Activities of multinational enterprise groups and national economic statistics

The business activities of international enterprise groups present great challenges for national economic statistics. They became a focus of attention for economic analysis when Ireland's gross domestic product (GDP) for 2015 was raised by one-quarter following a reorganisation of the division of labour within enterprise groups, even though the utilisation of labour and real installed capital in Ireland had not changed to any notable extent. This shows that GDP according to the national accounts methodology currently in place is not necessarily identical to the economic output generated by domestic labour and installed capital. For example, income from licenses, which serve to produce output abroad through the combination of labour and real installed capital there, counts towards domestic product. In consequence, the organisational decisions taken by multinational enterprise groups for, say, tax optimisation purposes can lead to abrupt shifts in the allocation of value added between national economies, thereby triggering jumps in domestic product levels. This can make interpreting key macroeconomic indicators such as economic growth, investment activity and productivity trends considerably more difficult.

The implications of the global economic activity of multinational enterprise groups are currently making themselves felt, above all, in small economies with a large share of such enterprises; but once they reach a certain scale, they can also have a tangible impact on the macroeconomic performance of larger economic areas. In 2015, for example, the events in Ireland led to a 0.4 percentage point increase in the estimate of GDP growth for the euro area. Even greater changes were seen that year and in subsequent years, particularly in the recorded statistics of investments in the euro area. Influences of this kind are highly detrimental to economic analysis, which is therefore very much dependent on detailed information from the statistical offices.

Growing global interconnectedness and official statistics

Growing importance of multinational enterprise groups …

The global interconnectedness of economic activity has accelerated considerably over the last three decades. Not only has trade in goods risen sharply; so, too, has the importance of cross-border production and supply chains as well as the cross-border provision of financial and consultancy services. This has been attributable to political and institutional changes such as the growing liberalisation of international economic activity as a result, inter alia, of progress made by the World Trade Organization or in connection with regional groupings such as the European Union (EU). Moreover, technological progress has drastically reduced communication and transport costs, which has facilitated a continual rise in the importance of enterprises that maintain production locations and subsidiaries in multiple countries or outsource parts of production to legally independent enterprises abroad.[1] This is particularly true of the EU, not least given the single market with its four basic freedoms. Multinational enterprise groups make major contributions to value added and employment in most EU Member States.[2]

… presenting great challenges for official statistics

The cross-border activities of globally interconnected enterprises present great challenges for national economic statistics.[3] In essence, the objective of official statistics is to capture domestic economic activity. However, multinational enterprise groups typically spread their activities among different countries. Given their complexity, it is often very difficult to allocate activities and transactions of multinational enterprise groups to specific national units.[4] Moreover, the structure and business operations of international networks are extremely diverse. Multinational enterprise groups do not operate solely on the basis of what is known as the horizontal or vertical division of labour.[5] Hybrid forms are also selected depending on the institutional, tax or cost-related circumstances.[6]

Recording the activities of multinational enterprise groups in the national accounts

Fundamental principles of the ESA 2010

Adjusting the standards in latest national accounts reform

The main objectives of the recent reform of the international standards for national accounts included a more comprehensive description of both the global economy and the changing production processes, in particular with regard to the provision of knowledge-based services. Research and development expenditure of firms on own account for own use is no longer regarded as intermediate consumption, but is instead treated as investment in intellectual property products and allocated to the capital stock. The resident units to which certain tasks of multinational enterprise groups are allocated can now also include what are known as special purpose entities or special purpose vehicles. Moreover, the principle of economic ownership is consistently brought to bear. The European System of Accounts (ESA) 2010, which is based on the System of National Accounts (SNA) 2008 that was drawn up under the auspices of

1 See P. Dicken (2015), Global Shift: Mapping the Changing Contours of the World Economy, 7th edition, The Guilford Press; World Trade Organization (2013), Global value chains in a changing world; and OECD (2013), Interconnected economies: benefiting from global value chains.
2 See C. Cadestin, K. de Backer, I. Desnoyers-James, S. Miroudot, M. Ye and D. Rigo, Multinational enterprises and global value chains: new insights on the trade-investment nexus, OECD Science, Technology and Industry Working Paper No 05/2018, p. 21; F. Boccara and T. Picard, Multinational enterprises and international trade: different country profiles, INSEE Première No 1558; and Eurostat, Multinational enterprise groups and their structure, https://ec.europa.eu/eurostat/web/experimental-statistics/multinational-enterprise-groups
3 See United Nations (2011), The impact of globalization on national accounts; United Nations (2015), Guide to measuring global production; and S. Allafi, S. Jung and V. Spies, Globalisierung in der amtlichen Statistik, Wirtschaft und Statistik 2017 (5), pp. 130-48.
4 See United Nations (2011), op cit., pp. 13-26.
5 Horizontal integration refers to enterprises on the same production level. With vertical integration, different levels of the production process are combined within one enterprise.
6 See C. Cadestin et al. (2018), op cit., pp. 8-9.

the United Nations, has been legally binding for EU Member States since 2014.[7]

Definition of resident units

The definition of "resident units" is of key importance when measuring the national value added contribution of multinational enterprise groups. It is these units that specific activities and transactions of the multinational enterprises are allocated to.[8] A key requirement for such a unit is that it engages in economic activity on a significant scale over at least one year in the country in question. However, it need not be formally legally independent. Branches, offices or production facilities may also be regarded as resident in the economic sense.[9] Resident producers pursuant to the ESA 2010 may also include what are referred to as special purpose entities or special purpose vehicles.[10] These are always formally subordinate to a larger company and in many cases they do not have significant staffing and lack production facilities. Thus, they do not usually meet the criterion of independent economic activity. They are regarded as separate resident units, as they are subject to the law of their country of residence and not that of the parent company's country of residence.[11]

Definition of economic ownership plays a key role

A second central principle when allocating activities to certain economic units is the ownership principle. Transactions are allocated based on ownership rights "in the economic sense". The economic owner according to the ESA 2010 is the unit that is "entitled to claim the benefits associated with the use of the asset by virtue of accepting the associated risks".[12] Thus, the economic ownership rights, which are of decisive importance for the national accounts, may deviate from the legal ownership rights.[13] In practice, however, the allocation of transactions is often likely to be based on business accounting, i.e. to take its bearings from the legal structures.[14] It is therefore possible that activities carried out jointly by the units of a multinational enterprise are recorded separately although they would be recorded jointly under a different organisational structure.

