Compendium

Economic review: January 2019

Analysis of how the UK economy interacts with the rest of the world using balance of payments and improved trade and foreign direct investment data. The economic review compendium is published quarterly, usually in January, April, July and October.

Chapters in this compendium

Compendium

The UK's Balance of Payments: tackling the global measurement challenges

The UK's Balance of Payments and emerging trends and challenges faced by statisticians when measuring cross-border activity.

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1 . Introduction

The UK's Balance of Payments records a country's economic transactions with the rest of the world, which has received much attention of late by economists and policy-makers. In recent years, the UK current account deficit – the extent to which the UK is borrowing from the rest of the world – has widened to levels that are high by historical and international standards. This has raised concerns around whether the UK can rely on record high levels of external financing to help fund its domestic expenditure – the reliance on the so-called "kindness of strangers".

While the prevailing economic conditions are very different to today, the Lawson Boom of the late 1980s offers some insights on how unsustainable levels of borrowing can pose risks for the real economy and financial stability. That period was characterised by a rapid economic expansion, fuelled in part by tax cuts and rising house prices. This led to an increase in imports as domestic producers could not meet this increase in demand. However, this boom proved to be unsustainable with the economy overheating, followed by a sharp adjustment, which led to the UK entering a recession in the early 1990s.

These concerns have been further heightened by the uncertainty over the future of the UK's trading arrangements. It has been commented that, in periods of increased uncertainty, foreign investors may be less willing to invest in the UK, and if this were to happen this could potentially lead to a "sharp fall in sterling, bringing about a more abrupt demand-led narrowing of the current account deficit" (see Office for Budget Responsibility, 2018 (PDF, 2.5MB) for more information). These risks to the economic outlook help explain why the UK's Balance of Payments continues to be monitored closely by policymakers.

The balance of payments has also received increased coverage from a global perspective in response to the recent increase in global imbalances, as highlighted in the latest External Sector Report by the International Monetary Fund. Excessive external imbalances pose risks for individual countries and for the global economy – and recently, there has been increasing focus on how these may be creating trade tensions among countries, which reinforces the interest in understanding the dynamics in international transactions.

There has also been much interest in the statistics community, reflecting an increasing number of measurement challenges for national statistical institutes and central banks. This is in response to the increasingly globalised nature of economic activity, which has made it much more difficult to record and understand the true nature of new types of cross-border transactions, many of which pose new challenges to statisticians. These include:

- the proliferation of interlinkages in global value chains, whose economic value are not fully reflected in the traditional gross flows of trade

- the rise in capability and use of technology, enabling faster and more efficient transactions, including trade, which can in some cases be ordered or delivered electronically via the internet or other electronic means, which are less visible and harder to identify separately

- the presence of multinational enterprises, which has complicated the recording of economic activity on the basis of national boundaries and residence

- the increase in the number of complex corporate structures, whose financing structures have become much more difficult to record

These challenges do not imply that headline estimates in the Balance of Payments are being recorded incorrectly. The UK produces its estimates in line with the latest international guidelines, as set out in the latest Balance of Payments Manual. However, some of these examples highlight a range of challenges for the measurement of official estimates in that a true reflection of the cross-border activity may not always recorded. For example, this paper explains how "financial engineering" being undertaken by multinational enterprises impacts upon the recording of net investment income. There are also other topics that look to unpick the headline figures in the Balance of Payments, so that users are able to get a better handle on the nature of the trading relationships (for example, the development of Trade in Value Added estimates) for policy purposes. These currently rely on a number of assumptions and are designed to supplement, not replace, the official estimates of the Balance of Payments.

This points to the need for further research into how these developments may affect the way trade and foreign investment are recorded and analysed, providing new insights on the UK's external activity. Office for National Statistics (ONS) has made considerable strides in responding to these challenges, including the establishment of an International Business Unit and through working in conjunction with the international community to develop guidance, while further areas of research are in the pipeline.

