GLOBALISATION - MEETING THE MEASUREMENT CHALLENGES

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Introduction

Ireland is one of the most globalised economies in the World. This is increasingly the case when we consider the Irish economy in 2018 compared to previous years and decades. The focus of this note is on meeting the measurement challenges for Ireland posed by the scale of economic globalisation in the economy. There is also, by extension, the broader application of these same strategies and frameworks in other countries where these measurement challenges arise.

The impacts of globalisation are observed in the activities of domestic players in Global Value Chains (GVCs). This is particularly true in Ireland where the top ten multinational enterprises (MNEs) involved in GVCs explain 53 per cent of exports and 43 per cent of imports of goods and services. In Ireland the activities of companies with a purely domestic focus are quite limited. This is explained by both the sizable concentration of MNEs operating in Ireland and the small open economy status of Ireland where even minor entities can have significant cross-border transactions. The domestic market is also quite limited in size and even the smallest companies need to adopt an export-oriented growth strategy from the outset.

This note will discuss the measurement challenges that arise for a National Statistical Institute (NSI) such as CSO (Ireland) tasked with estimating both the overall scale or level of a highly globalised economy and, critically, the transactions and other factors that explain economic growth. The cross-border dimension to this general economic picture is where globalisation is observed in detail and is very significant for Ireland.

The main measurement challenges associated with economic globalisation will be outlined. The related discussions will then address the strategies, those being followed and those still in the development phase. The current state of play internationally will also be referenced as Ireland does not act alone but does so in conjunction with our partners in the European Statistical System (ESS) and Eurostat. The OECD, UN and IMF are also key partners in this evolving work. The development of a common set of agreed standards in sizing an economy is led by the Inter Secretariat Working Group on National Accounts (ISWGNA) that report to the UN Statistical Commission. The

[1] The views expressed in this article are those of the author only, and do not necessarily reflect the views of the CSO

ISWGNA consists of five international organisations; ESTAT, OECD, UNSD, IMF and World Bank and is assisted by the Advisory Expert Group (AEG[2]).

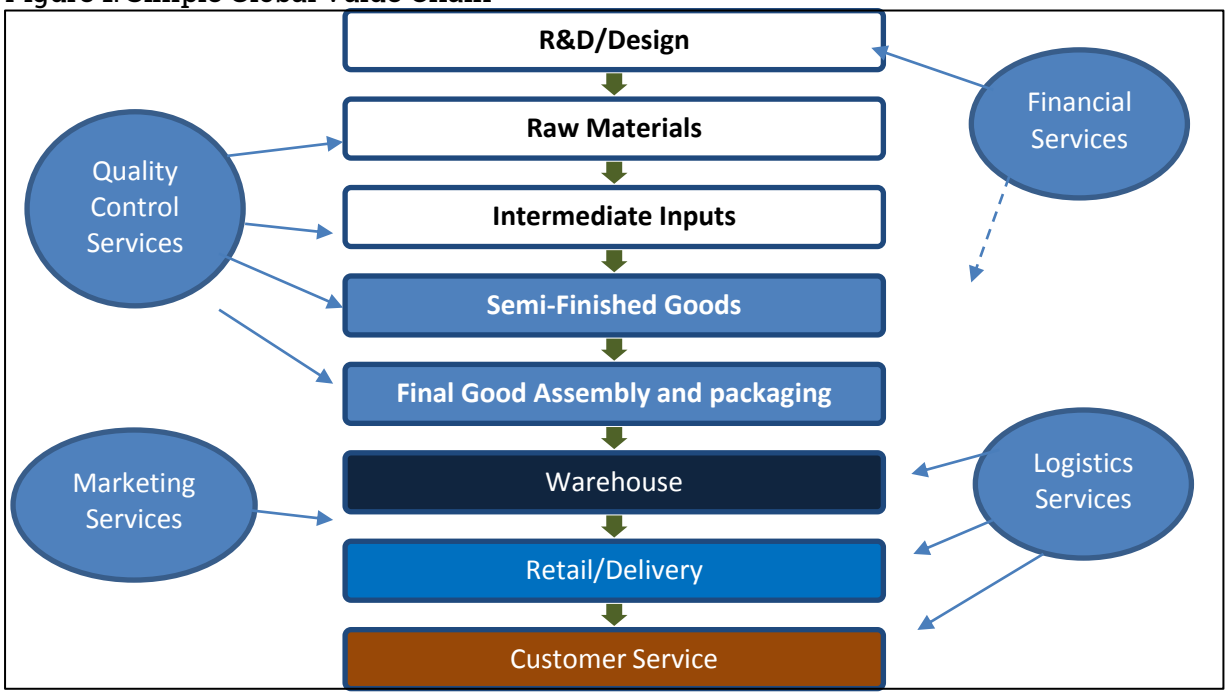
There is general international agreement on the main measurement challenges posed by economic globalisation. The following are the key ones impacting on Ireland:

- Economic ownership in the context of Global Value Chains
- Highly mobile tangible and intangible capital assets
- Productivity trends – role of capital
- Digital or shared economy
- Redomiciled plcs or corporate inversions

Section 1: Global Value Chains (GVCs)

Changes in the global economy, especially the rise of global value chains (GVCs), have created measurement problems that require not only continued innovation in the use of existing data sources but also the development and deployment of new measures that analyse GVCs more directly. MNEs operating in the Irish economy are all members of GVCs. In some cases, they are regional headquarters covering part of the global activities of a Group, e.g. covering the European, Middle Eastern and African (EMEA) activities. Typically, these MNE affiliates manage the globally fragmented operations of production, distribution, sales and after sales service that are a feature of 21st Century GVCs as described in Figure 1 below.