Transfer of economic ownership pivotal to goods trade transaction

With regard to the definition of trade in goods in the national accounts, it follows from the ownership principle that imports and exports are defined as transactions where economic ownership is transferred between a resident and a non-resident unit.[15] The objective of the national accounts statistics is to capture the income streams between residents and non-residents. This is in line with the current accounting rules of the balance of payments statistics (BPM 6).[16]

Transactions involving intellectual property products

The extension of the definition of investment in the ESA 2010 also has an impact on the accounting of transactions of multinational enterprise groups. According to the new national

7 See also United Nations (2009), System of National Accounts 2008; Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union; and A. Braakmann, Revidierte Konzepte für Volkswirtschaftliche Gesamtrechnungen, Wirtschaft und Statistik 2013 (8), pp. 521-527.
8 See Regulation (EU) No 549/2013, op cit., paragraph 1.61. "An [economic] unit is a resident unit of a country when it has a centre of predominant economic interest on the economic territory of that country – that is, when it engages for an extended period (one year or more) in economic activities on this territory."
9 As what are referred to as notional resident units. See also Regulation (EU) No 549/2013, op cit., paragraph 1.63.
10 See Regulation (EU) No 549/2013, op cit., paragraph 2.17. "A special purpose entity (SPE) or a special purpose vehicle (SPV) is usually a limited company or a limited partnership, created to fulfil narrow, specific or temporary objectives and to isolate a financial risk, a specific taxation or a regulatory risk."
11 A special purpose vehicle that had been set up in the country of the parent company would not be considered a separate institutional unit. See B. Moulton and P. van de Ven (2018), Addressing the Challenges of Globalization in National Accounts, Paper presented at the NBER Conference on Research in Income and Wealth, p. 4.
12 See Regulation (EU) No 549/2013, op cit., paragraph 15.06.
13 See United Nations (2009), op cit., p. 41. The reason given for this in the ESA 2010 is that "multinational corporations organising their business across national boundaries, [often seek] to maximise production efficiency and minimise the global tax burden. This can give rise to artificial corporation structures which may not reflect the economic reality" (Regulation (EU) No 549/2013, op cit., paragraph 1.16).
14 See B. Moulton and P. van de Ven (2018), op cit., p. 7.
15 See Regulation (EU) No 549/2013, op cit., paragraph 3.162, "Imports and exports of goods occur when economic ownership of goods changes between residents and non-residents. This applies irrespective of corresponding physical movements of goods across frontiers."
16 See International Monetary Fund (2009), Balance of Payments and International Investment Position Manual, sixth edition (BPM6).

accounts standards, firms' own-account expenditure on research and development is considered to be an investment alongside computer programs, mineral exploration and literary or artistic originals, which were already included in the ESA 1995, and is recognised as an intangible asset.[17] Like other intangible assets, the results of firms' own-account research and development can be protected with intellectual property rights. The outsourcing of such rights to units abroad[18] is regarded as a cross-border transaction which reduces the domestic capital stock. Income from licences and the corresponding value added is then also allocated to the units abroad.

Examples of cross-border economic activity and how it is recorded in the current ESA

Traditional cross-border trade

Following these principles, there are a number of particularities in recording the cross-border activities of multinational enterprise groups, as opposed to traditional trade.[19] In the case of traditional trade, an enterprise with a domestic economic owner produces goods domestically with domestic production factors, possibly using intermediate goods (e.g. raw materials) from an enterprise abroad to which it is not legally affiliated. When recorded in the national accounts, the proceeds from selling the goods abroad are allocated in full to domestic exports. Domestic value added is determined by deducting the cost of the imported intermediate goods from the export proceeds.

Cross-border production chains with transfer of economic ownership

If a domestic enterprise of a multinational group outsources parts of the production process abroad, economic ownership rights at the respective production stage determine how this is recorded. With a typical breakdown of the production chain, certain upstream activities, such as the development of new products and initial production steps, as well as downstream activities, such as the final assembly and marketing, remain with the head office, whereas the intermediary production stages are carried out by a subsidiary or an external enterprise abroad. If the economic owner of the goods to be processed changes in the course of the production process (i.e. where certain benefits and risks are transferred to the enterprise abroad), the value added created in the individual stages of production (output minus intermediate goods) is allocated to the manufacturing sector of the respective country of the producing unit. In the case of transactions within a multinational enterprise, the breakdown of value added at home and abroad is carried out on the basis of transfer pricing. Under these conditions, foreign trade transactions are recorded in the same way in the national accounts and the foreign trade statistics.

Cross-border production chains involving contract manufacturing abroad

It is also possible for the domestic enterprise to merely place a production order with the enterprise abroad. Economic ownership of the goods involved in the production process would thereby remain with the domestic enterprise. Under the ESA 2010, such manufacturing performed for a fee, but without a transfer of economic ownership, is referred to as contract manufacturing. This manufacturing is categor-

