



# Special Article

## *Problems Interpreting National Accounts in a Globalised Economy - Ireland*

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# Problems Interpreting National Accounts in a Globalised Economy - Ireland

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John FitzGerald<sup>1</sup>

## 1. Introduction

The globalisation of the world economy encompasses a number of different related processes which have resulted in a steady increase in the share of trade in national output or national income. Over time, this process results in a change in the structure of individual economies. While traditional national accounting rules can accommodate many of these changes, some of the more recent developments pose challenges both for national accounting practices and, more important, for the interpretation of the national accounts themselves. Because of the very open nature of the Irish economy this is a particular problem in interpreting the national accounts data for Ireland.

This article focuses on five special problems in interpreting the Irish national accounts. These are:

1. The so called “patent cliff”. Because the pharmaceutical sector accounts for a substantial share of Gross Value Added (GVA), developments in the statistical treatment of the sector can have a significant impact on the national accounts: for example, if patents on major drugs produced in Ireland run out.
2. The changing behaviour of the IT sector as to where they accrue their profits.
3. The effects of so called “redomiciled plcs” on Gross National Income (GNI) / Gross National Product (GNP) and on the current account.
4. The inclusion in exports and imports of goods and services produced abroad for Irish companies and later sold abroad.
5. The potential effects of incorporating aircraft leasing firms fully into the Irish national accounts.

Together these problems have a very big impact on the national accounts data for Ireland: artificially raising the current account surplus and distorting the measured growth rate of both GDP and GNI/GNP. This has made it very difficult to understand recent developments in the Irish economy unless these rather

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arcane national accounting issues are taken into account. It is likely that problems in interpreting the accounts will continue in the future.

While these problems are experienced in a more exaggerated form in Ireland, they do significantly affect the data for some other countries.<sup>2</sup> As globalisation continues it is likely that these problems will come to be seen as of more general concern across a range of developed economies.

Section 2 of this note briefly discusses the background to these problems in terms of changes in trade and the structure of economies. These changes are illustrated with data for Ireland in Section 3. Sections 4 to 8 discuss the five problem areas, identified above, where particular issues of interpretation arise and conclusions are drawn in Section 9.

## **2. Background**

At its most basic, countries import goods and services which they do not themselves produce – for example oil – and they export natural resources that they do possess and that other countries do not. However, trade goes far beyond goods that are specific to individual countries. One factor driving trade is what is referred to as the law of comparative advantage; also, as Adam Smith identified in the 18th century, firms (and countries) have tended to specialise to reap economies of scale. For small economies this specialisation has always necessitated significant trade to ensure the availability of the wide range of goods that the economy required. Where capital and skilled labour are abundant, this has resulted in a specialisation in the production of goods and services which have a high-skilled labour and capital content. By contrast, poorer countries tend to export goods with a higher unskilled labour content. Today, even large economies do not produce the full range of goods and services that they need.

A result of these processes is that a growing share of the output of individual countries is accounted for by trade, as the range of products and services that they produce narrows, while the range of goods and services that they consume expands. This results in a significant increase in the share of trade in GDP.

Side-by-side with this increase in the share of trade in individual economies there has been a change in how economies operate, as the production process for goods and services is itself broken up, so that parts of a good or service are

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<sup>2</sup> For example, in the Netherlands: see Rojas-Romagosa and van der Horst, 2015.

produced in a wide range of different locations, very often by a wide range of firms. They are gradually assembled into the final product, with the process of final assembly also possibly being spread over a number of countries. This has resulted in a growing proportion of trade being accounted for by intermediate products which are used in making other goods and services.

The process of globalisation has become even more complex in recent years, with companies producing goods and services across a range of different countries (Byrne and O'Brien, 2015). For example, German capital and labour may be combined by a German firm to produce some of the most sophisticated parts of a car, a car which is finished in a subsidiary of the German firm in Slovakia using Slovakian physical capital and labour. In addition, some of the parts used in making the car may be sourced in many different locations. The result of this process is that a sophisticated product or service may contain value added from a range of different economies. It has also meant that the share of domestic value added in gross output has fallen in many economies as more and more of the value of the final product or service (gross output) is produced elsewhere. This means that trends in gross output, including exports, may not provide a clear picture of what is happening to value added (GDP) in an individual economy, as domestic value added accounts for a diminishing share of gross output.<sup>3</sup>

Finally, over time, multinational enterprises have grown in importance. When they operate in countries outside their home location, the profits earned by those companies in the foreign destination properly belong to the shareholders in the company, rather than to the residents of the country in which the profits are generated.<sup>4</sup> This drives a wedge between GDP and GNI/GNP as the profits, net of tax, are remitted to the shareholder.<sup>5</sup>

### 3. Recent Trends in Key Variables

Figure 1 shows the growth in world trade relative to world GDP since 1970. With the exception of the great recession years of 2008 and 2009, world trade has grown more rapidly than GDP, as a result of the process of globalisation. This reflects the fact that, world-wide, the process of globalisation sees an ever larger share of final demand being met from goods and services produced in other countries.

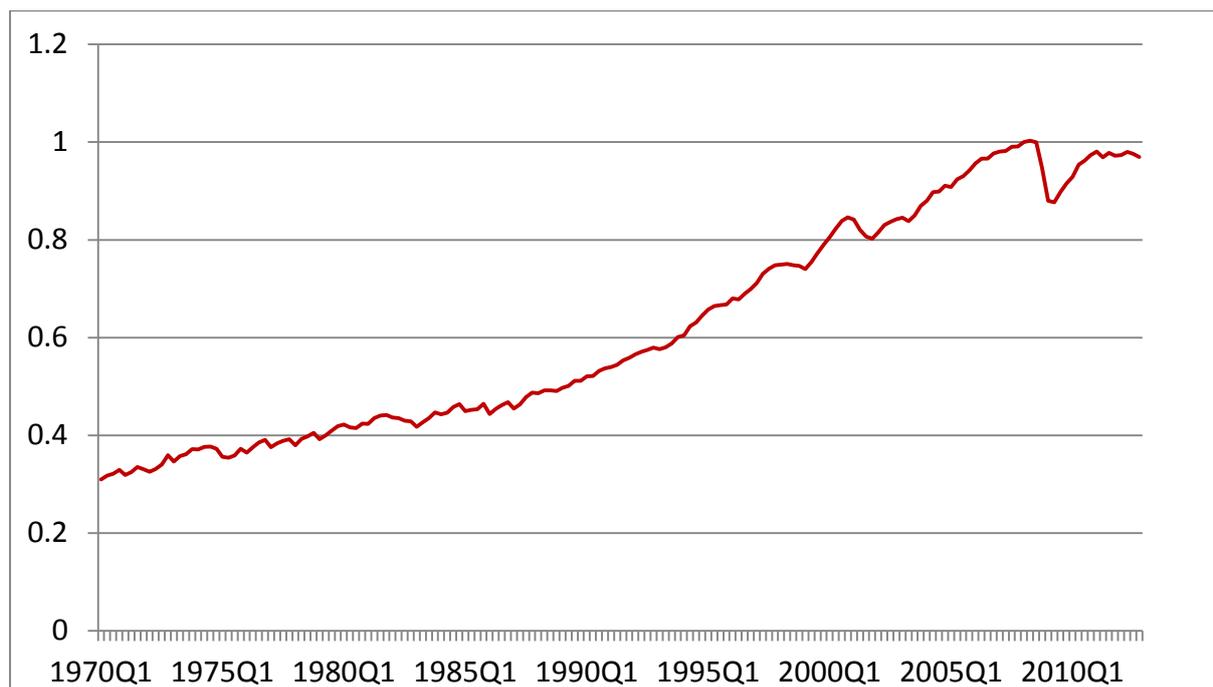
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<sup>3</sup> Rojas-Romagosa and van der Horst, 2015.

