.

While the current approach to recording activity in SNA 2008, if applied across the world, will consistently record world GDP, it poses many problems for the key users of the data. It means that GDP and also, as is outlined later, GNI may not provide a good guide for policy-makers. Also, if the SNA is not correctly applied in all countries by their national accounting authorities, world GDP and GNI may be incorrect and subject to discontinuities as MNEs change their legal structure.

4.2 Tax Law

A number of the problems with the Irish national accounts arise from how US tax law affects the behaviour of US MNEs. The problems are much fewer in dealing with MNEs originating in other countries such as Germany, France, the UK or Japan. The key difference is that, until now, US tax law meant that all profits of US firms, wherever earned, were taxable eventually in the US. However, until now, US firms were allowed to defer repatriating profits and so “temporarily” avoid paying the US tax liability. This has proved especially important for firms with large IP, such as firms in the IT sector.

The changes in US tax law in 2017 are significant and may lead to further movement, especially of where firms locate their IP. However, we do not consider how the recent US changes in tax law may affect the national accounts in the future in any detail.

Table 1: Share of Gross Operating Surplus by country of ownership

	2008	2009	2010	2011	2012	2013	2014	2015
US	53.2	55.2	58.2	57.1	57.5	NA	56.8	64.4
Other foreign	15.9	13.0	14.3	15.7	16.1	NA	12.6	9.7
Ireland	30.8	31.8	27.6	27.2	26.4	NA	30.6	25.9

Source: Eurostat Structural Business Statistics

While German, French and Japanese firms were able to exploit to a very limited extent a low rate of Irish corporation tax⁵, this was generally not the case for UK firms due to the way UK tax law operates. The effect of this difference in how tax laws have operated is that the bulk of the profits of MNEs arising in Ireland are attributable to US MNEs. Table 1 shows the share of the gross operating surplus arising in Ireland which is attributable to **US**, Irish, and other foreign companies in recent years. After the relocation to Ireland of IP in 2015 by one or more US firms, two thirds of the gross operating surplus was attributable to US firms and under 10% to firms from other foreign countries. By contrast, only 6% of employment in Ireland was in US owned companies.

US tax law has resulted in US companies transferring substantial profits to Ireland whereas, in the case of MNEs from other counties that account for the bulk of employment by MNEs in Ireland, they have not transferred much of their global profits to Ireland.

⁵ IN 1956 the law was changed to exempt profits earned from exporting from corporation tax. In 1980 this exemption was replaced by a 10% rate of tax on all manufacturing firms. In the 1990s a 12.5% rate was gradually applied to all sectors of the economy.

5. Irish National Accounting Issues

Ireland joined the EU in 1973 and, since that date, the economy has become increasingly globalised. There have been a series of important developments as a result of globalisation which have affected the economy and its portrayal in the national accounts over the subsequent 45 years.

The first development was the important role played by the low rate of corporation tax in attracting foreign MNEs to establish subsidiaries in Ireland. In turn, they tended to be highly profitable with some firms, especially from the US, transferring profits to Ireland (Conroy, *et al.*, 1998).

Initially the profits of such MNEs were only reflected in factor outflows when the profits were actually remitted to their parent. With substantial deferral of payments, especially by US companies, this led to an underestimate of the true outflow and an overestimate of GNI. The recognition of the importance of including the profits of MNEs on an accruals basis, rather than on the basis of actual remittances, only occurred in the early 1980s (Honohan, 1984).

More recently the national accounts for Ireland have been significantly affected by a range of other factors arising from globalisation: the growth of a large aircraft leasing sector; changes in patents of pharmaceutical companies; the growth in activity by redomiciled PLCs; and, finally, the inclusion of IP in investment, interacting with changes in ownership of this IP. National accounting rules have significantly affected how these developments have been represented in the national accounts: in some cases their treatment in the accounts means that GNI, rather than GDP, is a reasonable measure of the income and welfare of those living in Ireland. However, the effect of the growth of redomiciled PLCs, and of the ownership of IP by MNEs located in Ireland has, in more recent years, also seriously affected the usefulness of GNI for the purposes for which national accounts are used by policy-makers.

5.1 Accrued profits of MNEs

The direct benefit for people living in Ireland from the activity of foreign owned MNEs is the wage bill and the corporation tax paid in Ireland. The profits flow back to the foreign owners of MNEs. Thus GDP, which includes the profits of the MNEs, is not as good a measure of the economic welfare of those living in Ireland as GNI, which excludes the profits.

By the end of the 1970s there was very substantial manufacturing activity undertaken in Ireland by foreign owned MNEs. The attraction of Ireland for MNEs derived from their ready access to the wider EU market, the fact that labour costs were significantly lower than elsewhere in the EU, a stable business environment and a low corporate tax rate⁶. As a result of the low corporate tax rate there was a significant incentive for MNEs to move profits to Ireland through transfer pricing (Conroy, Honohan and Maitre, 1998). The result was that the profits earned by MNEs have represented an increasing share of GDP over time, driving a growing wedge between GDP and GNI.

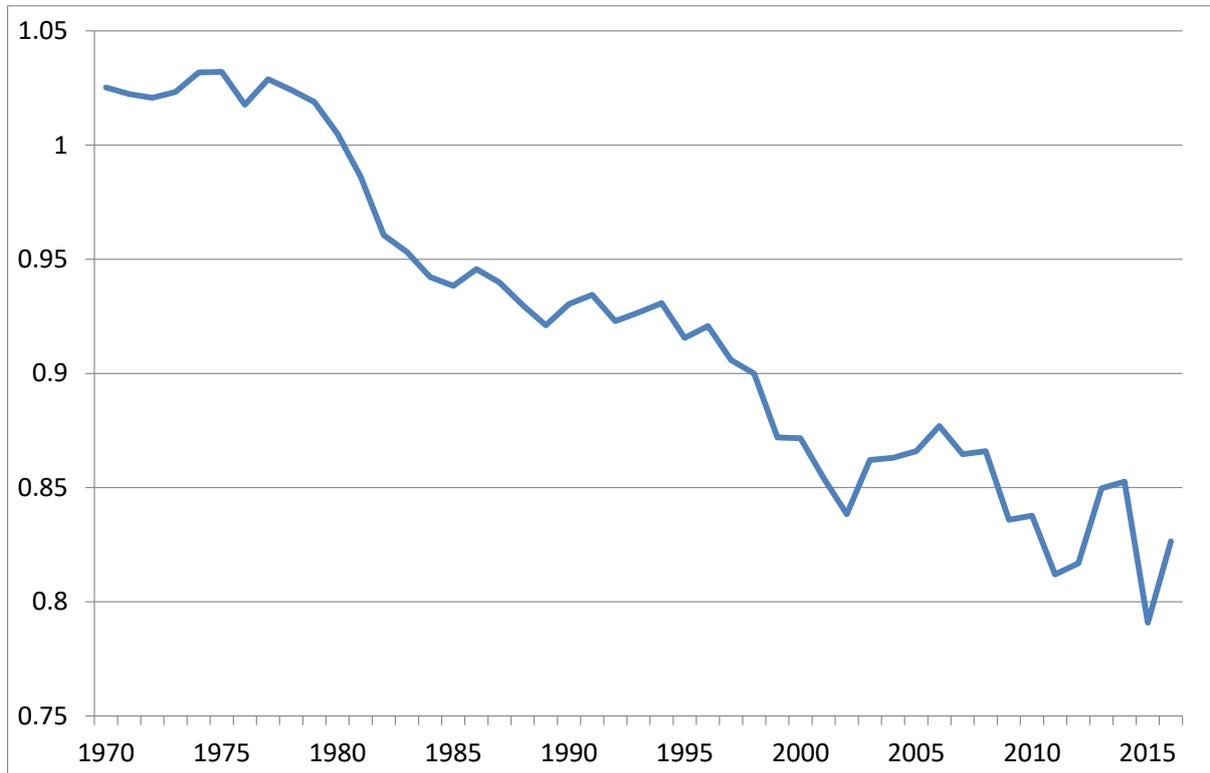
As shown in Figure 1, whereas in the early 1970s GNI was lower than GDP, by 1980 GNI was 5% less than GDP as a result of the outflow of profits of MNEs. This gap between the two has widened over time and, since 2009, GNI has generally been less than 85% of GDP.

