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Understanding the presence of MNEs in Ireland as an end user¹

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¹ This presentation was prepared for the meeting. The views expressed are those of the authors and do not necessarily reflect the views of the BIS, IFC, BoP, ECB or the central banks and other institutions represented at the meeting.

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Caroline Mehigan, Jenny Osborne-Kinch and Maria Woods¹

Abstract

Ireland is a highly globalised economy, as evident across trade and finance channels and also Multinational Enterprise (MNE) interlinkages. The role of the MNE sector in Ireland is greater than that for many other EU countries; MNEs are significant employers, exporters of both goods and services and taxpayers. This has made it increasingly complex in interpreting macroeconomic statistics in Ireland and specifically, in understanding the real domestic links to the economy from this sector. Given the size, extensive role and concentrated nature played by foreign owned MNEs in Ireland, this paper provides a broad structure to assist policy makers and statistical users in understanding their presence, benefits and vulnerabilities.

This paper first examines the importance of MNEs to the Irish economy drawing on Irish macroeconomic data and highlights the measurement challenges that exist. It then identifies approaches to better understand the activities of foreign MNEs located in Ireland and their possible response to key external developments. These can be assessed using market intelligence, firm-level analysis and case studies. Finally, potential opportunities linking new granular datasets are presented, which will be the basis of further work. While the findings are based on an Irish case study, they are of general interest, given the increasingly globalised nature of the economic and financial system.

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JEL classification: Globalisation, Multinational firms, National Accounts.

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1. Introduction

In recent decades, international trade has undergone significant change. Market liberalisation and improved technology have increased cross-border activity while the rise of Global Value Chains (GVCs) in production processes and Multinational Enterprises (MNEs) dominate certain industries and sectors. MNEs are large corporate structures that can easily leverage economies of scale and spread their operations across multiple countries. Further, the ability to restructure relatively quickly means that MNEs can minimise overall costs of production by locating in low-cost jurisdictions for profit maximisation purposes. Multiple factors determine their choice of corporate structure and in turn, the geographical location for each of the affiliated entities such as a stable business environment, access to an educated labour force, a competitive corporation tax regime and sustainable long-term macro-economic factors. While MNEs play an important role in the global economy (De Backer *et al.*, 2019) and can provide positive national spill-over effects (See Javorcik, 2004, Keller and Yeaple, 2009), higher levels of cross-country interconnectedness combined with the concentrated presence of large, complex corporate structures present data challenges for policy makers, risk analysts and statisticians.

To implement effective policy decisions, national policy makers need to understand and measure domestic economic activity and welfare. In this context, it is necessary to understand the impact of foreign MNEs in their country and disentangle their economic role relative to the domestic real economy. Reliable data and analysis are key to this role. Controlling for the impact of globalisation in economic data is, therefore, an active area of work for national accountants and the statistical community. The reform to the System of National Accounts (SNA, 2008) and its European counterpart (ESA, 2010) provided guidelines on how to account for business activities that were global in nature in the national accounts. Some open issues remain such as accounting for digitalisation, recording of intellectual property and research and development (R&D) expenditure (De Haan and Hayes, 2018), the role of Special Purpose Entities (SPEs), transfer pricing and the allocation of Gross Value Added (GVA) across different jurisdictions (Bundesbank, 2018).

Even within the statistical framework, the complex and evolving nature of MNE activities can, however, present measurement issues especially when the scale of their activities are large relative to a national economy (Stapel-Weber and Verrinder, 2018). Changes in business model strategies can lead to discontinuities in economic aggregates or discrete statistical movements that are unrelated to underlying driving forces in the real economy (Bundesbank, 2018). Confidentiality issues can also arise if a limited number of firms cause large movements in the data. Dealing with these confidentiality issues correctly may, conversely, create opacity for end-users of the data if certain aggregates must be removed. Further, if these firms or their affiliated entities have limited links to the real economy where they are located, the national data must be adjusted for effective policy making (Fitzgerald, 2018 and ESRG, 2016).

From a risk perspective, it is important to understand MNE group structures, their connections to other firms, their role in the economy and any sensitivity to changing market conditions. This applies both to assessing risk at the national level and when looking at global macro-financial conditions. Again, data issues and gaps are to the fore. Understanding these issues are particularly important for those organisations with a financial stability mandate in addition to those with monetary policy or fiscal

remits. Since the Global Financial Crisis, there has been increased willingness to bridge these gaps through the use of enhanced data collections and information-sharing initiatives. Some examples are the G20 Data Gaps initiatives and Cadestin *et al.*, (2018) on the OECD's Activity of Multinational Enterprises (AMNE) database. On the data side, the use of consolidated figures, where available, both at national and at an international level to complement national, resident data is favoured in financial stability work (See Tissot, 2016).

This paper contributes to the literature and analytical work on MNEs by presenting a broad approach implemented on Irish data to bridge certain data gaps in risk and policy analysis. Ireland is a very useful case study given the role of multinationals in the country since the early-1970s. Ireland is a highly globalised economy, as evident across trade and finance channels and also MNE interlinkages. The role of the MNE sector in Ireland is greater than that for many other EU and OECD countries. This has made it increasingly complex in interpreting macroeconomic and financial statistics in Ireland and specifically, in understanding the real domestic links to the economy. Also their outsized contribution relative to the domestic real economy highlights data distortions that can occur in a small open economy setting. While there are domestic MNEs present in Ireland, those with a foreign parent are of interest to this paper given their relatively larger size and sectoral concentrations.²

From a central banking perspective, there may be solutions to remaining data limitations on MNEs. First, the aggregate data reveal that MNEs are concentrated by sector and by geography. Therefore a monitoring framework that takes these concentrations into account is necessary for a complete risk assessment. Second, as national statistics often come with a significant lag, market intelligence and monitoring firm's financials can bridge the gap. Given the number of high profile MNEs are located in Ireland, anecdotal or local market intelligence can provide important insights and complement traditional research. Finally, the creation of granular statistical databases and registers (e.g., Anacredit, Centralised Securities Database (CSDB) and Register of Institutions and Assets Database (RIAD)) combined with the OECD's Analytical Database on Individual Multinationals and Affiliates (ADIMA) offers opportunities for network analysis both within and across MNE corporate structures. Given the extensive role and concentrated nature played by MNEs in Ireland, any shock to this sector could, therefore, have significant real effects.³ It is therefore important, from a policy and risk perspective to understand both the potential origin of such shocks and the transmission channels through which such shocks could impact the Irish macro-financial environment.

The paper proceeds as follows; section 2 shows the economic contribution of foreign owned MNEs in Ireland using aggregate macroeconomic data with a brief discussion of the data distortions and gaps for analytical purposes. Section 3 aims to bridge some of these data issues from a risk perspective by discussing the importance of sectoral analysis in the Irish case. Using recent experience, the benefits of complementing data with soft information such as market intelligence are also discussed. Section 4 presents the architecture and a broad outline of the

² Within the MNE category, there are both firms that are foreign-owned and firms that have an Irish parent. According to a CSO definition, having more than half of their sales revenue abroad differentiates Irish MNEs from other Irish firms. In this paper we assume foreign owned MNEs are MNE whose ultimate controlling parent is abroad.

³ See Lane, Philip. R. "Tail risks and the Irish Economy", speech delivered at UCD, 29 April 2019.

methodology underlying the design of a firm level data model; a summary and conclusion are contained in the final section.

