



13<sup>TH</sup> IMF STATISTICAL FORUM

# MEASURING **CROSS-BORDER ECONOMIC** and **FINANCIAL LINKAGES** in a Dynamic World

## Globalisation in the UK National Accounts: Pharmaceuticals

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### **Abstract**

This paper presents the UK's approach to improving the measurement of globalisation within the National Accounts, focusing on the pharmaceutical industry as a case study. Using detailed microdata analysis, enhanced business profiling, and direct engagement with multi-national enterprises (MNEs), we address challenges in capturing complex global production arrangements such as toll manufacturing and factoryless goods production. Our methodology aligns with international guidance and emphasises the importance of measuring transactions at the point economic ownership changes. The review resulted in significant revisions to trade in goods and services, gross value added (GVA), and industrial classification, improving coherence across time series. We also outline future plans for expansion and improvements to data sources.

## Introduction

The UK Office for National Statistics established its Large Case Unit in 2019 to work closely with a small number of large multi-national enterprise groups to ensure the appropriate capture of the impact of globalisation through the collection of data from business surveys and administrative data.

Building on this, an additional team within national accounts was formed in 2021 to develop our approach to measuring globalisation and implement improvements to data. We published two articles in 2023:

- [Globalisation in the context of the UK National Accounts: Blue Book 2023](#) which outlined the theoretical framework for users
- [Measuring globalisation in the UK National Accounts: Blue Book 2023](#) which presented early data impacts

Following this early work, analysis of survey microdata led to the commencement of a review of the manufacturing of pharmaceuticals industry. The results of this review have now been published in [Blue Book 2025: Globalisation](#). The combined impact of our work in 2023 and 2025 has led to a noticeable increase in measures such as trade in goods, more clearly since 2013. The approach and results of this year's review will be discussed in this paper.

The principal objective that underpins this work is to measure MNEs in line with guidance outlined in international manuals, recognising that the complexity of MNEs mean they require special attention. A key aspect is to go beyond research and ensure the data is embedded in our economic statistics and we revise national accounts outputs where necessary to minimise discontinuities in any time series because of our work.

The definitions used will be in line with those described in the [2015 UNECE Guide to Global Production](#), although also considering the changes in treatment in updated guidance as part of [System of National Accounts 2025](#). The two key manufacturing models we will refer to will be Factoryless goods producers (FGPs) and transformation of materials owned by a domestic principal, also referred to as goods sent abroad for processing. We will colloquially refer to the second as toll manufacturing. More detail on each of these will be explained in the Methodology and Conceptual Background section.

The rest of this paper will be structured as follows: First we will outline the methodology and results of the review, following this we will discuss challenges we encountered, and finally we will talk about our plans for the future.

## Methodology and Conceptual Background

Our approach is to attempt to build a complete and coherent framework to measure the activities of individual MNEs. This is done through a Supply and Use framework, partly inspired by work we have seen at previous international conferences. Each individual MNE has its own unique circumstances, and this means the approach will never be identical each time. However, there are principles we follow throughout.

Our first aim when researching an MNE is to build a broad awareness of their operating model. This will involve understanding any global production arrangements, their use of intellectual property, and the countries they operate in. This will give an early insight in to how their data should be treated and whether we should expect issues in their measurement as we progress in the research.

Another part of this early work is to also understand their selection in our business surveys. The approaches to managing employment in MNEs such as the consolidation of all employment across the group within the UK into a single legal unit can present challenges for survey sampling methodology that is geared towards employment and can lead to missingness.

Next, we bring together all data sources to identify how their activities are currently measured. This attempts to replicate the processing from raw data sources through to the calculation of national accounts concepts as closely as possible, highlighting any inconsistencies in the data. Subsequently, we attempt to remediate these inconsistencies. This involves using a range of secondary data sources that sit outside of the usual production processes. Company accounts in the UK are publicly available and often contain a rich amount of data and information on the nature of their activities. Crucially, additional questions and clarifications are put to the businesses as part of data collection to supplement other sources of data. The information we can gather from businesses depends on the strength of the relationship and their own setup, we often find some businesses are unable to answer questions that others are able to, regardless of their willingness to do so.

Additionally, we have in the past sought input from other national statistical institutes as a member of Eurostat. In some isolated cases we have continued to make contact, but this is something we would like to explore further. Data sharing can be difficult but intelligence on the operating models can be invaluable.

A benefit of this detailed research and focusing on coherency is that it brings about a range of data improvements beyond the measurement of globalisation set out in guidance. Issues with industrial classification and any errors in survey reporting are quickly highlighted as part of this approach.

### **Time Series Continuity**

An important objective for us when making revisions is to avoid introducing substantial discontinuities because of the impacts it has on our users' analysis and ability to examine changes over time.

Dealing with this historical data is one of the most challenging aspects. As we go further back in time, data sources change, knowledge and understanding of processes diminish, and businesses are more often unable to provide detailed information.