In the 1970s the profits recorded as flowing out of the country were actual remittances, but there was a growing build-up of accrued profits, especially among US MNEs. This was not recognised in the

⁶ Up to 1980 a zero rate of corporate tax rate applied to profits deriving from exports.

national accounts till 1984 when the profit outflows were shown on an accruals basis for the first time. This resulted in a substantial upward revision in the deficit on the current account of the balance payments, with serious implications for economic policy. (The deficit on the current account of the balance of payments was revised upwards from 12.5% of GDP to over 15% for 1981).

Figure 1: Ratio of GNI to GNP, current prices



5.2 The Patent Cliff

The pharmaceutical sector has grown in importance in the economy since the 1990s with the vast bulk of the output coming from foreign owned MNEs. By 2010 the sector accounted for almost 10% of GDP. These firms are generally highly profitable, reflecting the huge IP involved in developing their products. This IP is protected by patents which have a limited life.

While the pharmaceutical sector involves significant employment, the actual impact of the sector on GNI is much more limited than the gross value added (GVA) figures would suggest. This is because the vast bulk of the output is produced by foreign firms and the profits from the activity in Ireland, with the exception of the corporation tax paid in Ireland, accrue to their foreign parents. Thus the eventual impact of the activity in these firms on Irish GNI depends on the size of the wage bill and the corporation tax paid on their profits in Ireland.

At the end of 2011 and through 2012 a number of major drugs produced in Ireland fell out of patent. In particular Lipitor, produced by Pfizer in Ireland, went off patent first in the US and then in Europe and Japan between the end of 2011 and the end of 2012 (FitzGerald, 2013a). This resulted in a reduction in revenue for the company of around US\$5.5 billion (around 2.5 per cent of Irish GDP). In turn, this reduction in revenue was reflected in a reduction in Irish exports. To the extent that the patented drug was replaced by an unpatented generic this was treated as a fall in volume rather than a fall in price. This had a significant impact on GVA, reducing its growth rate by over 0.5

percentage points a year over the two years. As there was no loss of employment, the only loss to Irish national income was a reduction in corporation tax receipts amounting to something over 0.1 percentage points of GVA each year. The impact of the fall in output on GDP was almost entirely offset by the fall in profits flowing back to the MNE, leaving very little impact on GNI.

5.3 Aircraft Leasing

Over the last fifteen years aircraft leasing has expanded dramatically in Ireland, with most of the major MNEs engaging in this business having subsidiaries in Ireland (Fitzgerald, 2015). The Irish Central Statistics Office (CSO) has published detailed data on the operation of the sector over the last decade.⁷ It shows the value of the stock of aircraft in 2014 at €77 billion, representing approximately 10% of the stock of civilian aircraft in the world.⁸ This also represented 16% of the capital stock for the country as a whole. As a result of the large stock of capital, the sector also accounted for around 8% of the depreciation in the economy in 2016. The large purchase of aircraft each year also seriously distorts the figures for investment and it has a corresponding effect on imports.

As show in Table 2, while aircraft leasing has a major impact on some aggregates in the national accounts, its impact on GNI is actually very small at 0.2% in 2016. This reflects the fact that the sector’s wage bill is only 0.3% of that for the economy as a whole, while corporation tax paid by the sector accounts for 2.5% of the national total. While a big global player, the ultimate impact of the sector’s activities on the welfare of those living in Ireland, measured by GNI, is actually very small.

Table 2: Aircraft Leasing share of key National Accounts Aggregates, 2016, %

Wage Bill	0.3
Gross operating surplus	4.7
Corporation Tax	2.5
GDP	3.0
GNI	0.2
Depreciation	8.1
Capital Stock, 2014	15.6

Source: <http://www.cso.ie/en/releasesandpublications/ep/p-ali/aircraftleasinginireland2007-2016/>

5.4 Redomiciled PLCs

Over the last few years a number of companies have relocated their headquarters to Ireland without generating any real activity in the economy in terms of employment or purchases of domestic inputs (FitzGerald, 2013b). These companies, referred to technically as redomiciled PLCs, manage large investments elsewhere in the world. However, while they have established a legal presence in Ireland, they undertake no real activity in the country and they are resident elsewhere for tax

⁷ This is the latest year for which data on the capital stock of the sector are available.

⁸ According to *avolon.aero/wp/wp-content/uploads/2014/09/WFF_2014.pdf* there were 21,000 civilian aircraft in 2013. If the aircraft are valued at an average of €40 million each, the value of the world stock of aircraft would be €840 billion

purposes.⁹ While they receive large profits in Ireland, they pay out only 30% of the profits as dividends to their shareholders abroad.

The retained earnings in Ireland enhance the value of the companies. As a result, the recorded inflows into the economy that these firms generate are much larger than the recorded outflows on the current account of the BOP. However, the benefits of the retained profits of redomiciled PLCs are attributable to their foreign owners – there is no benefit to the Irish economy. Nonetheless, using the standard SNA/ESA accounting procedures, this has the effect of raising the measured current account surplus in the Balance of Payments and increasing the level of nominal GNI arising in Ireland.