2 . The balance of payments

It is helpful to provide an overview of the framework of the balance of payments, which records the economic transactions between the UK and the rest of the world, so that the measurement challenges can be better understood. In summary:

- the current account records international trade and cross-border income flows associated with the international ownership of financial assets, as well as current transfers (for example, foreign aid or remittances); if a country is running a current account deficit, it is said to be a net borrower from the rest of the world

- the financial account records the change of ownership in international financial assets between UK residents and the rest of the world; it shows how net borrowing is funded or net lending is invested by recording changes in the net acquisition of foreign assets and net incurrence of liabilities to the rest of the world, and so is seen as the counterpart to the current and capital accounts [1,2]

- the international investment position records the total stocks of foreign assets and liabilities held by a country; it is linked by a flow-stock relationship with the financial account, though revaluation effects (for example, fluctuations in exchange rates or equity markets) also play a role in driving movements in the stocks

Current account

The UK has run a current account deficit for over 30 years. However, in recent years, there has been a marked widening in the UK current account deficit, peaking at a record high 5.2% of nominal gross domestic product (GDP) in 2016 (Figure 1). This has raised concerns around whether the UK can continue to run such a large current account deficit, as it requires the UK to be able to finance its net borrowing from the rest of the world – whether it be by attracting net inward capital flows, which might leave the UK potentially vulnerable to shifts in the preferences of foreign investors, and/or by selling its external assets.

Figure 1: The UK current account deficit is large by historical standards

1948 to 2017

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1948 to 2017

% of GDP
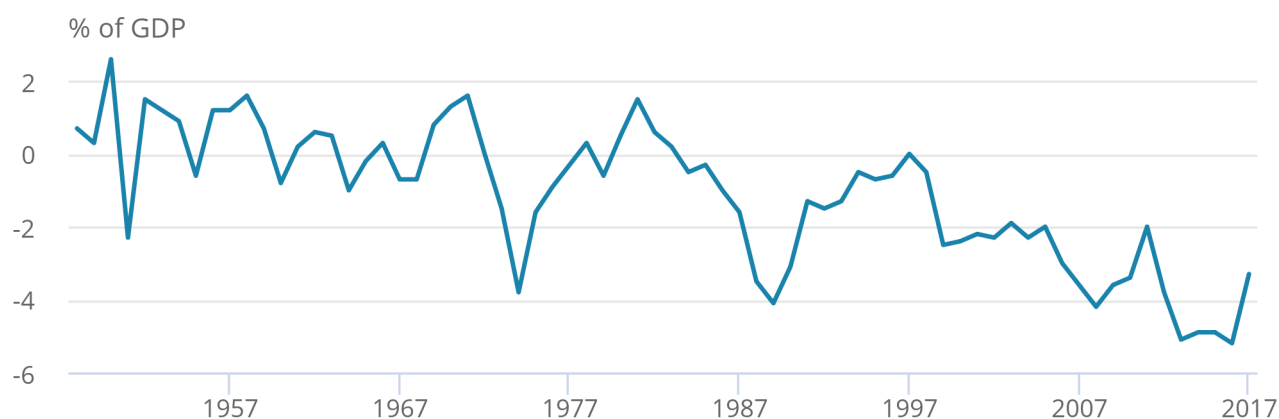
Source: Office for National Statistics

In contrast to previous episodes in the UK, the recent widening of the current account deficit has primarily been driven by movements in net investment income. This captures the income flows generated on cross-border investment, with the recent deterioration reflecting a fall in the net rate of return on its foreign investments. This is likely to have reflected the speed and timing of the recoveries in other countries relative to the UK over this period, such that movements in the rates of return on UK assets and liabilities have not been fully synchronised in recent years.

There has been much interest in the extent to which running a current account deficit matters. Running external deficits (and surpluses) can be beneficial for a country, provided it is in line with its economic fundamentals – for example, the demographics or levels of development of a country. Another way of looking at the current account is that it reflects the excess of national savings over national investment (see Annex). A country that runs a current account deficit (surplus) has a low (high) level of savings relative to its investment. The UK would be expected to be a net importer of financial capital, as there are likely to be a plethora of investment opportunities in the UK, which cannot be financed only by domestic savings. As such, a more efficient allocation of capital would see global savings help finance these investment opportunities, which could lead to faster economic growth.

Financial account

As the rest of the world is a net lender to the UK, this borrowing must be financed by net financial inflows. This can be achieved by increasing the foreign liabilities that are held by the rest of the world and/or disinvesting in previously-owned foreign assets. Solvency requires a country to be able to finance this external borrowing. The financial account records the net acquisition of financial assets and net incurrence of financial liabilities and is the counterpart to the current and capital accounts.