2. National Accounts: What do they tell us today?

Economic contribution of foreign owned MNEs

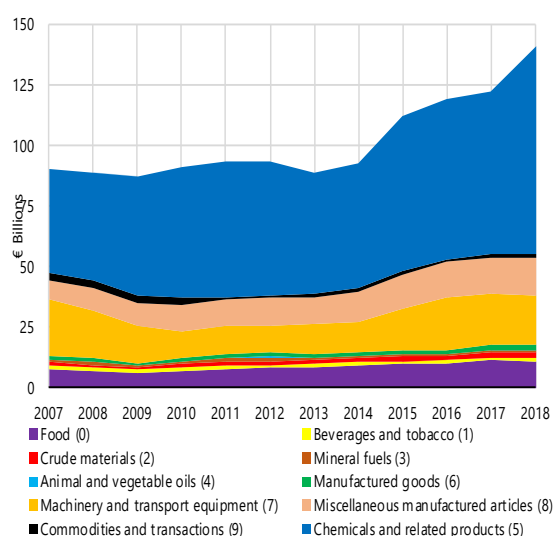
Foreign direct investment and MNEs have been an important part of the Irish economic landscape since the 1970s. Some of the key factors that influence MNEs' decisions to invest in a country include; demographics, education and skills, competitiveness on wages, infrastructure and taxation. In line with changing trends in international trade and technology, the profile of foreign owned MNEs has altered over time. More recently, the production of pharmaceutical products, medical devices along with technology are key sectors in terms of export share. According to IDA Ireland, all of the world's top ten pharmaceutical companies, and nine of the top ten medical technologies firms are located in Ireland.⁴ Although much of their activities are focused on global markets, foreign owned MNEs make an important contribution to the Irish economy. Specifically they are significant employers, exporters of both goods and services and contribute to tax revenue. Other potential indirect benefits could include knowledge spill-overs to indigenous firms and potential multiplier effects in the form of job creation in associated firms.

Ireland is a highly globalised economy. In terms of trade, the Irish economy is one of the most open in the world. Total gross exports in 2017 amounted to 120 per cent of GDP. Furthermore, the amount of domestic value-added (output) that meets foreign final demand, an indicator of openness, is significant at 63 per cent using 2016 data from the OECD Trade in Value Added (TiVA) database. This is one of the highest in the OECD, second only to Luxembourg. Focusing in on the top 20 exporting MNEs, firms in the technology, medical technology and pharma sectors accounted for 83 per cent of the exports of this group in 2015.⁵ At a national aggregate level, the export base is highly concentrated in a small number of sectors. Merchandise exports have long been dominated by chemical products (i.e., 61 per cent in 2018), while the contribution of computer services to services exports has increased substantially in recent years (i.e., 46 per cent in 2018) (Figures 1 and 2). Aggregate export levels increased by 10.4 per cent in 2018 but this was predominantly driven by a small number of products in the chemicals sector.

⁴ IDA Ireland is the Industrial Development Agency, a non-commercial, semi-state body promoting Foreign Direct Investment into Ireland.

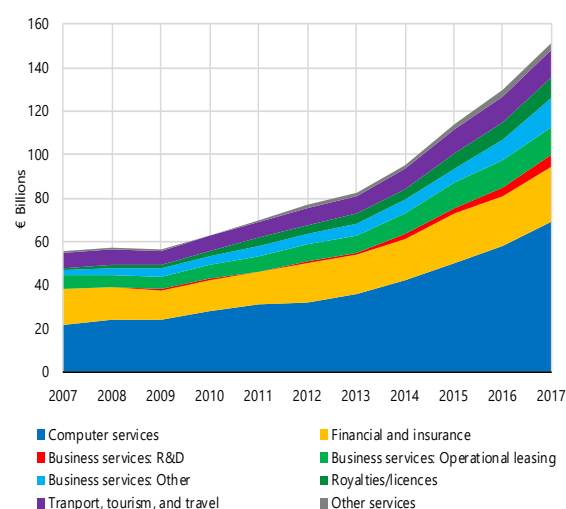
⁵ Using The Irish Exporters Association (2015) "Top 250 Exporters in Ireland and Northern Ireland 2015", The top foreign MNEs by exports in technology, medtech, and pharma are: Google, Apple, Microsoft and Facebook, Adobe, Dell, Intel, Oracle, VMware, and Western Digital, Abbott Lab, Alexion, Allergan, Baxter, Boston Scientific, Gilead, Johnson & Johnson, Mallinckrodt, Medtronic, McKesson, Merck, Perrigo, and Pfizer.

Figure 1: Merchandise Trade Exports



Source: CSO

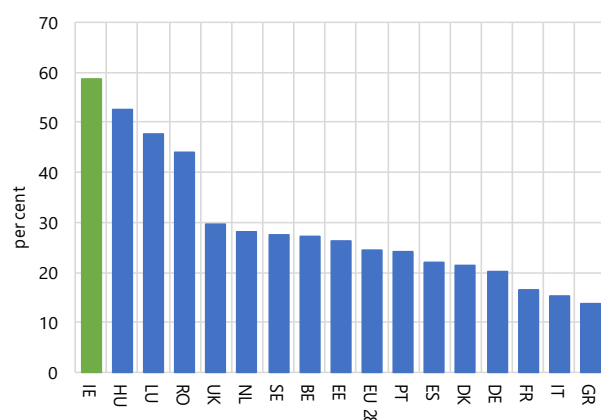
Figure 2: Services Trade Exports



Source: CSO

The contribution of MNEs to domestic output as measured by Gross Value Added (GVA) is large compared to European peers (Figure 3). Within sectors, the value added of the pharma and computer and electronic sectors in manufacturing is almost entirely driven by MNEs.⁶ However, as much of the profit from these activities flows to foreign owners, the direct contribution to Net National Income (NNI) through wages and corporation tax paid – is estimated to be less (See Fitzgerald, 2018).

Figure 3: Sizeable MNE contribution to GVA (2015)

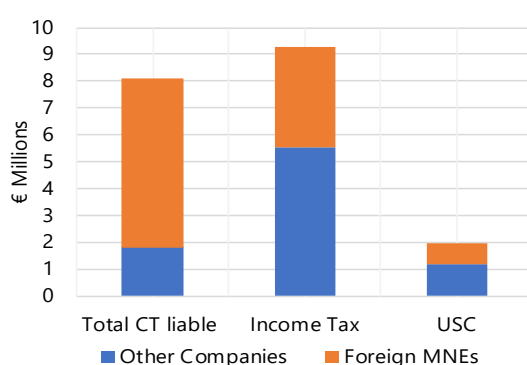


Source: Eurostat and Central Bank calculations

⁶ OECD Activity of Multinational Enterprises (AMNE) Data for 2012

Research has shown that taxation plays a key role in the location decisions of MNEs (Lawless, Morgenroth and O'Toole, 2014) in addition to the legal system, political stability, agile and educated labour force and English language. In Ireland, MNEs make a significant contribution to the exchequer. According to Revenue (2014), between 2008 and 2012, foreign owned MNEs accounted for three quarters of the corporation tax paid in the State with sectors such as Finance, Information and Communications Technology and Manufacture of Pharmaceuticals contributing the most over this period.⁷ The latest figures for 2018, show that MNEs accounted for almost 80 per cent of corporation tax (CT) receipts in 2018 (Figure 4).^{8,9} Further, MNEs account for 40 per cent of income and Universal Social Charge (USC) charges in 2018.

Figure 4: MNE tax contribution (2018)



Source: Revenue Commissioners.

Although much MNE activity is focused on global markets, these entities contribute substantially to employment in Ireland. Foreign owned MNEs account for one in seven jobs in Ireland. This number could be higher still if indirect employment through firms that have grown to service MNEs and their employees could be counted leading to positive multiplier effects. In terms of the controlling parent, US firms account for almost 40 percent of MNE employment which is not surprising given the established role of US foreign direct investment in Ireland.¹⁰ Of course, certain sectors (e.g., manufacturing and retail) are more labour intensive than others within the MNE category.