The treatment of these redomiciled PLCs in the national accounts differs from the treatment of the profits of the rest of the foreign multinationals already operating in the Irish economy in the manufacturing or services sector. For the MNEs producing goods and services their profits, whether or not they are remitted to their parent, are accrued as an outflow of factor income in the national accounts (and in the current account of the balance of payments).

Table 3: Net Income of Redomiciled PLCs as % of GNI

2008	2009	2010	2011	2012	2013	2014	2015	2016
0.2	1.1	3.7	4.0	5.0	4.2	4.1	2.3	2.5

Source:

<http://www.cso.ie/en/releasesandpublications/in/rpibp/redomiciledplcsintheirishbalanceofpayments/>

Redomiciled PLCs grew very rapidly from a very low level in 2008 so that, as shown in Table 3, their retained earnings reached 5% of GNI in 2012. Since 2008, their activity has had a significant impact on the Irish national accounts and on the current account of the balance of payments. Having risen rapidly in the period 2009-2012, expressed as a share of GNI their retained earnings had fallen back by 2016.

To get a picture of what is happening to the economic welfare of those living in Ireland national income needs to be adjusted to exclude these retained earnings. This makes a significant difference to the growth rate in GNI over the period of the economic crisis. It also substantially alters the path of the current account deficit/surplus on the balance of payments, making a difference to how one understands the recent development of the Irish economy.

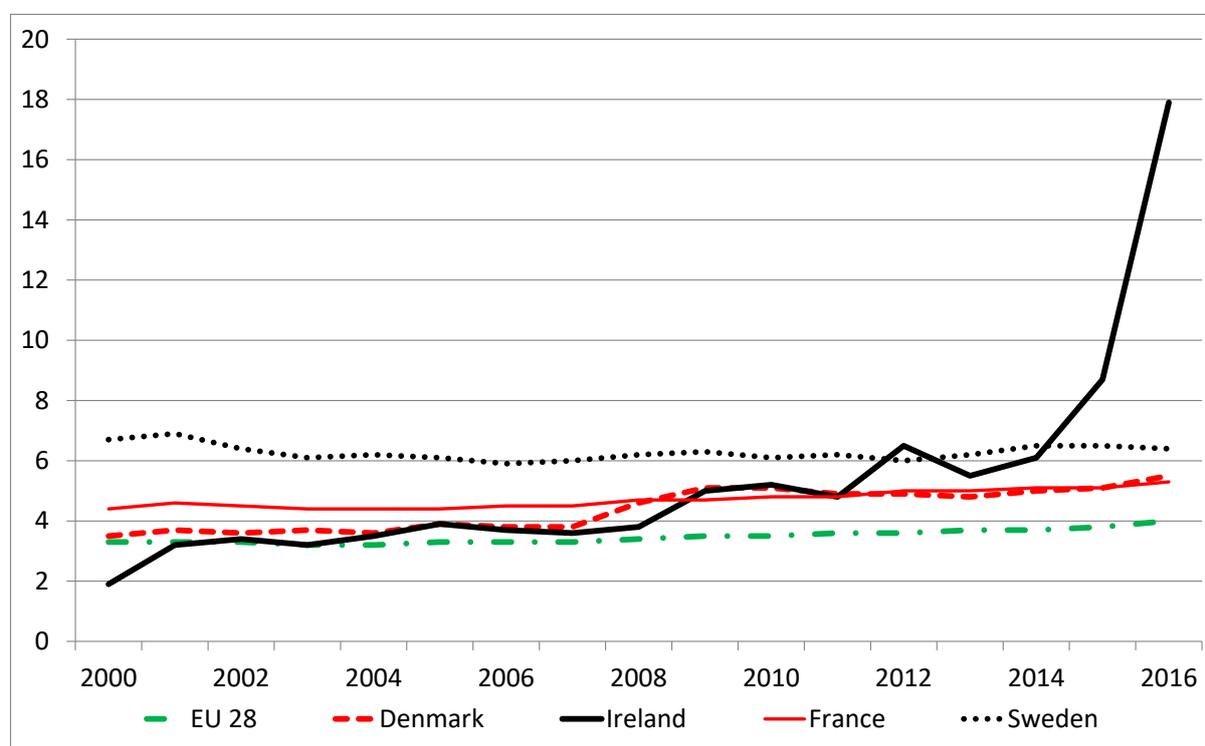
Ireland is not unique in having this problem with headquartered companies that have little economic presence, boosting the current account surplus. The Netherlands has a similar problem, though there it does not seem to have as much impact on the current account of the balance of payments (Rojas-Romagosa and van der Horst, 2015).

⁹ Initially they were predominantly UK firms but the bulk of the retained profits now belong to US firms, some of which redomiciled to Ireland from Bermuda. They now include the treasury operations of a number of MNEs.

5.5 IP and contract manufacturing

The scalability of the IP capital means that it can be, and has been, used to produce very large output of phones and computers. A second aspect of the IP capital is that it can be exploited by workers (and physical capital) located in different jurisdictions than where the IP capital is itself located; it is separable from the other factors of production. This is very different from other capital, where the equipment has to be physically present in the country where the production takes place.