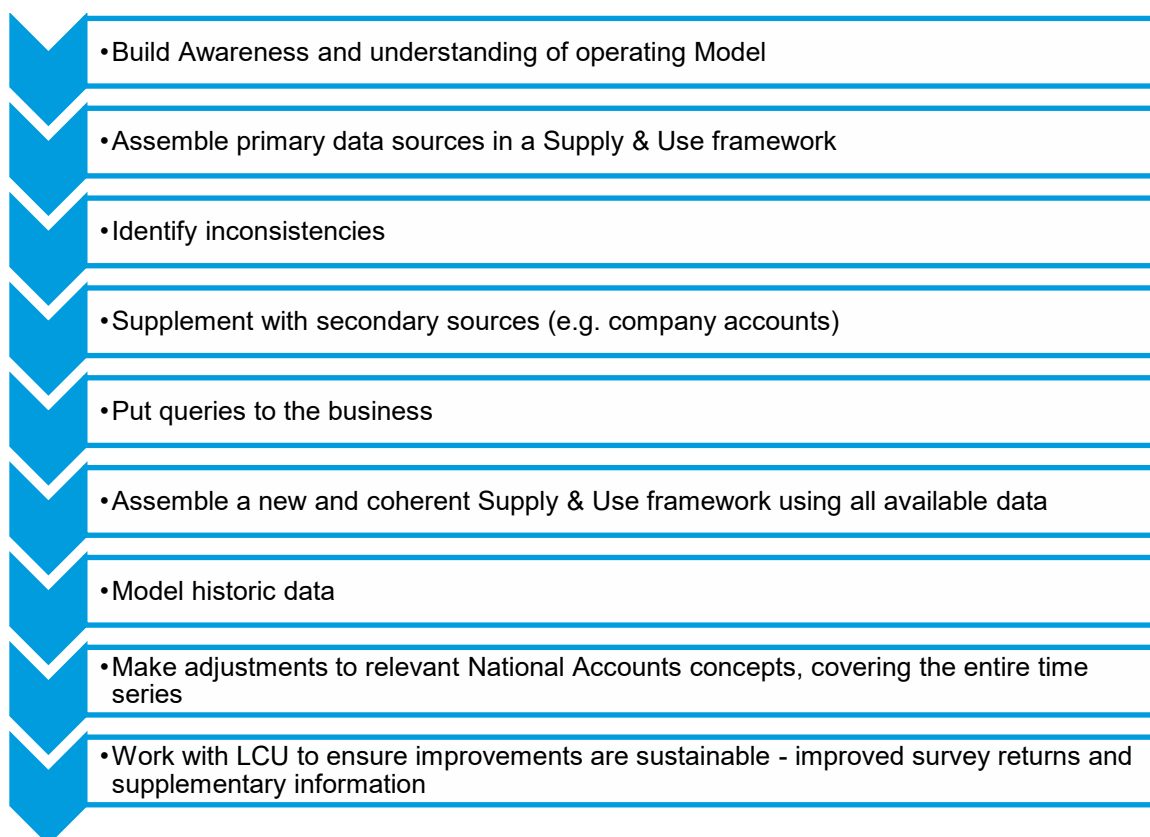
Because of this, we limit ourselves to providing revisions consistent with our renewed view of their measurement back to when the current business model was put in place. Typically, this will be

within the last 10 years. This means we are able to make reasonable assumptions when estimating historic data. In practice, if the business model has been in place for a significant period, this becomes far more challenging as the availability of our survey and administrative data becomes limited. There is an inherent trade-off when preserving continuity and this balances the need for a consistent time series with the quality of the data.

We benchmark against some supplementary sources of data that also have a long and consistent time series such as company accounts, however it often lacks the detail we require at, for instance, country level. Inevitably this means that we must model data and assume that some relationships will stay constant over time such as the proportional relationships between inputs and outputs, or the geographic distribution of missing exports and imports.

These limitations are clearly communicated in our output, and we continue to explore ways to improve historical coherence.

Figure 1: Summary of Approach



Before presenting the results of our industry review, it is important to outline several key concepts that underpin our approach to measuring globalisation. These concepts are central to how we interpret data from multi-national enterprises and ensure consistency with international statistical guidance. In particular, the principles of economic ownership and the treatment and classification of manufacturing models play a critical role in how we treat cross-border transactions and revise national accounts outputs.

## **Economic Ownership**

One of the most critical concepts in measuring globalisation is economic ownership. The idea that transactions should be recorded where the associated economic benefits and risks lie. This is important in the context of global supply chains where goods may be produced, stored, or sold in multiple countries, but the economic ownership remains with a single entity.

For example, a UK-based pharmaceutical company may contract a manufacturer overseas to produce a drug. Even though the drug never physically enters the UK, if the UK company retains economic ownership throughout the process, the sale of the drug abroad should be recorded as a UK export. Alongside this there may be a series of other transactions between the UK pharmaceutical company and others overseas such as the sourcing of materials for manufacture that should also be recorded.

This reporting approach follows company accounts reporting standards. This is because the UK's Financial Reporting Standard (FRS) 102 requires accounts to reflect the substance of a transaction and not just the legal form.

## **Manufacturing Models**

Companies will employ a variety of models to enable them to manufacture goods. They may choose to manufacture in house, outsource manufacturing to a third party, or use a combination of both. Outsourcing to a third party could allow a manufacturer to save on cost and have access to capacity or a capability they do not have in house.

We take an interest when these types of manufacturing arrangements are outsourced and offshored, because it can lead to a difference in the treatment of goods that cross borders depending on its economic ownership.

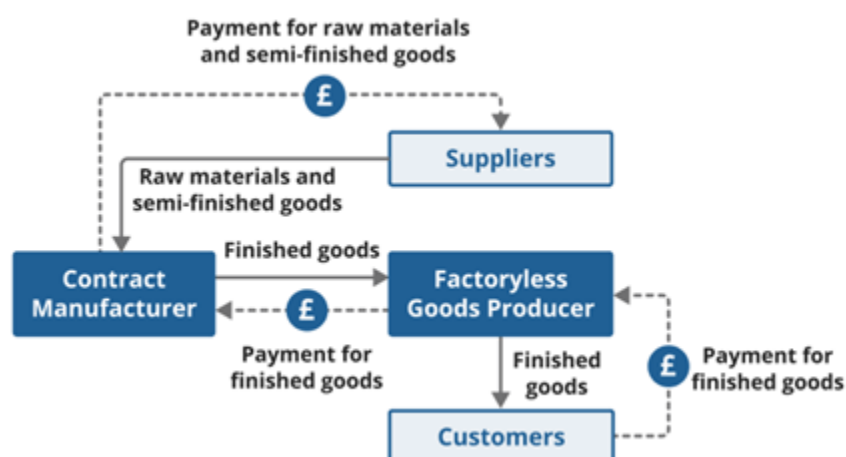
Understanding whether a firm operates as an FGP or uses toll manufacturing is critical to determining how we measure their outputs and trade flows alongside their industrial classification.