Figure 1: Simple Global Value Chain



[2] For further information see https://unstats.un.org/unsd/nationalaccount/aeg.asp

Concentration of GVCs has resulted in a number of sectors in the Irish economy being dominated by MNEs[3]. The particular sectors are shown in the following table:

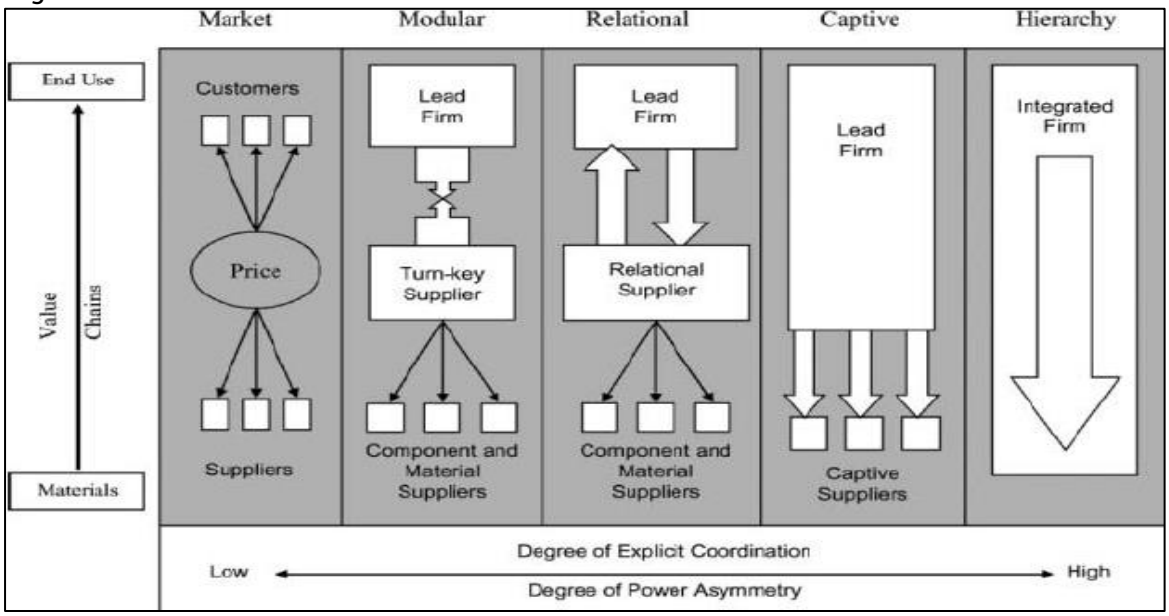
Table 1: Irish Economy - MNE Dominated Sectors

Description	**NACE code**	**Percentage of 2016 GVA at constant basic prices**
Chemicals and chemical products	20	1.6%
Software and communications sectors	58-63	9.2%
Other NACE sectors dominated by Foreign-owned MNEs[4]	18.2, 21, 26, 27 and 32.5	29.2%
Foreign-owned MNE dominated Total		**40.0%**
"Other" Sector		**60.0%**

In addition, in the Retail/Wholesale sector there are entities at the end of the GVC operating in Ireland to meet local customer demand.

So, what are the measurement challenges that arise in the context of GVC activities? In this note only GVCs with a hierarchical or captive governance structure are really being considered and discussed. See Figure 2 below

Figure 2: Governance Structures in GVCs from Market to Hierarchical[5]



[3] See CSO MNE and Non MNE Release http://www.cso.ie/en/releasesandpublications/er/gvafm/grossvalueaddedforforeign-ownedmultinationalenterprisesandothersectorsannualresultsfor2016/

[4] Reproduction of recorded media, basic pharmaceutical products and pharmaceutical preparations, computer, electronic and optical products, electrical equipment, medical and dental instruments and supplies

With reference to Figure 2, the most common governance structures for MNEs in Ireland are hierarchical or captive. In these governance structures all or most of the activity is retained within the MNE group, or alternately contract manufacturers (CMOs) are engaged, who are captive suppliers that produce goods on behalf of the Irish resident entity. This contrasts to other GVCs such as Food industries where there exist many customers and many suppliers, having a "market" governance structure.

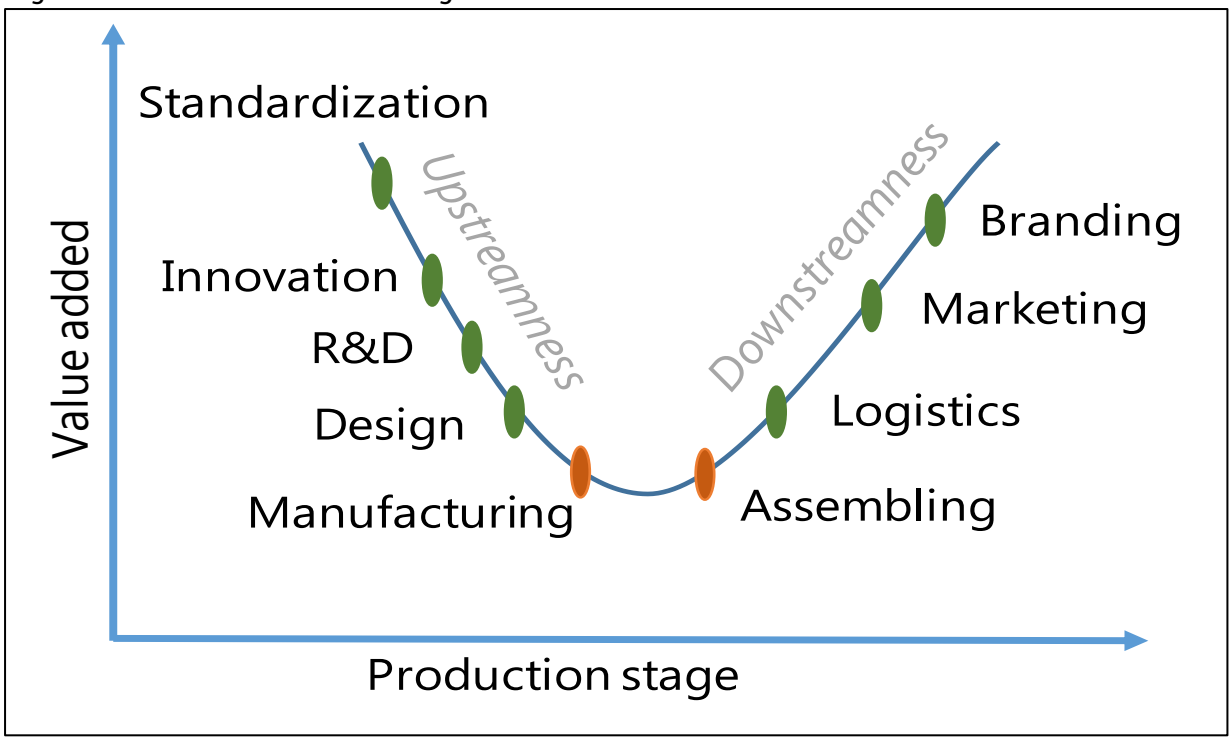
Nevertheless, MNEs are all structured differently for a host of reasons so while a generalised model can explain their activities the specifics do differ. To address the challenges posed by diverse MNE structures, CSO established a Large Cases Unit to deal with these entities on a case-by-case basis. The LCU framework allows for differing approaches to be followed to ensure the achievement of the ultimate goal of data consistency and coherence across the various data sources that are used to compile the economic aggregates that include the activities of these MNEs.