Figure 2: Investment in Intellectual Property as a % of GDP



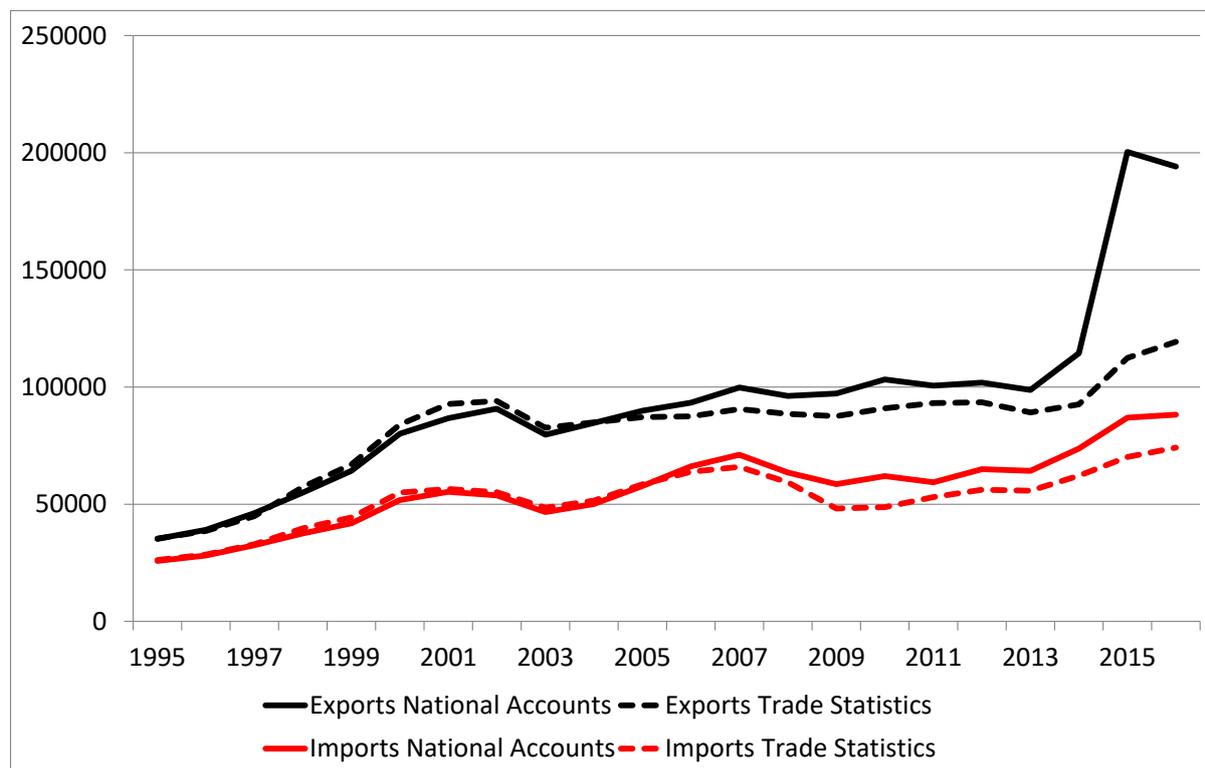
While IP plays a very important role in many industries, the IT sector appears to be unusual in the extent to which the IP is separated in terms of geographical jurisdiction from the related physical production. The pharmaceuticals sector, which is an important part of the Irish economy and where production is dominated by foreign MNEs, uses very extensive IP in producing its output. The IP is either located in Ireland, where the production takes place, or is licensed by the Irish subsidiary from the parent MNE, appearing as an import of services. Thus the IP in pharmaceuticals is more closely associated with where the goods themselves are actually produced.

In the case of some key IT sector firms in Ireland, they have used contract manufacturing to undertake the manufacture of their products, such as smart phones and computers. This contract manufacturing does not involve the transfer of the IP or the licensing of the IP to the contract manufacturer. This contrasts with the situation where a firm uses a subsidiary abroad, licensing the IP to that firm.

Since the early 2000s, there has been extensive investment in intellectual property by foreign MNEs. Figure 2 shows investment in IP as a percentage of GDP for Ireland and the other EU countries where it is also important. In the case of Ireland this investment represented between 3% and 4% of GDP for much of the last decade, rising to 5% in 2009. The vast bulk of this investment was not produced

in Ireland but was imported. The investment in IP is being undertaken by foreign MNEs who choose to operate in Ireland through subsidiaries of their parent companies.

Figure 3: Trade on a National Accounts and Trade Statistics Basis, € million



The biggest shock to the Irish national accounts in recent years has come from the once off movement to Ireland in 2015 of IP owned by foreign MNEs. Because it was a relocation of the firms it did not show up in investment; instead the transfer shows up in the financial account of the balance of payments. This transfer of IP capital amounted to between €250 billion and €300 billion, increasing the domestic capital stock by 40% in that year. The increase in the capital stock also amounted to over 50% of Irish GNI.¹⁰ In addition to the transfer of ownership of IP, there has been major additional investment in IP in 2015 (10% of GNI) and in 2016 (21% of GNI), which is also reflected in services imports of IP. As a result, the capital stock rose by another 10% in 2016.

This movement of firms and their IP to Ireland was also associated with dramatic changes in output. The newly relocated firms used their IP located in Ireland in other countries, such as China, to produce IT products such as smart phones and computers. These operations were undertaken in the third countries on a contract basis rather than through a wholly owned subsidiary. The Asian firms undertaking the manufacture were paid a fee for the manufacture, which covered the cost of the physical capital and the labour used in the production process. The difference between this payment to the firm manufacturing the goods and the value of the product produced (the profit on the goods), which embodied the parent firm’s IP, is then considered as output in Ireland.

The fact that the actual manufacture took place in a third country and that the goods produced never pass through Ireland is irrelevant. What is crucial in determining where this output is located is

¹⁰ It also represented over 2% of US GNI.

the ownership of the goods produced. If they had been produced by a subsidiary then the output, including the profit related to the IP, would have been located where the goods were physically produced. The profits would then have been remitted to the parent company, appearing as a factor flow in the national accounts, but not in GDP.

Instead, the profit of the company owning the IP, which is the “pure” return on the firms’ IP, is treated as output in Ireland and the full value of the goods produced in the third country is treated as an export from Ireland in the national accounts. This has seen a huge difference open up between the merchandise export figures on a trade statistics basis and the same item in the national accounts (Figure 3).

In the national accounts the relocation of these firms to Ireland accounted for much of the very large increase in real GDP in 2015 of 26%. Obviously this increase in the output of the foreign MNEs, which is primarily reflected in an increase in their profits, only benefits those living in Ireland to the extent that corporation tax is paid in Ireland on those profits.¹¹

GNI is arrived at by deducting the profits of the MNEs, after depreciation, as they are treated as being accrued to the foreign parent whether or not they are actually remitted in the year in question. However, because of the presence of these MNEs’ very large stock of IP in Ireland, from 2015 depreciation accounted for by large foreign MNEs jumped from under €6 billion in 2014 to €29 billion in 2015 and €33 billion in 2016.¹² This massive rise in depreciation in 2015 accounted for much of the increase in GNI of around 16% in that year. However, because the depreciation on the capital stock of foreign-owned MNEs does not benefit domestic residents, the resulting growth in GNI in no way reflects the change in welfare of Irish residents.

GNI was used by policy makers as a good indicator of what was happening to domestic economic activity over the last 30 years. However, as a result of these changes, it is no longer fit for this purpose.

As discussed later, to deal with this problem, the Irish Central Statistics Office (CSO) has introduced an “adjusted” GNI, referred to as GNI*, which excludes the depreciation on foreign-owned IP and leased aircraft, and also makes an adjustment for the profits of redomiciled PLCs (CSO, 2017). Alternatively, Net National Income, which grew in nominal terms by around 10% in 2015 would be an appropriate variable for domestic policy-makers to target if it were also adjusted for the profits of redomiciled PLCs. However, in the case of both NNI and GNI* the CSO has not yet developed these series on a constant price basis.

While the effects of the large IP related activity of foreign MNEs on the output side of the national accounts is confined to the gross operating surplus in the sectors where these companies operate, the effects on the expenditure side of the account are more complex.

