Problems Interpreting National Accounts in a Globalised Economy – Ireland

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1. Introduction

The globalisation of the world economy encompasses a number of different related processes. At its most basic, countries import goods and services which they do not themselves produce – for example, oil. However, following the laws of comparative advantage countries have tended to specialise: 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. A result of this process a growing share of the output of individual countries has been accounted for by trade.

Side by side with this increase in the share of trade in individual economies has been one where the production process for goods and services is itself broken up, so that parts of a good or service are produced in a wide range of different locations, very often by a wide range of firms. This has resulted in a trend whereby a growing proportion of trade is accounted for by intermediate products which are used in making other goods and services.

However, the process of globalisation has become even more complex, with companies producing goods and services across a range of different countries. 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 capital and labour. In addition, the parts used in making the car may be sourced in many different locations. The effect 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 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 value added accounts for a diminishing share of gross output.

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.[1] This drives a wedge between GDP and GNI/GNP as the profits, net of tax, are remitted to the shareholder.[2]

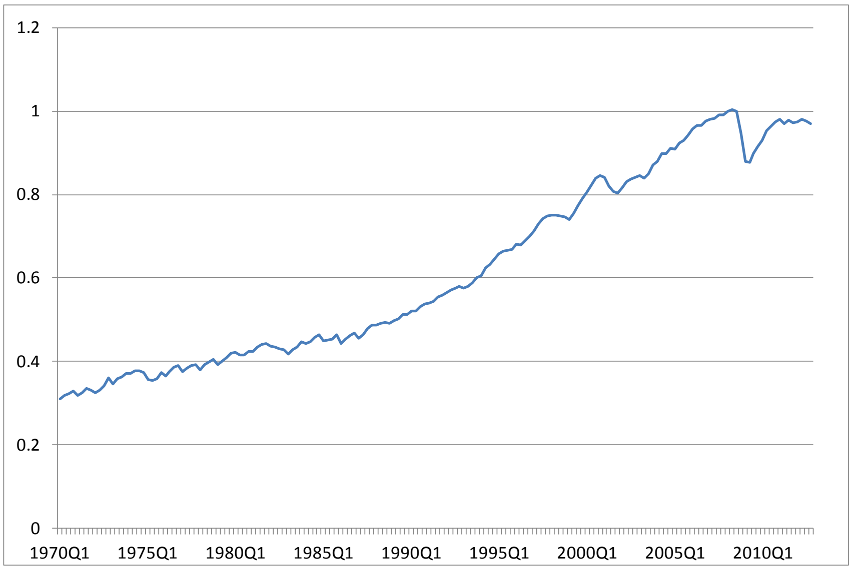
2. Recent Trends in Key Variables

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, reflecting

[1] 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.
[2] 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.

the process of globalisation. This trend 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.

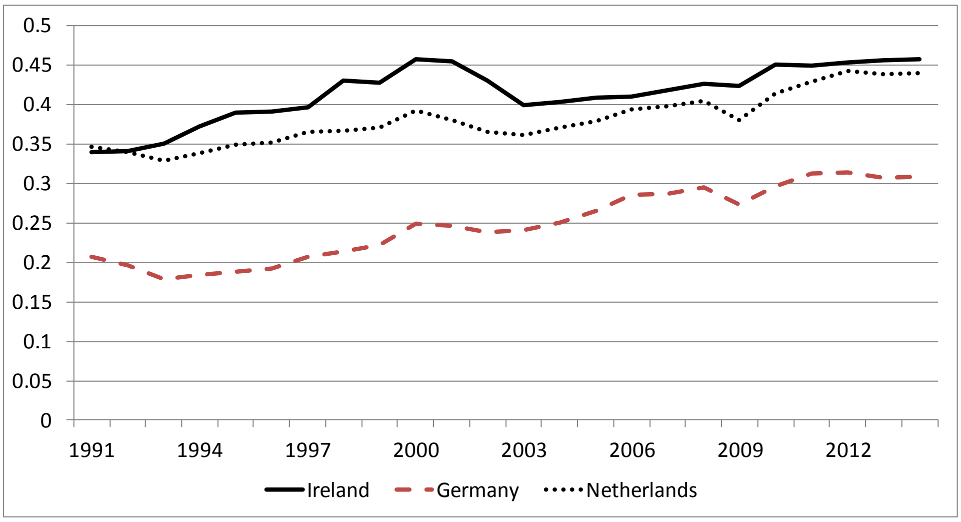
Figure 1: World Trade relative to GDP



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 twenty years.