The trading arrangements of these MNEs are structured to optimise value added at the Group level and also at the Regional level. To help explain the rationale for these arrangements, Figure 3 is presented below. It can be seen that in a given GVC, value added generated is at its highest for Research & Development, Branding and Retail activities while the lowest additions to value added are generated in Manufacturing and Assembly. Consequently, when it comes to production decisions related to whether a given MNE wants to establish a factory or instead engage a contract manufacturer (CMO) to produce a product for the MNE, the arguments that an MNE might consider are the following:

- What is the lead in time for planning approval for the project?
- What is the construction timeline?
- What are the regulatory hurdles?
- Are there CMOs that can produce the product efficiently?
- Is there scope and flexibility with the CMO to accommodate sudden changes in demand?
- Is there a risk that the intellectual property may be divulged in the CMO process?

[5] Gereffi, Gary, Humphrey, John and Sturgeon, Timothy (2005) 'The governance of global value chains', Review of International Political Economy, 12: 1, 78 — 104

Figure 3: Where Value Added is generated in a GVC

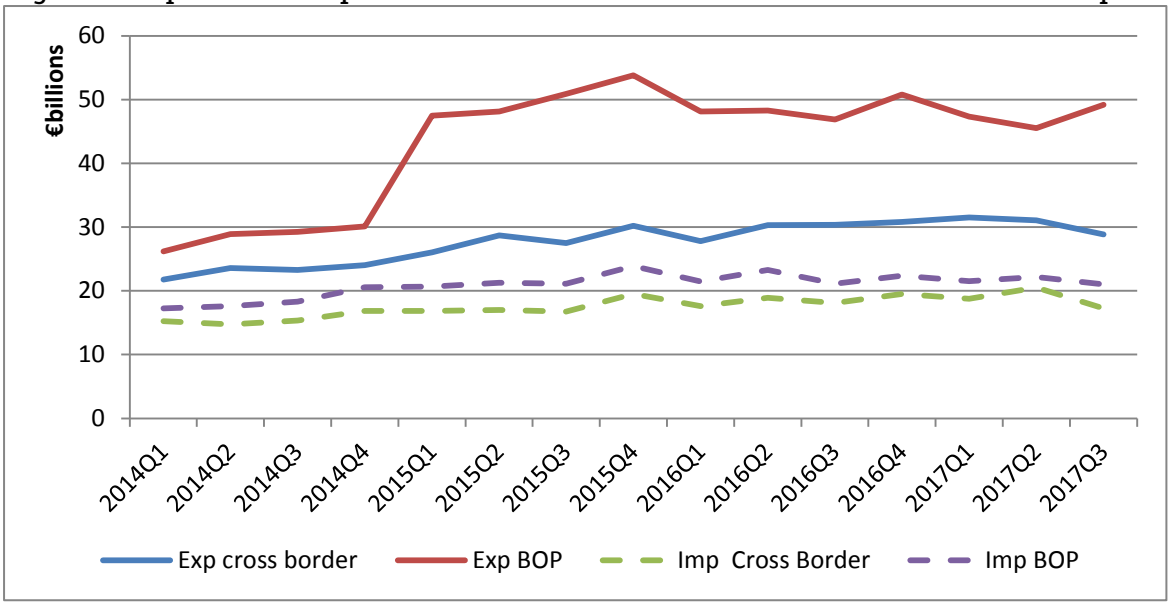


Having considered these, and no doubt other factors, an MNE decides to either retain or commence production in Ireland or alternately it decides to engage a CMO either in Ireland or abroad to do it instead.

This decision has immediate consequences for the measurement of economic transactions in these GVCs. The standard model used by NSIs[6] to compile exports and imports require the International Trade statistics compiled using Intrastat surveys for trade within the EU and Extrastat data based on customs declarations for trade outside of EU. However, this data is recorded on a cross-border movement basis rather than a change of economic ownership basis. In fact, for Ireland exports of goods require significant adjustment to align these cross-border data to a change in economic ownership basis. It may well be the case that many NSIs used this data based on cross-border movements as a proxy for the ownership-based data, however at this stage, the pitfalls associated with this approach are apparent to most compilers. To illustrate the difference between the two bases of compiling trade in goods, see Figure 4 below.

[6] and some National Central Banks in cases where they compile the Balance of Payments and International Trade statistics

Figure 4: Exports and Imports of Goods – Cross-Border and Economic Ownership



To identify these measurement challenges is one thing but to implement a solution that resolves the gaps or addresses the challenges in a consistent and repeatable way is considerably more difficult. In CSO the impact of MNEs on the overall macroeconomic picture has required a coordinated approach through the work of the LCU and its predecessor the Consistency Unit. The highly centralised nature of the Irish statistical system has greatly facilitated arriving at an acceptable solution that requires access to the whole range of economic data that relate to these MNEs that meet the individual requirements of several statistical domains in CSO. Much of this data is collected by LCU from the MNEs and is supplemented and extended by data from administrative sources such as Corporation Tax, Companies Registration Office (CRO), International Trade, etc. An example of the type of analysis performed on elements of this data set is presented in Table 2 below. In the row titled "LCUQ MerchTransExportAdjust, the adjustment of an MNE's export data that is required to align it with the change in economic ownership basis is shown for each of the six calendar quarters.

This general approach predates the emergence of a dominant GVC model internationally that has entailed a fragmentation of the various stages of production and distribution, i.e. from research and development activities to sales and after sales services. It has, however, left CSO well positioned to address the GVC related measurement challenges.

Formerly the objective in ensuring consistency between various statistics was that, for example, turnover equalled exports of goods (where a company exported all its production). Another was to test the alignment between production and turnover

through the measurement of the changes in stocks (inventories). However, with the widespread use of CMOs by MNEs in Ireland these same inconsistencies that are identified still inform us in the appropriate measurement of the economy. For example, where an MNE reports lower exports of goods compared to reported turnover, immediately the possibility of production abroad and the use of CMOs is considered in the deliberations of LCU analysts. Of course, these suppositions have to be confirmed and validated with the relevant MNE which might change the trading model of this entity as understood by LCU. Similarly, a substantial build-up of inventories abroad needs to be taken into account when making adjustments to align exports to a change in economic ownership basis. A change in ownership does not occur until the goods are sold from inventory.