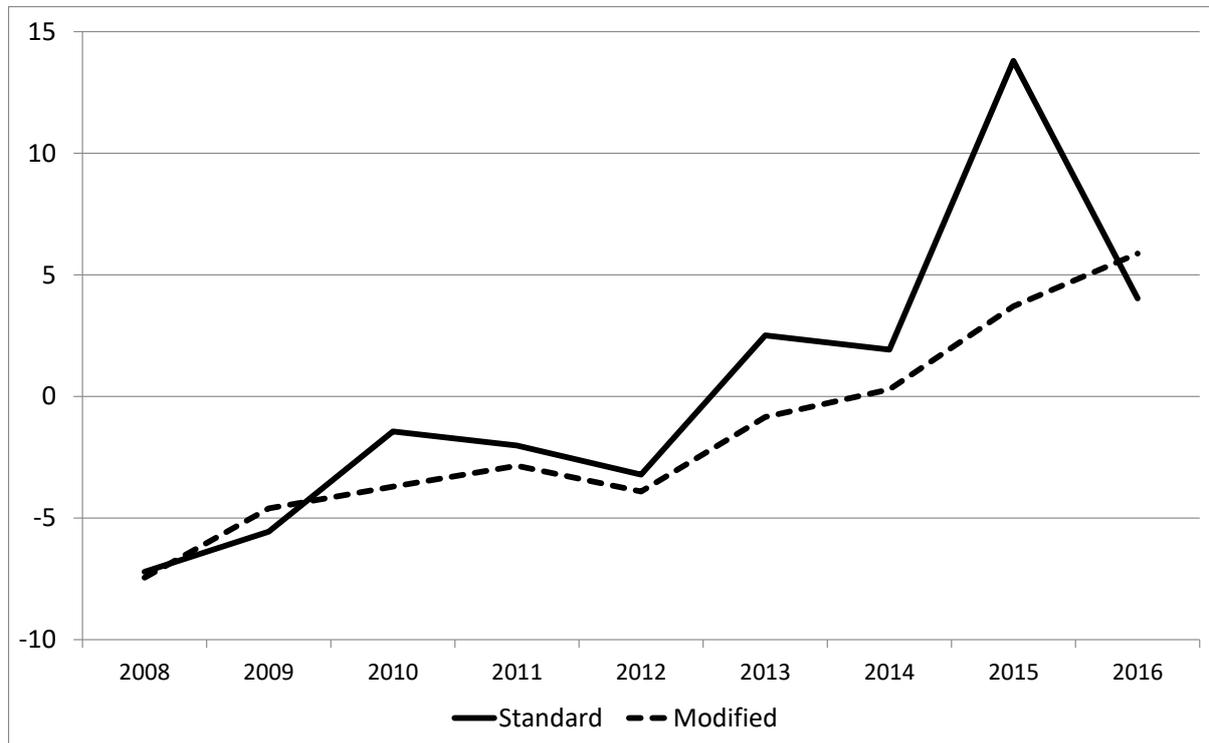
¹¹ Because Ireland’s contribution to the EU Budget is based on GNI, part of the increase in corporation tax was offset by an increase in the EU budgetary contribution.

¹²

http://www.cso.ie/en/media/csoie/newsevents/documents/seminars/globalisationinireland/Multinationals_in_the_Institutional_Sector_Accounts_-_Peter_Culhane,_CSO.pdf

Investment in IP and aircraft for leasing accounts for a substantial share of total investment. The CSO publishes a figure for modified total domestic demand which excludes these components of investment. It gives a better picture of domestic demand of Irish residents.

Figure 4: Current Account of the Balance of Payments, % of GNI



Source:

<http://www.cso.ie/en/releasesandpublications/in/acabi/amodifiedcurrentaccountbalanceforireland1998-2016/>

However, it can be very difficult to unscramble what is happening on trade. It is affected by the import of the IP and aircraft for leasing that are included in investment. There are also large amounts of contract manufacturing affecting both imports and exports. There are substantial services imports and exports in respect of the licensing of IP, and there is the repatriation of profits by foreign MNEs and the profits of redomiciled PLCs. This has made it very difficult to determine the contribution from trade with the outside world to domestic economic welfare.

Because of the complexity of the relationship between the domestic economy and the rest of the world, much of which arises from the effects of a large foreign MNE presence, it is also difficult to interpret the current account of the balance of payments.

As discussed already, the activities of redomiciled PLCs has served to artificially boost the surplus (reduce the deficit) on the current account of the Balance of Payments in recent years. The massive increase in depreciation in 2015 on the IP of foreign MNEs in Ireland also greatly magnifies the surplus. The gross operating surplus of these companies includes the depreciation. While the net operating surplus, after tax, flows back out in factor income, this is not the case for the depreciation. Instead the write down in the value of the assets in Ireland is reflected in the financial accounts of the balance of payments. As shown in Figure 4, the effect of this relocation in 2015 was to produce a

massive surplus on the current account reflecting the depreciation on the IP that relocated to Ireland. This makes the balance on the unadjusted current account useless for monitoring internal pressures in the Irish economy.

To deal with this problem the CSO have issued an adjusted current account balance as shown in Figure 4. This excludes imports of aircraft for leasing, imports of IP, depreciation on these two items and the profits of redomiciled PLCs. This provides a more realistic picture of the balance between savings and investment in the Irish economy.

5.6 Problem for Policy-Makers

The widely ranging and complex effects of globalisation on the Irish national accounts have made it very difficult for policy makers to understand what is really going on in the economy. During the recent crisis years the headline indicators of GDP and GNI, which are normally targeted by policy-makers, were seriously distorted by the changing effects of globalisation on the economy. Today there are concerns as to how rapidly the economy may be approaching capacity. However, the problems with available national accounting data make it very difficult to assess the urgency with which corrective action should be taken.

Table 4: Key National Accounts Aggregates, growth rate nominal and real, %

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Current Prices										
GDP	6.6	-4.8	-9.4	-1.5	2.6	2.1	2.7	7.9	34.7	5.2
GNI	5.1	-4.6	-12.5	-1.3	-0.6	2.7	6.8	8.3	24.9	9.9
GNI*	5.1	-4.9	-13.6	-4.2	-1.0	1.3	7.5	8.0	11.9	9.4
Constant Prices										
GDP	5.2	-3.9	-4.6	1.8	3.0	0.0	1.6	8.3	25.6	5.1
GNI	3.5	-3.3	-7.6	3.3	-0.4	1.0	5.2	8.9	16.4	9.4

Table 4 shows the growth rate from 2007 for certain key aggregates in current and constant prices. (The adjusted GNI figure, GNI*, is not yet available in constant prices.) While, GNI* in nominal terms is only a partial solution to the problems of interpretation arising from globalisation, it is a better guide to growth in the domestic economy than the more traditional measures of GDP and GNI.