## **Factoryless Goods Producers**

This is an arrangement where the directing business, or principal, outsources the entire production process to another business that acts as a contract manufacturer. This includes the purchase of raw materials by the contract manufacturer. The principal is described as a factoryless goods producer. The input of the principal is the intellectual property, blueprints, or designs of the product.

Historically, a principal acting as an FGP is treated similar to a wholesaler and classified to that industry because it is purchasing completed goods with the intention to resell it. Manufacturing or transformation does not take place while under their economic ownership. Updated guidance in international manuals such as the [System of National Accounts 2025](#) means FGPs will be classified as a manufacturing business.

Figure 2: Example of a Factoryless Goods Producer Model



As an example of how this may work across borders, a UK-based FGP contracts an overseas contract manufacturer to manufacture a good according to their specifications. The contract manufacturer purchases all raw materials. The finished goods are purchased only by the FGP and sold in the UK and across the world.

When National Accounts and balance of payments transactions are measured at the point economic ownership changes occur, the following balance of payments transactions should be recorded:

- goods purchased from the overseas contract manufacturer should be considered a general merchandise import
- the sale of goods overseas should be considered as a general merchandise export of goods from the UK to the country where the goods are sold

Alternatively, where the contract manufacturer is based in the UK and the FGP overseas, the sale of the good from the contract manufacturer to the FGP should be captured as an export of goods from the UK to the country of the contract manufacturer. This should happen regardless of the goods crossing the UK border.

## Toll Manufacturing

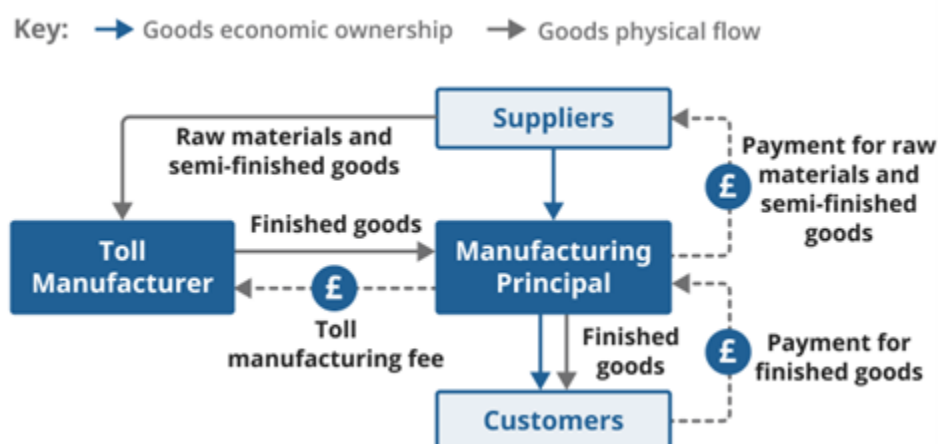
An alternative form of outsourcing is toll manufacturing. In contrast to an FGP, in this relationship the principal retains a greater level of control over the supply chain by providing raw materials and components to a contracted toll manufacturer. The toll manufacturer supplies the plant, machinery, and labour to perform a manufacturing service on those materials.

The principal retains ownership of the raw materials, intellectual property, and finished goods throughout the process, while the toll manufacturer receives a service fee.

The principal in a toll manufacturing arrangement should be classified to the relevant manufacturing industry according to the type of good.

Companies using the toll manufacturing model may have different characteristics to traditional manufacturers, for example, low manufacturing employment. This means it may be difficult to identify them as manufacturers and can lead to them being misclassified to a service industry.

Figure 3: Example of a Toll Manufacturing Model



As an example of how this may work across borders, a UK-based manufacturing principal contracts an overseas toll manufacturer to carry out manufacturing services on their raw materials to produce a finished good. The finished goods are sold in the UK and across the world.

When National Accounts and balance of payments transactions are measured at the point economic ownership changes occur, the following balance of payments transactions should be recorded:

- goods produced by the overseas toll manufacturer and sold outside the UK should be considered an export of goods from the UK to the country where the goods are sold
- goods that return to the UK from the overseas toll manufacturer should not be considered an import of goods, as the goods are already under the economic ownership of the UK when it crosses the border
- raw materials and semi-finished goods purchased outside the UK and used by the toll manufacturer as part of the production process should be considered an import of goods to the UK from the country the raw materials are purchased from
- raw materials and semi-finished goods purchased in the UK and moved overseas to supply the overseas toll manufacturer as part of the production process should not be considered an export of goods
- the service fee paid to the overseas toll manufacturer should be recorded as an import of services of the goods manufactured to the UK from the country of the toll manufacturer

Changing perspective, and considering a UK company as the toll manufacturer for a manufacturing principal based overseas:

- goods manufactured by the UK toll manufacturer and sold in the UK should be considered an import of goods to the UK from the country of the overseas manufacturing principal
- goods manufactured by the UK toll manufacturer and sold overseas should not be considered an export regardless of it crossing the UK border



- raw materials and semi-finished goods purchased in the UK by the overseas manufacturing principal should be considered an export of goods from the UK to the country of the manufacturing principal, even if the goods physically remain within the UK
- raw materials and semi-finished goods owned by the overseas manufacturing principal entering the UK should not be considered an import, because they remain under the ownership of the overseas manufacturing principal
- the service fee paid to the UK toll manufacturer should be recorded as an export of services of the goods manufactured from the UK to the country of the overseas manufacturing principal

Table 1 below gives a summary of the key distinguishing features of the main manufacturing models and the roles enterprises play within them.