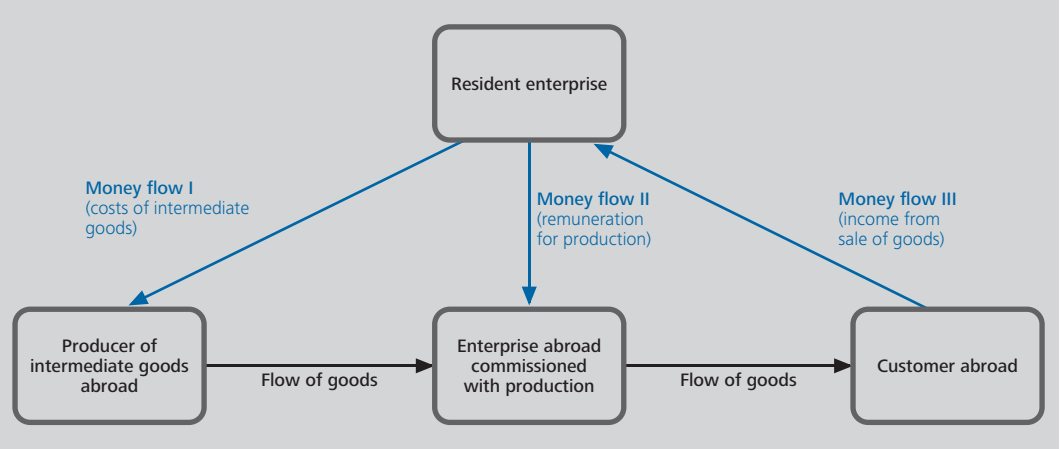
17 In the ESA 1995, firms' own-account expenditure on research and development was still regarded as intermediate consumption. The change in accounting approach was explained by the similarity to other investment processes and the growing importance of intangible assets in the production process. For questions on reporting with regard to the recognition of intellectual property, see OECD, Frascati Manual 2015, Guidelines for Collecting and Reporting Data on Research and Experimental Development; OECD (2010), Handbook on Deriving Capital Measures of Intellectual Property Products; Eurostat (2014), Manual on measuring Research and Development in ESA 2010; and W. Adler, N. Gühler, E. Oltmanns, D. Schmidt, P. Schmidt and I. Schulz, Forschung und Entwicklung in den Volkswirtschaftlichen Gesamtrechnungen, Wirtschaft und Statistik 2014 (12), pp. 703-718. The EU Member States have currently not yet fully harmonised the procedure for capturing investment in intellectual property products. See J. Ribarsky, P. Konijn, H. Nijmeijer and J. Zwijnenburg (2018), The Measurement of Stocks and Flows of Intellectual Property Products, Paper prepared for the 35th IARIW General Conference, Copenhagen.

18 These units may also include special purpose vehicles.

19 See also S. Stapel-Weber and J. Verrinder, Globalisation at work in statistics – Questions arising from the 'Irish case', EURONA, Eurostat review on National Accounts and Macroeconomic Indicators No 2/2016, pp. 29-44; as well as S. Avdjiev, M. Everett, P. R. Lane and H. S. Shin, Tracking the international footprint of global firms, BIS Quarterly Review, March 2018.

Contract manufacturing abroad

Simplified overview



Deutsche Bundesbank

ised as a service, even if the goods are processed or manufactured by the non-resident company. In the balance of payments and the national accounts, such manufacturing is recorded as an import of services in the domestic country and should be recorded as an export of services in the foreign country. The share of the value added ascribed to the foreign country is derived from the fee agreed in exchange for the processing performed. The remainder of the value added is ascribed to the domestic contracting party and allocated to the manufacturing sector.[20] However, the value of semi-finished or finished goods transferred across national borders in the course of contract manufacturing transactions is not recorded under trade in goods pursuant to the national accounts, as only transactions associated with a change of ownership are recorded there. Hence, the physical movement of goods diverges from the income streams recorded in the national accounts if the physical flow of goods does not match the path of ownership transfer. This is the case if a domestic enterprise purchases an intermediate good, which the non-resident manufacturer sends directly to the non-resident company in charge of production, or if the non-resident enterprise delivers the finished product directly to the non-resident customer. In both cases, payments flow across national borders from or to the resident enterprise.

Factoryless goods production

In extreme cases, all production is outsourced, as opposed to just individual production stages. In such a case, the domestic enterprise would, for example, only be in charge of product design as well as specifying and monitoring the production stages. Such enterprises are known as factoryless goods producers. How this is recorded depends on the ownership of the input factors used in production and of the finished product. If a factoryless goods producer is also the economic owner of the intermediate input factors and thus also of the finished product, production is treated as contract manufacturing in statistical terms. If this is not the case, the factoryless goods producer is deemed to be a trader in goods who purchases and sells on the finished product.[21]

Accounting of merchanting trade

Accounting based on the ownership principle also applies to what is known as merchanting trade.[22] In the case of such transactions, resi-

20 If the finished product is a service, the value added is recorded in the corresponding services sector.
21 See United Nations (2015), op. cit. pp. 14 f., where it is stated that "A principal who completely outsources the transformation process should be classified into manufacturing if and only if it owns the input materials to the production process – and therefore owns the final output."
22 See S. Allafi, S. Jung and V. Spies (2017), op. cit., p. 139.

dent traders acquire goods from non-resident producers and sell them to non-resident customers, without the goods ever physically entering or leaving domestic territory. The flow of these transactions via domestic territory thus relates to ownership and payments, not to the physical movement of the goods.[23] Here, the national accounts show the acquisition of goods by the merchants as a negative export of goods and the sale of goods as a positive export of goods.[24] The determining factor for recording this as a trade of goods transaction is solely the transfer of economic ownership. The difference between the acquisition cost of the goods and the sales proceeds is recorded as domestic value added.[25]

Outsourcing intellectual property rights to subsidiaries abroad

If the rights to the results of firms' own-account research and development, such as patents, trademarks and copyrights, are managed by institutional units resident in another country, the accrued value added is divided up between the parent enterprise's country of residence and that of the subsidiary managing the rights. The share of value added pertaining to the entity abroad depends on the transfer prices for the use of intellectual property products. In the event that intellectual property rights are transferred across national borders along with the economic ownership, the corresponding value added is transferred as well.[26] Much the same is true of a legal transfer of a corporation's headquarters. The transactions linked to these headquarters, including income arising from intellectual property rights, would then count towards the target country's value added.