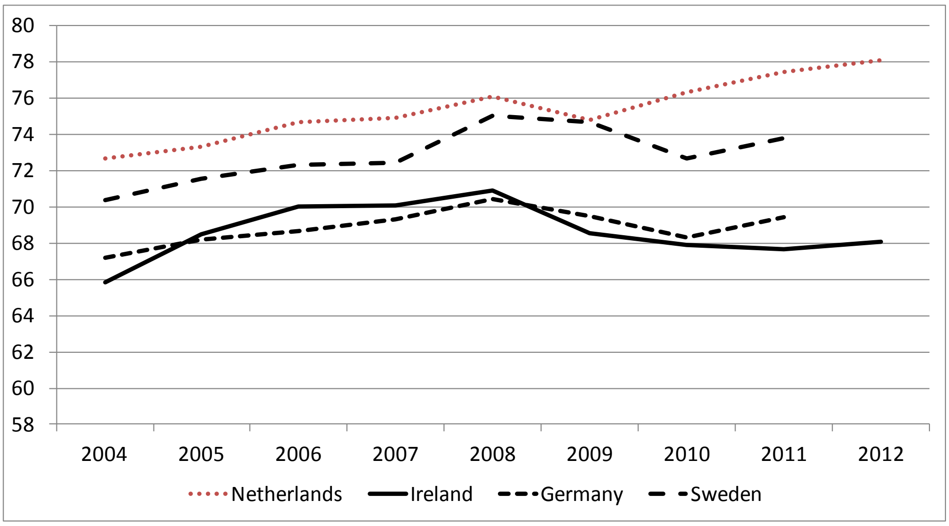
Figure 2: Ratio of imports to Final Demand, current prices



Source: EU AMECO database

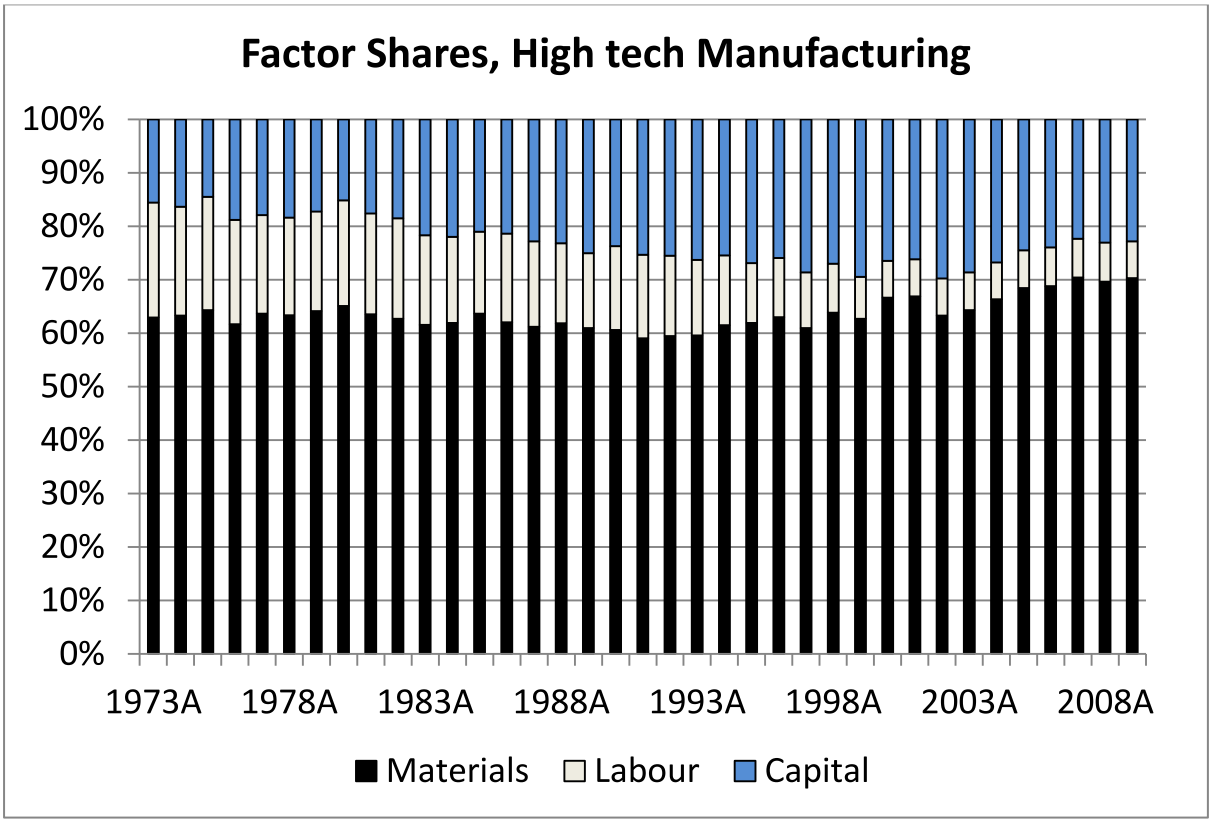
Within the manufacturing sector the share of the output of the sector which is accounted for by intermediate inputs of goods and services is also tending to grow. While consistent data are only available for a relatively short period from Eurostat, Figure 3 shows that for Germany, Ireland, the Netherlands and Sweden intermediate inputs accounted for a significantly higher share of GVA in manufacturing in 2011 than they did in 2004.