<sup>4</sup> Obviously, to the extent that taxes are payable on those profits some of the gross profits earned in the country will remain as a benefit for those living in that country.

<sup>5</sup> Even if not immediately remitted they are accrued and flow back out to the owner as an outflow on the current account of the balance of payments.

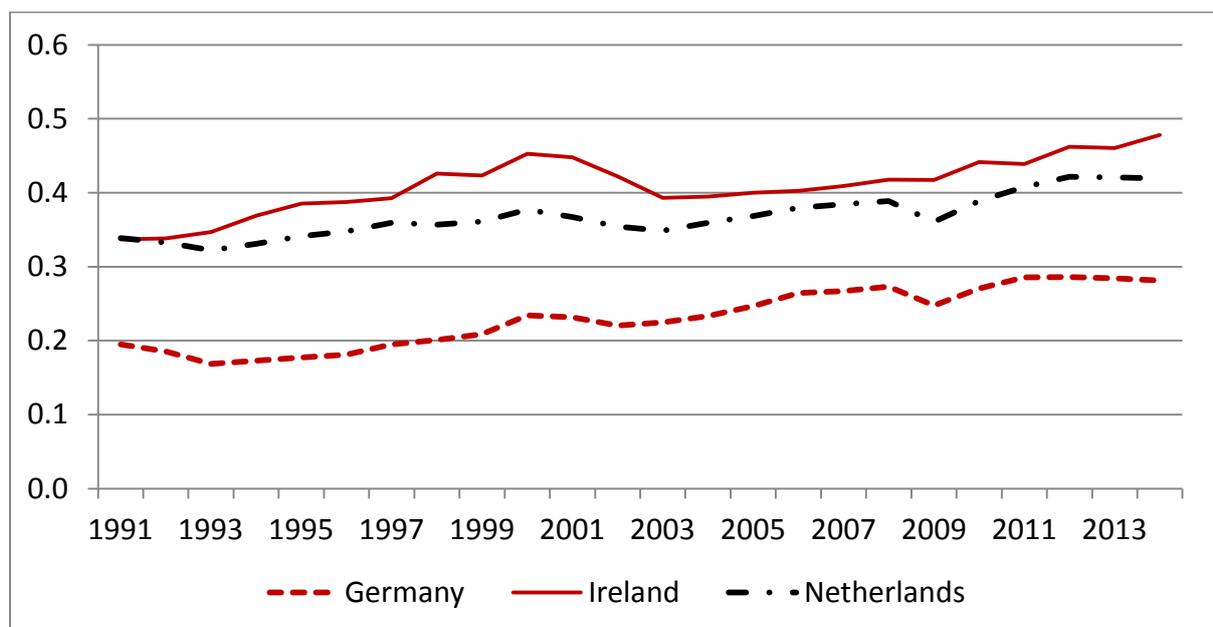
**FIGURE 1** World Trade Relative to GDP



Source: NIESR NiGEM model database.

Figure 2 illustrates the fact that this is a common experience within the EU and is not confined to small countries. The figure shows the ratio of imports to final demand for three countries – Ireland, the Netherlands and Germany. In each case the share of imports has risen significantly over the last 20 years.

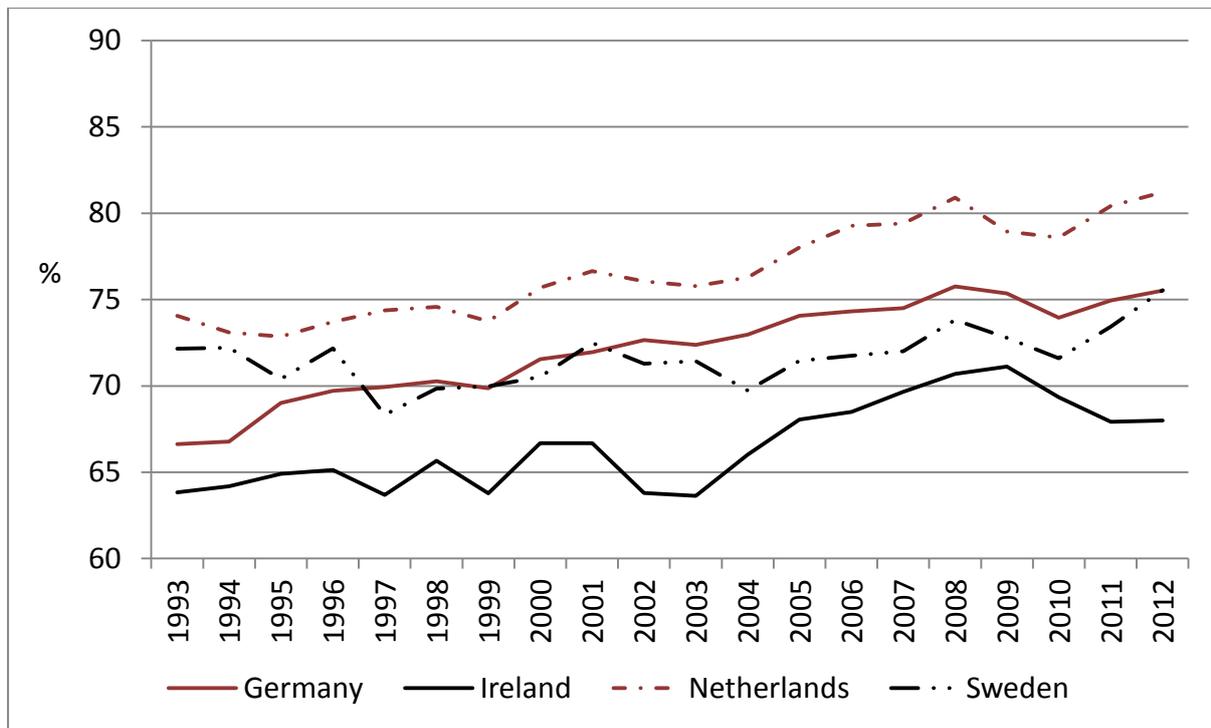
**FIGURE 2** Ratio of Imports to Final Demand, Current Prices



Source: EU AMECO database.