Table 1: Manufacturing Models

Entity	Intellectual Property	Materials	Processing	Sale of Good
Manufacturer (in-house)	x	x	x	x
Manufacturing Principal	x	x		x
Toll Manufacturer			x	
Factoryless Goods Producer	x			x
Contract Manufacturer		x	x	

## Pharmaceutical Industry Review

Pharmaceuticals are a substantial part of the UK economy, especially in manufacturing. In 2023, the manufacture of pharmaceuticals is estimated to be worth £23.8bn in gross value added, forming 10.5% of total manufacturing GVA in the UK economy.<sup>1</sup> It is a major contributor to UK exports of goods with pharmaceutical products forming 10.8% of total goods exports<sup>2</sup> and is highly R&D intensive, the pharmaceuticals product group made the largest contribution to total business R&D performed in 2023 at £8.7bn forming 17.4% of total R&D performed by UK businesses.<sup>3</sup>

Numerous prominent MNEs either originate or have substantial operations in the UK. In 2025, 8.7% of enterprises in the manufacture of pharmaceuticals have 250 or more employees compared to an average of 1% across manufacturing and 0.4% across the entire economy.<sup>4</sup> It is dominated by a small number of large MNEs, supported by a wider network of SMEs, contract

<sup>1</sup> UK National Accounts, The Blue Book: 2025

<sup>2</sup> UK Balance of Payments, The Pink Book 2025

<sup>3</sup> Office for National Statistics (ONS) [Business enterprise research and development, UK: 2023](#)

<sup>4</sup> Office for National Statistics (ONS) [UK business; activity, size and location: 2025](#)



manufacturers, and biotech firms. Pharmaceutical supply chains are highly globalised, with production, R&D, and IP management often spread across the world.

The choice of which area of the economy to focus on most is difficult as many areas are affected by globalisation and the activities of MNEs. Further to the evidence above, the choice of pharmaceuticals was led by three primary factors:

- Analysis of survey and administrative microdata indicated a high prevalence of contract manufacturing in pharmaceuticals
- Our LCU had already built strong relationships with a small number of MNEs in pharmaceuticals
- Information scraped from company websites in [research by the Economic Statistics Centre of Excellence](#) on factoryless manufacturing indicated a relatively high use of contract manufacturing in life sciences and pharmaceuticals.

High level results of our first industry review was published in our recent article [Blue Book 2025: Globalisation](#).

A review of the pharmaceutical industry involves multiple overlapping industries, that make up the life sciences sector. The product pipeline starts with:

- research and development of new or existing pharmaceutical products
- the consolidation of research into intellectual property (IP)
- the generation of royalty payments for the use of IP, or the in-house use of IP
- the manufacture of the product
- the wholesale of the product to customers

Our approach to the review has been a detailed analysis of the business models of several of the largest multi-national enterprises within the industry to better understand and capture them more accurately.

An observation common across all companies in our research of pharmaceuticals is that goods and other costs associated with manufacturing form a relatively small proportion of the intermediate inputs. Services, and in particular royalties are far larger.

We have witnessed a wide range of global production arrangements. The most common form being toll manufacturing arrangements. Even when using contract manufacturing, the companies we have worked with have retained a large degree of control over their supply chains and have tended to retain control over raw materials and goods throughout the production process. There have been some examples of full outsourcing of production as typically experienced with an FGP, but these have been rarer and not the dominant approach in any single MNE.

A common feature is that MNEs will invest substantial amounts in R&D and place economic ownership of their manufacturing operations in the UK alongside the R&D function in one legal entity but often do not physically manufacture in the UK. The R&D is often then subsequently funded by proceeds from manufacturing rather than royalties for the use of the IP or the direct sale of it.

The placement of intellectual property is often complex and split by either the rights in specific geographic regions or by individual drugs. As a result of this, there are often substantial flows between companies within MNE groups that will cover both the development and use. Depending on the circumstances this will allow ownership or use of the IP.

For example, the UK company could receive a fee for research and development from another group company in country B. In return, the group company in country B receives the IP covering their own geographic region. The UK company then pays royalties back to the company in country B to enable them to manufacture and sell the goods there.

The MNEs we have researched don't necessarily have UK parent companies. A common feature is that non-UK businesses have chosen the UK as a hub for their R&D and elements of their intellectual property and aligned the UK company as a principal for a global or regional manufacturing arrangement, placing economic ownership here for their operations.

## **Reclassifications**

A feature of our research on pharmaceuticals has been the discovery of misclassified businesses. This is because industrial classification in the UK is, by convention, based on employment. Ideally, it would be based on gross value added (GVA) by activity, but data on employment are more readily available and generally a good proxy. Several MNEs involved in the production of pharmaceutical products were classified to the research and development industry because of the high number of R&D employees compared with those in manufacturing.

Guidance specific to globalisation currently states that those involved in a toll manufacturing arrangement should be classified to manufacturing and factoryless goods producers to wholesale.

It is only possible to identify and reclassify businesses using such models with detailed micro-level research, as implemented within this industry review. In doing so, we have identified businesses mis-classified to the R&D industry and have reclassified them accordingly.

The reclassification of pharmaceutical manufacturers follows current international guidance. Upcoming changes to international guidance as part of the [System of National Accounts 2025 \(SNA25\)](#) will see FGPs also considered to be manufacturers, rather than wholesalers as they are currently. We will update our treatment of FGPs as part of our adoption of SNA25.

## **Case Study**

During our review of the pharmaceutical industry, we conducted an in-depth analysis of a UK-based subsidiary of a large multi-national enterprise with operations spanning Europe and North America. The entity was initially classified to the research and development (R&D) industry due to its high proportion of R&D employment. However, through detailed microdata analysis and direct engagement, we identified that alongside R&D in the UK, the entity functioned as a manufacturing principal within a toll manufacturing arrangement.

They retained economic ownership of raw materials and finished goods throughout the production process, which was carried out by contracted toll manufacturers located in the UK and overseas. It coordinated its global supply chain from the UK base and held intellectual property for several key pharmaceutical products. This IP was segmented by geographic region, with the parent company retaining the IP rights domestically, while the rest of the world was owned by the UK subsidiary.

Despite the absence of in-house manufacturing, the entity directed production and bore the associated economic risks and rewards, consistent with the definition of a manufacturing principal.