Figure 3: Intermediate inputs as share of gross output, manufacturing



Source: Eurostat National Accounts

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% of the gross output of the sector, by 2010 the share of GVA had fallen to 30%. In addition, the Figure also shows that the labour share of value added also declined dramatically in this sector in Ireland. Whereas in the 1970s it accounted for around 20% of the gross output of the sector, by the end of the period it accounted for only 5%. 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 was very limited by 2010. As discussed below, this means that trends in exports may not be a good guide to trends in GNI or GNP.

3. Problems in Interpreting Standard National Accounts

In this note I want to focus on five special problems in interpreting the Irish national accounts. These are:

1. The so called "patent cliff". When patents on major drugs produced in Ireland run out this can have a very big impact on the national accounts because of the size of the pharmaceutical sector in Ireland.
2. The changing behaviour of the IT sector on where they accrue their profits.
3. The effects of so called "redomiciled plcs" on GNP/GNI and on the current account.
4. The inclusion in exports and imports of goods and services produced abroad and later sold abroad for Irish companies.
5. The potential effects of incorporating aircraft leasing firms fully into the Irish national accounts. At the moment only their value added is fully incorporated and the gross flows are netted off. However, from 2015 onwards these transactions will be included on a gross flows basis.

Together these problems have had 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 arcane national accounting issues are taken into account. It is likely that these problems 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. 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.

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% of GVA in Ireland in 2013 (there is very limited production of pharmaceuticals by Irish owned firms). Nearly all 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, with the exception of the corporation tax paid in Ireland, from the activity in Ireland accrue to their foreign parents. 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. This resulted in a reduction in revenue for the company of around $5.5 billion (around 2.5% of Irish GDP)[3]. 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.[4] 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, iIt 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% and by 3.7% in 2012. By contrast the current price GVA in the sector fell in 2012 and 2013 by 4.5% and 30.7% 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 was much more limited than had been suggested in the preliminary national accounts published for 2012 and 2013.

The wage bill in the sector fell by 1.1% in 2012 but it actually rose by 1.6% 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 GNP/GNI 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 (NACE58-63). This sector has manifested a rather different pattern of behaviour to that of the pharmaceuticals sector. While in the case of pharmaceuticals the relevant firms have continued to report substantial profits in Ireland and, as a result, pay substantial corporation tax in Ireland, in the case of the IT services sector there has been a dramatic reduction in profits reported in Ireland in 2013.

Table 1 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%. On its own this had a negative

[3] FitzGerald, J., 2013, "The Effect on Major National Accounting Aggregates of the Ending of Pharmaceutical Patents", in ESRI, *Quarterly Economic Commentary*, Autumn 2013.

[4] 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 as a major fall in volume. This is the standard approach adopted in the US national accounts for such drugs.

impact on GVA for the economy as a whole of -2.3 percentage points in 2013. However, the GVA at constant prices actually rose in 2013. The wage bill in the sector has risen every year since 2005.