As shown in the Table, GNI* shows a markedly different path than GNI or GDP from 2010 onwards. While it. At the height of the crisis in 2010 it suggests that the economy was performing worse than would have be understood using GNI or GDP. It also suggests that the robust recovery may have begun in 2013 rather than in the second half of 2012. Finally, it provides a picture of a more stable, but still very rapid, rate of growth in 2014 to 2016, in contrast to the unbelievable picture from GDP and GNI.

5.7 Wider Implications of Developments in Ireland

Obviously the problems in interpreting the national accounts for Ireland, identified in this Section, are of primary concern to Irish policy makers. However, some of the changes in 2015 are big enough to be noticeable in the accounts for other countries, such as the US. Guvenen, *et al.*, 2017, have considered how US output may be under-recorded as a result of the operation of US MNEs who own large IP. Given the size of the relocation to Ireland in 2015 and the fact that the companies involved

were almost certainly US based, the changes in key Irish aggregates can also usefully be considered in terms of how the US national accounts might have been affected if the relocation had been to the US.

Table 5: Changes in Some Key Irish National Accounts Aggregates, % of Irish and US GDP

	Ireland 2015, Change, € M	Ireland 2014 € M	US 2014 € M	Change in Ireland as % of	
				Ireland	US
GDP	50000	194537	13118250	25.7	0.4
Exports	66075	219786	1786676	30.1	3.7
Depreciation	23861	29486	2068497	80.9	1.2

Source: Author's estimates

Table 5 gives an estimate of the change in Ireland in 2015 of nominal GDP, exports and depreciation as a result of the movement of the relocation of companies with very large IP. The increase in output attributed to Ireland added almost 26% to nominal GDP. This output was produced on contract in Asia for subsidiaries of US firms located in Ireland. If the subsidiaries relocating to Ireland had instead relocated to the US it would have added 0.4% to US GDP.

Similarly the increase in exports of goods, produced on contract in Asia, amounted to 30% of Irish exports and almost 4% of US exports. Finally, the increase in depreciation added around 80% to the Irish aggregate and the change was equivalent to 1.2% of the relevant US aggregate.

6. Solutions

The difficulties caused by the process of globalisation for national accounting obviously differ from one country to another. However, many of the problems faced in accounting for the Irish economy are faced by other economies, albeit generally to a lesser extent. To meet the needs of users of national accounts significant additions are needed to the current standard accounting framework.

Both Eurostat and the CSO will, as the law requires, continue to produce the national accounts on the SNA 2008 / ESA 2010 basis. This means that the headline GDP figure will not be amended but will continue to be affected by the actions of MNEs that are resident in Ireland. However, while the law requires accounts to be produced on this basis, and these accounts must be used for certain administrative purposes in the EU, there is no restriction on the CSO (or Eurostat) from producing additional "satellite" accounts, which could better meet the needs of most users of national accounting data.

In the case of Ireland the Central Statistics Office has already introduced a number of innovations dealing with some of the problems identified earlier in this paper. However, it would be beneficial for users of the Irish national accounts if a comprehensive framework of supplementary accounts could be developed that dealt with the aspects of the globalisation process that have already been identified as problematic for the standard accounting presentation. A range of suggestions are made in CSO, 2017.

The supplementary accounts that are needed should have a number of characteristics:

- Ideally they should be developed to meet the needs of all economies, to ensure transparency.

- They should provide a consistent treatment of economic activity over time. Serious discontinuities can pose major problems policy makers.
- They should provide a good representation of the economic welfare of those living in a country.
- It is important that they are publishable without infringing on the confidentiality of data on individual companies (and households). This is a problem for small economies like Ireland. The supplementary accounts need to be robust: possible future changes in location by MNEs (or domestic firms) should not prevent the continuing publication of the series on confidentiality grounds.
- They should not be affected by changes by MNEs in the precise legal framework they use in the country where their goods or services are physically produced.
- The supplementary accounts need to deal with the problems affecting both the national accounts and the balance of payments

There is unlikely to be a single framework of supplementary accounts that will meet all these requirements. As the process of globalisation evolves new problems will arise and new solutions will be needed.

This paper first considers three minor adaptations of the existing framework which would be helpful. It then sets out a simple set of indicators that could usefully be developed to provide additional information for users. Finally it considers features of a more detailed disaggregation of the SNA 2008 accounts that could provide a useful framework for understanding the Irish economy.

6.1 Adapting the Current Accounts

As outlined above, the very extensive aircraft leasing business, which makes a small contribution to Irish GNI, greatly complicates some aspects of the national accounts due to very large gross flows it generates. It is likely that the standard financial accounting treatment of this business may change in the coming years, with implications for the national accounts. This would involve essentially treating this business as a financial sector enterprise.

In the aircraft leasing business planes are provided to airlines under a legal agreement that is rather similar to a mortgage. The planes are financed by loans, with the planes themselves as collateral. In the case of mortgages on houses the investment in the housing and the stock of housing is recorded in the national accounts in the country where the houses are located and used, not where the banks providing the finance reside. However, in the case of aircraft they are currently recorded in the accounts of the country where the leasing company is located.

The possible change in financial accounting would see the aircraft recorded as the asset of the airline that is the lessee and the relationship with the leasing company would then be a purely financial relationship. The fees received by the leasing company would be a service export from the country where the leasing company resides. This would eliminate the large investment, capital stock and depreciation from the Irish accounts, leaving the domestic value added by the leasing companies.

In the case of foreign MNEs that produce goods or services in Ireland, all of their after tax net operating surplus is accrued as a factor outflow in the year in which it is earned, irrespective of whether a dividend is paid to the parent company. If a similar treatment were applied to the

redomiciled PLCs, with their retained profits being accrued as a factor outflow, this would remove another anachronism from the Irish national accounts.

Connolly, 2018, suggests that some of the problems arising from the relocation of firms with a major stock of IP could be better handled in the long run if they were treated as financial enterprises; the ownership of the IP has been separated from its use and the owner in Ireland receives income in respect of this asset, just as an investment company receives income from its assets. As with a change in the treatment of the aircraft leasing companies, this could greatly simplify the national accounts, especially of smaller economies such as Ireland where substantial IP is located. However, the downside is that at a global it might not adequately capture the key role that such IP plays in the global production process. It is a stock of capital that has been produced and must be located in some jurisdiction to be included in global measures.

6.2 Limited Set of Indicators

The CSO, as recommended in CSO, 2017, has introduced an adjusted GNI figure, referred to as GNI*, in its latest set of national accounts. This measure adjusts GNI to exclude the depreciation of IP and leased aircraft and the retained profits of redomiciled PLCs. To date it is only available at current prices, which means that it cannot yet be used directly for fiscal policy purposes.