In the run-up to the financial crisis, the UK's net borrowing was financed through an increase in financial liabilities. There were large volumes of financial net inflows into the UK, while there were also similar sized flows out of the UK, as these gross flows of capital peaked at over 60% of GDP in 2007 (Figure 2).

These inflows were largely made up of "other" investments, which comprise loans and currency deposits, and tend to be more easily reversible. This is in contrast to longer-term investments, such as foreign direct investment and, to a lesser extent, portfolio investment. These flows are typically a more stable form of capital and so less subject to capital flight.

It can be seen that this financing position reversed in the immediate aftermath of the crisis, as there were withdrawals of financial capital, which likely reflected the heightened risk environment at the time. As such, the current account deficit was financed by UK investors selling more of their external assets than foreign investors selling their UK assets. This overall financing position then reversed between 2016 and 2017, resulting in an increase in the accumulation of financial liabilities, although the levels are much lower than in the period up to the financial crisis – the size of these capital inflows and outflows reached up to 25% in 2017. The latest Financial Stability Report (PDF, 6.8MB) highlights that there has been "mixed evidence as to investor appetite for UK assets since the EU referendum".

Figure 2: Financial investment flows into and out of the UK peaked in the run-up to the financial crisis

1990 to 2017

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1990 to 2017
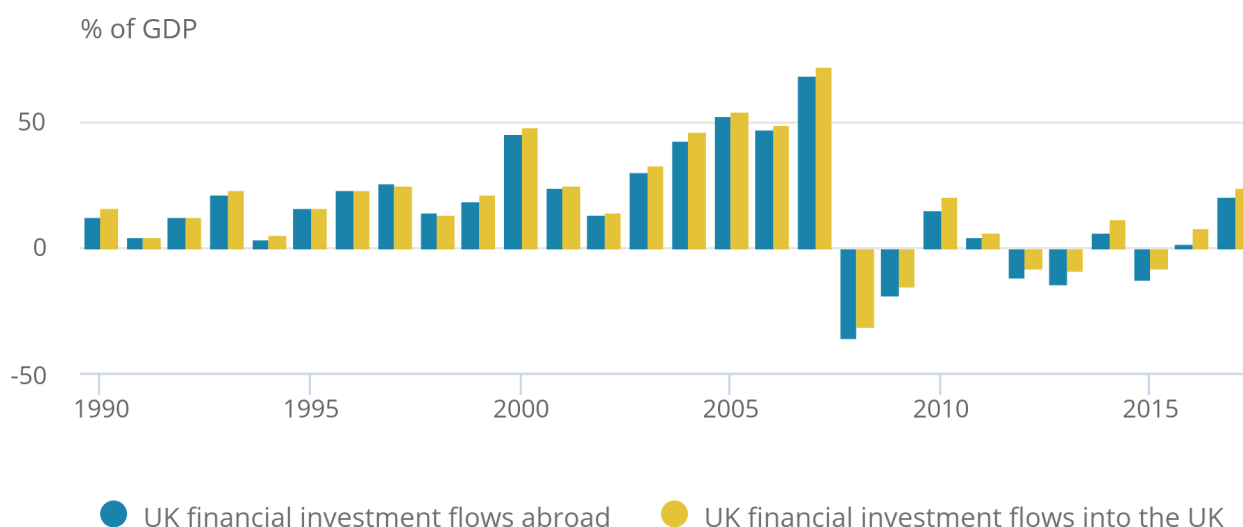
Source: Office for National Statistics

Net international investment position

While the financial account records international flows in the acquisition and disposals of financial assets, the stock positions are shown by the international investment position (IIP). The IIP provides a snapshot of the UK's external balance sheet at a specific point in time, which is linked by a flow-stock relationship with the financial account.

Reflecting the openness of the UK, as well as its role as a global financial centre, the UK has a large external balance sheet with its stock of foreign assets and liabilities over five times the size of GDP. The stock positions have increased markedly over the last 30 years, which is likely to reflect the period of financial liberalisation.

The change in the IIP not only reflects the accumulation of new assets and liabilities, but also the revaluation of existing ones – including the effects of currency and price changes, which capture changes in exchange rates and movements in bond and equity markets.