Complex business structures

The exact features of cross-border activity may vary substantially and encompass complex business structures. For example, a group may be headquartered in country A, where research and development are conducted. The intellectual property rights are outsourced to a special purpose vehicle in country B. The actual physical production of the product is performed in country C, with input factors from yet other countries. There are units in other countries which also take charge of distribution in a number of neighbouring countries. How to record such complex cross-border business activities in the national accounts requires a relatively detailed knowledge of the production process in place and the prevailing economic and legal ownership structure as well as a high level of coordination between the statistical offices. Moreover, given that rules and recommendations are not in place for all conceivable cases, it is likely that decisions on how to record highly complex transactions are made on a case-by-case basis.[27]

The informative value of domestic product as a measure of domestic production

Problems arising from the use of transfer prices

Despite a strict application of the ESA 2010 principles, value added cannot always be clearly allocated to specific national units as the organisational structure of multinational enterprise groups is sometimes very complex. Problems arise, for instance, from the application of transfer prices for intermediate goods and for the use of intellectual property products. Pursuant to the requirements of the ESA 2010, transfer prices should be equivalent to market prices. However, many services are never or rarely traded on markets, which makes it difficult to determine the corresponding prices. It is likely that enterprises will often carry out their reporting based on intra-group transfer prices – an area in which enterprises enjoy discretion. This discretionary scope may be used, for ex-

23 The resident trader records an incoming payment from the non-resident customer and an outgoing payment to the non-resident producer.
24 See Regulation (EU) No 549/2013, op. cit., paragraph 18.40; as well as United Nations (2009), op. cit., paragraphs 14.73 and 26.21.
25 Such transactions can also occur at leasing enterprises, who may, for instance, lease capital goods which have never physically been in domestic territory, but were produced in one foreign country and are used in another foreign country. The owner is the domestic leasing enterprise.
26 A transfer of value added shares also occurs in the event of a cross-border sale of ownership rights.
27 For a typology of global production structures and how they are recorded in the current national accounts, see United Nations (2015), op. cit., pp. 7-27.

ample, to report the smallest possible amount of income domestically and a correspondingly higher amount in a country that is more favourable in terms of tax. For this purpose, exports to such a country are undervalued, whereas imports are overvalued. The GDP recorded at home compared with estimated "real" market prices would then be too low and that recorded abroad would be too high.[28] Internationally coordinated regulatory and fiscal rules should, however, be able to limit enterprises' room for manoeuvre in this regard (see the box on pp. 72 ff.).

Organisational decisions of international corporations can affect GDP level

A country's domestic product can also reflect purely organisational decisions taken by multinational enterprise groups. In the case of outsourcing intellectual property rights or transferring an enterprise's headquarters to which the intellectual property rights are linked, the proceeds assigned to intangible assets are transferred across national borders and subsequently treated as domestic output in the respective foreign country.[29] Domestic product can therefore contain value added which is not generated through the joint deployment of domestic labour and installed capital, but is the result of income streams from ownership rights held by domestic subsidiaries which do not themselves carry out any manufacturing. The geographical separation of an enterprise's headquarters, the production sites and the locations of its various subsidiaries is a key characteristic of globalised economic activity. The current accounting practice reflects the associated payment streams. However, this represents a break with the notion that income is generated at the place of physical production through the joint deployment of labour and capital.[30] As a result of globalisation, the national accounts series are departing from established concepts of macroeconomic analysis.

Sectoral composition of GDP reflects income streams

Outsourcing intellectual property rights to non-producing subsidiaries abroad also has implications for the sectoral composition of the domestic product. For instance, both the country in which the parent enterprise is domiciled and that of the subsidiary owning the intellectual property products can record value added in the manufacturing sector without having to carry out the corresponding manufacturing or having the necessary production capacity in place for this. The functions performed by the parent enterprise itself may include services such as marketing and accounting. By contrast, in the country where the physical production takes place, the material transformation can be recorded as a service (contract manufacturing). The national accounts statistics measure the factor income generated in these sectors, including the charges for the use of intangible assets.

The impact of accounting practices under ESA 2010 on economic analysis

The accounting rules outlined here have potentially far-reaching implications for the analysis of macroeconomic trends and relationships. This applies not only to the allocation of economic output by region and sector or the recording of aggregate output, but also to economic growth, imports and exports, investment activity, productivity, and unit labour costs.

28 See B. Moulton and P. van de Ven (2018), op. cit., p. 6; as well as the Federal Statistical Office, Infoblatt Außenhandel, Ursachen für Asymmetrien in den Außenhandelsstatistiken.
29 In principle, outsourcing physical capital has the same effect but is more costly than a shift of intellectual property rights and therefore less important.
30 See OECD (2016), Irish GDP up by 26.3% in 2015?, available at http://www.oecd.org/sdd/na/Irish-GDP-up-in-2015-OECD.pdf. On the discussion of the implications of the broad definition of investment in intellectual property in the current national accounts, see also M. de Haan and J. Haynes, R&D capitalisation: where did we go wrong?, EURONA, Eurostat review on National Accounts and Macroeconomic Indicators No 1/2018, pp. 7-34; as well as B. Thage and P. R. Jensen (2018), GDP and Globalization, Paper prepared for the 35th IARIW General Conference, Copenhagen.

Globalisation and official statistics – the way forward

In order to meet the statistical challenges arising from the cross-border economic activities of multinational enterprise groups, official statistics producers need to make better contextualised use of the data from the various statistical fields and step up their cross-border cooperation. This is the objective of a number of initiatives at the national, European and international levels.

The most important thing here is to standardise reports from enterprises and enterprise groups by way of common definitions and standards and thus facilitate the exchange of information, both between the various statistical fields and between data producers. With its Framework Regulation Integrating Business Statistics (FRIBS), the EU intends to consolidate all regulations for short-term business statistics and structural statistics in one legal basis.[1] The corresponding draft regulation has not yet been finalised.[2] This regulation is intended to consolidate and further harmonise the legal bases for the field of business statistics. It includes a number of provisions that will help improve the recording of multinational activities. The role of the national business registers will be strengthened and it will become easier to exchange information between them. The single European statistical definition of "enterprise"[3] is to be implemented in all areas, after previous attempts proved to be only partially successful. In future, it will be possible to exchange information on trade in goods in a largely standardised way, and sales and production data in the services sector will be reported on a monthly rather than quarterly basis, as is already the case for manufacturing. Improvements are also to be made to the recording of cross-border trade in services and cross-border supply chains.