Table 2: Company A Consistency Analysis

	2,016				2016 Total	2,017			2017 Total
Row Labels	Q1	Q2	Q3	Q4		Q1	Q2	Q3	
Industry_A									
Sum of LCUQ_TradeImport	11	10	10	13	45	14	15	0	29
Sum of LCUQ_MerchTransImportAdjust	180	170	260	350	960	275	280	0	555
Sum of LCUQ_NetTrade_Import	191	180	270	363	1,005	289	295	0	584
Sum of LCUQ_COGS	201	186	273	368	1,028	291	629	0	920
Sum of LCUQ_COGSIE	0	0	0	0	0	0	0	0	0
Sum of LCUQ_MaterialsCost	222	182	273	366	1,042	336	624	0	961
Sum of LCUQ_Turnover	526	600	699	830	2,655	827	790	0	1,618
Sum of LCUQ_TradeExport	24	28	22	25	99	30	31	0	61
Sum of LCUQ_MerchTransExportAdjust	500	570	675	800	2,545	800	785	0	1,585
Sum of LCUQ_GoodsSold	526	600	699	830	2,655	827	790	0	1,618
Sum of LCUQ_GoodsSoldIE	0	0	0	0	0	0	0	0	0
Sum of LCUQ_NetTrade_Export	524	598	697	825	2,644	830	816	0	1,646
Sum of LCUQ_BOPgap	52	51	52	55	209	56	55	0	111

In all these cases, the monthly trade in goods correctly records the physical cross-border movements between Ireland and abroad. In the National Accounts and International Accounts (Balance of Payments) however, the data are rightly adjusted for the additions to exports arising from the sale of goods manufactured abroad by foreign CMOs that remain in the ownership of the MNE in Ireland until they are sold to the customers abroad.

These adjustments can pose serious challenges for forecasters and policymakers forming early estimates of economic developments. They also entail considerable LCU

efforts in the validation process through outreach activities with the MNEs concerned. At this stage, on account of CSO's experience in this type of LCU related work, the Unit is a designated Centre of Excellence by Eurostat.

A change in economic ownership can occur for reasons other than the use of CMOs. There are trading structures in MNEs where, although goods move to a warehouse abroad, a change in economic ownership is not associated with this cross-border movement. Instead it is only when the goods are sold from the warehouse abroad that the change in ownership occurs. In these situations, adjustments to the monthly international trade data is also required. In such cases, the export data is valued at the cost of production as it crosses the border and needs to be revalued to a selling price basis. The LCU follow a similar approach to that outlined above to make the necessary adjustments to the exports data.

More generally this work on GVCs has enormous policy importance by revealing the role played by MNEs in Ireland in the overall EU or Global Value Chains for particular products. It also assists in identifying clusters of activities related to a particular GVC, e.g. the pharmaceutical GVC or medical device GVC. Indeed, there is a growing opinion that the National Accounts need to present more data on GVCs. This is particularly important given the need to understand trade flows and also the generation of value added, which is the objective of the Trade in Value Added work of OECD and WTO. This approach is also the focus of the UNSD sponsored Group of Experts on International Trade and Economic Globalisation who are working towards a statistical presentation of GVC activities in domestic economies and also by region such as EU or North America.

In the statistical standards European System of Accounts (ESA 2010) and IMF Balance of Payments and International Investment Position Manual, production abroad used to be seen as partial finishing of a production process and that the finished product would return to the economy of the sender. It was termed goods sent abroad for processing. Now, although some of the features of contract manufacturing related cross-border movements fit with the descriptions of goods for processing, conceptually these movements are seen in the context of the fragmentation of MNE activities across the globe rather than goods going abroad for further work and then being returned following completion. Consequently, the recommended treatment prior to the latest set of statistical standards envisaged a different set of trading models for MNEs internationally. Ultimately and unavoidably, the statistical standards will lag actual developments in corporate structures.

In summary, the LCU approach to ensuring data quality has greatly assisted in the identification of the change in economic ownership as it occurs for MNEs in Ireland that are covered by the Unit. In addition, other sections of CSO follow a similar

approach where MNEs outside the scope for LCU are observed with similar characteristics.

Section 2: Highly Mobile Tangible and Intangible Capital Assets

The previous section considered the measurement challenges associated with production and distribution in the context of GVCs having MNE members that are located in Ireland.

In this section the focus is on the capital structure of these entities. There are two key asset categories that are particularly significant in explaining globalisation trends in Irish economy, namely Aircraft and Intellectual Property Products (IPPs). However, only the latter category is discussed here. Another CSO paper being presented at this seminar deals with the subject of Aircraft Leasing in detail. To avoid repetition, I do not propose to discuss the matter here and am restricting myself to IPPs.

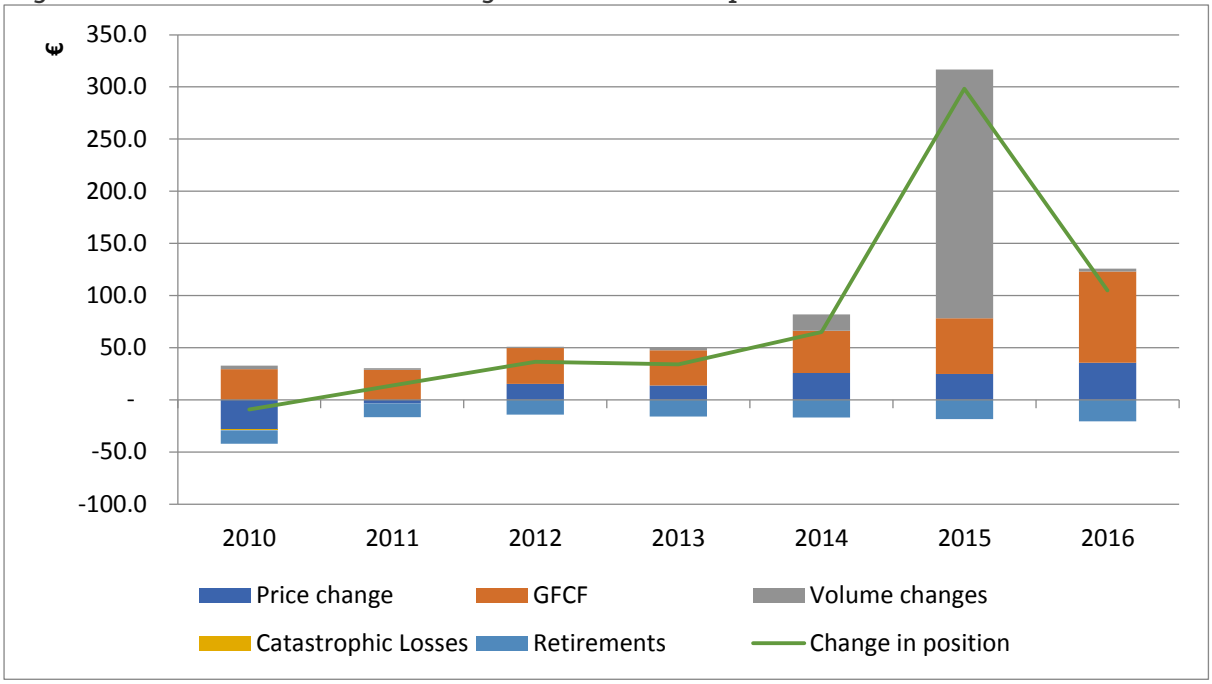
Highly mobile intangible assets pose a serious measurement challenge to NSIs owing to their non-physical form and the fact that they can be moved from one jurisdiction to another simply by completing legal documentation. As some commentators[7] have said, wealth is no longer in factories, pipelines or retail outlets (for these MNEs) their capital is not anchored to specific jurisdictions.