Following our review, the industrial classification was changed from Research & Development to the Manufacture of Pharmaceutical Products. This reclassification was based on the principle that classification should reflect the activity generating the greatest gross value added and aligned with international guidance that toll manufacturing principals should be treated as manufacturers. The cost of manufacturing the goods in payments to toll manufacturers and raw materials was small in comparison to the revenue gained from the sale of goods because much of the value was in the intellectual property. Most of the group's expenditure was and remains on the development of new drugs.

The statistical impact of this research and reclassification was significant. Trade in goods estimates were revised to reflect economic ownership rather than physical border movements that are reliant on customs data. Finished goods sold overseas were newly captured as UK exports, while goods returning to the UK from overseas toll manufacturers were excluded from import totals, as no change in ownership occurred. Additionally, raw materials sourced internationally for use in overseas production were recorded as imports to the UK, reflecting the UK entity's ownership.

In trade in services, we undertook a detailed review alongside the company to understand their intra-group flows better. We came to understand that a significant portion of their intra-group flows were royalty payments because they segmented the IP geographically, and therefore, paid royalties for the right to manufacture and sell in that territory. Following final confirmation with the business of the revised data, it led to upwards revisions in trade in services and goods alongside value added for the pharmaceutical manufacturing industry, while also improving coherence across national accounts.

This case illustrates the importance of combining conceptual frameworks with detailed microdata and direct business engagement. Without this level of scrutiny, the entity's activities would have continued to be misclassified and mismeasured.

## Impacts of Pharmaceutical Industry Review

All impacts are described in nominal, or current price (CP), terms.

### Trade in Goods

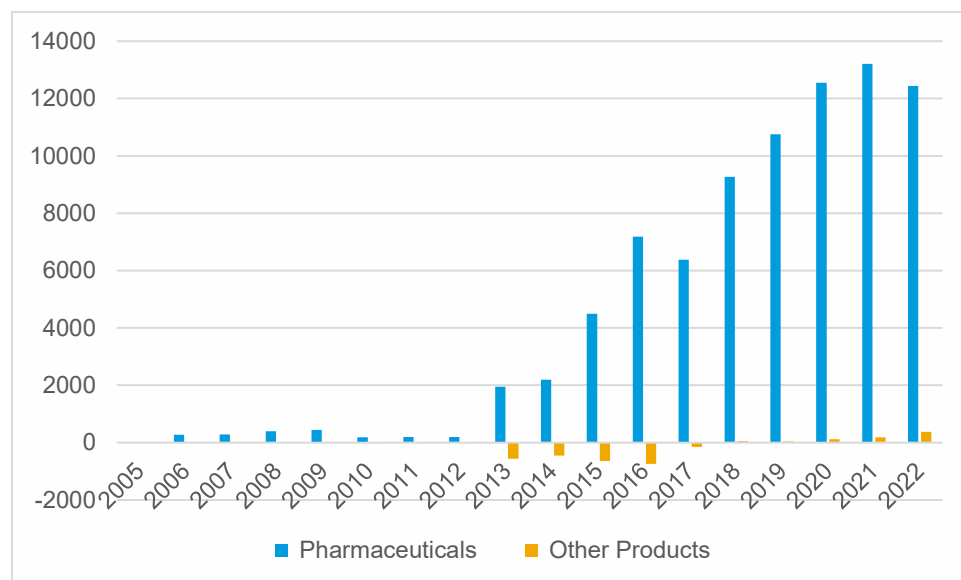
The primary data source for UK trade in goods estimates are His Majesty's Revenue and Customs (HMRC) Overseas Trade in Goods Statistics (OTS), compiled from customs declaration data. Customs declaration data measure physical movements across the UK border effectively, and in most cases, this correlates well with a change of economic ownership.

The largest MNEs use a mixed manufacturing model, with in-house manufacturing operations and outsourcing to third party contractors. These arrangements can take place both in the UK or offshored overseas. Therefore, there are large quantities of uncaptured raw materials and finished goods that do not cross the UK border but may involve a change in economic ownership, and also goods that cross the border without a change in economic ownership.

Moving the measurement of these MNEs trade in goods to an economic ownership basis has resulted in a noticeable increase from 2013 and generally growing over the time series. This has come about because of the development and commercialisation of new drugs and the emergence of new companies that have centred the management of their manufacturing operations in the

UK. We have observed more global production arrangements led by UK based principals leading to the impacts being noticeably more positive for exports of goods than they are imports.

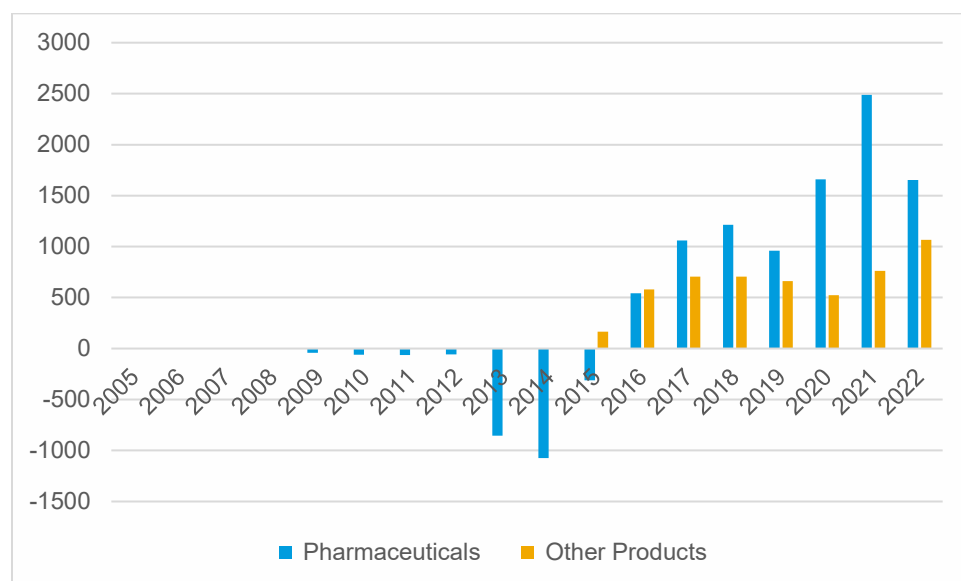
Figure 4: Changes to trade in goods exports, 2005 to 2022, £ million