These revaluation effects impact upon the value rather than the underlying volume of assets. For example, there is a currency mismatch in the UK's balance sheet – its external assets have a relatively higher foreign currency denomination than its external liabilities – so there tends to be an improvement in the net asset position when there are large currency depreciations. This explains why there were marked improvements in the IIP in 2016 (Figure 3), with the latest estimates showing that the UK had a net liability position of 8.1% of nominal GDP at the end of 2017.

Figure 3: The recent improvement in the net international investment position reflects revaluation effects, driven by the fall in the sterling exchange rate

UK, 1990 to 2017

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UK, 1990 to 2017

Source: Office for National Statistics
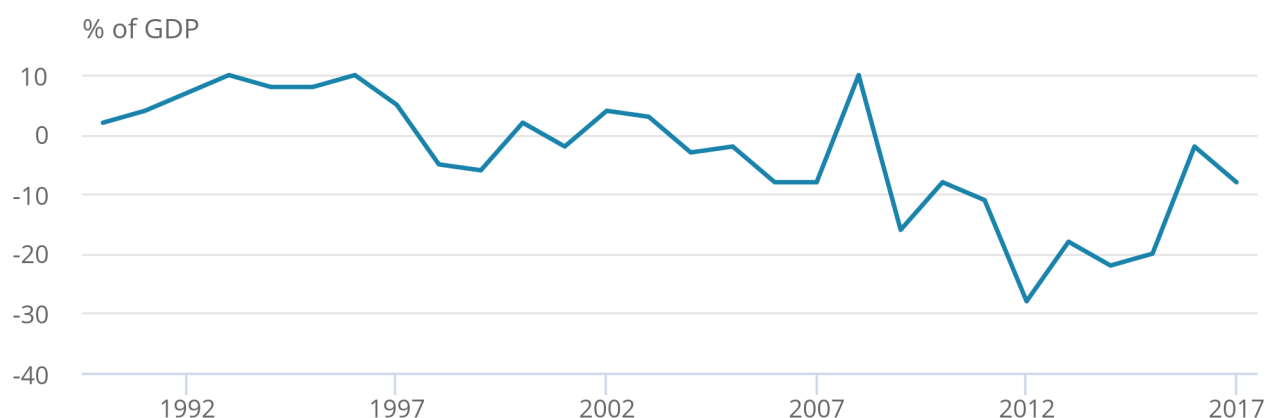
Notes for: The balance of payments

1. The capital account also forms part of the balance of payments, comprising of several miscellaneous transactions. These record transactions in non-produced non-financial assets, as well as capital transfers such as debt forgiveness. As the capital account forms a very small part of the UK's international transactions, it is not discussed further.

2. In theory the capital and financial accounts should offset the current account, although in practice this is rarely the case for all countries due to errors and omissions.

3 . Global measurement challenges

In many ways the world is a much smaller place than it was just 30 years ago. It is now easier to move goods and services around the globe either for trade or as part of a wider production process. Large multi-national enterprises (MNEs) benefit from operating across national boundaries. As such the old world that had more distinct national economic boundaries and more easily recognised resident firms is diminishing. This globalisation presents a wide range of economic opportunities, but it also creates measurement challenges for statisticians.

Production is now more easily fragmented across countries in "global value chains" (GVC), where several countries may be involved in the production chain. GVCs are becoming more common and their presence requires new ways to understand and analyse trade flows around the globe.

The rise in capability and use of technology across the world has enabled faster and more efficient transactions, including trade. This "digitalisation" has brought with it measurement challenges. Many services and some goods transactions are either ordered or delivered electronically via the internet or other electronic means. This can make this trade less visible and hence harder to record.

Cross-border activities such as sending goods abroad for processing, merchanting (where goods are bought and sold in third countries and never actually enter the country of the economic owner of the goods), and factory-less production (where the physical transformation of goods can be 100% outsourced to another company in the same or another country, but the resident firm owns the intellectual property used in the production process) are all practices that have grown as a result of globalisation.

The rise in capability and use of technology has also enabled faster and more efficient transactions, including trade. This "digitalisation" has brought with it further measurement challenges. Many transactions are either ordered or delivered electronically via the internet or other electronic means, which can make theses trade flows less visible and hence harder to record.