⁷ <https://www.revenue.ie/en/corporate/documents/research/corporation-tax.pdf>

⁸ <https://www.revenue.ie/en/corporate/documents/research/ct-analysis-2019.pdf>

⁹ Despite an increase in the number of contributors, CT receipts are currently quite concentrated in Ireland with 100 largest companies paying the vast majority at 70 per cent (See Revenue, 2019 and Conefrey et al, 2019 for an analysis of the potential issues for public finances arising from reliance on higher, more volatile corporation tax receipts).

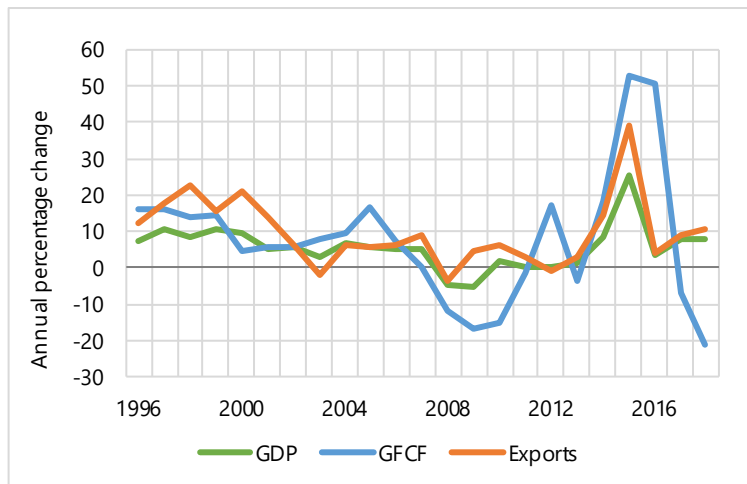
¹⁰ By ultimate investor, the US had a position of €519.5 billion of a total of €717 billion inward FDI in 2017.

National Accounts, distortions and MNEs

Due to the established and significant presence of foreign owned MNEs in a small economy such as Ireland, statisticians and economists have long considered their impact on both economic data and related analysis. More recently, there has been considerable volatility in the Irish data due to changes in business model operations by large foreign MNEs. Further, the implementation of ESA 2010 combined with certain activities by MNEs has also led to large movements in key economic aggregates which are unrelated to underlying domestic activity.

One notable recent example was the 2015 increase in real GDP by 25.2 per cent, which made international headlines and was significantly out-of-line with 2014 figures of 8.6 per cent per annum and underlying activity. Trade and investment figures for Ireland also experience considerable volatility as a result of MNEs (See Figure 5).

Figure 5: GDP, GFCF and Exports for Ireland (constant market prices)



Source: CSO and Central Bank calculations

Note: GFCF is gross fixed capital formation

According to Fitzgerald (2018), recent volatility in national accounts relate to the growth of both the aircraft leasing sector and in activity by re-domiciled PLCs; patent changes for large pharmaceutical companies and the capital transfer of international assets such as intellectual property (IP) to affiliated entities located in Ireland.^{11, 12}

In terms of re-domiciled PLCs, while they have moved headquarters to Ireland, they contribute little to employment or enhance domestic factors of production (See Avdjiev *et al.*, (2018)). Such entities can, however, create distortions to external accounts given that they generally retain a significant proportion of earnings so their market value is high. The current account balance can therefore be affected given

¹¹ The growth in the aircraft leasing sector in Ireland and its impact on national investment and trade figures is discussed further in Fitzgerald (2015) and is a further example of the effects of globalisation on the national accounts of a small open economy.

¹² For further discussion on the patent cliff please see section 3. The distortions associated with aircraft leasing are not discussed in detail here. For further detail please see Fitzgerald (2015).

the shortfall between outflows and inflows from this sector (Fitzgerald, 2018). In recognition of the fact that although these re-domiciled entities are Irish by definition, their activities have limited links to the domestic economy, their accounts are presented separately as sub sector S11.c. of the NFC category in the institutional sector accounts.

The transfer of intellectual property (IP) assets to affiliated entities in Ireland is considered to have contributed significantly to the 2015 increase in GDP. Such expenditure on R&D is now included in national investment in line with ESA, (2010) and following the principle of economic ownership (See De Haan and Hayes, 2018). Also according to Bundesbank (2018), the licencing income arising from the transfer of these IP products increased exports significantly. IP is important to both IT and Pharma companies which are dominant sectors in Ireland.

Such distortions complicate fiscal policy discussions and the assessment of domestic financial stability which in turn, supports macroprudential policy decisions. For example, many macro-financial risk indicators rely on economic activity as a benchmark for public and private indebtedness levels. The distortion of trade figures also makes the assessment of Ireland's external position through the current account balance problematic. Productivity figures and institutional sector accounts are also affected by MNE activity requiring separate releases for foreign MNEs versus indigenous firms. Confidentiality issues also arise if activities of a small number of firms explain movements in one economic aggregate: dealing with such movements can complicate analysis at sector level.¹³

In Ireland, work is underway to understand the role of MNEs in national economic aggregates and aid interpretation by end-users by Irish statisticians. Some examples are the establishment of a large cases unit (LCU) by the national statistics office (The Central Statistics Office (CSO)) to understand large foreign-owned MNEs and the publication of separate statistics and methodological notes on this sector for end-users of national accounts.

As labour market developments and other measures of domestic demand such as consumption remain relatively unaffected, they provide an alternative measure of underlying national activity for economists. In response to the 2015 distortion and subsequent volatility in the national accounts, the Economic and Statistical Review group (ESRG) was established in Ireland to provide a useful guide for policymakers when analysing Irish macroeconomic data. The ESRG created a number of alternative metrics to aid policymakers and market analysts modified domestic demand and modified current account indicator (ESRG, 2016).

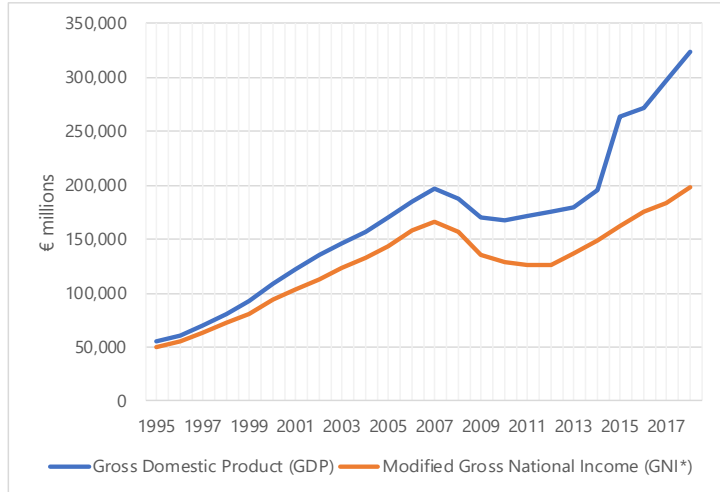
An example of one of these alternative measures introduced by ESRG is Gross National Income (GNI*) which is a measure of Irish economic output which excludes the depreciation on foreign-owned IP and leased aircraft, and also makes an adjustment for the profits of re-domiciled PLCs. This metric therefore may provide a more accurate picture of economic growth in Ireland (Figure 6).

The group also created a number of further recommendations to deal with these issues. To aid end-users when analysing MNEs and broader globalisation issues in

¹³ For example, in 2018, it was necessary for confidentiality reasons to merge together different sectors (e.g. Nace Rev.2 divisions 18, 21, 26, 27 & 32.5).

Ireland, the CSO provides information releases on key sectors such as aircraft leasing and the link between re-domiciled plc and Balance of Payments.^{14, 15}

Figure 6: GDP and GNI* (Current Market Prices)



Source: CSO and Central Bank calculations

Complementarily to national statistics (i.e. Sectoral, Financial Accounts, Balance of Payments), there is a need to move beyond the aggregates and the use of micro data is considered an important way forward. Such work is also reflected at a European level as detailed by Bundesbank (2018).