Changes in exports of goods are because of the:

- addition of pharmaceutical product finished goods manufactured and subsequently sold overseas without entering the UK
- removal of raw materials and semi-finished goods that constitutes "other products" exported from the UK to supply overseas manufacturing arrangements where economic ownership does not change

Figure 5: Change to trade in goods imports, 2005 to 2022, £ million

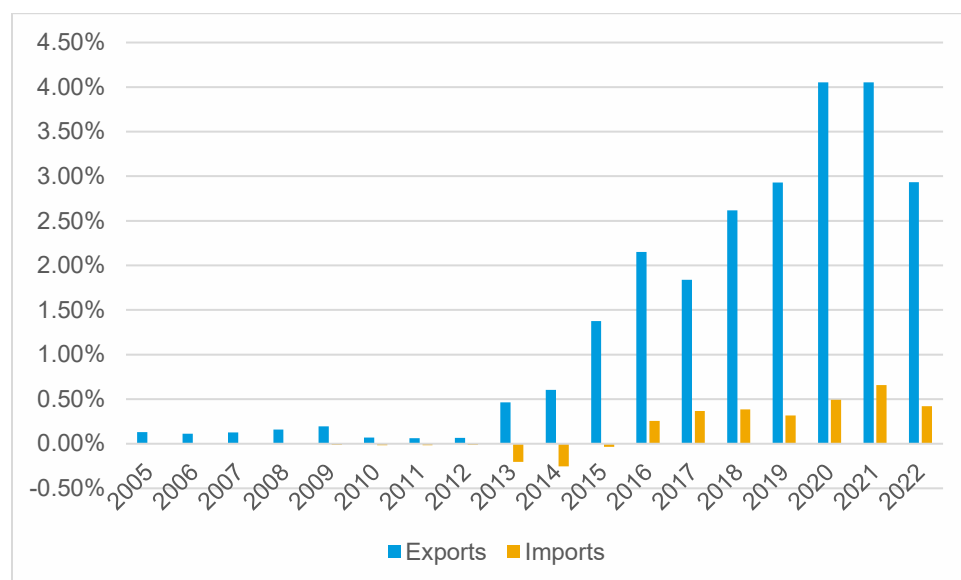


Changes in imports of goods are because of the:

- removal of pharmaceutical product finished goods that enter the UK without changing economic ownership, for example from UK owned overseas manufacturing arrangements, to supply the UK market
- addition of pharmaceutical product, and connected product in the form of raw materials and semi-finished goods purchased to supply overseas manufacturing arrangements resulting in a change in economic ownership without entering the UK

Figure 6 below gives the percentage impacts on total trade in goods. Our work on the pharmaceutical industry led to a peak increase of over 4% in exports of goods and over 0.6% of imports of goods.

Figure 6: Percentage changes to total UK Trade in Goods, 2005 to 2022



## Trade in Services

While the HMRC trade in goods dataset is based upon customs declarations to monitor the physical movement of goods across the border, the majority of our services data comes from the International Trade in Services Survey (ITIS). Data quality relies on the businesses understanding and interpreting what is required in survey responses. The complexity of the arrangements used by multi-national enterprises can mean the risk of incorrect reporting by businesses is higher, which can be mitigated by account management from the Large Cases Unit (LCU).

Our detailed analysis of services activity identified two substantial areas of change. Transactions associated with R&D services were particularly prominent in exports and transactions associated with royalties were prominent in imports. The complex arrangements of IP were not always immediately clear to us and was only clarified with in-depth conversations with the companies involved. Through these conversations we were able to provide guidance to businesses on how the transactions should be recorded.