Table 1: 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	9049	8012	6843	5941	5048	4641	4752	6345	2705
% 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

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. Thus the effect on GNP/GNI will be largely determined by the pattern of growth in the wage bill. In 2013, while there was a dramatic fall in GVA at constant prices, the wage bill in the sector rose by over 4%, reflecting continued growth in employment (labour input) in the sector. This suggests that while developments in this sector had a major negative effect on the measured growth in real GDP in the economy, the sector may actually have contributed to growth in GNP/GNI.

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 sectors relative to the Irish economy means that the accounting problems loom much larger in the Irish national accounts.

6. Redomiciled PLCs[5]

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. 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 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 head quartered 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 attributed to their foreign owners – there is no benefit to the Irish economy. Nonetheless, this has the effect of raising the measured current account surplus in the Balance of Payments and increasing the level of nominal 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 head quartered in Ireland. These latter multinational firms also generate very substantial profits in Ireland; however, these profits are entirely attributed to their foreign owners. They also generate major activity in the

[5] See FitzGerald, J., 2013, “The Effect of Redomiciled Plcs on GNP and the Irish Balance of Payments”, ESRI, *Quarterly Economic Commentary*, Summer 2013.

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 GNP/GNI. 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 GNP/GNI and the current account balance.

Redomiciled plcs, which are engaged in investing in global financial assets, have grown very rapidly in importance from a relatively low level in 2008. 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.

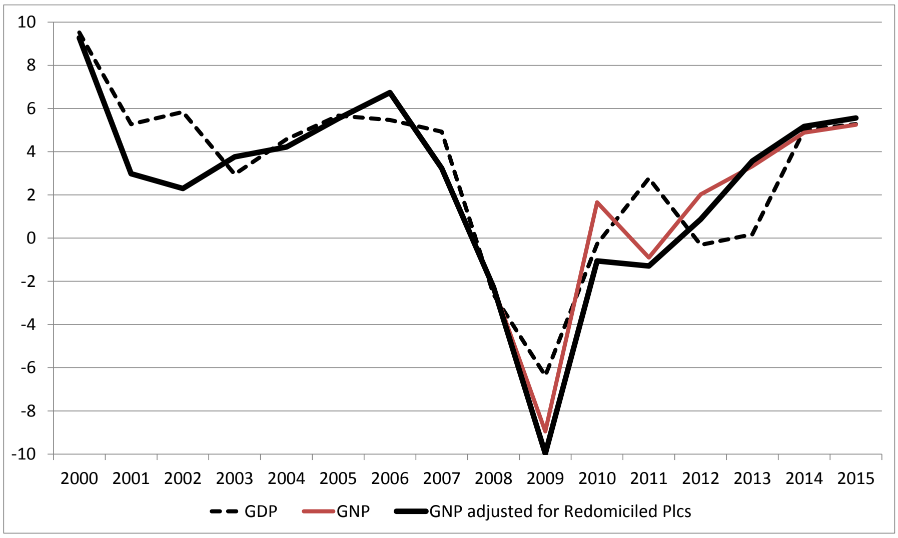
TABLE 2 Net Profit Flows for Redomiciled plcs., € million

	2009	2010	2011	2012
Undistributed Profits	1563	5177	5715	7396
As % of GDP	1.0	3.3	3.6	4.5
As % of GNP	1.2	4.0	4.5	5.5

Source: Author’s calculations based on CSO Balance of Payments data and consultations with the CSO

Set out in Table 2 is an estimate of the undistributed profits of these companies between 2009 and 2012. There was little change in the level of these profits in 2013 or in the first half of 2014. As can be seen from the Table, from 2009 onwards 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 1, by 2012 they amounted to 5.5 per cent of GNP.

FIGURE 5: GNP adjusted for undistributed profits of redomiciled plcs.



The change in the undistributed profits 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 around 2.0 per cent on the previous year, if allowance is made for the undistributed profits of the redomiciled plcs, the growth rate was under 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 1.7 per cent, would be transformed into a fall in GNP of around 1.1 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.

There is also a corresponding implied adjustment needed in the official current account figures. This would imply that, instead of having a current account surplus of around 3.8 per cent of GDP in 2013, there was an underlying deficit was of around 0.5 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 this year the underlying situation is rather different with the surplus being much smaller in magnitude. [6]

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 of possibly even greater magnitude helping explain its apparently exceptional current account surplus.