However, there are some remaining gaps in knowledge that can be filled by sectoral analysis and market intelligence as discussed in Section 3. Combining the information provided from market intelligence, case studies, monitoring firm financials and external developments can provide additional insights to understanding the presence of MNEs in Ireland and their responses to the evolving global landscape. Such information can facilitate scenario analysis, for example a shock to corporation tax receipts or employment in the MNE sector and investigating the corresponding real effects using structural macroeconomic models of the economy.

3. How can we enhance this information?

While national statistics are one way of understanding the economic landscape, they often come with a significant lag. Speaking with market participants can provide more timely information. Furthermore, in a country where the number of big firms is very concentrated, market intelligence, monitoring firm financial information or case studies can provide additional insights. In order to increase the understanding of the MNE sector, and the tail risks associated with such a dependence, as end users, staff

¹⁴ <https://www.cso.ie/en/statistics/internationalaccounts/aircraftleasinginireland/>

¹⁵ <https://www.cso.ie/en/releasesandpublications/in/rpibp/redomiciledplcsintheirishbalanceofpayments/>

in the Central Bank have started monitoring the sector beyond national statistics. This has been conducted in a three pronged approach i) market intelligence, ii) monitoring the larger firms and the sectors they operate in, and iii) MNE case studies.

Market Intelligence

Using market intelligence (MI) or qualitative information to enhance an understanding of a sector or industry is often used by and across institutions. For example, the approach of speaking to firms or market participants is conducted at the ECB via the non-financial business sector dialogue. The dialogue helps to inform the ECB about the business sector's views on the economic situation and thereby deepen its understanding of economic developments and issues relevant to policymakers.¹⁶ In the context of MNEs, the Deutsche Bundesbank and Banque de France worked together to better understand and explain the contribution of MNEs in their Balance of Payments (BoP) (Mosquera Yon & Walter 2018). This involved the exchange of information between the central banks, and also collaboration with the multinational enterprises involved.

Staff in the Central Bank of Ireland started gathering market intelligence on the MNE sector in 2019. This approach was developed in order to better understand the possible responses of MNEs located in Ireland to the many external developments for example, to the global tax and trade landscape. The MI involves quarterly meetings with professional services firms, industry experts and at times, the MNEs themselves. Mainly, the meetings focus on the trends in the sector. The MNEs are not identified in line with the confidentiality conditions of the firms, unless speaking directly with the MNE. These meetings are conducted on the understanding that the material is confidential and the resulting analysis would be compiled along Chatham House rules, circulated to a limited group (as necessary) and not be published.

To illustrate, in 2019, the main external developments and the possible implications for the activities of MNEs discussed in the interviews were:

- Trade tensions affecting the investment decisions of MNEs
- US tax reform
- OECD BEPS 2.0 process
- Brexit
- Onshoring patterns of intellectual property
- Competitiveness of Ireland for FDI relative to other destinations

The information increases our understanding of international corporate taxation and trade developments and how firms are responding to changes. It has also provided information which has helped to clarify movements seen in the national accounts, and at times served as a signal of movements to come. This channel could serve as an early warning system for potential future shifts in behaviour.

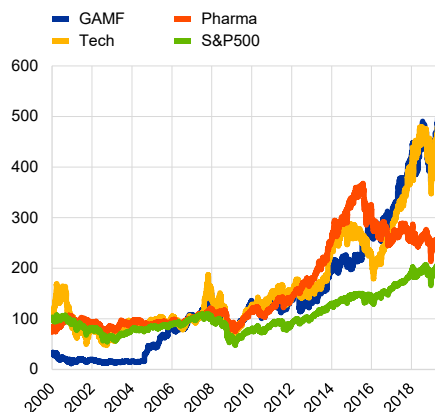
¹⁶ For further details please see <https://www.ecb.europa.eu/mopo/devel/html/nfbd.en.html>.

Monitoring the MNEs

Firm level information provides insights into the opportunities and challenges firms face and a deeper understanding of the sectors in which they operate. The concentrated nature of the MNE sector in Ireland merits firm level analysis. A shock or organisational change to one firm or industry could have significant implications for statistics, trade or employment. Firm level analysis of these MNEs can help monitor areas of vulnerability and benefits for the Irish economy more broadly.

A closer look was provided in “MNEs in Ireland: A firm level analysis” (Emter et al 2019). Financial indicators of the top MNEs in Ireland (as defined by their exports) were examined. When thinking of the resilience of the economy, it is important to consider the prospects of these MNEs and the sectors in which they operate. In this way, the equity prices and profit performance of the firms are informative (See Figure 7). In addition, the growth in forecast earnings for these sectors can be helpful. How the firms operate, from operating expenses and revenue ratios, to capital expenditure, assets and the role of intangibles, all add to the understanding of the firms and the risks they face (see Figure 8). For example, Pharma exhibited a relatively low capital expenditure coupled with relatively high operating expenses to revenue compared to the technology focused MNEs.

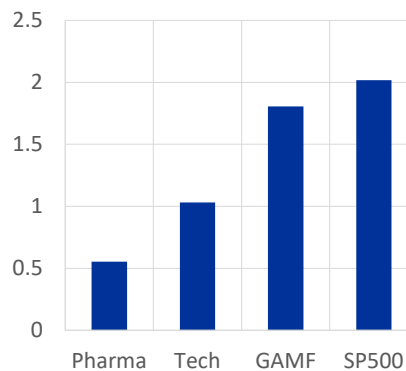
Figure 7: Equity Performance vs S&P 500



Note: Index: 2007=100, average within group. Based on 24 large MNEs operating in Ireland. GAMF refers to Google, Apple, Microsoft and Facebook. Tech consists of 6 companies: Adobe, Dell, Intel, Oracle, VMware, Western Digital. Pharma includes 14 companies, namely: AbbottLab, Alexion, Allergan, Baxter, BostonScientific, Gilead, Johnson & Johnson, Mallinckrodt, Medtronic, McKesson, Merck, Perrigo, Pfizer, and Takeda.

Source: Emter et al (2019)

Figure 8: Capital Expenditure to Assets Ratio



Note: Based on 24 large MNEs operating in Ireland. GAMF refers to Google, Apple, Microsoft and Facebook. Tech consists of 6 companies: Adobe, Dell, Intel, Oracle, VMware, Western Digital. Pharma includes 14 companies, namely: AbbottLab, Alexion, Allergan, Baxter, BostonScientific, Gilead, Johnson & Johnson, Mallinckrodt, Medtronic, McKesson, Merck, Perrigo, Pfizer and Takeda.

Source: Emter et al (2019)

Beyond the financial indicators of the firms themselves, the importance of monitoring issues from global trade tensions and tax reform, to market power and anti-trust concerns is also recognised.

Sectoral case studies

In addition to MI and firm financial indicators, case studies can add a further layer of detail to our understanding of these entities, especially how their activity is reflected in the national statistics and potential risks to particular products or services. Given the high concentration and size of activities of some of the MNEs, case studies can especially inform some of the statistical distortions we see in the data. For example, a closer look at one of the recent statistical distortions suggests that it may have been due to the global restructuring of an MNE. This case study also highlighted the role of the group when analysing these firms - different subsidiaries can be mainly used for sales, while others are used to hold intellectual property. Corporate inversions, on-shoring of IP and the patent cliff are other instances where case studies have informed the interpretation of statistics.

Irish merchandise exports are becoming increasingly concentrated in pharmaceuticals with remaining growth attributable to the computer hardware sector (Byrne *et al.*, 2020). Using disaggregated trade data, a Herfindahl-Hirschman index illustrates that Ireland's merchandise export basket is higher than most other EU countries, second only to Cyprus. Given the concentrated nature of Irish exports, for example the relatively high concentration of antisera and blood vaccine products in merchandise exports (Byrne, 2019), a clear understanding on the firms producing these products is beneficial. A shock to one or two firms or products could result in a significant downturn in Irish exports.