Figure 7: Change to trade in services exports, 2015 to 2022, £ million

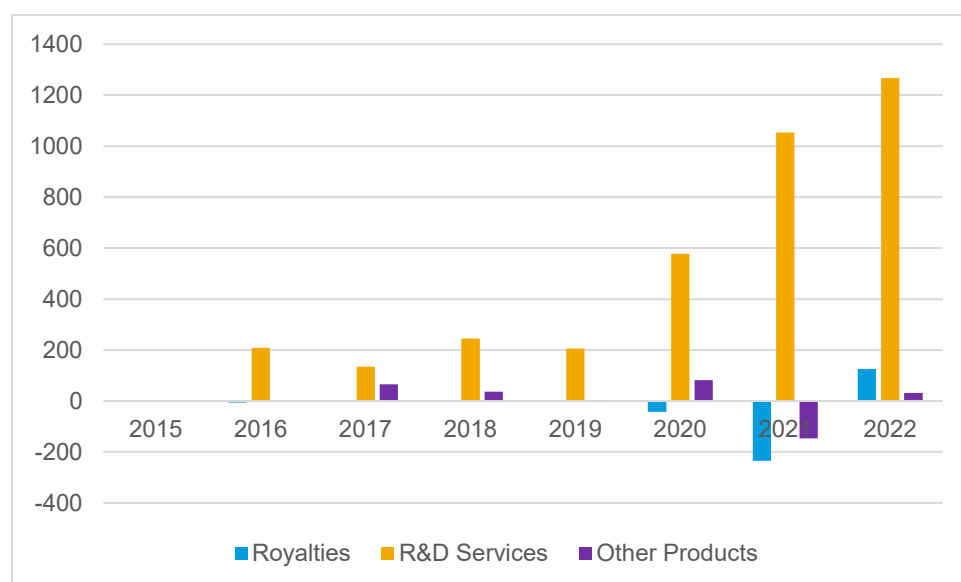


Figure 8: Changes to trade in services imports, 2015 to 2022, £ million

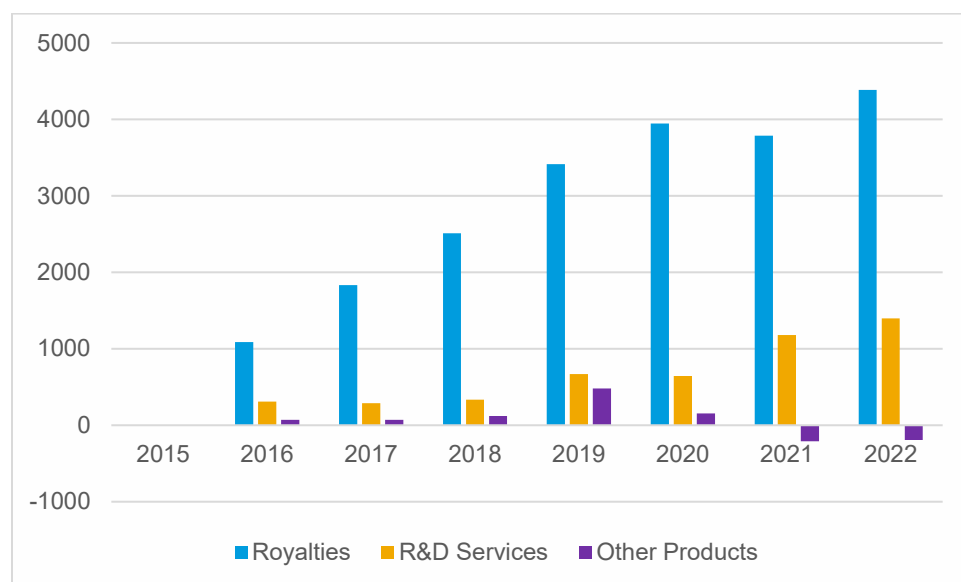
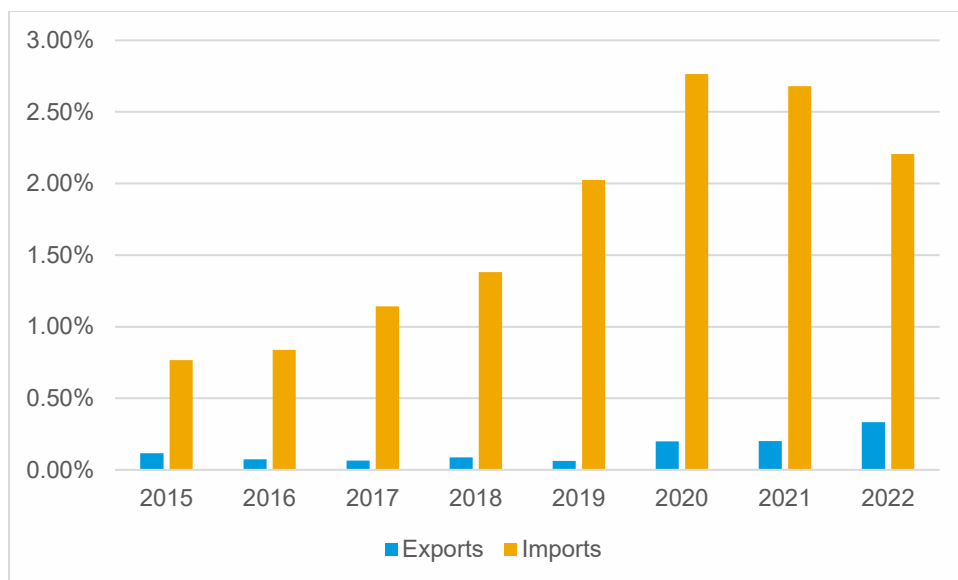


Figure 9 below gives the total percentage impact on UK trade in services. Our work on the pharmaceutical industry led to a peak increase of over 0.3% on exports and over 2.7% on imports.

Figure 9: Percentage changes to total UK trade in services, 2015 to 2022

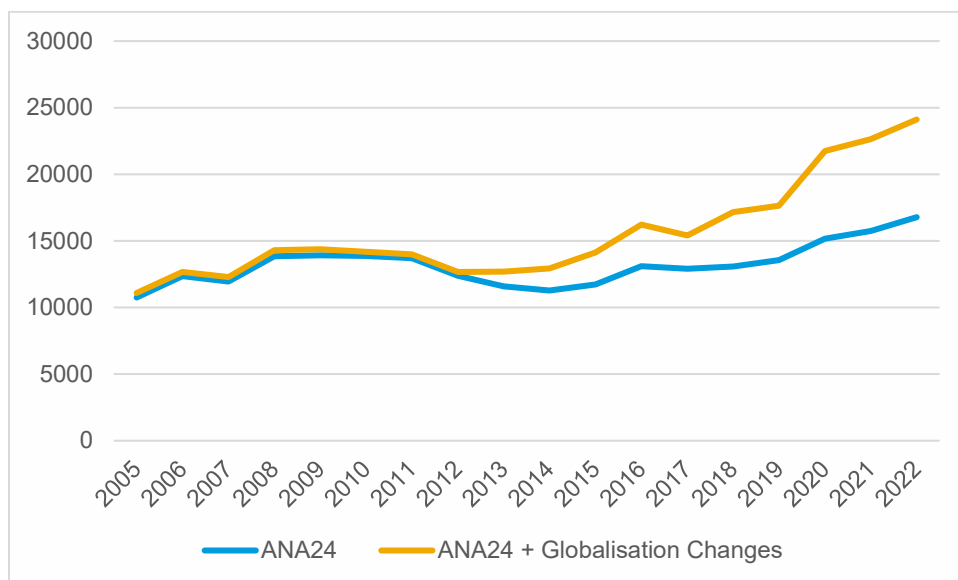


### Gross Value Added

While improved measurement of globalisation might not necessarily be expected to bring about changes to GVA, focusing on the measurement, classification, and coherency of MNEs as a whole can bring about significant impacts to all areas of the national accounts.