7. Trade in Goods and Services Manufactured Offshore

There has been a change in the treatment of goods which are manufactured abroad for a domestic company and which are subsequently sold abroad. In the trade statistics these goods would not appear in the trade of the company where the company that engages in such a practise resides. That is because the goods never enter the country of the company that owns the goods. However, in the latest treatment of trade in the national accounts the key issue is the location of the company that owns the goods.

Under current practise where a company has goods manufactured abroad on its behalf these goods are treated as an import into the country of the owner of the goods from the point at which the company takes ownership of the goods. They are then treated as an export from the country of the owner of the goods at the point where the company sells the goods. An example of such an arrangement would be where a company which manufactures mobile phones[7], has phones manufactured in China for sale to the rest of the world. In this case the company would take ownership of the phones when they are completed in the factory in China and it would only relinquish ownership when they were sold to the final customer.

[6] An implication of these data is that the large retained earnings of the redomiciled plcs raise Gross National Income – the base on which Irish contributions to the EU Budget are calculated. 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.

[7] It is unlikely that the Irish data involve the manufacture of mobile phones abroad. However, this could be an issue when considering US data and this could pose problems in interpreting the US national accounts.

If Apple were located in Ireland the phones would first be treated as an import into Ireland in the national accounts when the company took delivery of them in China. They would be treated as an export from Ireland when they were sold elsewhere in Europe. Because they never physically passed through Ireland they would not appear in the trade statistics for Ireland.

In recent years there has been a significant amount of goods which have been processed in Ireland for foreign companies, which appeared in the trade statistics as imports and exports but did not appear in the national accounts merchandise trade. In particular, where valuable pharmaceuticals were sent to Ireland to be turned into tablets the movement of the powder to Ireland and the export of the finished pills did not appear in merchandise trade in the national accounts because the ownership of the pharmaceutical powder at all times remained with the foreign firm. Instead the payment to the Irish firm for undertaking the work is included as a service export.

In the case of the temporary import of goods for processing the only 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. However, the situation can be rather different in the case where goods are manufactured abroad on behalf of firms located in Ireland.

Figure6: Ratio of National Accounts Merchandise Exports to Trade Statistics

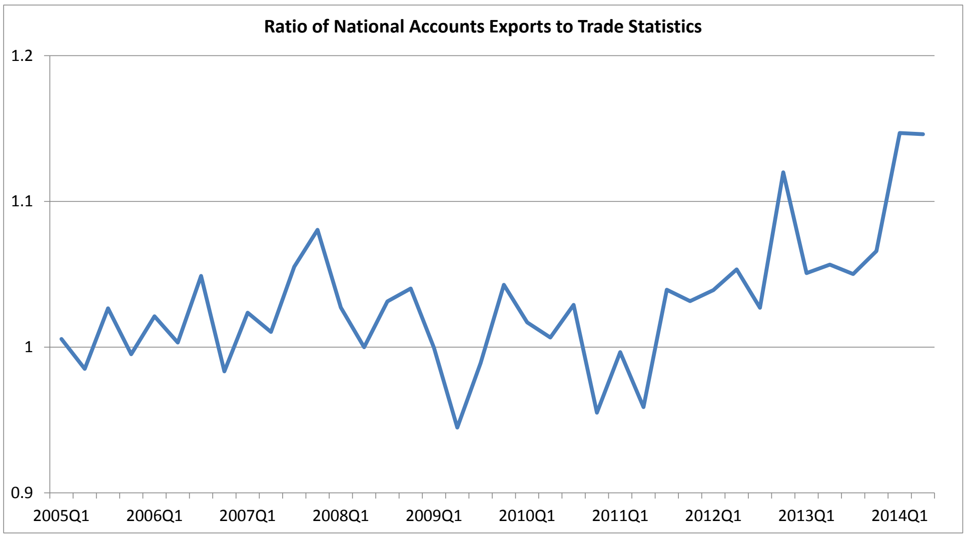


Figure 6 shows the ratio of national accounts exports to trade statistics exports in recent years. As can be seen from this graph this issue of exports manufactured abroad was not significant until 2012. However, especially in the first half of 2014 a significant proportion of Irish exports were actually manufactured abroad. 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.

In addition, because these goods were predominantly manufactured abroad for foreign multinationals operating in Ireland all of the profits arising from the exports will have flowed back out as factor income. Thus the effect of these large exports was to raise GDP but it will have had little or no effect on GNP/GNI.