In terms of product risks, the so-called "patent cliff" is one such example of a risk to the economy. The role of patents is important for the pharmaceutical and medical technology sectors. Between 2011 and 2013 the patents for a number of "blockbuster" drugs produced in Ireland were due to expire. The "patent cliff" was a significant concern for the sector and Irish trade and growth statistics. Between the end of 2011 and the end of 2012, the patent on a number of drugs produced in Ireland expired. There was a significant fall in revenue for one company which led to a reduction in Irish exports and gross value added. Despite the large movements in the headline statistics, employment remained unchanged (Fitzgerald, 2013).

4. New data sources and opportunities to explore further?

Mapping MNE corporate structures is an important part of building up knowledge of the interlinkages across MNE firms, between MNEs and with systemically important firms such as domestic banks. This knowledge is key to understand the potential macro-financial channels through which shocks or structural changes could propagate in Ireland. There are already a number of ongoing initiatives led by international organisations such as the OECD and NCBs including Banco de Portugal (Pinto, Neves and Pereira, 2018) in this space. In this section we present a broad architecture being designed to help bridge data gaps from a Central Bank perspective and understand MNE interlinkages. The authors identify the potential opportunities surrounding a number of Eurosystem granular datasets, and look to link these datasets with internationally available databases such as the OECD's ADIMA database, in order to understand MNEs and their complex ownership structures. This includes matching information from the OECD ADIMA database with reference data in the

Central Bank of Ireland (Central Bank) institution database in combination with micro level data on loans and securities. Its first objective is to map out the corporate structures and examine counterpart and credit data for foreign controlled corporations. Figure 9 presents the initial model in its infant stages. The building blocks of the data model are explained in more detail below.

Data Model Steps

1. As a first building block, the ADIMA database was used to develop the multinational financial interlinkages database, and more specifically, data on MNEs associated with Ireland - Irish affiliates. This database contains information on the affiliate name, parent name and legal entity identifier (LEI) code for Irish affiliated companies. An LEI is a unique global identifier of entities that participate in financial transactions. At the time of writing this paper, there were 593 Irish affiliates belonging to 67 MNE's with a presence in Ireland from the OCED's ADIMA dataset.¹⁷ Of this, 296 out of the 593 Irish affiliates found on ADIMA had an LEI recorded. Using name matching, one can retrieve affiliates LEIs and Irish Company Registration Office (CRO) numbers (Irish National Tax Identifier) from the LEI Register and Irish CRO Database respectively¹⁸. This enriches the data on Irish subsidiaries, enabling analysis where LEI or other indicators are unavailable in ADIMA.
2. Using a combination of Irish CRO Numbers and LEIs (attained from Step 1), along with name matching, it is possible to search affiliates against the Central Bank's Institution Database (Master Central Bank Database).¹⁹ This database provides counterparty reference data (using Anacredit²⁰) for affiliates including details on address, number of employees, annual turnover, as well as credit data related to each affiliate including details on the bank/agent providing credit, the type, value and maturity of the credit instrument, as well as the interest rate. Identifying the relationship builders, one can begin the process of mapping out the corporate structures.
3. This can include connecting to the CSDB (Central Securities Database) on the basis of Irish CRO Numbers, LEIs and name matching, thereby obtaining data on securities issued by affiliates.²¹ Additionally, ISIN (International Securities Identification Number) codes, a code that uniquely identifies specific securities issued, can be attained from the CSDB Database. The ISIN code provides a

¹⁷ ADIMA currently covers 100 of the largest global MNEs at end 2018. It is to be extended towards 500 by 2020. Five selection criteria were created for MNEs to be included in the ADIMA database. These included revenues, stock listing and whether a multinational has an online presence. The selection of MNEs covers enterprises with headquarters in 16 countries.

¹⁸ The LEI Register contains data on companies that possess a Legal Entity Identifier (LEI). The Irish CRO Database provides data on companies that bear an Irish CRO Number; an Irish CRO number is a Irish National Tax identifier, unique to Irish companies.

¹⁹ Central Bank of Ireland's Institution Database is a Central Bank Master Database.

²⁰ Anacredit is a dataset with detailed information on individual bank loans in the euro area. The name stands for "analytical credit datasets". <https://www.ecb.europa.eu/explainers/tell-me-more/html/anacredit.en.html>.

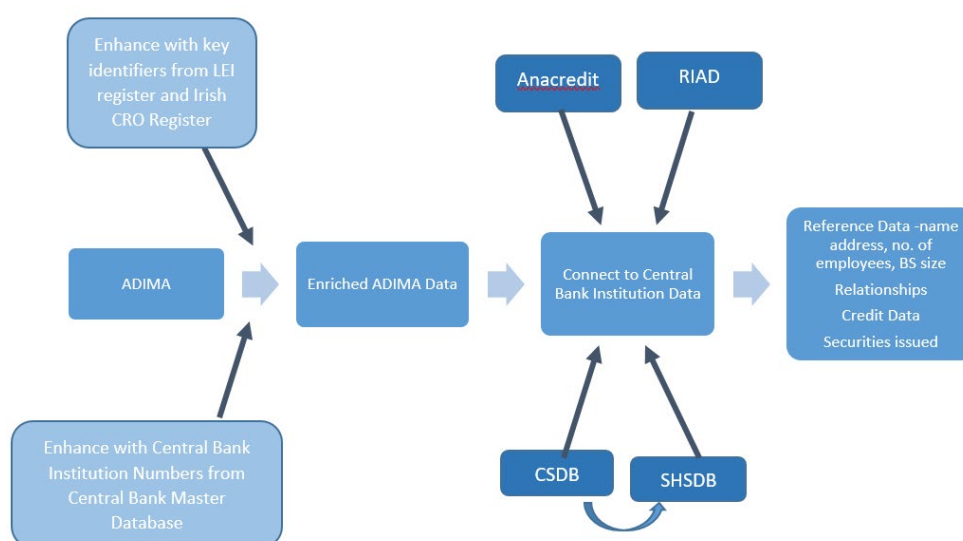
²¹ Central Securities Database (CSDB) contains data on securities and their issuers. <https://www.ecb.europa.eu/pub/pdf/other/centralisedsecuritiesdatabase201002en.pdf>.

valuable identifier to facilitate connection to additional databases, thus allowing further analysis on securities issued by the ADIMA affiliates.

4. Finally, using the ISIN code identified from the CSDB Database, the SHS (Securities Holding Statistics) Database can subsequently be examined.²² The SHS, which is collected on a security-by-security basis, provides information on securities held by selected categories euro area investors. This exploration of the SHS Database provides, where possible, information on the country and sector of holders of the debt and equity issued by affiliates.

Enriching information from the ADIMA database with key identifiers such as the LEI and CRO number, one can connect to the Central Bank's Institution database (which includes information from Anacredit and RIAD). It is possible then to map out the parent structure and also potentially understand the financial linkages. The next step of the project is to assess the quality of the data and explore further the uses of the SHS Database. The LEI identifier is an important part of the mapping process, and in these vain, initiatives to promote the use of LEIs should be pursued.

Figure 9: Overview of Data Model



²² Securities Holding Statistics (SHS) Database contains information on holders of debt and equity. https://www.ecb.europa.eu/stats/financial_markets_and_interest_rates/securities_holdings/html/index.en.html.

5. Summary and Conclusions

While MNEs play an important role in the global economy and provide positive national spill-over effects; higher levels of cross-country interconnectedness combined with the concentrated presence of large, complex corporate structures present data challenges for policy makers, risk analysts and statisticians.

There has been significant progress both at national and at international level in enhancing the analysis of this sector through the collection and discussion of data on this sector. At a national level, the establishment of the ESRG and the publication of its 2016 Report provided guidance and recommendations to support economic analysis. At an international level, the G20 Data Gaps Project and the publication of the AMNE database by the OECD are just two examples of on-going work in this area.