The importance of foreign direct investment (FDI) has grown rapidly in recent decades and has therefore become an important indicator of a country's interconnectedness in an increasingly globalised world. However, this rapid pace of change and increasing complexity in corporate structures has posed further challenges in how to record such activity, particularly with a view to its implications for external sustainability.

Here is an overview of some of the statistical challenges that impact upon how we traditionally record and analyse the balance of payments, including some of the recent initiatives that have been undertaken in being able to provide further insight into the UK's relationship with the rest of the world.

Trade in Value-Added

The emergence of global value chains (GVCs) has led to an increase in the number of interlinkages in the production of final goods. Imported goods can be used in the production of other goods that are then exported, while exported goods can then be used as inputs in other countries' exports. Final goods produced all over the world are increasingly composed of intermediate inputs from various countries around the world – raw materials from one country, technology from another, labour input from another country and service delivery from yet another.

The import content of UK exports is known as "backward" or "upstream" participation, whereas the contribution of UK inputs in other countries' exports is known as "forward" or "downstream" participation.

The economic value of these interlinkages is not captured in the gross flows between residents and non-residents recorded in the balance of payments. However, the value added that is embodied in exports and imports can be particularly relevant for trade policy. While gross trade flows essentially attribute the geographical origin of the product to the location of the final stage of production, this is not a true reflection of how value is added through the international production process, so additional information is required. The development of trade in value added (TiVA), which builds on the concept of input-output tables, provides insight on the value added by each country in the production of goods and services, so that the impact of GVCs can be better recorded.

The Organisation for Economic Co-operation and Development (OECD) has led significant development in this area, including the production of a TiVA database, recently updated to include projections for 2016, and also providing accompanying country notes for several countries, including the UK.

In response to demand, we have commissioned work from the Economic Statistics Centre of Excellence to produce early estimates of TiVA for certain UK sectors. This project has delivered and published initial findings, including "The value added from Trade for Key Business and Financial Service Industries: Initial Estimates" (Ebell, Pilkington, Rowe and Srinivasan, 2017) and "Constructing estimates for exports, imports and value added from exports of the car industry and other manufacturing industries in the UK" (Mion, 2018).

We have also worked with experts at the University of Sussex, who have been carrying out research to form a clearer picture of the business characteristics and behaviours of traders and to develop further TiVA estimates.

We are working collaboratively to provide further estimates of TiVA for the UK in our ongoing developments.

Multinational enterprises

There are now more multinational enterprises (MNEs), for whom their country of residence, the country in which their assets are owned and from which capital services are derived may all be different and not easily determined. As such, "intellectual property assets may be accounted for in one country, but provide capital services across affiliates abroad" (PDF, 771KB). Additionally, MNEs involved in a production process may use intellectual property assets (for example, computer software) across borders and utilise new approaches to create value added such as toll processing.

This is a challenge for the national accounts, which look to record economic activity on the basis of national boundaries and residence. In the balance of payments, we estimate the economic ownership and transactions between the UK residents and non-residents to show the UK's financial position with the rest of the world either as a net borrower or net lender. However, it has become more of a challenge for national statistical institutes (NSIs) to determine where the economic activity of large MNEs is located.

As such, it has become more difficult for NSIs to identify the location of the economic ownership of assets of the capital services derived from their assets, as well as the wider partners in trade or foreign direct investment relationships. This is why we have established an International Business Unit and invested in analysis of MNEs and FDI relationships including ultimate parent companies, to better understand how MNEs operate and to improve how we record their economic activities. These developments are touched on a little later in this article and are the topic of a further article in this Economic review.

FDI by the ultimate investing parent and ultimate host country

The emergence of global production networks and the incentives to minimise tax and regulatory burdens help explain why the financing structures of multinational enterprises has become more complex in recent years, in which these multinational corporations have investment chains spanning several borders. Official FDI statistics that use balance of payments concepts are based on the immediate counterpart country, which can incorporate investment chains spanning multiple economies. However, in analysing the residence of the investor, it is often the case that the ultimate investing company in some of the larger and more intricate multinational corporate structures is of more interest from a policy perspective.