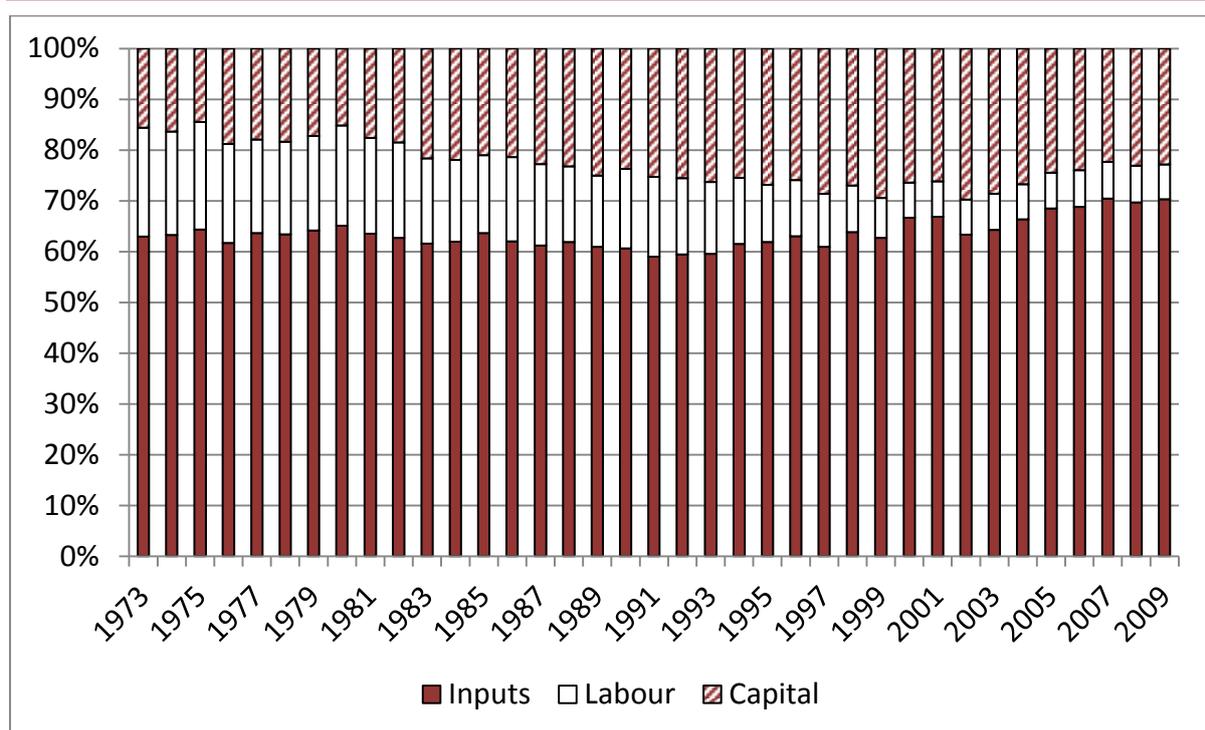
Within the manufacturing sector the share of the output of the sector which is accounted for by intermediate inputs of goods and services is also tending to grow. Figure 3 shows that for Germany, Ireland, the Netherlands and Sweden, intermediate inputs accounted for a higher share of Gross Value Added (GVA) in manufacturing in 2011 than they did in the early 1990s.

**FIGURE 3** Intermediate Inputs as Share of Gross Output, Manufacturing



Sources: Eurostat and CSO Census of Industrial Production.

**FIGURE 4** Ireland, High Tech Manufacturing, Factor Shares



Source: CSO Census of Industrial Production.

Figure 4 shows data for a longer period for Ireland for the pharmaceutical and engineering (including computers) sector. Whereas in the 1970s GVA accounted for 40 per cent of the gross output of the sector, by 2010 the share of GVA had fallen to 30 per cent. In addition, the Figure also shows that the labour share of value added declined dramatically in this sector in Ireland. In the 1970s it accounted for around 20 per cent of the gross output of the sector, but by the end of the period it accounted for only 5 per cent. As most of the output of the sector was produced by foreign firms, the impact on GNI or GNP is confined to the wage bill and the corporation tax paid on the profits; the rest of the profits are repatriated. Thus the share of the gross output (and exports) from the sector that has a lasting impact on the Irish economy (contributing to GNP) was quite small by 2010. (Albeit, because of the very large output, the small share of that output that contributed to GNP was very important to the Irish economy.) As discussed below, this means that trends in exports (gross output) may not be a good guide to trends in GNI or GNP, as the share of gross output that contributes to GNP is falling over time.

#### **4. The Patent Cliff**

The pharmaceutical sector accounts for an exceptionally large share of GVA in the Irish economy. The latest CSO data show that the foreign-owned firms in the sector accounted for over 11 per cent of GVA in Ireland in 2013 (there is very

limited production of pharmaceuticals by Irish-owned firms). Nearly all of the major international pharmaceutical companies have plants in Ireland. While they are important employers, the actual impact of the sector on GNI/GNP is much more limited than the value added figures would suggest. This is because of the fact that 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/GNP 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.<sup>6</sup> This had a big effect on the preliminary estimate of the growth rate of GDP (and exports) in 2012 and 2013.

However, the latest version of the national accounts (*National Income and Expenditure, 2013*) paints a rather different picture. When the accounts for the year were finalised, it would appear that the drug companies cut the price of their branded products rather than switching to the production of generics; hence there was not a major fall in volume and the earlier estimates prepared by the CSO have been revised. Also a range of new drugs began production in the sector in the period masking the impact of the loss of patents. As a result, the GVA in the sector fell in real terms in 2012 by 0.7 per cent and by 3.7 per cent in 2013. By contrast the current price GVA in the sector fell in 2012 and 2013 by 4.5 per cent and 30.7 per cent respectively. Because of the size of the sector in the economy, the fall in the price deflator in 2013 had a significant effect on the price deflator for GVA (and GDP) in the economy as a whole. However, the impact on the measured growth rate for GDP was much more limited than had been suggested in the preliminary national accounts published for 2012 and 2013 (discussed in FitzGerald, 2013a).

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<sup>6</sup> The patented drug was treated as a different product from the generic. Thus there was a discontinuity in the production process and both drugs were dropped from calculating a price index. Instead the price index was calculated based on all other drugs and it was used to deflate the value series to produce a volume series. The result was a major fall in volume. This is the standard approach adopted in the US national accounts for such drugs.

The wage bill in the sector fell by 1.1 per cent in 2012 but it actually rose by 1.6 per cent in 2013. The very substantial fall in profits, in particular in 2013, will have had a negative impact on corporation tax payments. However, with the exception of the tax payments, the rest of the loss of profits will have served to reduce profit repatriations. As a result, the impact of the loss of patent on GNI/GNP and on the current account in 2012 and 2013 will have been very limited.

## 5. The IT Sector

In 2013 9.6 per cent of GVA in the Irish economy was accounted for by foreign-owned firms (FDI) in the computer services and related sectors (NACE 58-63).<sup>7</sup> This sector has manifested a rather different pattern of behaviour to that of the pharmaceuticals sector.

As shown in Table 1, GVA arising in the sector (NACE 62 and 63) has grown by 50 per cent since the crisis began in 2008. Also, wages form quite a large share of the total GVA – rising from 38 per cent in 2005 to 43 per cent in 2013. In 2011, the latest year for which such data are available, the total output of the sector was around €26 billion with around €21 billion of inputs – largely payment for royalties and licenses and the residue of GVA being just over €5 billion. Much of the profit arising in the sector effectively flows out as royalties, rather than being included in profits in Ireland, subject to Irish tax.

**TABLE 1** GVA and its Components Current Prices, Computer Programming, Consultancy and Information Services Activities (NACE 62, 63), € million

	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>GVA current prices</b>	4,027	3,998	4,121	5,103	4,183	5,215	5,217	6,345	7,614
<b>% change</b>		-0.7	3.1	23.8	-18.0	24.7	0.0	21.6	20.0
<b>Gross operating Surplus</b>	2,449	2,228	2,313	2,952	1,899	2,822	2,574	3,157	4,293
<b>Wages etc.</b>	1,540	1,727	1,763	2,101	2,228	2,333	2,582	3,125	3,259
<b>Indirect Taxes etc.</b>	38	43	44	50	56	60	61	63	62

Source: CSO National Income and Expenditure, 2013.