For many of the products produced in Ireland or produced abroad by CMOs for Irish MNEs, the key input to production is the IPP service. Over recent years Ireland has witnessed a significant series of inflows of IPPs that were previously located abroad. The use of these IPPs, when located abroad used to be remunerated by royalty payments by the MNEs based in Ireland to the owners abroad. Once located in Ireland the related royalty flows no longer occur because the Irish MNE now owns the IPP. As a result of the reduced level of costs associated with production the contribution of these activities to Irish GDP increases. Of course, other models have also been followed in an attempt to provide greater transparency around their activities by these MNEs in line with the BEPS[8] recommendations, nevertheless at this stage the dominant approach appears to be the onshoring of IPP. See Figure 5 below for an illustration of the overall annual increases in capital assets in Ireland that are explained largely by additions of IPP from abroad. The significance of the events of 2015 that contributed to the dramatic increase in GDP of 26.3% can be seen in Figure 5.

[7] Jonathan Haskell of Imperial College and Stian Westlake of Nesta in "Capitalism without Capital". See https://www.chathamhouse.org/event/capitalism-without-capital-rise-intangible-economy

[8] See http://www.oecd.org/ctp/beps/

Figure 5: Additions and other changes to Ireland's Capital Assets 2010 - 2016



These movements into Ireland of IPP are difficult to detect but can generate significant future service flows that can contribute significantly to GDP.

In these cases, once again, the operations of the LCU are the key to identification and measurement of the intangible assets involved. The matter is discussed routinely at all LCU outreach meeting with MNEs. In addition to information on the current Balance Sheet and P&L, information is also sought regarding future plans and an approach agreed for the MNE to notify LCU where any significant changes are expected to occur. In this way this particular challenge has been addressed.

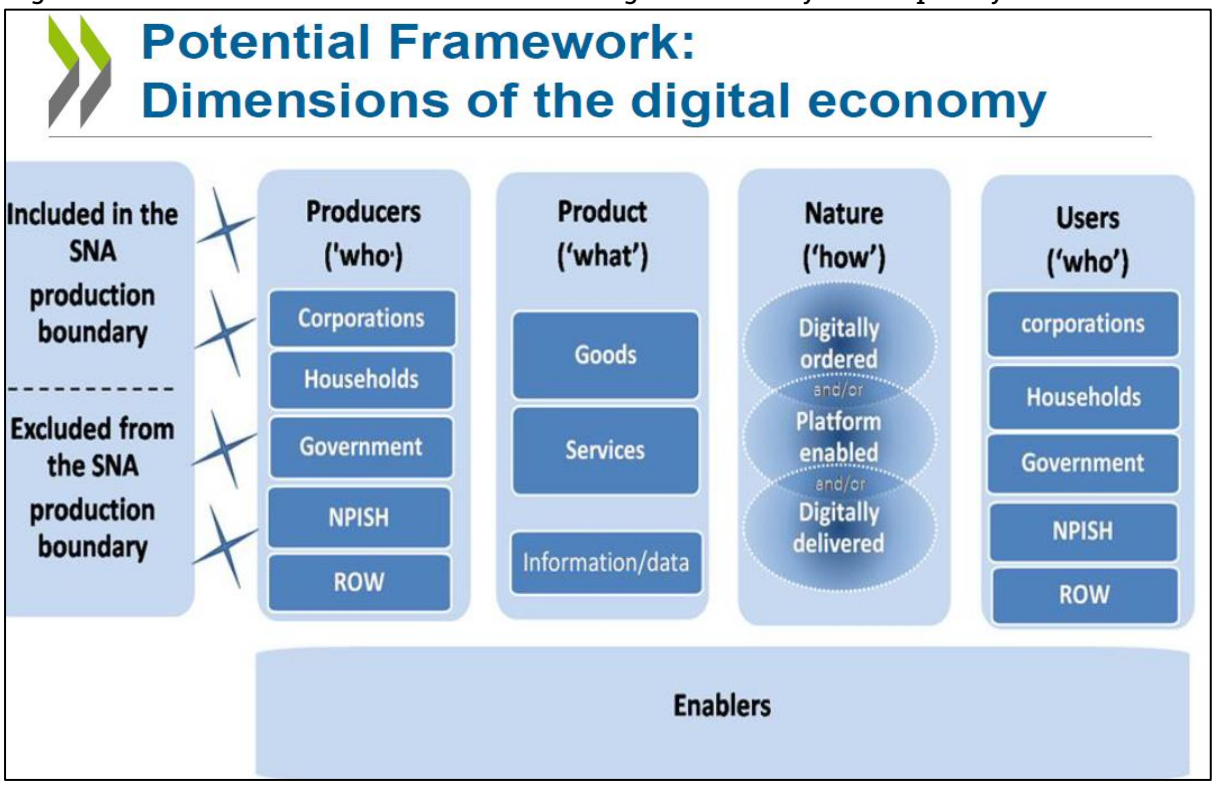
Section 3: Digital Economy

The issues related to the identification of IPP are closely associated with the activities associated with the digital economy. In fact, the top seven highest valued companies in the world are all in the technology sector or digital economy. Many of these entities have a presence in Ireland and pose challenges in observing the services they supply internationally. Although in many cases their income is earned through advertising, the product being produced is a platform for the sharing of information, free of charge in most cases. The valuation of these free services poses measurement challenges from a conceptual standpoint. Nevertheless, the scenario is similar to media services supplied by the state broadcaster RTÉ where free content is funded by the license fee together with revenue from advertising. The viewer is presented with free content (leaving aside the licence fee) but there are frequent adverts.