With the Data Gaps Initiative, the G20 agreed on a number of steps to improve the data basis, while also aiming to capture multinational economic activity more precisely.[4] The second phase of this initiative now also demands the removal of obstacles faced by statistical authorities with regard to a more extensive exchange of data and metadata, without this jeopardising statistical confidentiality.[5]

Alongside the members of the OECD and G20, other developing countries and emerging market economies also participate in

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1 See B. Waldmüller and J. Weisbrod, Neuere Entwicklungen in den Unternehmensstatistiken, Wirtschaft und Statistik 2015 (5), pp. 33-48; and R. Klein, Konzepte der Weiterentwicklung der Unternehmensstatistiken. FRIBS und die Umsetzung des EU Unternehmensbegriffs, Statistical Monatshefte Rheinland-Pfalz 2017 (3), pp. 153-159.

2 Bundesrat, Drucksache 211/17 of 6 March 2017: Proposal for a regulation of the European Parliament and of the Council on European business statistics amending Regulation (EC) No 184/2005 and repealing 10 legal acts in the field of business statistics. The draft is currently being worked on in a European Council working group.

3 In European statistics, an enterprise is the smallest independent economic entity with a certain degree of autonomy in decision-making. If economically necessary activities, such as accounting, are spun off in separate units, then the enterprise consists of multiple legal units in statistical terms. It is possible for such legal units of an enterprise group to be based in different countries. A comprehensive and consistent implementation of this concept in the EU has yet to occur. See R. Opfermann and M. Beck, Einführung des EU-Unternehmensbegriffs, Wirtschaft und Statistik 2018 (1), pp. 63-73.

4 An overview of the role of the recommendations of the second phase of the Data Gaps Initiative concerning questions of globalisation is provided by T. Jellema, S. Stapel-Weber, J. Verrinder and C. Willeke, Overview of statistical initiatives and outcome of the CMFB brainstorming, CMFB Globalisation Workshop, Vienna, 4-5 July 2018, p. 19 (https://www.cmfb.org/meetings/cmfb-globalisation-workshop).

5 The Inter-Agency Group on Economic and Financial Statistics (IAG) has made detailed proposals for implementing the recommendations on the exchange of granular data: IAG, Update on the Data Gaps Initiative and the Outcome of the Workshop on Data Sharing, March 2017. They were expressly welcomed in July of last year as part of the "Hamburg Action Plan" of the G20 heads of state and government.

the Base Erosion and Profit Shifting Project, which aims to combat tax avoidance by multinational enterprise groups and curb tax competition between countries.[6] Although the initiative does not have a statistical background, it could nevertheless be of considerable importance for the quality of the data bases. The project was completed in October 2015 with a series of recommendations. Since then, an automated exchange of information between tax authorities has been introduced with the common reporting standard. The international guidelines on transfer pricing[7] have been updated to restrict loopholes. For transactions between affiliated enterprises, the prices charged must generally be those that would have been charged in comparable transactions between independent third parties. Furthermore, for external reporting purposes, enterprises are obligated to break down most of their economic activities by country.[8] This has already been transposed into German national law.[9] These arrangements are also likely to indirectly improve the international comparability and quality of statistical data.

As globalisation can entail rapid changes in the organisation of multinational enterprise groups, such changes need to be recorded as soon as possible after they occur. Furthermore, the collection and processing of this information must be coordinated at the international level if asymmetries in the statistical data from different countries are to be avoided. This requires improvements to the statistical infrastructure and the exchange of information.[10] To this end, changes are being made to business registers. At the EU level, the EuroGroups Register has been in operation for some years. It provides reference data for all enterprise groups that are active in more than one EU country to ensure that consistent statistical treatment is possible in the participating countries. Data on ownership structures, particularly on intra-group relationships, are also provided. In parallel, the Eurosystem is setting up a business register for the euro area with its Register of Institutions and Affiliates Data (deepened and broadened by AnaCredit, the ESCB credit data statistics).

For the production of internationally coordinated statistics, it is essential that the relevant domestic and foreign producers of statistics are able to use the national and supranational registers. It would be helpful to put in place the necessary legal arrangements for an exchange of data between the national business registers and the Eurosystem business register. This could improve the statistical database and thus the coherence of financial and non-financial statistics.[11]

In order to amalgamate the information on the activities of international enterprises in different jurisdictions, global common iden-

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6 For more information see the website of the Federal Ministry of Finance https://www.bundesfinanzministerium.de/Web/DE/Themen/Steuern/Beps/beps.html

7 See OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations 2017.

8 See the OECD's documentation at http://www.oecd.org/tax/beps/

9 BEPS-I Implementation Act (*BEPS-I Umsetzungsgesetz*) of 20 December 2016 (Amendment to section 90 (3) and introduction of section 138a of the Tax Code (*Abgabenordnung*)).

10 For current overviews, see S. Stapel-Weber, P. Konijn, J. Verrinder and H. Nijmeier, Meaningful Information for Domestic Economies in the Light of Globalization – Will Additional Macroeconomic Indicators and Different Presentations Shed Light?, NBER Working Paper, No 24859; and Jellema et al. (2018), op. cit. (https://www.cmfb.org/meetings/cmfb-globalisation-workshop). The latter document also contains scheduling information.

11 See also Recommendation 2 of the Committee on Monetary and Financial Statistics (CMFB) on statistical work using business identifiers and business registers of 2 December 2016. The CMFB is calling for the removal of legal obstacles to the exchange of data between the European Statistical System and the ESCB for statistical purposes, and for a limited set of business register characteristics also for non-statistical purposes; see https://www.cmfb.org/opinions

tifiers are required. An identifier already exists for entities listed in the European business register. The Legal Entity Identifier endorsed by the G20 is a global initiative for a system of clear global identifiers. It is an alphanumeric code that includes key reference data.[12] While it is, in principle, voluntary for enterprises to apply for such an identifier, the European Markets in Financial Instruments Regulation and other regulations already require such an identifier to be quoted when submitting certain reports.