Table 2 shows GVA arising in the computer services sector at constant prices. As can be seen from this Table, the GVA at constant prices has behaved very erratically over time with large rises and falls from year to year. In 2013 the GVA in the sector fell by over 57 per cent. On its own this had a negative impact on GVA for the economy as a whole of -2.3 percentage points in 2013. However, as shown in Table 1, GVA at current prices actually rose in 2013.

<sup>7</sup> <http://www.cso.ie/en/releasesandpublications/er/gvafm/grossvalueaddedforforeign-ownedmultinationalenterprisesandothersectorsannualresultsfor2013/#.VWNPUka-POU>.

**TABLE 2** GVA, Constant Prices, Computer Programming, Consultancy and Information Service Activities (NACE 62, 63)

	2005	2006	2007	2008	2009	2010	2011	2012	2013
GVA, constant prices	9,049	8,012	6,843	5,941	5,048	4,641	4,752	6,345	2,705
% change	34.2	-11.5	-14.6	-13.2	-15.0	-8.1	2.4	33.5	-57.4
% of GVA for economy	6.3	5.4	4.3	3.8	3.3	3.1	3.0	4.0	1.7

Source: CSO National Income and Expenditure, 2013.

Because the GVA in the sector is produced largely by foreign-owned firms, the bulk of the profits earned in the sector flow back out as profit repatriations and the effect on GNI/GNP will be largely determined by the pattern of growth in the wage bill. As can be seen from Table 1, this has showed continuous growth over the period 2005-2013. Thus, while the effect of this sector on growth in GDP was very volatile over the period, the impact on GNP is likely to have been much smoother, involving pretty continuous growth.

The very large fall in GVA at constant prices, in spite of the big rise at current prices, reflects a rather unusual pattern of deflation of the large amount of inputs in the sector (royalties). However, with consistent deflation of inputs used in the sector, and of imports of royalties and of repatriated profits, the net effect on GNP of the very large fall in GVA in constant prices should be limited. This suggests that while developments in this sector had a major negative effect on the measured growth in real GDP in the economy in 2013, the sector may actually have contributed to growth in GNI/GNP. However, the divergence between the current and constant price figures looks very unusual and it is difficult to explain.<sup>8</sup>

As in the case of the pharmaceutical sector, the issues discussed here may well arise for other countries with similar industries. However, the large size of the sector relative to the Irish economy means that the accounting problems loom much larger in the Irish national accounts.

## 6. 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, hold major investments elsewhere in the world but they have established a legal presence in Ireland. This

<sup>8</sup> The fall in volume of GVA arises because of a very large increase in the volume of inputs relative to Gross Output (GVA=Gross Output-Inputs). However, this does not appear to be the case in the current price flows where GVA actually increases.

means that their profits are paid to them in Ireland even though, under double taxation agreements, their tax liability arises in other jurisdictions. While they receive large profits in Ireland, because they are headquartered here, they pay out only some of these profits to their shareholders abroad when they declare a dividend. The retained earnings in Ireland enhance the value of the companies. As a result, the recorded inflows into the economy, which these firms generate, are much larger than the recorded outflows. 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/GNP arising in Ireland.

The treatment of these redomiciled plcs in the national accounts differs from the treatment of the profits of many of the multinationals already operating in the Irish economy in the manufacturing or services sector because, crucially, these latter multinationals are not headquartered in Ireland. These latter multinational firms also generate very substantial profits in Ireland; however, these profits are entirely attributed to their foreign owners and flow out as factor income. They also generate major activity in the economy through employment, payment of tax and purchase of Irish goods and services. Even if the profits of the multinationals operating in manufacturing or services do not flow back out as dividends, but are instead retained as earnings, they are still treated as an outflow in the current account of the balance of payments (as reinvested earnings). Thus, while the profits of these companies raise GDP, the “reinvested earnings” are deducted to calculate GNI/GNP. This means that the substantial benefit to the Irish economy which arises from the activities of these companies as employers or taxpayers is fully accounted for but the profits, which are due to their foreign owners, are excluded from GNI/GNP and the current account balance.

Redomiciled plcs, which are engaged in investing in global financial assets, grew very rapidly in importance from a relatively low level in 2008 to peak in 2012. This growth may have been partly driven by expectations of changes in the tax code in other jurisdictions. Whatever the reason, they are now exerting a major impact on the Irish national accounts and on the current account of the balance of payments.

**TABLE 3** Net Profit Flows for Redomiciled plcs, € million

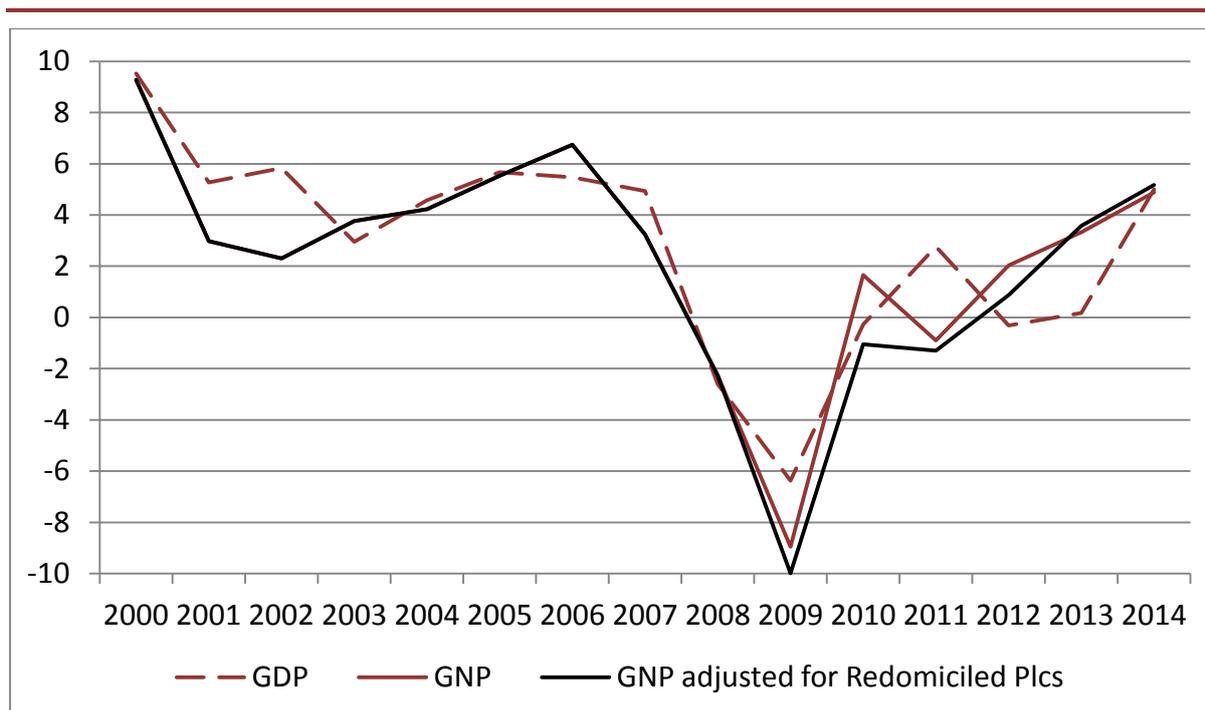
	2009	2010	2011	2012	2013	2014
Undistributed Profits	1,563	5,177	5,715	7,400	6,800	6,900
As % of GDP	0.9	3.1	3.3	4.3	3.9	3.7
As % of GNP	1.1	3.7	4.1	5.2	4.6	4.4

Source: Author's calculations based on CSO Balance of Payments and consultations with the CSO.