The discussions on this matter continue internationally with countries and international organisations interpreting the current standards in attempting to arrive at a measurement solution for these activities that incorporates the earnings of the entities themselves and the services provided. However, the increasing importance of these activities gives an added incentive to resolve these difficulties in the short term.

In this context a framework on how to understand the digital or sharing economy was drawn up by OECD[9] and is outlined below. Questions such as who are the producers of the services that enable goods and services to be digitally ordered, platform enabled or digitally delivered need to be considered. It also explores the extent to which institutional sectors are involved with particular reference to UBER-style and AirBnB-style activities where households become engaged in the production of services using their own house or their own car, both of which were previously outside the production boundary or simply not included in the productive capital assets of the economy. What are being considered are the activities of digital services, digital enablers, digital goods, digital services and platforms.

Figure 6: Framework for dimensions of the digital economy developed by OECD



[9] Nadim Ahmad (Nadim.Ahmad@OECD.org) and Jennifer Ribarsky (Jennifer.Ribarsky@OECD.org) Issue paper on a proposed framework for a satellite account for measuring the digital economy. See http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=STD/CSSP/WPNA(2017)10&docLanguage=En

This work is only in the developmental stage and the preparation of satellite accounts[10] is being progressed at OECD. Nevertheless, there have been some attempts to measure the impact on GDP of these activities and the initial estimates for a number of countries range from 0.2% - 0.6%. In this context the measurement question is whether we are considering market producers' activities that are being substituted by non-market producers, i.e. UBER for Taxis or AirBnB for Holiday Rental Accommodation or whether this is all incremental in terms of GDP. In all likelihood, the majority of this activity is a substitution with a limited element of additional activity. The major challenge is to ensure that these platform-enabled services and the products they are used to supply, are all captured in the statistical system. This is the key measurement challenge in this area.

CSO has already initiated a series of dialogues with digital providers[11] with a view to obtaining data from the Irish registered entities covering the transactions entered into and by whom, etc. In addition, exporters of goods to Ireland of goods that have been digitally ordered are required to complete Intrastat returns for VIMA in Ireland using non-resident VAT numbers. In this way a considerable amount of online shopping can be identified and recorded in the imports statistics of Ireland.

Section 4: Productivity

Productivity is the measurement of how goods and services are produced in the economy and how this measure changes following additions to the inputs of capital and labour. In addition, the impact of efficiency improvements is measured in the framework of productivity measures.

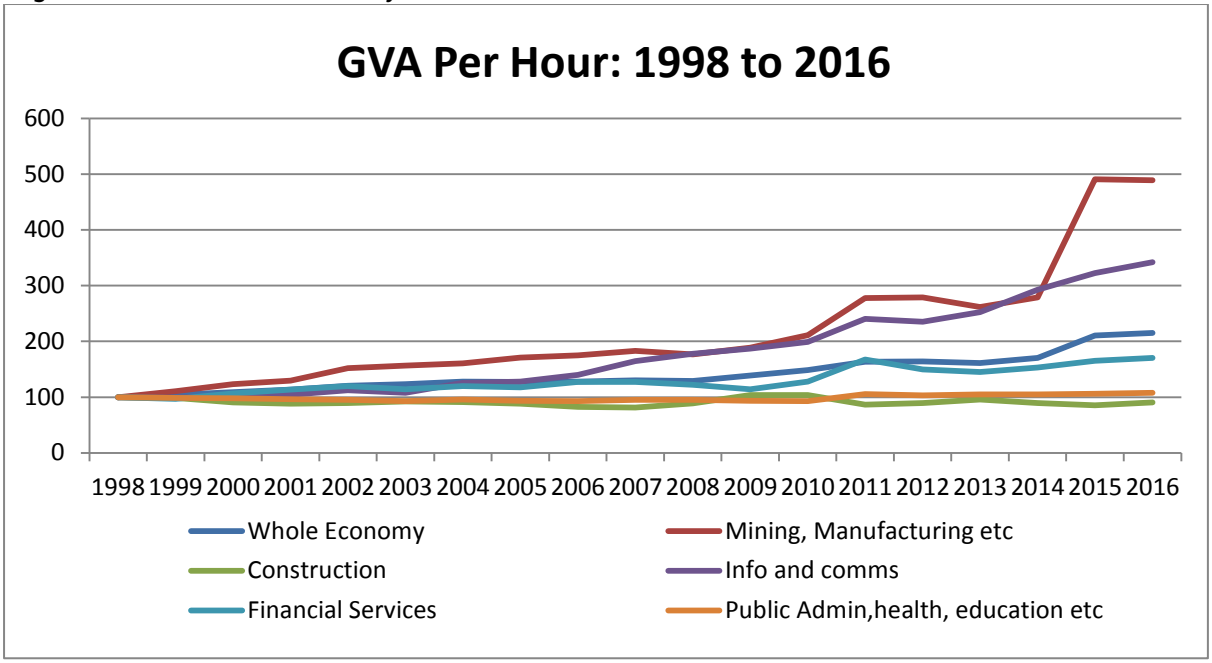
Practically all of the issues already discussed above have an impact on productivity through the following:

- Additions to the stock of capital assets, in particular additions to IPP assets,
- Changing methods of production where goods and services are produced abroad - domestic labour not utilised in production,
- Use of digital platforms to enable trade in goods and services.

CSO is currently engaged in a project to produce a range of productivity measures for the Irish economy covering labour productivity and capital services and total factor productivity. The plan is to produce a comprehensive annual productivity publication together with a quarterly release covering labour productivity.