In 2017, a European early warning system[13] to identify significant restructurings of multinational enterprise groups was also set up. It aims to ensure a coordinated approach between the relevant authorities and central banks through the exchange of information at the earliest possible stage. In some statistical offices in the EU, such as in Ireland and the Netherlands, "large cases units" have already been set up. These are intended to ensure complete and consistent recording of the activities of large multinational enterprise groups that are active in their respective countries.

In order to improve the recording of gross national income (GNI), the European Statistical System has set up a pilot project to examine the way in which the activities of a select number of very large multinational enterprise groups are captured in the national accounts of the Member States. The assessments of groups based in Germany are being coordinated by the Federal Statistical Office. It is envisaged that data on these groups will be exchanged in a non-anonymised form between the relevant Member States and Eurostat, in compliance with the legal provisions.[14] The focus of this examination is on whether the value added of enterprises and their legal entities is being booked in full and in the correct EU Member States. In addition, a review is also taking place as to whether transactions involving intellectual property products are being adequately captured, particularly with regard to research and development.

The EuroGroups Register, the early warning system and the GNI pilot project are important approaches at the European level for a granular information exchange between producers of official statistics in Europe. Thus far, however, this exchange is limited to a few narrowly defined fields. For a radical improvement in the information base, it would be necessary for the exchange of data within the statistical systems to be simplified overall without compromising confidentiality, as proposed in recommendation 20 of the second phase of the G20 Data Gaps Initiative.

12 https://www.gleif.org/en/about-lei/introducing-the-legal-entity-identifier-lei
13 See S. Allafi, S. Jung and V. Spies, Globalisierung in der amtlichen Statistik, Wirtschaft und Statistik 2017 (5), p. 143 f.; and Jellema et al. (2018), op. cit. p. 5 f.
14 See Jellema et al. (2018), op. cit., p. 6 f.; and Destatis, Informationen aus der Statistik 2018 (1), p. 8. This publication also addresses challenges regarding data protection in Germany.

Jumps in time series following relocation of intellectual property rights

Relocation of economic ownership changes how value added is allocated among countries

If intellectual property rights are relocated across borders, if intellectual property usage fees change, or if an enterprise's headquarters are relocated, then the corresponding value added is also transferred to another country. For that transfer, the change in economic ownership is crucial. It need not necessarily entail changes in the production process itself or in the utilisation of labour or physically installed capital. Depending on the size of the affected country and of the transaction, this can have a considerable impact on GDP and its components. For instance, in the summer of 2016, Irish GDP from the first quarter of 2015 onwards was retroactively revised upwards by almost a quarter due to the restructuring operations of multinational enterprise groups at the time.[31] The underlying transactions were not disclosed for confidentiality reasons. However, communication from the Irish Central Statistics Office and Eurostat revealed that intellectual property rights worth €300 billion (150% of Ireland's GDP in 2014) were transferred to legally associated entities that were already operating in Ireland.[32] According to the assessment of the Irish Central Statistics Office, the units in Ireland are now the economic owners of these intellectual property products.[33] The licensing income from these intellectual property products is consequently factored into Irish exports of services. In addition, the Irish entities are classified as factoryless goods producers that are the economic owners of the input materials and of the final output.[34] As a result, the processing carried out abroad is recorded as contract manufacturing services and the income from the sales of the final products is allocated to Irish exports of goods in the national accounts. Intellectual property products newly created by the business entities in Ireland are registered as Irish gross fixed capital formation.

The unusually large GDP rise in 2015 was therefore largely due to the income from licensing (services exports) newly ascribed to Ireland as well as the sales of the final products (goods exports). According to the definition in the national accounts, total exports including services correspondingly rose by nearly one-third. Conversely, the increased reliance on foreign manufacturing services led to services imports rising by one-fifth.

Level shifts and jumps in Irish time series since 2015

Very strong, temporary expansion of investment in Ireland

Estimated investment in intellectual property products grew by 170% in 2015. However, unlike in the case of value added, this did not amount to a long-term level shift. Admittedly, investment expenditure for intellectual property products again saw very strong growth in 2016. In 2017, however, it fell by almost a third compared with the previous year. Besides these examples, there were subsequent further conspicuous movements in the time series of the Irish national accounts. Without additional information, these time series are no longer usable for economic and growth analyses.[35]

Jumps in Irish data complicate economic analysis for euro area

Level shifts and jumps in macroeconomic time series due to relocation of intellectual property rights are likely to affect small economies in particular. Difficulties in conducting economic analyses can also arise for larger economic regions, however. Without adequate communication from statistical offices, changes in GDP due to relocation of intellectual property prod-