For example, inward FDI may be channelled through financial centres, such as the Netherlands and Luxembourg. If an investor holds an affiliate indirectly in this manner, the inward FDI of the ultimate host country is attributed to the country of the financial centre – and not the country of the ultimate investor. This raises challenges when trying to understand who ultimately controls FDI in a country. FDI statistics by ultimate investing country (UIC) help establish the beneficiaries and risk-takers of such investments, while by ultimate host country (UHC) analyse where investments ultimately reach (Figure 4).
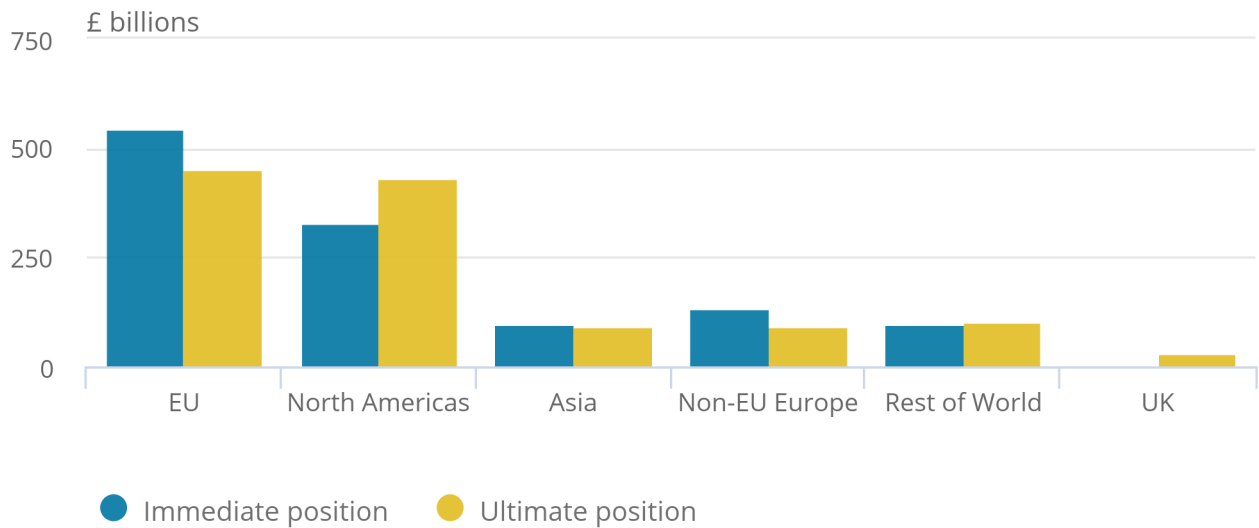
We have worked with international colleagues – particularly as part of the Eurostat Task Force on FDI – to share respective expertise and to develop new methods and guidance for developing these new statistics. We have used this useful engagement to develop a new methodology for producing FDI statistics by UIC, and continue to explore potential approaches for estimating FDI by UHC.

Figure 4: Inward foreign direct investment stocks according to the country of the ultimate and immediate parent country

UK, 2016

Figure 4: Inward foreign direct investment stocks according to the country of the ultimate and immediate parent country

UK, 2016

£ billions

[Bar chart showing Immediate position (blue) and Ultimate position (yellow) in £ billions for categories: EU, North Americas, Asia, Non-EU Europe, Rest of World, UK. Y-axis from 0 to 750 with gridlines at 250, 500, 750.]

- Immediate position   - Ultimate position

Source: Office for National Statistics

Notes:

1. Data featured in this chart were first released in an analysis paper published July 2018.

Special purpose entities

A salient development in this area has been the increasing role special purpose entities (SPEs) have in cross-border corporate structures, which are utilised by multinationals to manage their access to capital markets, financial risks, and regulatory or tax burdens. The measurement of SPE activity is important for ensuring FDI statistics accurately capture financial flows and corporate structures, while the ability to isolate SPEs from these data is increasingly required by users who wish to analyse the true beneficiaries and risk-takers of cross-border investment in terms of both the countries and entities involved.

We use FDI surveys as the main source for producing UK FDI statistics; however, while these surveys help to identify whether foreign parents and subsidiaries are (non-resident) SPEs, they do not currently include questions for identifying resident SPEs. As a member of the International Monetary Fund's Task Force on SPEs, we have worked with other members to develop an international definition of a SPE. We are also utilising this definition to develop a decision tree for identifying resident SPEs in the UK's FDI statistics.