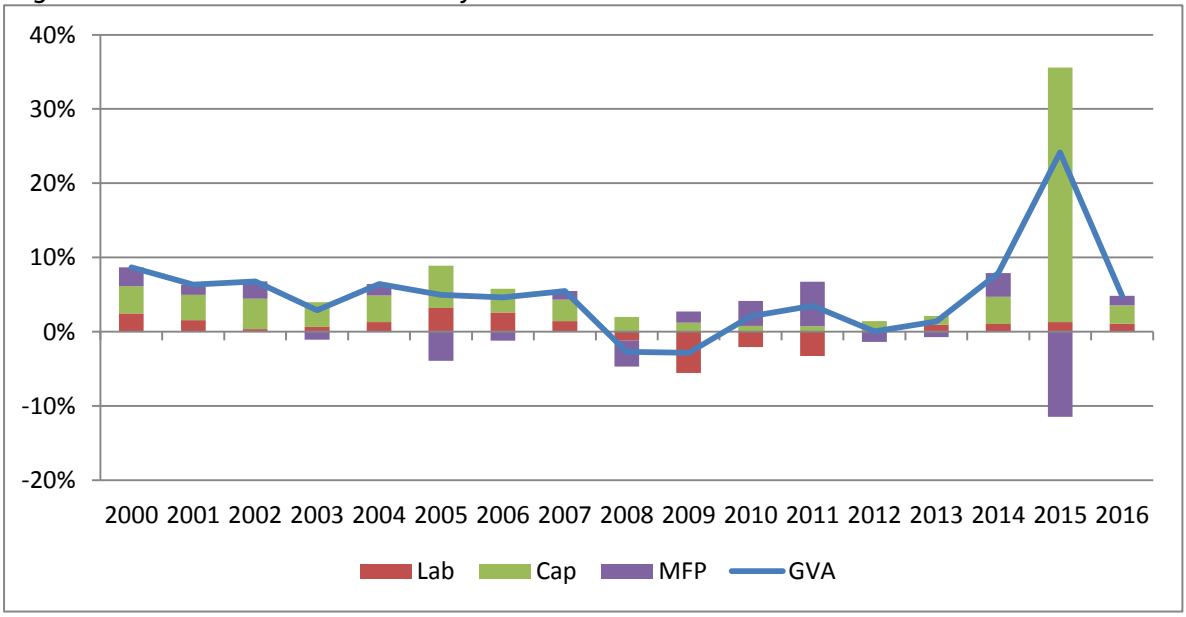
[10] See link for explanation of Satellite Accounts
http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Satellite_account

Figure 7: Labour Productivity



To illustrate the different presentations of productivity, in Figure 7 the impact of the changes in GDP in 2015 is shown in terms of the changes in Gross Value Added per hour. The limitations to this type of analysis in Figure 7 is really evident when Figure 8 is contrasted to this basic productivity analysis. In Figure 8 the impact of the substantial additions to intangible capital in 2015 with Labour inputs relatively unchanged is presented. This graph illustrates the impact of the increases in capital stock and GVA on Total Factor Productivity.

Figure 8: Multi Factor Productivity 2000 - 2016



The major challenge is the measurement of the impact of enormous additions to the capital stock of intangible assets that occurred in 2015 but continue to happen in 2016 and 2017. The work has entailed peer reviews by international experts of the progress to date. It is anticipated that the first publication will be available early this year.

Section 5: Redomiciled PLCs or Corporate Inversions

A number of large MNEs relocated their corporate headquarters to Ireland over the period 2009 - 2014. Each of the relocated entities owned a large block of foreign subsidiaries while at the same time there was little additional economic activity occurring in Ireland.

The impact of these entities on the economic data for Ireland was to dramatically increase the level of Foreign Direct Investment abroad, because all of the foreign subsidiaries of these redomiciled corporations are now classified as Irish owned. In addition, the related income earned by these subsidiaries is recognised as Irish Direct Investment Income. The undistributed element of these earnings, i.e. after accounting for dividends paid to shareholders, accrues directly to Ireland's Gross National Product and Gross National Income.

A series of measurement challenges result from these redomiciled corporations' activities; both from the interpretation of Irish FDI statistics and also the impact these activities have on Irish GDP and GNI.

These issues and the measurement challenges they pose are outlined in detail in the CSO Information note on this topic.[12]

A New Approach – ESRG Report

Throughout the previous sections of the note the discussions have in general centred on the approach followed by CSO when different issues have emerged relating to globalisation in Irish economic data.

The CSO approach had been to produce more detailed analysis of the issue to illustrate the impact on the various economic indicators such as GDP, Current Account Balance of Balance of Payments, etc.

An interesting way to illustrate this is to consider the number of tables in the Quarterly National Accounts (QNA) Release[13]. The first release on 25 November 1999 contained three tables. It was extended to six tables in Quarter 1, 2004[14]. However, as a consequence of the various additional analyses delivered in the annexes to the QNA

[12] http://www.cso.ie/en/media/csoie/methods/balanceofinternationalpayments/RedomiciledPLCs.pdf
[13] http://www.cso.ie/en/media/csoie/releasespublications/documents/economy/1999/qna_q11999.pdf
[14] http://www.cso.ie/en/media/csoie/releasespublications/documents/economy/2004/qna_q12004.pdf

that have been added over the years the current QNA for the third quarter of 2017 contains an additional twenty tables[15].

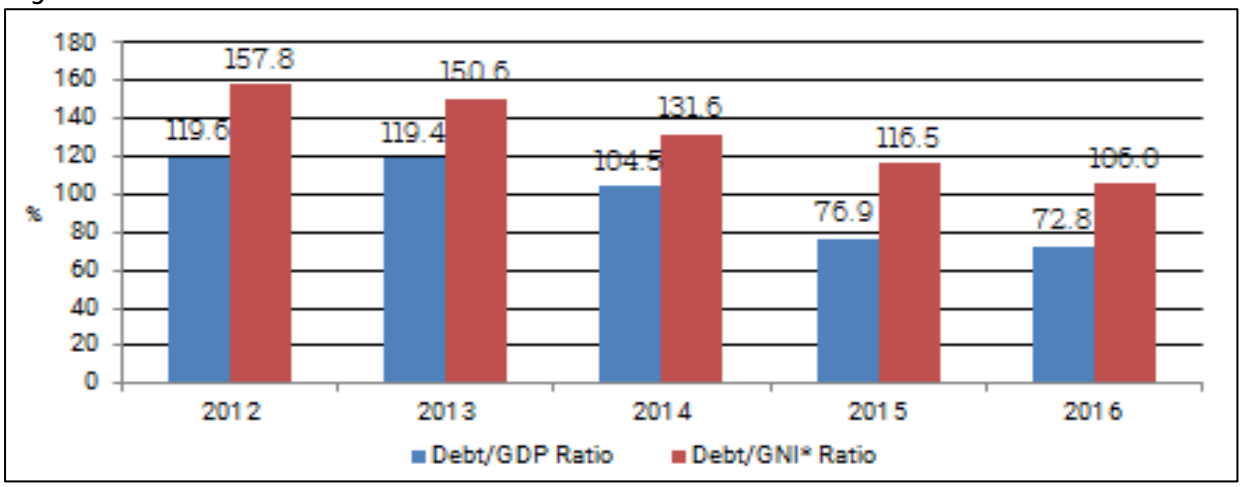
These tables have been added gradually to assist our users develop an understanding of the impact of globalisation on various elements of the National Accounts.