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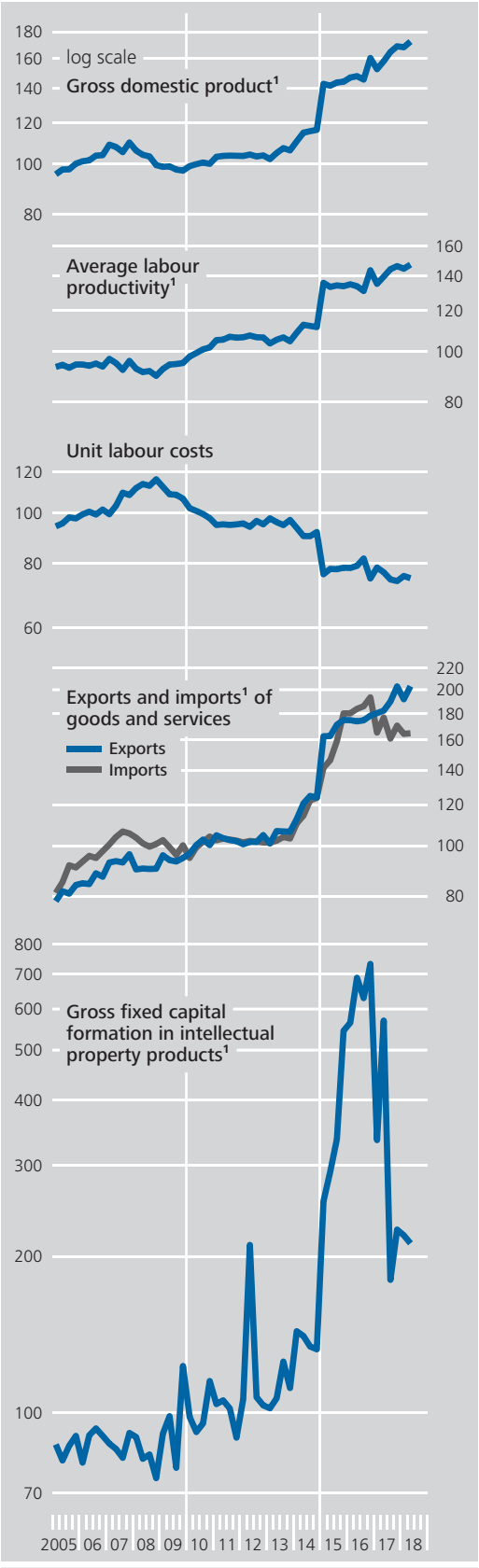
31 See Central Statistics Office (2016), National Income and Expenditure Annual Results 2015, Dublin; and Deutsche Bundesbank, The revision of the euro-area national accounts for 2015, Monthly Report, November 2016, p. 16 f.
32 Central Statistics Office (2017), Report of the Economic Statistics Review Group, Dublin; and S. Stapel-Weber and J. Verrinder (2016), op. cit.
33 See S. Allafi, S. Jung and V. Spies (2017), op. cit., p. 142.
34 See S. Allafi, S. Jung and V. Spies (2017), op. cit., p. 142; and OECD (2016), op. cit.: "… the intellectual property is used in contract manufacturing type of arrangements. Under these arrangements, Irish enterprises (among which Irish affiliates of foreign MNEs) involve contract manufacturers, including those domiciled outside Ireland, to produce final products using the blueprints from the IPPs. The subsequent distribution and sale of these products, organised by the Irish enterprises, results in value added being created in the Irish economy, which also includes income generated by the IPP."
35 See J. FitzGerald (2018), National accounts for a global economy: the case of Ireland, Trinity Economic Papers No 0418.

Selected economic data for Ireland

2010 = 100, seasonally adjusted



Source: Eurostat. **1** Price-adjusted.
Deutsche Bundesbank

ucts could potentially be falsely attributed to cyclical movements. Especially in the cases of major countries, there is a danger of these jumps and level shifts not being properly recognised as such due to their smaller relative magnitudes. For example, after the level of Irish GDP was shifted by one-quarter, euro area GDP was revised upwards by ½%. Without the Irish one-off effect, the annual GDP growth rate in the euro area would have been 1.5% in 2015, representing only a gradual increase over the 1.4% GDP growth rate of the previous year. By contrast, due to the Irish one-off effect, the official time series depicts significant strengthening to 1.9%. The growth rate would have subsequently remained static in 2016. Excluding Ireland, however, the data indicate a cyclical upturn, which would have better reflected the underlying economic trends.[36] Furthermore, investment in intellectual property products in Ireland in 2016 was so significant that even official figures on investment activity in the euro area have recently been skewed. Official euro area figures indicate that investment activity decelerated in 2017. If the Irish contribution to the euro area is ignored, however, it becomes clearly apparent that the upswing in investment activity continued last year.[37] For this reason, alongside the official national accounts figures, the Bundesbank also uses its own time series excluding Ireland for its euro area economic analysis.

36 Similar irregularities can also be found in Irish primary statistics such as industrial production.
37 In line with the Dutch figures published in summer 2018 as part of a major revision, there were also significant changes here in gross fixed capital formation. According to the revised data, real investment expenditure rose by seasonally adjusted 160% on the quarter in the second quarter of 2015. The reason for this was unusually high investment in intellectual property products. The investment was sourced from imports of services. In the third quarter, price-adjusted gross fixed capital formation then fell by just under half. These changes are also reflected in the euro area aggregates. They also explain the year-on-year decline in investment in the second quarter of 2016 with this base effect. By contrast, real gross fixed capital formation in the euro area rose fairly steadily during the second quarter of 2016. See Statistics Netherlands (2018), National accounts 2015 benchmark revision.