This led to an upwards revision to the GVA of the manufacture of pharmaceuticals. It follows a pattern similar to that of trade in goods exports reflecting the approach where outputs and uses are coherent.

Figure 10: Impact on manufacture of pharmaceuticals industry gross value added, 2005 to 2022, £ million





## Challenges

Work of this nature is interesting and rewarding, but detailed and arduous with many challenges arising. Traditional business surveys often lack the detail needed to capture complex global production arrangements.

Administrative data such as customs returns for estimates of trade in goods measures the movement of goods across borders well but does not always align with the principle of measuring transactions when economic ownership changes. Nature of transaction and customs procedure codes can provide insight into whether these movements across borders constitute a change in economic ownership, but we are still developing our understanding of that data, testing it against the information we have from other sources.

Furthermore, the complex models used by MNEs do not always fit neatly into the guidance we follow. Inevitably guidance is stylised because it cannot deal with the subtleties of every arrangement. MNEs frequently operate global production arrangements such as toll manufacturing and factoryless goods production with complex intellectual property flows but these production arrangements do not always align neatly with international statistical guidance.

As an example, we saw a payment to a contract manufacturer which we assumed was to take ownership of the goods, as would be expected of an FGP. However, when working closely with the business to understand this it also had similarities to toll manufacturing. There were distinct payments to cover the costs of raw materials and manufacturing services rather than a single payment to take ownership of the goods.

Addressing these requires detailed research to understand and interpret the intricacies of how they operate and collaboration across business and national accounting teams within ONS, as well as input from the enterprises themselves. The existence of a toll manufacturing relationship was subsequently confirmed.

Aligning country and product level data with the principle of measuring transactions when economic ownership changes is particularly challenging. We work to the same level of granularity that is published in all our existing estimates of trade in goods, derived from administrative customs data. However, it is challenging for us to compile at that level of detail as businesses are often not able to provide detailed product and country data.

## Company Engagement

Engaging directly with MNEs has been a cornerstone of our approach to improving the measurement of globalisation. The LCU plays a critical role in this process, acting as a dedicated point of contact for the most significant businesses. Through this relationship, we are able to build trust, reduce survey burden, and gain access to richer data that is more closely aligned with our needs than would otherwise be available through our standard suite of surveys.

Our engagement strategy is built on mutual understanding. We recognise that MNEs operate complex and often sensitive business models, and we approach discussions with transparency about our objectives and the potential impact of their data on statistics. In return, businesses are generally receptive to collaboration, particularly when they understand how their data contributes to the accuracy of economic statistics and the importance of accurate economic statistics in shaping policy decisions that directly affect them. Additionally, improving their company's structure on our business register, and providing immediate clarification and feedback to questions helps reduce the burden of surveys and encourages cooperation.

The depth of engagement varies by enterprise. In some cases, there are long-term relationships that allow for regular dialogue. In others, engagement has been more targeted and focused on specific issues such as the classification of manufacturing activity, the treatment of intellectual property, or the interpretation of intra-group transactions. Where possible, tailored guidance is provided to help businesses align their reporting with statistical standards, particularly in areas where guidance is complex.

One of the most valuable aspects of this is the ability to clarify ambiguous and complex arrangements. For example, the information provided by several businesses helps us distinguish between toll manufacturing arrangements and factoryless goods production by explaining the nature of payments, ownership of materials, and control over production. These insights are invaluable for ensuring our measurement reflects the reality of their business models rather than assumptions based on incomplete data.

## Conclusion

This review of the pharmaceutical industry is part of the UK's continued work to improve its measurement of globalisation in the National Accounts. Our aim is to cover the most important parts of the economy through a structured programme of industry reviews. These reviews are designed to provide targeted improvements to the measurement of globalisation for the most impactful areas.

While pharmaceuticals were selected as the first area for detailed review due to their importance, prevalence of global production arrangements, and the relationships our LCU had already built within the area, our longer-term strategy is to expand this approach to other industries. The selection of future industries will be guided by a priority matrix which considers factors such as trade intensity, MNE concentration, reliance on intellectual property, and known classification challenges.

Initially we plan to focus on oil and gas, and aircraft and automotive manufacturing. Beyond manufacturing, we will also consider service-based MNEs that may not engage in global production arrangements but nonetheless present challenges for example in their IP flows and industrial classification, and opportunities for improved data quality and classification. Evidence from our current research suggests that these enterprises can have substantial impacts on economic statistics.

The methodology developed through the pharmaceutical review, including detailed business profiling, economic ownership analysis, consideration through a supply and use framework and enterprise engagement, will be adapted to suit the characteristics of each industry. We anticipate that some industries may require additional conceptual development, particularly where international guidance is still evolving.

In addition to industry reviews, our longer-term strategic aim is to improve data sources. The immediate focus will be on admin data. Analysis of nature of transaction and customs procedure codes included on customs declarations may prove helpful although these are unable to identify trade that occurs outside national borders. Second are new data sources that capture the impact of globalisation across our economy, particularly around trade in goods and services. We plan to launch a new survey in 2029 with implementation by 2033.

However, even with more complete data sources the understanding and interpretation of complex and changing business models is fundamental. Therefore, the current approach of industry reviews of the largest MNEs will continue to be needed until 2033 and beyond to ensure quality.

While the improvements to the measurement of globalisation in our national accounts represent a significant step forward, several risks and uncertainties remain that could affect the work going forward. MNEs continue to adapt their operating models in response to technological advances, regulatory changes, and market pressures. These may introduce new complexities that challenge existing business surveys and existing frameworks. The quality and breadth of our work is continually constrained by the availability of high quality and appropriate data.

Our plans are described further in our [ONS Survey Improvement and Enhancement Plan for Economic Statistics](#) and [The plan for ONS economic statistics](#) articles.

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