Financial engineering

The main reason for the recent widening in the UK current account deficit has been a fall in net FDI income. It has been proposed in a recent article by the National Institute of Economic and Social Research that "financial engineering" (PDF, 166KB) has played a role here, arising from a shift in a company's headquarters to a foreign location for the purposes of tax-planning activities of multinational corporations. Such "engineering" affects recorded net investment income as profits are re-allocated to the foreign location, even though there has been no shift in the real cross-border activities of that company.

The article concludes that "substantial investments by national and international agencies in the gathering and analysis of more granular financial data are required if cross-border financial transactions and linkages are to be understood with any degree of accuracy". In response, we produced firm-level analysis to provide further insights into these cross-border financial linkages to see whether financial engineering was taking place in the UK, concluding that there was little evidence that companies re-domiciling their headquarters overseas have been having an adverse effect on UK FDI statistics in recent years.

Modes of supply

For service economies such as the UK, international trade in services play an ever more important role in the UK's transactions with the rest of the world. Trade in services statistics are by nature more challenging to produce, largely due to their intangible nature. It is relatively straightforward to measure the number of cars that are imported and exported through UK ports, but capturing the amount UK advertisers generate from providing services to overseas clients is much more challenging.

In addition, policy-makers are increasingly interested in how trade in services is conducted. This type of information is critical for understanding what barriers businesses face when wishing to trade, and assists policy-makers engaged in trade negotiations.

The World Trade Organisation's General Agreement on Trade in Services (GATS) defines trade in services as being conducted through four modes:

- Mode 1: Cross-border supply of services products, where both the supplier and consumer remain in their respective territories (for example, legal advice or financial services being supplied remotely via email or an online platform)

- Mode 2: Consumption of services products abroad, where the customer visits the supplier's territory (for example, tourists travelling abroad)

- Mode 3: Commercial presence abroad, where a supplier sets up a commercial presence in another country to provide services to a new market (for example, a telecoms company establishing a foreign subsidiary to provide mobile phone services abroad)[1]

- Mode 4: Provision of services abroad by natural persons, where personnel working for the supplier travel abroad to provide services to the customer (for example, the supplier sending an architect or business consultant to the customer's site to provide services)

An important challenge is that while these concepts are familiar to statisticians and trade negotiators, they are generally not recorded by businesses in their accounts. As such, requesting businesses to provide detailed breakdowns of their exports and imports, by product, country and mode of supply is likely to be very burdensome, if even possible. Nevertheless, as part of various task forces, we have worked closely with international organisations and other countries to share understandings of user needs and potential solutions.

One approach that is readily available was developed by Eurostat in 2017, which apportioned trade in services products by mode of supply, based on guidance received from statistical experts from a number of countries (Figure 5).

Figure 5: EU-28 outward supply of services (experimental)
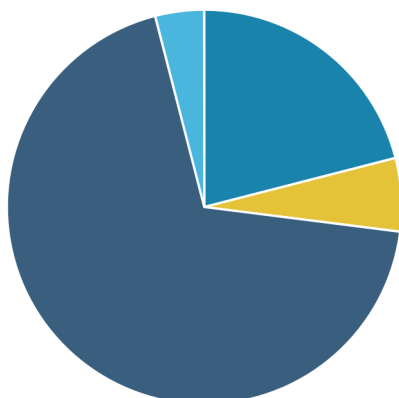
Source: Eurostat

Notes:

1. Data featured in this chart were published in a [Eurostat working paper](#).

2. Modes of supply breakdowns presented here follow the World Trade Organisation's definition of Trade in Services as detailed in the General Agreement for Trade in Services (GATS). These definitions are broader than those used to report trade in services statistics in the balance of payments.

However, this is only illustrative in nature and the Eurostat method does not meet the requirements of many users of Office for National Statistics (ONS) trade statistics, many of whom have emphasised the need for UK-specific estimates collected from businesses.