Set out in Table 3 is an estimate of the undistributed profits of these companies between 2009 and 2014. Having risen rapidly in the period 2009-2012 they appear to have plateaued in 2013 and 2014.

As can be seen from the Table, from 2009 to 2012 there was a dramatic rise in the profits of these companies. While the dividends paid out have averaged just under 30 per cent of the total, these retained earnings are very large. As shown in Table 3, by 2012 they amounted to 5.2 per cent of GNP.

**FIGURE 5** GNP Adjusted for Undistributed Profits of Redomiciled plcs.



Source: CSO: National Income and Expenditure 2013 and additional data from the CSO.

The change in the undistributed profits of these companies as a share of GNP is a measure of the extent to which the measurement of GNP (and GNI) has been inflated by the activity of these firms over the last five years, without a compensating reduction affecting GNP through increased factor outflows. As

shown in Figure 5, while the latest national accounts estimates for 2012 suggest that GNP grew by 1.1 per cent on the previous year, if allowance is made for the undistributed profits of the redomiciled plcs, there was actually a decline in the volume of output of 0.1 per cent. With very substantial growth in 2010 in these undistributed profits, the growth rate of GNP for that year, which is shown in the national accounts as having been just under 1.4 per cent, would be transformed into a fall in GNP of around 1.2 per cent when these payments are taken into account. Because all of the flows into and out of Ireland occur as factor income there is no impact on the figures for GDP.

If the current account of the balance of payments was adjusted to exclude the redomiciled plcs, this would imply that, instead of having a current account surplus of around 6.2 per cent of GDP in 2014, there was actually a surplus of around 2.5 per cent of GDP.

When these adjustments are taken into account it makes a big difference to how one understands the recent development of the Irish economy. It also means that while the economy appears to be running a very large current account surplus in 2015, the underlying situation is rather different with the surplus being much smaller in magnitude.<sup>9</sup>

Ireland is not unique in having this problem with headquartered companies, which 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 (Jansen and Rojas-Romagosa, 2015).

## **7. Trade in Goods and Services Manufactured Offshore**

There has been a change in national accounting rules affecting how trade is recorded.<sup>10</sup> This change affects the treatment of goods which are manufactured abroad for a domestic company and then subsequently sold abroad.

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<sup>9</sup> An implication of these data is that the large retained earnings of the redomiciled plcs, as well as adding to the current account surplus, also raise Gross National Income (GNI) – the base on which Irish contributions to the EU Budget are calculated. (The budgetary contribution of all Member States is set as a specified percentage of GNI). Thus, while these companies confer no significant benefit on the Irish economy in terms of employment or taxes, they do give rise to a higher EU budgetary contribution by Ireland.

<sup>10</sup> A new version of the national accounting definitions, ESA2010, has been gradually implemented by all Member States of the EU. With the publication of the next edition of *National Income and Expenditure*, the CSO will have fully implemented the changes required to conform to the new national accounting standard.

In the trade statistics, and in the old national accounting treatment, when a firm located in one country, such as Ireland, has goods manufactured for it in another country (e.g. China), these goods do not appear in the recorded trade of the country in which the firm organising the manufacturing is located (e.g. Ireland) unless the goods are physically shipped to that country.

However, in the latest treatment of trade in the national accounts, the key issue is when and where a change in ownership of the goods takes place. Under the new convention, if a company in Ireland has goods manufactured on its behalf in another country (e.g. China) the key issue is where and when the goods change ownership. If the Irish firm takes delivery (ownership) of the goods in China they are treated as an import into Ireland (where the owner is located). Then, if the goods are sold in a third country, they are treated as an export from Ireland to that third country. Under this treatment in the national accounts, it does not matter if the goods never pass through Ireland, because an Irish firm had ownership of the goods the purchase and sale of the goods is recorded in the Irish national accounting trade data. The goods will still only be recorded in the trade statistics for Ireland if they pass through Ireland.

This change in national accounting rules affects both firms in Ireland undertaking contract manufacturing for firms abroad and also where Irish firms have goods manufactured abroad for them.

The first case affected by the change in treatment is where a firm located in Ireland undertakes processing activities on contract for a firm located abroad. In recent years a significant amount of goods, which have been processed in Ireland for foreign companies, appear in the trade statistics as imports when they are brought to Ireland for processing and then, subsequently, as exports when they have been processed. Under the previous accounting conventions this movement of goods also showed up in trade in the national accounts. However, under the new rules, while the movement of the goods still appears in the trade statistics as imports and exports, it does not now appear in the national accounts merchandise trade. Instead, the payment to the firm located in Ireland for undertaking the processing on contract for the foreign owner of the goods is treated as a service export.

An example of this is the case where valuable pharmaceuticals have been sent to Ireland in powder form to be turned into tablets. The movement of the powder to Ireland for processing and the export of the finished pills do not now appear in

merchandise trade in the national accounts because the ownership of the pharmaceutical powder at all times remained with the foreign firm.

In the case of this “temporary” import of goods for processing, the effect is to drive a wedge between the trade statistics and the national accounts, rendering the trade statistics a poor guide to what is actually happening in the economy when this kind of trade is large. The net benefit to GDP (and GNP if the processor is Irish-owned) is the payment for the service rendered to the foreign company – a service export. This can be quite small relative to the value of the good being processed (for example where valuable pharmaceuticals in powder form are transformed into pills).

The effects on the national accounts are rather different where goods are manufactured abroad on behalf of firms located in Ireland, whether or not the firms in Ireland are Irish or foreign multinational enterprises (MNE’s).

Under the previous national accounting rules, where a company had goods manufactured abroad on its behalf, these goods were only treated as an import into the country of the firm commissioning the manufacture of the goods if the goods were physically imported into the country where that company, the owner of the goods, resided. Then, if imported into the owner’s country and sold abroad they would have been treated as an export.