While this indicator is potentially more useful than GNI, it could need further changes if globalisation affected the economy in new ways. For example, if the pharmaceutical sector were to fully separate its IP capital from production, and locate such IP in Ireland, this would need a further change in GNI*.

GNI* is designed to mimic GNI as it is measured in many other countries. This should facilitate its use in Ireland for international comparisons. However, as it is a measure only used in Ireland it will not be understood elsewhere. Thus the measure currently lacks transparency for international users.

Even within the current ESA 2010 data, Net National Income, NNI, is less affected than GNI by the problems that surfaced with the Irish national accounts for 2015. The bulk of the activity of the MNEs that shifted to Ireland is effectively excluded from these aggregates, including the huge effect on depreciation. This may make it more useful than GNI* which only excludes some of the depreciation of foreign MNEs.

However, NNI has, until now, only been available on a current price basis for Ireland, though the CSO plan to address this problem in future publications. In addition, it includes the retained profits of redomiciled PLCs. The exclusion of this latter item would produce a very useful variable for Ireland but, like GNI*, it would also not be well understood internationally.

The other problem with NNI is that, while it is included in the standard framework of national accounts, little attention is given to it internationally, making it much less useful for the purpose of international comparisons. Part of the problem may lie with the fact that, while the CSO has done detailed work on measuring depreciation, many other jurisdictions have paid less attention to this issue: GNI and GDP are considered a more liable indicator of economic activity internationally.

The second essential indicator that is required is one for the balance on current account of the BOP. The two problems with the current measure for Ireland relate to the treatment of depreciation by foreign MNEs and redomiciled PLCs' retained profits. The CSO have recently published an adjusted

current account figure for the balance of payments which excludes these items. However, further work may be needed on this measure. In particular, if depreciation of some major foreign owned MNEs is excluded, should depreciation of all other foreign MNEs be similarly treated?

6.3 Supplementary Accounts

The effects of globalisation on the Irish economy permeate many of the items of the national accounts. This makes it very difficult to understand developments in the economic welfare of those living in Ireland or to establish the productive capacity of the Irish economy. Even if one or two high level indicators of growth are used, such as GNI* or NNI, it is still exceptionally difficult to understand where this growth is occurring in the economy. Detailed knowledge of what is happening in the economy is vital for economic policy; it was part of the original justification for developing national accounts.

Even before the latest difficulties with the Irish data, arising from relocation of IP, there were increasing problems in identifying where growth was arising in the Irish economy. While the foreign owned MNE sector contributes hugely to exports and industrial output, the sector also has massive imports and the very large profits from the sector flow back out of the economy. Thus, while the contribution of the MNE sector to the economy is undoubtedly very positive, it is difficult to identify just how much of the growth in the real economy in recent years has come from this sector and how much has come from domestic firms.

It is essential for economic policy that a range of supplementary data is provided in the national accounts identifying the contribution of different sectors to growth. Here I concentrate on the additional information needed on the output side of the accounts.

Any new presentation of national accounting data must also ensure that confidential information on individual companies is not disclosed. This constraint is important in determining the appropriate level of sectoral detail to present. If the sectoral breakdown is too fine then individual large companies may be easily identified. However, if there is inadequate sectoral detail it will be very difficult to understand what is driving change in the economy. While a particular level of sectoral disaggregation may be possible today without disclosing confidential information, new companies, or closure of existing companies, may make such a level of sectoral detail impossible in the future. Thus in choosing the appropriate level of sectoral disaggregation to use it should be robust to movement of companies in the future

The CSO already publish data at current and constant prices on GVA arising in the foreign owned MNE sector and the rest of the economy at an aggregate level.¹³ However, this release provides no information on either sectoral detail or on the breakdown between GOS, depreciation and the wage bill. The CSO have also derived experimental data on aggregate employment and wages in MNEs and the rest of the economy. Most recently, in the CSO Institutional Sector Accounts, they give data for the wage bill, depreciation and corporation tax paid by large foreign owned non-financial corporations. If these published statistics were greatly expanded it should be possible to give a much better picture of where output, that contributes to GNI, is arising in the economy.

¹³ <http://www.cso.ie/en/releasesandpublications/er/gvafm/grossvalueaddedforforeign-ownedmultinationalenterprisesandothersectorsannualresultsfor2016/>

Table 6: Alternative Presentation – Example of Manufacturing Sector

		e.g. Manufacturing			
		Total	Foreign	Domestic	
Current prices	GVA Factor cost				
	Gross operating surplus				
	Wages	8383	4800	3582	
	Stock adjustment				
	Depreciation				
	Net operating surplus				
	Non-Product Taxes				
	GDP Basic prices				
	Corporation Tax				
	GNI in sector				
	NNI in Sector				
	<hr/>				
		Deflator			
Constant prices	GVA Factor cost				
	Wages				
	Depreciation				
	NDP at factor cost				
	GVA Basic prices				
	Corporation Tax				
	GNI in sector				

Set out in Table 6 is a proposed framework for expanding the accounts for the output side of the national accounts to meet users' needs. As discussed above, in order to understand what is happening in the domestic economy the sectoral composition of GNP/GNI needs to be broken down by domestic and MNE firms.

For each sector value added needs to be broken down into the wage bill, the net operating surplus, corporation tax and depreciation, cross-classified by MNE and other (domestic) firms. The aggregate data for each sector are already available on this basis from Eurostat and the CSO. Some of the additional breakdown into MNE and "other" is also available from Eurostat and the CSO. What would be needed would be to ensure that this breakdown by ownership was available for each sector where there was a mix of MNEs and other firms. If a sector was predominantly accounted for by MNEs or else by "other" (Irish owned) firms, then the breakdown would be unnecessary.¹⁴

GNI arising in a sector would then be the sum of the GVA in the "Other" domestically owned sub-sector and the wage bill, depreciation, and corporation tax paid by the MNE sector. NNI would exclude the depreciation.

For illustrative purposes, Table 6 sets out an example of how this approach might be applied to the individual sectors of the economy, such as manufacturing. For many of the aggregates data are

¹⁴ It could also prove problematic to publish such data for confidentiality reasons if there were only one or two MNEs or "other" firms in a sector.

already available from either the CSO or Eurostat. Data are not currently published for the cells highlighted in yellow. However, these data should already be available to the CSO.

This breakdown, if applied on an annual basis would show the contribution to GNI from each sector of the economy. This would allow the growth in GNI to be decomposed both by sector in which it occurs and also by whether it occurs in Irish owned firms or MNEs.