The growth of this phenomenon is making the use of 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.

This problem is not unique to Ireland. It is also a problem for the US. 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 company from having its 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 tend to boost GVA while no US factors of production are used in the actual production process. This will tend to boost US measured productivity.

The issues involved here are very similar to those that arise where goods are temporarily imported into a country. This latter issue poses significant problems in understanding Netherlands data because of the importance of Rotterdam as a major port for all of Europe.

8. Aircraft Leasing

Next year a further change will occur in how trade transactions are treated in the Irish national accounts which will pose additional problems for economists who use them. This will involve a change in the way aircraft leasing operations are treated and it will be implemented retrospectively back to the 1990s.

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 more than offset the cost of the aircraft in the long term.[8]

However, the change in the treatment of aircraft leasing is likely to have a bigger and more complicated impact on the national accounts. 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 and they buy a limited range of services locally, such as legal and accountancy services. Possibly the biggest element of the domestic value added may arise from corporate tax paid on their profits. Thus, however, they are treated in the accounts, the final impact on GNP or GNI of their presence in Ireland should be relatively small both before and after the change in accounting treatment. In so far as profits arise in Ireland they will be remitted to their foreign owner as factor income paid abroad.

As it is reported that almost 20 per cent of the world’s civil aircraft fleet is owned by leasing companies in Ireland[9], this change in accounting treatment could dwarf the effects of Ryanair’s purchase of aircraft over the next four years. The value of the stock of aircraft currently being managed from Ireland would amount to almost 70% of GDP in 2014.[10]

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 on the financial account of the balance of

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[8] That assumes that Ryanair continues to trade profitably.
[9] http://www.irishaviationresearchinstitute.blogspot.ie/p/ireland-aircraft-leasing-companies.html
[10] This assumes that the stock of aircraft is worth $150 billion as suggested in the reference above.

payments. However, when they move to being treating 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 will represent a very substantial increase in the Irish capital stock.

Currently the flow of leasing income, a service export, includes the pure profit on the lease (it excludes the depreciation of the aircraft). In 2012 this leasing income already amounted to 4.3% of GDP.[11] However, when moving to a gross flow basis, that element of the leasing income that covers the depreciation on the aircraft will also be included in leasing income. It is not clear how much this will be. However, if depreciation on the stock of aircraft was, say, 7%, then this would add another 5% of GDP[12] to the leasing income – a service export.

In turn, this depreciation would be added to the GVA arising in the sector. Thus there would be a substantial addition to GDP as the proceeds of the depreciation would presumably be used to repay the loans used to fund the aircraft. Of course NDP would be unaffected by this change in depreciation. This increase in leasing income would also appear as a positive impact on the current account of the balance of payments, before account is taken of the purchase of the aircraft. However, as in the case of Ryanair, the purchase of aircraft would add simultaneously to imports and investment.

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 and on the growth in the value of GDP 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 real 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 approach to goods which are manufactured abroad for firms resident in Ireland poses serious problems in understanding developments in the economy. It poses particular problems for those who want to model the production process. With the addition to GVA of

[11] it may cover other items than aircraft

[12] This assumes 7% depreciation and a stock of aircraft equivalent to 70% of GDP.

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 this has serious implications for the way that potential output and the structural deficit is measured. For many users of national accounts it might be more useful to have an alternative set of accounts available on the old basis where imports and exports are physical flows.

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 GNP/GNI arising by individual sector of the economy. In the case of foreign owned firms, the GNP/GNI 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.[13] As some sectors are dominated by foreign owned companies this may simplify the task. Already the Irish CSO have gone some distance down this route in a recent publication.[14]

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 GNP/GNI contribution of each sector of the economy.

In the case of the patent cliff problems in Ireland it might have been better if the ending of a patent were treated as a price effect, where the same physical compound is produced before and after the patent runs out.

In the case of the redomiciled plcs it would have been much easier to interpret the data if their profits received in Ireland (or the Netherlands), 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.

[13] This is actually an oversimplification as the dividends paid to foreign shareholders in the Iirsh 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.

[14] http://www.cso.ie/en/releasesandpublications/er/gvafm/grossvalueaddedforforeign-ownedmultinationalenterprisesandothersectorsannualresultsfor2013/#.VFZ-ism0N-I