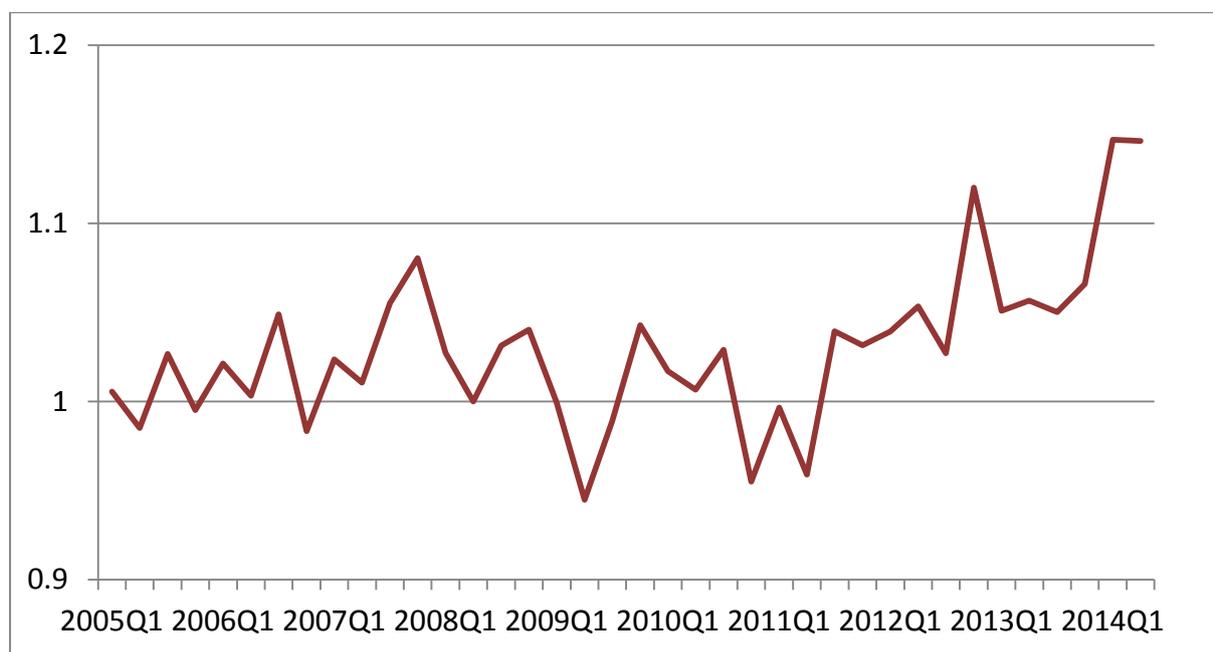
In the case of MNEs, it is much more usual that the goods are shipped from the country where they were manufactured directly to the country where they are consumed, without passing through the country where the MNE resides (e.g. Ireland). In that case, under the old accounting rules, they would not have appeared in the national accounting trade data of the country where the owner resided (e.g. Ireland).

Under the new set of rules, the key issue is the ownership of the goods. An example of such an arrangement would be where a company, which manufactures electronic products, has the products made abroad for sale to the rest of the world. In this case the company would take ownership of the products when they are completed in the factory abroad and it would only relinquish ownership when they were sold to the final customer, also abroad. If the firm were located in Ireland the goods manufactured abroad and sold abroad, without physically passing through Ireland, do not appear in the trade statistics for Irish imports and exports (or in the national accounts under the old rules). However,

under the latest convention, they appear as an import in the national accounts when the company takes delivery of them in the foreign country and they are then treated as an export when they are sold in a third country.

The effect of this is that the value of exports and imports is higher in the national accounts than in the trade statistics, which are based on the physical movement of goods. A more detailed treatment of the issues involved is given in Byrne and O'Brien, 2015.

**FIGURE 6** Ratio of National Accounts Merchandise Exports to Trade Statistics



Source: CSO.

Figure 6 shows the ratio of national accounts exports to trade statistics exports in recent years, which is an indicator of the significance of this contract manufacturing. As can be seen from this graph, this pattern, where firms have goods produced abroad for onward sale as an export, was not very significant until 2012. However, a significant proportion of Irish exports were actually manufactured abroad, especially in the first half of 2014. This served to raise value added in Ireland in spite of the fact that domestic factors of production were not used in the production of the goods.

Where a firm has goods manufactured abroad on its behalf the difference between the imports, what the firm pays the foreign producer, and the exports, what the firm gets when the goods are sold abroad, is the company's profit.

Where a firm undertaking this activity resides in Ireland (and the trade is recorded in the Irish national accounts) the profit will thus accrue in Ireland. This profit (the difference between the value of the export and the cost of the import) will add to Irish GDP. However, if the firm is a foreign-owned MNE then the profit, after tax, will flow back out as factor income. In this latter case there would be very little effect from the transaction on Irish GNP.<sup>11</sup>

It is understood that most of this activity was undertaken by foreign MNE's residing in Ireland so that most of the profits arising from these "exports" will have flowed back out as factor income. Thus the effect of these large exports in 2014 was to raise GDP but it will have had little or no effect on GNI/GNP.

The growth of this phenomenon is making the national accounts data for exports a misleading guide to real activity in the Irish economy. In biasing upwards domestic value added, where no domestic factors of production are used in the production process, it will complicate modelling of the economy. Once again it shows the importance of concentrating attention on GNI/GNP rather than GDP.

This problem is not unique to Ireland. It is also a problem for those using US data. However, it is understood that in the US the gross trade flows are not included in the US national accounts data for exports and imports. However, the value added accruing to the US companies from having their products produced abroad, for sale to third countries, is included in the GVA of the relevant sector in the US. In the case of the IT sector, this will boost GVA, while no US factors of production are used in the actual production process. This will boost US measured productivity.

## **8. Aircraft Leasing**

This summer, when the first full set of national accounting data for Ireland are published in *National Income and Expenditure, 2014*, the CSO will make one further change in accounting conventions to bring the accounts fully into line with the latest accounting standards. This will involve incorporating all the transactions involved in aircraft leasing on a gross flows basis. At present this business is included in the national accounts on a limited basis where some key gross flows are netted off and where the aircraft involved are treated as a financial asset rather than a physical asset. The leasing income (c. €8 billion) is included as a service export but the aircraft used do not appear in the trade flows or the physical capital stock.

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<sup>11</sup> The corporation tax paid in Ireland on the firms' profits would be the only factor adding to GNP.

The changes being made to accounting practices will be significant as they will, to some extent, change the measured current account balance. As this is a key indicator of what is happening in the economy the change in its magnitude will be important. In addition, because of the size of the sector, the inclusion of the gross flows related to the sector will further complicate the interpretation of the data on trade. When the CSO publish the new data in the summer this change will probably be implemented retrospectively back to the early 2000s.

Already the presence of Ryanair in Ireland is affecting the national accounts in an appreciable manner. With Ryanair planning to acquire 180 new Boeing 737 aircraft over the next four years this will show up as a significant rise in imports. This import of aircraft will be counterbalanced by a rise in investment, so the immediate impact of the transactions will not directly affect GDP. However, it will have a considerable immediate impact on the current account of the balance of payments. This will be offset, over time, by exports of transport services, which should eventually more than offset the cost of the aircraft.<sup>12</sup> However, the initial impact is likely to be a deterioration in the current account position. It will also make the movement of investment and imports even more volatile and more difficult to interpret.

The key change in the accounting treatment will involve including the import of aircraft by the leasing companies in merchandise imports and then including the same aircraft in the investment figures. The effect of these two changes will cancel each other out insofar as they affect GNP and GDP.

In the case of the aircraft leasing firms, nearly all of them are foreign-owned. They employ a relatively small number of people in Ireland, they buy a limited range of services locally, such as legal and accountancy services, and they pay corporation tax on their profits; this is their contribution to the Irish economy. However the gross flows relating to aircraft leasing are treated in the national accounts, the final impact on GNI or GNP of the presence in Ireland of aircraft leasing companies is relatively small.

Insofar as their profits arise in Ireland these profits will be remitted by the Irish company to their foreign owner as factor income paid abroad. In addition, because the bulk of the funding for these companies comes in the form of debt finance, there is a very substantial outflow of interest paid abroad under primary

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<sup>12</sup> That assumes that Ryanair continues to trade profitably.

income. Together the outflows of primary income partly offset the inflows of leasing payments so that the companies have a positive impact on the current account at present. Probably the best way to illustrate the significance of the change in national accounting treatment is to use a stylised example of an aircraft leasing company and to consider how its activities would impact on the national accounts under the old and the new conventions.