From a central banking perspective, bridging data gaps to complete both risk assessments and economic analysis is important. Therefore this paper introduces a broad structure applied to Irish data to bridge certain data gaps in these areas. Ireland is a very useful case study given that the role of the MNE sector in Ireland is greater than that for many other EU and OECD countries. Further, given the extensive role and concentrated nature played by MNEs in Ireland, any shock to this sector could, therefore, have significant real effects. It is therefore important, from a policy and risk perspective to understand both the potential origin of such shocks and the transmission channels through which, such shocks could impact the Irish macro-financial environment.

This paper presents, from an end user perspective how the aggregate national accounts data can be complemented by both quantitative and qualitative information to inform risk and policy assessment. The sectoral and firm level approach assists the analysis given the heterogeneity of firms within the MNE sample and the differing risk profiles across these sectors. The market intelligence network, drawing on key market analysts, MNE consultants and MNEs themselves provides a forum to gain early insights into the sector's activities and any sensitivity to macro-financial developments. Further, initial work in the area of mapping the corporate structure of MNE entities using micro data will allow greater understanding of firm interlinkages. Such work is an important building block to assessing cross-sector interconnectedness.

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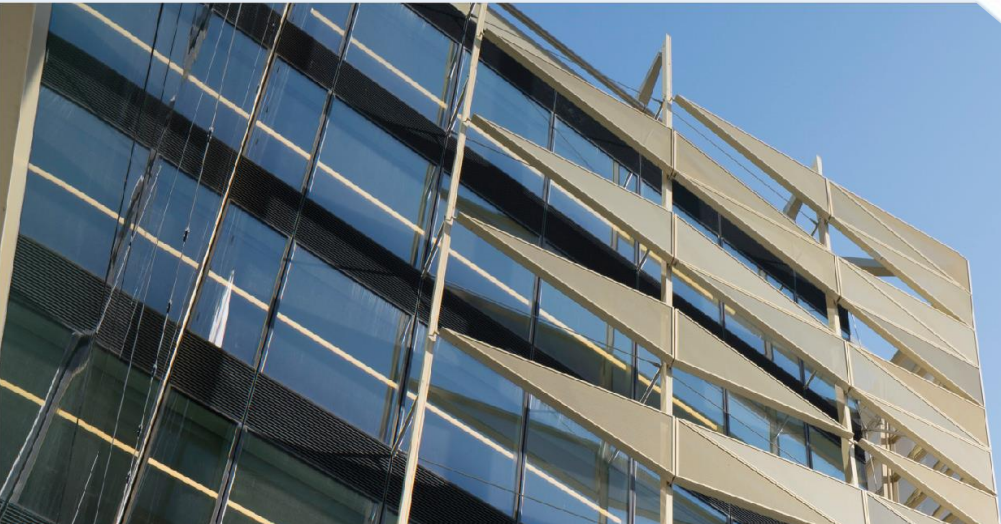
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Understanding the presence of MNEs in Ireland as an end user

External Statistics Conference 17/18 February 2020

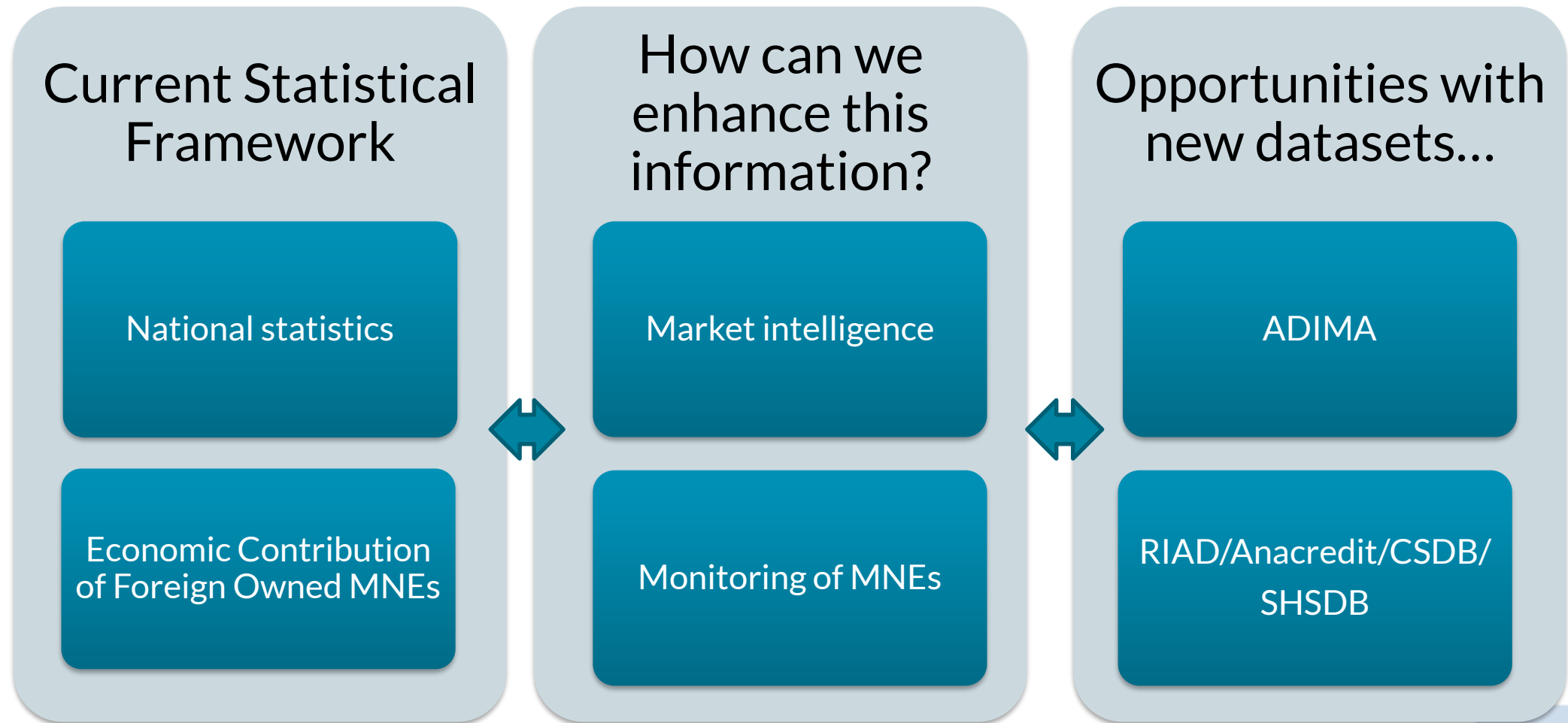
Jenny Osborne-Kinch*, Caroline Mehigan and Maria Woods

The views expressed are not necessarily those of the Central Bank of Ireland

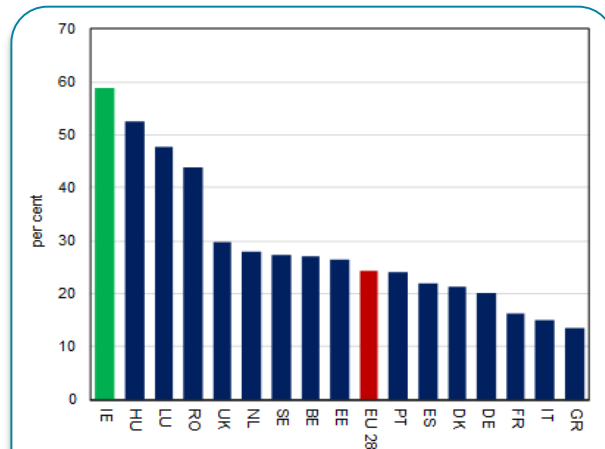
Introduction/Motivation

- Importance of MNEs for global trade ; provide positive national spill-overs but
 - corporate structure can be complex and span multiple jurisdictions
 - poses challenges for statisticians, analysts and policy makers
- Statistical initiatives to bridge data gaps and enhance understanding
- Issues remain as an **end user** and Central Bank
 1. Aggregate data mask important sectoral/firm heterogeneity
 2. Macroeconomic data released with a lag
 3. To assess risk at national level need to know financial linkages within individual MNEs (entity level), across the sector and with other systemically important firms
- Present broad structure to bridge these data gaps in Ireland