Table 7: Alternative Presentation of key aggregates – from GDP to NNI

	Foreign	Domestic	Total
GDP at factor cost	X	Y	X+Y
GDP at market prices	X1	Y1	X1+Y1
Net factor income attributable to sectors	X2	0	X2
Sectoral GNI	X1-X2	Y1	X1-X2+Y1
Other net factor income	-	-	Z
GNI	-	-	X1-X2+Y1-Z
Redomiciled Plcs	-	-	Z1
GNI adjusted	-	-	X1-X2+Y1-Z-Z1
Depreciation	X3	Y3	X3+Y3
NNI adjusted	-	-	X1-X2+Y1-Z-Z1-(X3+Y3)

Table 7 shows how the results from individual sector could then be aggregated up to produce key national accounting aggregates.

One issue, which has not been discussed earlier, is the treatment of factor inflows. Where there are large MNEs with operations abroad, the profits of these MNEs are included in aggregate form in the schema shown in Table 7, rather than attributed in Table 6 to individual sectors. This treats the activity abroad by MNEs as an investment that is not related to its domestic output. While this may be appropriate for some MNEs, for MNEs who have developed substantial IP and use it to produce goods or services abroad, this does not seem sensible.

As discussed earlier, the result of the current national accounting treatment of such activity is that if a firm produces abroad through a subsidiary the profits will flow back to the owner of the IP as factor income. However, if the production abroad is done on contract, then the profits earned abroad are treated as part of the MNEs domestic output and included in the relevant sector's GVA. As discussed in Section 3, this difference in treatment leaves open the possibility of substantial discontinuities if an MNE changes the legal status of its operation in a third country.

To avoid this problem of possible discontinuities, one approach would be to include the factor income of MNEs as part of their output in satellite accounts. Then sectoral output would be unchanged if a firm moved from contract manufacturing to operating through a subsidiary. This would be especially relevant where the profits were earned as a result of using IP. Such a change could have a significant impact on the accounts not only of the US, but also of countries such as Germany where many of their MNEs have very large production undertaken abroad by subsidiaries.

The downside of such a treatment of factor income is that the profits resulting from production abroad would be included in the GVA of the MNEs in the home country but use of physical capital and labour input abroad would be omitted. This, in turn, would bias upwards domestic productivity.

The attribution of profits from operations abroad would probably best be included in domestic output where these profits arise largely from the exploitation of the home country MNE's IP. Guvenen *et al.*, 2017, attempt such an exercise for the US. However, it is difficult for most businesses to separate out the return on IP from profit reflecting the return on use of physical capital, making such an approach difficult for many sectors.

6.4 Alternative Approaches to the Expenditure Side of the National Accounts

As discussed earlier, the CSO currently produces a measure of "modified" domestic demand which excludes investment in IP and aircraft for leasing. These forms of capital are excluded because they are almost all used to produce output outside Ireland. This modified variable provides a better picture of what is happening on domestic demand.

However, to date, a suitable approach to the trade and factor flows has not been established which can separate out the role of foreign MNEs and domestic firms. Without such separation between the activity of these two types of firms it is very difficult to establish the effects of trade on the economic welfare of those living in Ireland.

As a result of globalisation, foreign MNEs affect the external side of the economy through a multiplicity of different channels. They may simultaneously export goods and import materials for use in domestic production; license IP for use abroad; purchase IP abroad; provide services abroad; receive profits from subsidiaries abroad and remit profits to their head offices. While for the larger foreign MNEs the CSO captures good data on all of these transactions, it is a much more complex task to derive appropriate deflators and maintain consistency with the available data on output.

In the past, much of the attention of those forecasting the economy has gone on the components of the expenditure side of the national accounts. Thus the problems in interpreting what is happening on the expenditure side of the accounts are particularly difficult for policy makers. For example, both the Central Bank of Ireland and the Irish Department of Finance only provide detailed estimates of current and expected future economic activity on an expenditure basis.

A further problem with the trade data is that there are massive gross flows. In recent decades globalisation has seen production processes being broken up into multiple stages occurring in many countries. Thus the exports associated with the production of a car or a computer (including exports of parts) could end up being a multiple of the value of the final product. We have seen in the Irish input-output tables how the true domestic value added associated with exports, especially of services, has fallen over time.

This is not just an Irish problem. One approach suggested in Koopmans *et al.*, 2014, Rojas-Romagosa, 2015 and Los *et al.*, 2016, would use input-output information to try and derive the domestic value added content in gross exports. If the data were readily available on a timely basis this might be a useful approach.

However, the detailed data needed to implement this approach are not available in a timely manner. If implemented it would involve using the latest available data to undertake the analysis but these

would, inevitably, be out of date. As we have seen in Ireland, there have been very rapid changes in the structure of the economy over time which could render such an approach unreliable.

7. Conclusions

Globalisation has changed the model that traditionally underpinned the national accounts. Economic activity in one country is now linked to activity in other countries through many different channels. This interdependency of economic activity in different countries makes it difficult to separate out the output of a particular country and to measure it appropriately.

The recent revisions to the System of National Accounts (SNA 2008) have tried to capture the effects of this globalisation process in a comprehensive fashion. The inclusion of IP in the capital stock has a strong basis in economic theory. However, possibly because of the concentration on capturing the effects of globalisation in a comprehensive manner, the headline national accounting indicators for countries such as Ireland now do not provide a useful guide for policy-makers in individual countries such as Ireland.

In recent decades the growth of MNEs spanning the globe has driven a growing wedge between the output attributed to a country such as Ireland, measured by GDP, and the economic welfare of those living in a country, previously measured by GNI. While in the past GNI provided a good guide to the output and income available to those living in a country, this is no longer the case for Ireland because of the way globalisation has affected the behaviour of MNEs. The traditional indicators need significant adjustment to make them useful.

Probably the biggest distortion to the Irish national accounts has arisen as a result of the inclusion of IP in the capital stock. This meant that the relocation to Ireland in 2015 of companies with large IP had a dramatic effect on the national accounts. The fact that IP capital is scalable in the sense that it can be used to produce unlimited output, and the fact that it is separable from all the other factors of production and can be combined with capital and labour in many countries to produce output means that it does not fit well into the framework of national accounts for a single country.

Also, the fact that the national accounts treat activity undertaken by MNEs in third countries very differently, depending on their legal structure in the third countries, can give rise to serious discontinuities if firms change that legal structure.

To deal with these problems it will be necessary to develop satellite accounts that separate out the activities of MNEs in each sector of the economy. This will allow policy-makers to identify where growth is occurring in the economy and the contribution to growth that is coming from different sectors.

While the Irish CSO has developed a headline indicator for the economic welfare of domestic residents, referred to as adjusted GNI, this indicator could need further adjustment if there is a significant change in the population of foreign MNEs in Ireland.

While developing national solutions to these problems can meet the needs of domestic policy-makers, this is not ideal: it lacks transparency at an international level. Because the national accounting problems discussed in this paper are not unique to Ireland it would be better if there were some international co-ordination of the development of the necessary satellite accounts to understand how individual economies are really behaving.

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