### **Stylised Example**

Table 4 shows an example of the balance sheet for a stylised aircraft leasing company. In this case in year one it is assumed that the company has a stock of aircraft worth €1 billion. It is financed by 70 per cent debt and 30 per cent equity. It is assumed that it increases its net stock of aircraft by €100 million in year two. This includes the purchase of replacement aircraft of €50 million due to depreciation and the purchase of additional aircraft amounting to €100 million. (Without any investment the stock of aircraft would fall in value by €50 million due to the depreciation of the existing stock of aircraft.)

**TABLE 4** Accounts of a Stylised Leasing Company

	Old Basis	New Basis	Old Basis	New Basis
Year	1	1	2	2
Balance Sheet				
Assets (aircraft)	1000	1000	1100	1100
Liabilities				
Debt	700	700	770	770
Equity	300	300	330	330
Profit and Loss				
Income				
Leasing Revenue	100	100	110	110
Expenses				
Irish costs (labour etc.)	5	5	5.5	5.5
Debt interest	28	28	30.8	30.8
Depreciation	50	50	55	55
Profit before tax	17	17	18.7	18.7
Tax	2.1	2.1	2.3	2.3
Profit after tax	14.9	14.9	16.4	16.4

Source: Author.

Table 4 also shows a profit and loss statement for the same stylised leasing company. It is assumed that the leasing income of the firm is equivalent to 10 per cent of the value of its stock of aircraft. It is also assumed that it pays a rate of interest of 4 per cent on its debt and that the depreciation on the aircraft is at a rate of 5 per cent.<sup>13</sup> This rate of depreciation is slightly higher than what would be arrived at on the basis of straight line depreciation with the expected life of an aircraft being 25 years. However, some acceleration in the depreciation in the early years of an asset would not be unusual. Irish labour costs are assumed to be 5 per cent of leasing income. These are assumed to include the labour content of services bought in Ireland (e.g. legal and accountancy services).

On this basis the company made a profit in year one of €45 million before deduction of interest and before tax. After deduction of interest payments the profit would be €17 million in year one. Tax is assumed to be paid at a rate of 12.5 per cent on the profit after deduction of interest and depreciation.

<sup>13</sup> The assumptions made here are broadly consistent with published accounts for such companies.

In year two it is assumed that the company expands its stock of aircraft by a net €100 million. The funding of this investment is assumed to be on the basis of the same debt/equity ratio as in year one.

**TABLE 5** Output side of the National Accounts of Stylised Leasing Company Operations

	Old Basis	New Basis	Old Basis	New Basis
Year	1	1	2	2
Output				
GVA	100	100	110	110
Wages	5	5	5.5	5.5
Profit before interest	95	45	104.5	49.5
Depreciation	0	50	0	55
Contribution to GDP	100.0	100.0	110.0	110.0
Factor outflows	42.9	42.9	47.2	47.2
Debt interest	28.0	28.0	30.8	30.8
Profits repatriated	14.9	14.9	16.4	16.4
Contribution to GNP	57.1	57.1	62.8	62.8
Contribution to NNP	57.1	7.1	62.8	7.8

Source: Author.

Table 5 then shows the impact of this on the output side of the national accounts in year one and year two, both on the basis of the current national accounting rules and also on the rules to be implemented this summer. Under the old accounting treatment there would be no depreciation deducted as there were considered to be no physical assets in Ireland to depreciate (the aircraft). However, under the new treatment, the depreciation, identified in the company accounts, is also treated as depreciation in the national accounts. This difference in treatment does not affect GDP or GNP but it does affect Net National Product (NNP).

In the old accounting treatment, while the allowance for depreciation in the company accounts was treated as a profit for national accounting purposes it was not treated as being remitted as profit by the foreign multinational. Instead the depreciation, as calculated in the company's accounts, would flow back out on the financial account of the balance of payments. Thus there is no difference between the profit outflows under the new and the old national accounting treatments.

On this basis the addition to GNP in year one as a result of the operations of the leasing company would be €57.1 million. However, when the depreciation on the

aircraft is taken into account the effect on net national product NNP would be €7.1 million, equivalent to the wages and the corporation tax paid in Ireland.

**TABLE 6** Expenditure side of the National Accounts for Stylised Leasing Company Operations

	Old Basis	New Basis	Old Basis	New Basis
Year	1	1	2	2
Investment			0	150
Export Services	100	100	110	110
Imports			0	150
Contribution to GDP	100	100	110	110
Factor outflows	42.9	42.9	47.2	47.2
Debt interest	28.0	28.0	30.8	30.8
Profits repatriated	14.9	14.9	16.4	16.4
Contribution to GNP	57.1	57.1	62.8	62.8

Source: Author.

Table 6 shows the expenditure side of the national accounts on the new and the old basis. Here there is a significant change through the inclusion of the imports of new aircraft in year two. In the case of year two, where there is assumed to be an import of €150 million of aircraft, this shows up in imports and investment under the new national accounting convention, whereas these two items are omitted in the current national accounts treatment, where the stock of aircraft is treated as a financial asset. Because the imports and the investment cancel, there is no change in the effect on GDP and GNP as a result of the change in accounting.

**TABLE 7** Current Account of the Balance of Payments for Stylised Leasing Company Operations

	Old Basis	New Basis	Old Basis	New Basis
Year	1	1	2	2
Exports	100	100	110	110
Imports	0	0	0	150
Net Factor Income	-42.9	-42.9	-47.2	-47.2
Balance	57.1	57.1	62.8	-87.2

Source: Author.

Table 7 shows the effect of the change in accounting conventions on the current account of the balance of payments. In this case there is a significant change from the current treatment to the new treatment of the physical stock of aircraft. Under the existing treatment the current account is in surplus, even when the

stock of aircraft is increasing in year two. However, under the new treatment there is a deficit in year two when new aircraft are bought. The turnaround is equivalent to the cost of the purchase of the aircraft i.e. -€150 million.

The new treatment is more appropriate than the old treatment. However, it does highlight a problem in assessing the economic significance of a current account surplus or deficit. In the case of the new treatment, the negative current account balance as a result of the aircraft leasing operation would appear, on the face of it, to be adverse for domestic welfare. However, as represented by the increase, albeit small, in NNP there is a positive impact in welfare even when the leasing firm is building up its stock of aircraft through imports. While there is an apparent conflict between these two measures it is not a real difference.

The current account statement for year two under the new treatment takes account of the cost of the aircraft but it does not take account of the lifetime income from owning that aircraft. The NNP measure gives a better indication of the long-term benefit from the investment. A true measure of the welfare impact on the economy of the investment in new aircraft would require the initial cost of the import of aircraft to be offset against the lifetime leasing income and costs of operation of the aircraft. In that case the investment by the leasing company would also be seen as being beneficial to the economy on the basis of a cumulative improvement in the current account over the lifetime of the aircraft.

This problem arises in all cases where there is a surge in productive investment. Provided that the investment does prove productive when installed, there is a benefit to society from that investment. With the activities of aircraft leasing companies building up quite rapidly in the next few years this will have a negative impact on the current account of the balance of payments measured using the new convention. However, if and when the stock of aircraft stabilises, then the current account would move into surplus as the leasing income exceeded the cost of aircraft replacement.