More recently, a new approach was followed in line with the recommendations of the Economic Statistics Review Group, (convened by the Director General of CSO and chaired by the Governor of the Irish Central Bank). A suite of new indicators was created and compiled, to assist users in understanding the economic results of 2015.

These new indicators included the following[16]:

Level Indicators: An adjusted indicator (GNI*) of the size of the economy, adjusted for the retained earnings of redomiciled firms and depreciation on foreign-owned domestic capital assets. See Figure 9 below for an illustration of the use of GNI* as a sustainability indicator for Government debt compared to GDP.

Figure 9: Debt/GDP and Debt/GNI* ratios



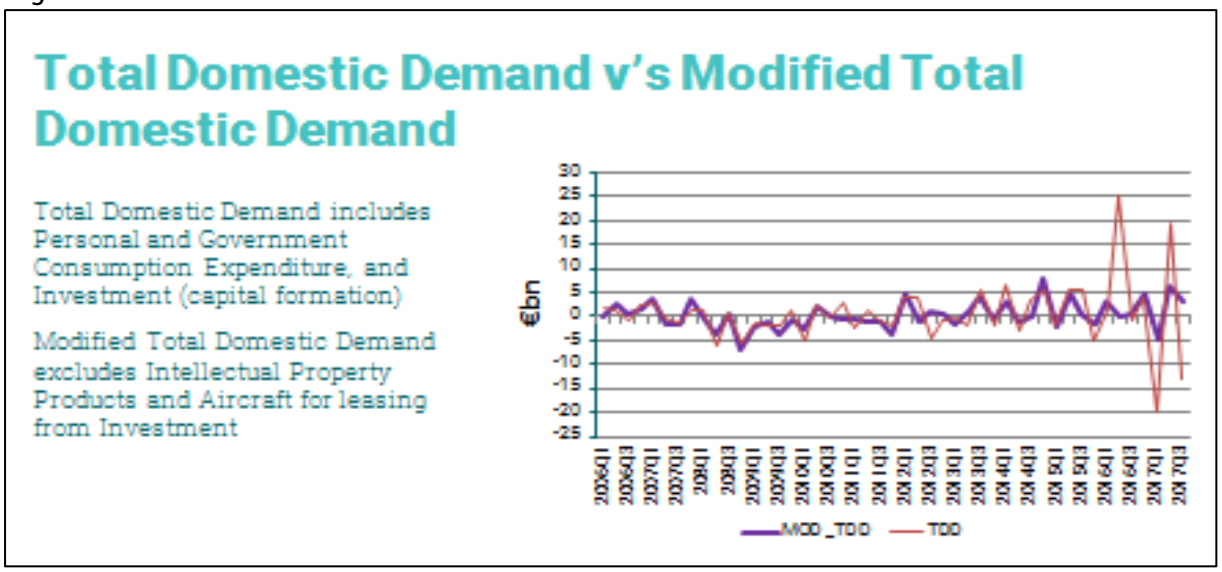
Corresponding adjusted presentations of the BOP/IIP, (Current Account Balance*) data are also produced.

[15] Current price and constant price presentations counted as separate tables
[16] For further details see Report of Economics Statistics Review Group
http://www.cso.ie/en/methods/nationalaccounts/newdevelopmentsandinformationnotes/

Structural Indicators: The implementation of a Large Cases Unit/Remainder presentation to elements of National Income and Expenditure accounts and the Non-Financial Sector of the Institutional Sector Accounts.

Cyclical Indicators: Quarterly publication of Modified Domestic Demand, an indicator of underlying investment and underlying domestic demand that take account of the impact of IP relocations, aircraft leasing. Figure 10 illustrates the difference between modified domestic demand and Total Domestic Demand. The reduced volatility is particularly evident for 2016 and 2017. In the modified presentation, publication of similarly-adjusted exports and imports data to provide more meaningful indicators of domestic trade in both current and constant prices are also produced.

Figure 10: Total Domestic Demand v's Modified Total Domestic Demand



These presentations of modified indicators recommended by the ESRG are a new approach by CSO where analytical outputs are produced outside of the standard frameworks for National Accounts and Balance of Payments statistics. The success of this approach was demonstrated by the uptake of the new indicators and their inclusion in the reporting of Domestic and International analysts on the Irish economy. These new indicators were used primarily in assisting commentators, analysts, policymakers and academics in understanding the impact of globalisation on the Irish economy. The CSO has emphasised that these new indicators should not be viewed as Official Statistics, but instead as analytical indicators created to assist analysts. They have been described as deglobalised indicators.

Summary

The measurement challenges arising from globalisation are many and varied. In this note I have outlined the key issues as they impact the Irish economy.

In some cases, the CSO is already well advanced in addressing the measurement challenges posed by Contract Manufacturing and identifying cases where a change in Economic Ownership occurs.

When it comes to aspects of the digital economy considerable progress has been achieved in the context of the LCU operations. However, work on the sharing or gig economy is still in the initial exploratory phase, although early indications are that this is not very significant in its impact on GDP. Nevertheless, these activities themselves are still in the early stages of development so there is no room for complacency.

The impact of globalisation on productivity measurement is a work in progress in CSO. It will deliver to analysts a critical analysis of the impact of the ongoing additions to the capital stock of IPPs on GDP and other measures of economic activity. Also, the impact of contract manufacturing can be observed where significant additions to value added occur that don't entail the use of domestic labour. The first publication on productivity in Ireland is due to be published in the early months of 2018.

The corporate relocations have been addressed comprehensively by CSO and the information note is particularly informative.

Finally, and critically the success of the new indicators; GNI*, Modified Domestic Demand, Current Account*, etc in communicating the impact on the Irish accounts of the dramatic globalisation events that occurred in 2015 clearly illustrates the value of this approach to explain economic developments in the Irish economy.