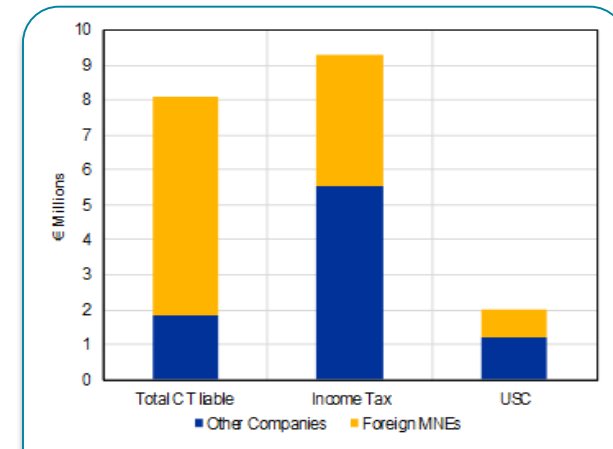
Economic contribution of foreign owned MNEs significant



Economic Activity (GVA)

- 1 in 7 jobs
- Multiplier effects
- Manufacturing & Retail

Employment

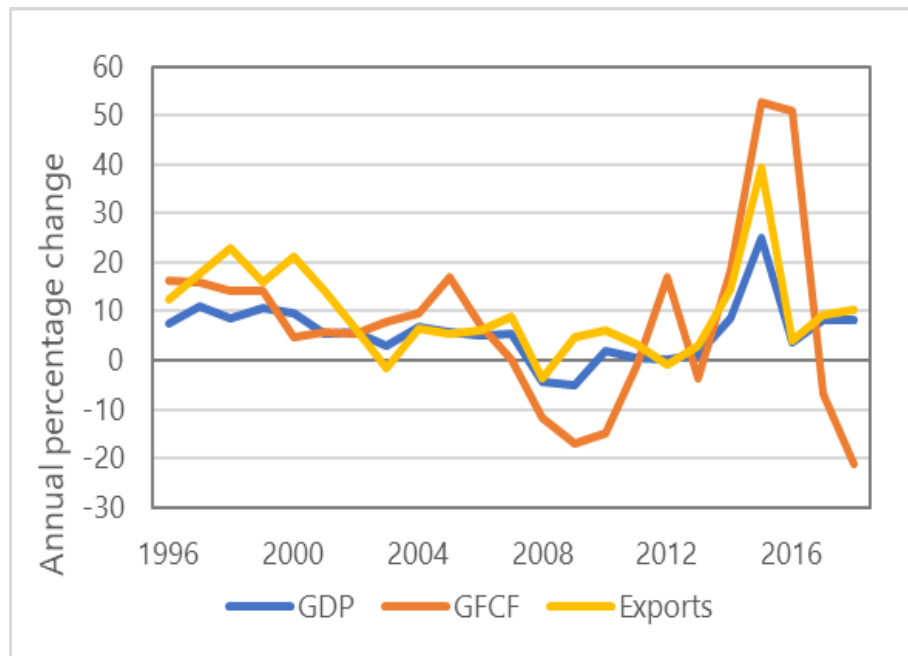


Tax

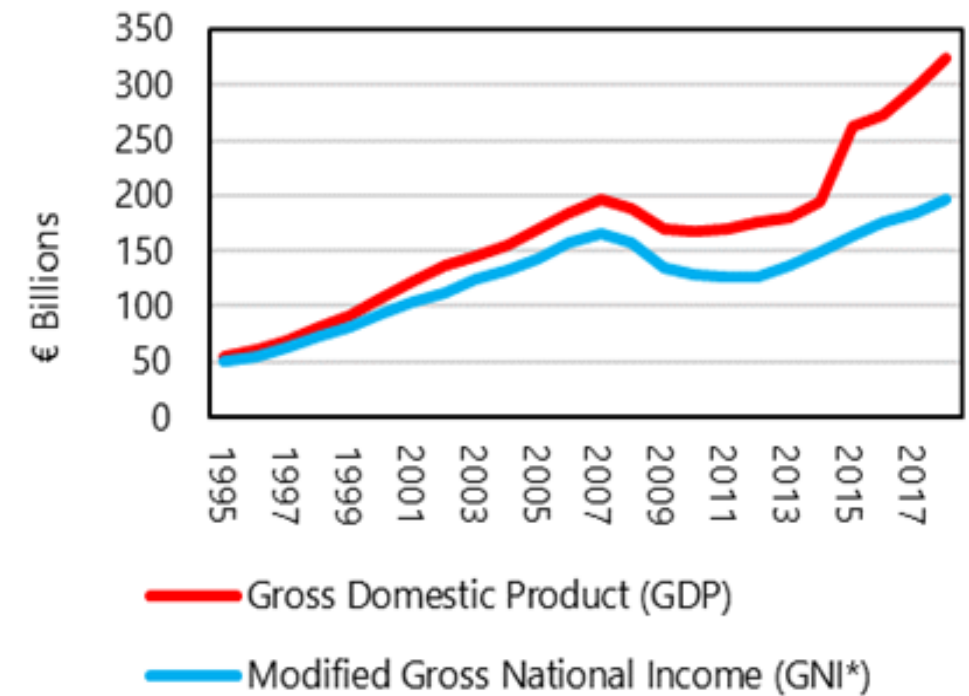


Statistical Challenges

Volatility in trade and economic growth figures



Alternative measures constructed



How can we enhance understanding beyond national statistics?

- Anecdotal or firm specific information can provide additional insights beyond national statistics - number of large firms is very concentrated.
- We use a three pronged approach
 - i) Market intelligence,
 - ii) Monitoring the larger firms and the sectors they operate in, and
 - iii) MNE case studies.
- Can facilitate scenario analysis



Market Intelligence	MNE Monitoring	Case studies
<p><u>Quarterly meetings</u> with network of contacts</p> <p>Possible MNE responses to external developments 2019:</p> <ul style="list-style-type: none"> - Trade tensions - US tax reform - OECD BEPS 2.0 process - Onshoring patterns of IP - Irl as an FDI destination <p>Clarify movements in NA</p>	<p><u>Semi annual</u> firm & sector level assessment</p> <p>Firm: Stock prices, forecast earnings, CapEX operating expenses, revenue ratios and Intangible asset share</p> <p>Sector risks: global trade tensions, global tax reform.</p>	<p>Given high concentration and size of some MNEs, case studies can at times help explain data distortions.</p> <ul style="list-style-type: none"> ➤ Corporate inversions ➤ IP onshoring ➤ Patent cliff <p>Product specialisation i.e. antisera and blood vaccine products in merchandise exports.</p>