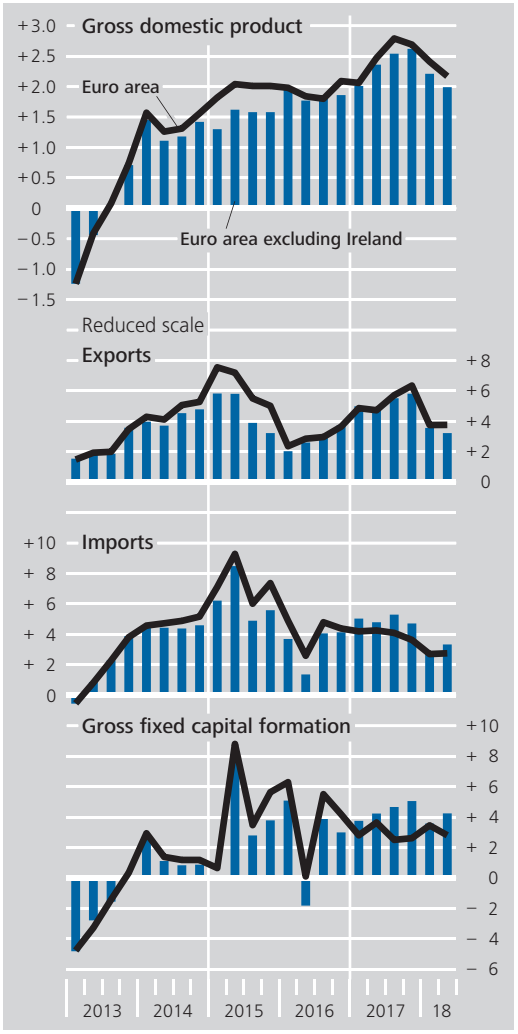
Distortion of derived indicators

Greater difficulties in interpreting derived indicators

The jumps in GDP also make it more difficult to interpret key derived macroeconomic indicators. Against a backdrop of relatively steady growth in employment, average labour productivity in Ireland rose by just over one-fifth in 2015 according to official figures. However, this is just the product of a particular statistical approach. The actual productivity of the Irish labour force is likely to have risen to a much more limited extent. Accordingly, the average compensation of employees also only increased by just under 3%. As a consequence, unit labour costs appear to have fallen by no less than 15%. This would represent a distinct improvement in the competitiveness of the Irish economy. In actual fact, however, the competitiveness of Irish companies is likely to have improved to a far lesser degree. Similar problems regarding the usefulness of indicators affect other key macroeconomic indicators such as the aggregate output gap, labour income share, current account balance as well as budget balance and government debt in relation to GDP. All of this also has consequences for model-based empirical economic research.

Selected economic data for the euro area including and excluding Ireland

Year-on-year percentage change, price and seasonally adjusted



Sources: Eurostat and Bundesbank calculations.
Deutsche Bundesbank

Differences between goods trade data in national accounts and foreign trade statistics

Discrepancy between foreign trade data in national accounts and trade statistics

While goods trade transactions in the national accounts are defined based on the ownership principle pursuant to the European System of Accounts (ESA 2010) and the Balance of Payments and International Investment Position Manual (BPM6), foreign trade statistics continue to revolve around goods physically crossing borders.[38] Discrepancies in these statistics occur in particular where there is a high proportion of contract manufacturing and as a result of merchanting transactions. These discrepancies concern the absolute values of imports and exports, their rates of change, as well as the balance of trade. In Germany, for example, export earnings in 2017 amounted to €1,279 billion in the foreign trade statistics (special trade) and €1,270 billion in the national accounts.[39] Expenditure

38 Another difference resulting from this definition is that the value of the goods in the foreign trade statistics is evaluated at the reporting country's border (imports including transport and insurance costs, exports excluding transport and insurance costs), while goods in the balance of payments (goods trade) are evaluated at the border of the exporting country (i.e. always excluding transport and insurance costs). Taken in isolation, imports in goods trade (national accounts) are thus lower than imports in foreign trade. Accordingly, the goods trade balance is likely to be higher than the foreign trade balance.

39 The goods exports in the national accounts are derived from general trade in goods (which comprises special trade and supplementary trade items) as well as net goods exports in merchanting trade and exports of non-monetary gold. See Deutsche Bundesbank, Statistical Supplement, Balance of payments statistics, table I.3.a.

on imports also came out higher in the foreign trade statistics than in the national accounts. By contrast, the trade balance was higher when calculated using the national accounts approach (€265 billion or 8.1% of GDP compared with €244 billion or 7.5% of GDP). There were considerably larger discrepancies for Ireland. According to the national accounts, goods exports totalled €193 billion or 65% of GDP in 2017. In the foreign trade statistics, this figure was €122 billion or 42% of GDP. In the case of imports, this gap was significantly narrower. This reflected the fact that multinational enterprise groups domiciled in Ireland outsource considerable volumes of production abroad via contract manufacturing. In the national accounts, this is recorded as imports of services. Conversely, the income from the sales of the goods produced is recorded as Irish exports of goods. Accordingly, the surplus in goods trade comes out considerably higher using the national accounts method (€104 billion) than in the trade statistics (€44 billion).[40] Once again, this shows just how far removed cross-border income streams linked to goods trade can become from traditional trade flows due to the impact of globalisation.

Outlook and initiatives

Alternative measures of activity for Ireland

The problems in capturing and classifying the economic activity of multinational enterprise groups and their implications for economic analysis have been thoroughly investigated in recent years. In 2016, a working group was set up in Ireland to shed light on the GDP level shift and to devise supplementary indicators for measuring domestic economic output.[41] Since last year, the Irish Central Statistics Office has published figures for gross national income adjusted for certain activities of multinational enterprises. Furthermore, the figures for the value added of multinational enterprise groups are presented separately.[42] In this respect, the Irish Central Statistics Office has taken on a pioneering role.

Initiatives to improve statistical recording of multinational enterprises

There are also a number of international initiatives to address the challenges posed by globalisation with regard to official statistics. In particular, the aim is to process larger volumes of data at the international level and to increase harmonisation between national statistics and individual statistical fields (see the box on p. 72 ff.). However, it would also be important to develop standards for communicating level shifts in macroeconomic indicators due to specific activities of multinational enterprises. In terms of economic analysis, it is essential to be able to differentiate between transfers of capital stock and material macroeconomic developments. For this reason, the impact of multinational enterprise groups' cross-border activities on the presentation of macroeconomic data should – with due regard to the relevant data protection provisions – be made more apparent.[43]

40 See International Monetary Fund (2017), Selected Issues Ireland, Country Report No 17/172.
41 See Central Statistics Office (2017), Report of the Economic Statistics Review Group.
42 "Modified gross national income" was introduced as a new indicator for domestic economic output. See Central Statistics Office (2017), Press Statement Macroeconomic Releases Year 2016 and Quarter 1 2017; and Central Statistics Office (2017), Gross Value Added for Foreign-owned Multinational Enterprises and Other Sectors Annual Results.
43 See S. Stapel-Weber, P. Konijn, J. Verrinder and H. Nijmeijer (2018), Meaningful Information for Domestic Economies in the Light of Globalization – Will Additional Macroeconomic Indicators and Different Presentations Shed Light?, NBER Working Paper No 24859.