This new treatment of aircraft leasing is more appropriate than the current (old) treatment. The old treatment “flatters” the current account as the leasing income is included but not the import of the capital stock on which it depends. By contrast, in the early years, as the capital stock builds up through imports of aircraft, the result of the new treatment will be to paint an unduly unfavourable picture of the current account. This is because the import of aircraft will be included but not the full flow of leasing income that the capital stock generates because that only accrues over the relatively long lifetime of the aircraft.

## Scale of Aircraft Leasing

The aircraft leasing sector has risen rapidly in size in Ireland over the last decade. According to one report almost 20 per cent of the world's civil aircraft fleet is owned by leasing companies in Ireland.<sup>14</sup> While this is probably an overestimate of the true size of the sector, nonetheless it is very large relative to the size of the Irish economy and this change in accounting treatment could dwarf the effects on the current account of the balance of payments of Ryanair's purchase of aircraft over the next four years.

The web sites of ten companies operating in Ireland suggest that they have 4,000 aircraft, a figure roughly consistent with the suggested value of the assets of the sector in Ireland shown above. However, there are reasons to believe that this figure exaggerates the true size of the sector. In a significant proportion of cases the firms do not distinguish between ownership and management of aircraft when aggregating the aircraft they control. This distinction is important as, if they only manage the aircraft, their revenue will cover the management costs (and profits) but not the depreciation or remuneration of the capital. Also, in this latter case the aircraft would not form part of the Irish capital stock.

**TABLE 8** Services Exports, Leasing Income, € million

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Operational leasing	1,752	2,110	4,076	5,439	5,803	5,764	5,729	6,699	6,812	7,537	7,497

Source: CSO, Balance of Payments.

Table 8 shows the services export revenue from leasing, the bulk of which is in respect of aircraft leasing. In the case of one of the largest leasing companies, Avolon, the leasing income is roughly equal to 10 per cent of the value of the aircraft owned.<sup>15</sup> Assuming that the position is similar for other leasing companies, the flow of leasing income would suggest that the value of the aircraft owned in 2013 was around €75 billion or just over 40 per cent of GDP, somewhat smaller than suggested in the reference above.

The build-up of capital in the form of aircraft implied by the leasing income shown in Table 8 is quite rapid over the last decade. It implies that, over the decade from 2003 to 2013, the stock of aircraft rose by over €57 billion or €5.7

<sup>14</sup> <http://www.irishaviationresearchinstitute.blogspot.ie/p/ireland-aircraft-leasing-companies.html>.

<sup>15</sup> [http://finance.yahoo.com/news/avolon-2014-fourth-quarter-full-110000464.html;\\_ylt=A0LEV0ngFShVh9kA32JXNyoA;\\_ylu=X3oDMTEzbGFkZ2FIBGNvbG8DYmYxBHBvcwM4BHZ0aWQDU01FOTU3XzEEc2VjA3Ny](http://finance.yahoo.com/news/avolon-2014-fourth-quarter-full-110000464.html;_ylt=A0LEV0ngFShVh9kA32JXNyoA;_ylu=X3oDMTEzbGFkZ2FIBGNvbG8DYmYxBHBvcwM4BHZ0aWQDU01FOTU3XzEEc2VjA3Ny).

billion a year. This would have amounted to between 3 per cent and 3.5 per cent of GDP each year over the decade.

At present the value of the stock of aircraft managed in Ireland, and also the funding of those aircraft, are treated as financial assets and liabilities in the international investment position for Ireland and transactions in leased aircraft are recorded in the financial account of the balance of payments. However, when they move to being treated as a fully onshore activity, the stock of aircraft will be included as a physical asset of the renting and leasing sector (NACE 77). This would also represent an increase in the Irish capital stock of around 20 per cent, something that will have implications for the standard EU method for estimating potential output.

The impact of all of these changes on the current account of the balance of payments in any one year is unclear. However, the concern is that there could be significant effects on the current account in individual years. However, as discussed above, over time, the net effect of all of these transactions undertaken by foreign-owned companies operating in Ireland should be small, representing their true impact on the economy. Nonetheless, until the details are fully teased out there remain concerns that this change in accounting treatment could further complicate the interpretation of what is going on in the “real” Irish economy.

## **9. Finding Solutions**

In this paper the primary focus has been on problems in interpreting the Irish national accounts as the Irish economy is affected by many new facets of the globalisation process. In some cases other countries are tackling the same problems, but the magnitude and number of issues affecting the Irish accounts is probably quite unusual compared to other OECD economies.

Many of the problems identified in this paper affect the data for exports and imports. Traditionally, these variables have provided important indications of what is happening in an economy. However, the data for Ireland are now subject to so many different “unusual” factors that they are no longer particularly useful for this purpose. Instead it is more useful to concentrate on the current account of the balance of payments, in both current and constant prices – exports less imports and net factor income. Obviously an adjustment also needs to be made to this aggregate for the behaviour of redomiciled plcs.

The change in the national accounting approach to goods which are manufactured abroad for firms resident in Ireland poses serious problems in understanding developments in the economy. It poses particular issues for those who want to model the production process. With the addition to GVA of substantial value added / output which is not produced with domestic factor inputs – capital and labour – traditional production functions will not make sense. Among other areas of economic analysis, this has serious implications for the way that potential output and the structural deficit is measured.

More generally, in a globalised world, many of the problems that are arising with the national accounts are related to the definition of residence. However, the answer is not to change the definition, as the accounts provide an essential coherent and consistent framework across all economies. Rather, the answer is to provide more information on a standardised basis, which would allow the kind of anomalies identified in this paper to be taken into account, to provide a clearer picture of what is happening in an individual economy.

In the case of Ireland the best solution is probably to focus on the output side of the accounts. The aim should be to identify the GNI/GNP arising from individual sectors of the economy. In the case of foreign-owned firms, the GNI/GNP effect will be confined to the wage bill and corporation tax paid. In the case of Irish-owned companies the contribution will be the same as the GVA arising in the firm.<sup>16</sup> As some sectors are dominated by foreign-owned companies this may simplify the task. Already the Irish CSO has gone some distance down this route in a recent publication.<sup>17</sup>

To facilitate an understanding of current developments in the economy it would be useful to extend this approach to produce output indices which are weighted by the GNI/GNP contribution of each sector of the economy.

In the case of the redomiciled plcs it would have been much easier to interpret the data if their profits received in Ireland, which were not paid out as dividends, were accrued to the foreign owners. This is the approach with firms that have a real presence in the economy, such as foreign firms in the manufacturing sector. However, this would not be consistent with ESA2010 and, instead, we must make do with adjusting the published data to take account of the problem.

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<sup>16</sup> This is actually an oversimplification as the dividends paid to foreign shareholders in the Irish economy will also flow out of the economy. Also, both national debt interest paid abroad and the inflow of factor income are not readily attributable to a particular sector of the economy.

<sup>17</sup> <http://www.cso.ie/en/releasesandpublications/er/gvafm/grossvalueaddedforforeign-ownedmultinationalenterprisesandothersectorsannualresultsfor2013/#.VWdPH0a-POU>.

Finally, the problem with aircraft leasing will make the interpretation of the movements in the current account much more difficult to interpret. Because of the large size of the gross flows associated with aircraft leasing it may be necessary to separate out leasing income and the flow of aircraft imports and to adjust the current account to arrive at a more meaningful aggregate for policy purposes. Certainly crude use of the current account balance in the EU macroeconomic imbalances procedure could give rise to serious misinterpretation of what is actually happening in the Irish economy.

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