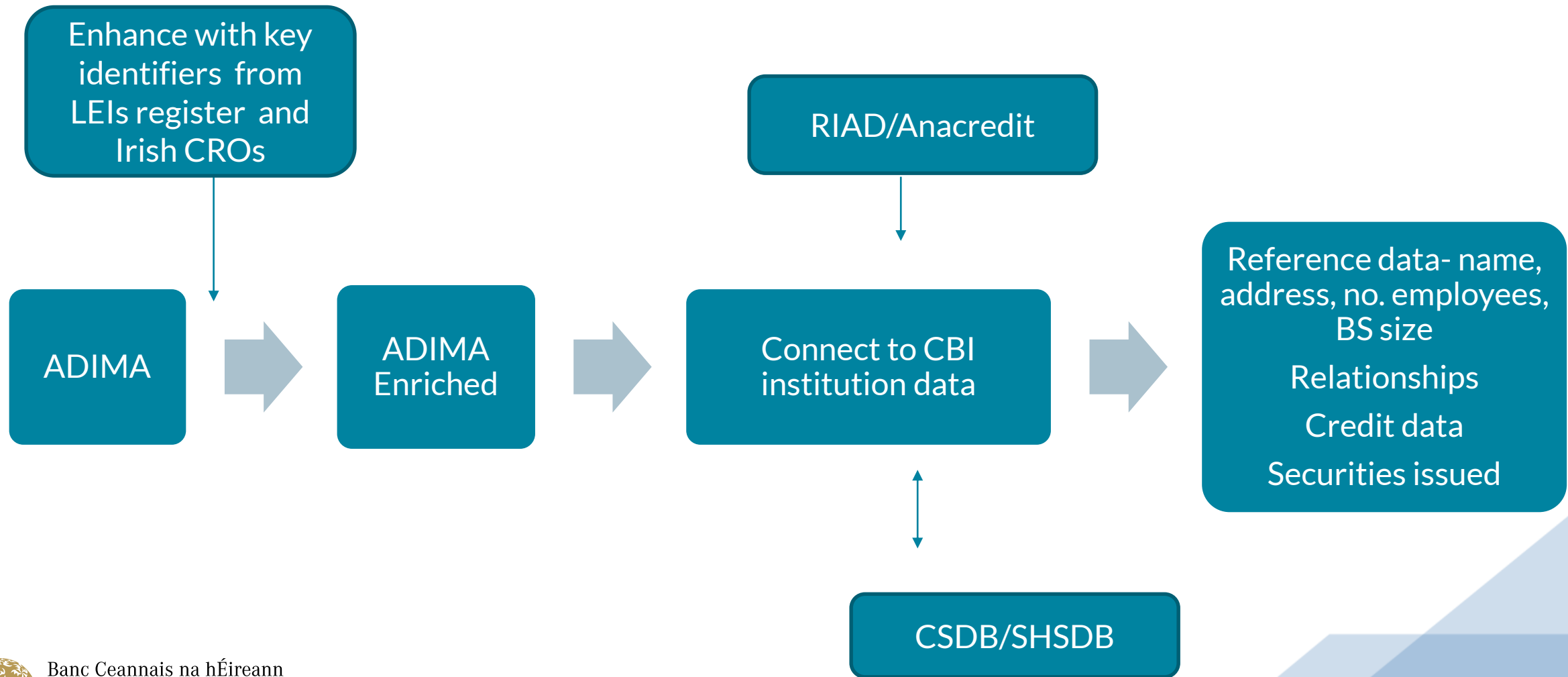


New data sources and opportunities

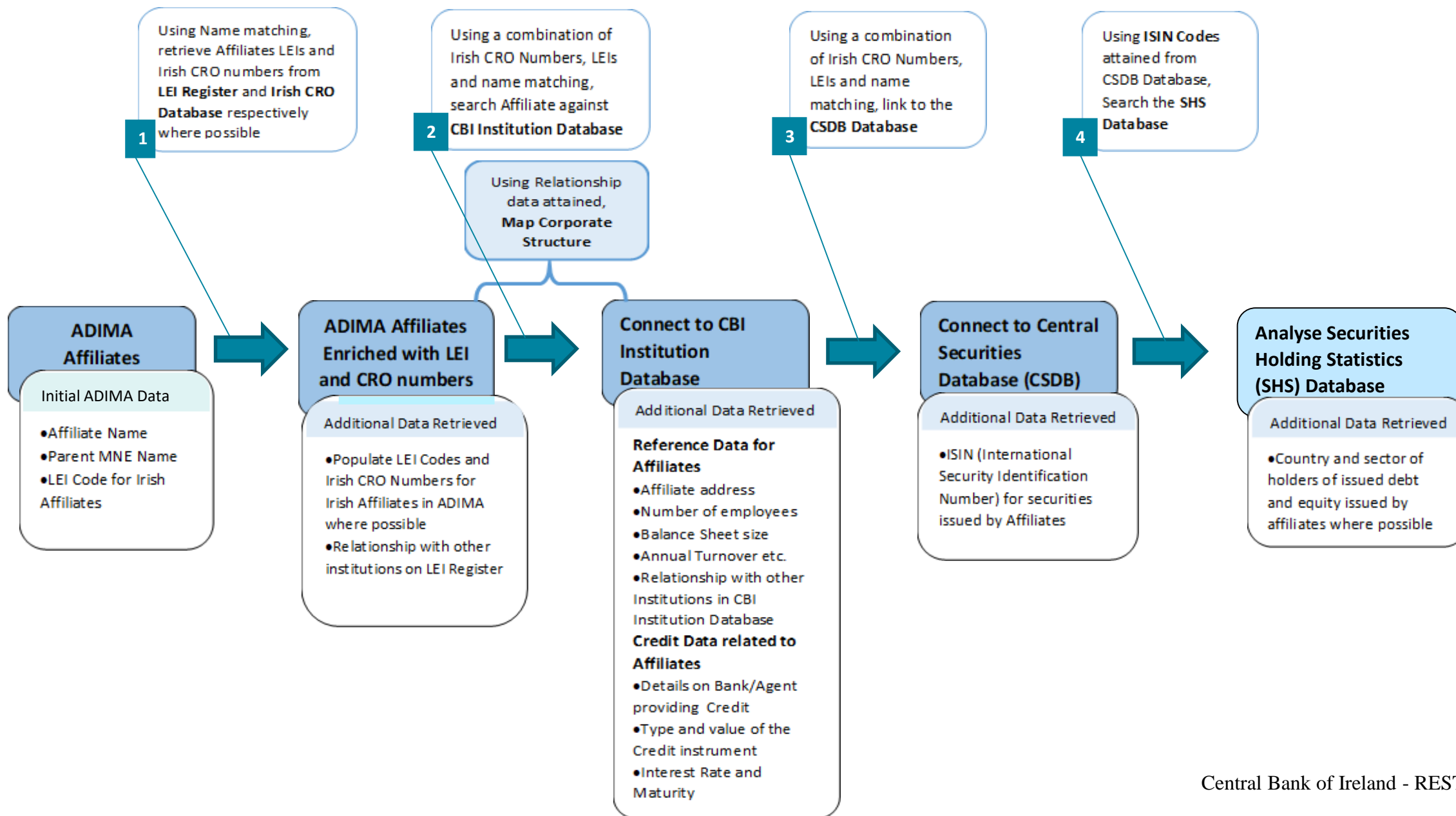
- Mapping MNE corporate structures is an important part of understanding macro-financial interlinkages
- Ongoing initiatives internationally – OECD, Banco de Portugal
- Seek to build a broad architecture and data model
 - Utilise internationally available databases (ADIMA database)
 - use of granular Eurosystem datasets
- Initial step – seek to match ADIMA database with reference data and credit data - MNE group structure
- Entity identifiers – LEI, tax ID (CRO), name, country



Data model : MNFID – Multinational Financial Interlinkages Database



Data Model: Connecting ADIMA



Summary and Conclusions

- MNEs play an important economic role but present challenges for statisticians and policy makers
- National statistics can be distorted especially if MNE large relative to domestic economy
- End users such as Central Bank face challenges
 - Timeliness, sectoral and firm level detail, financial interlinkages across firms
- This presentation details the Irish case and presents a structure to address some of these issues
 1. Market intelligence network,
 2. Sectoral/firm case studies and
 3. Data model as first step to understanding financial interlinkages within MNEs
- Further work will enhance these structures



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Thank you...

Any Questions?



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