In response, we have commissioned a project to investigate the feasibility of collecting data on modes of supply from businesses. The project first reviewed different countries' experiences of collecting this data, and engaged with businesses that conduct trade in services to better understand the data available to them. Based on this information, we explored the feasibility of asking businesses to provide estimates of trade that is conducted remotely (Mode 1) through adding new questions to the International Trade in Services (ITIS) survey, in line with a similar approach being considered by the USA's Bureau of Economic Analysis.

In September 2018, a sample of 100 businesses were selected to test the new survey questions for the ITIS survey. There was little change in the response rate amongst the pilot sample and most businesses were able to respond, so we decided to add the new questions to the annual ITIS survey for 2018 for 5,000 businesses who are known to engage in international trade in services. This larger sample will enable us to further test the quality of responses that are received, and to potentially produce new UK-specific estimates for trade in services by modes of supply through producing a hybrid method that combines results from the new survey questions with the Eurostat method. We hope to produce a methods article in summer 2019, including progress of the project so far and initial findings.

Greenfield FDI

There is increasing user desire to link FDI statistics to the national accounts concepts, such as capital investment [2]. FDI statistics focus on financial relationships between affiliated businesses, capturing their equity positions, debt and cash injections. While some of these financial flows will fund investment in fixed capital – referred to as "greenfield FDI" – other flows are used to finance other expenditures such as mergers and acquisitions (M&A) activity and corporate restructures, which often dominate headline estimates. Furthermore, foreign-controlled businesses are unlikely to rely solely on financing from their parent company to invest, but can also utilise local financial markets – activity that is not captured in the balance of payments.

Several approaches have been discussed and shared internationally on how best to address this requirement, including breaking flows down by purpose, or by estimating the total domestic investment of foreign-owned businesses. We are continuing to engage in these international discussions and are considering the use of data-linking techniques, similar to those we utilise to produce experimental statistics that describe the contributions of businesses engaged in FDI to the UK economy.

Asymmetries

Trade and FDI asymmetries have been a global phenomenon for decades, which is where statistics produced by different countries on the same bilateral relationships are not equal. These stem from the fact that national statistical institutes (NSIs) produce statistics independently.

While international guidelines have helped harmonise concepts and methods, asymmetries remain due to many reasons including differences in the data sources, estimation methods, definitions and valuations methods. Further efforts are therefore required to enable statisticians to collaborate internationally to understand and address the main drivers behind asymmetries.

Asymmetries are a challenge as they result in multiple estimates being available to users for the same bilateral relationship. To understand the underlying issues, we are working with international partners to exchange information and data via Eurostat's FDI Network and through working closely with other European countries' institutions with which the UK has the largest FDI relationships.

The ambition of these efforts is to identify the main drivers of asymmetries, determine whether they are systematic and therefore likely to explain UK asymmetries with other countries, and to assess what steps can or should be taken to address these differences.

Likewise, we have delivered wide-reaching analysis of the UK trade asymmetries, providing context and explaining some of the reasons behind the asymmetries. We focused initially on the USA and the Republic of Ireland, followed by further work expanding our international collaboration and analyses to include Germany, France, the Netherlands, Luxembourg and Belgium. These analyses have highlighted that not all countries are moving to revised international standards quite as fast as the UK.

Digital Trade

One of the main recommendations from the [Independent Review of UK Economic Statistics (2016; PDF, 5.1MB)](#) relates to the measurement of economic activity associated with the digital economy, where "the rapid and sustained rise in computing power, the digitisation of information and increased connectivity have together radically altered the way people conduct their lives today", including how trade is conducted. Digitalisation encompasses a wide range of new applications of information technology but there is a distinct rise in user demand for a better understanding of the extent to which trade is facilitated by digitalisation.

The [International Monetary Fund (IMF)](#) explain that "digital trade includes cross-border transactions that are digitally ordered, platform-enabled, or digitally delivered", which in theory, some of which is being picked up by our data sources and methods. However, it will be recorded with other trade flows, not as a distinct concept. It is the separate estimation and presentation of this digital trade that is required by users as well as potential improvements to its measurement.

We are engaged in international efforts, led by the [OECD](#), to provide a standard definition and improve the measurement of digital trade. We are working closely with our users to better understand the requirements and ultimately to develop initial estimates of digital trade as part of our future development.

Flow of funds

The financial crisis highlighted the need for more granular whom-to-whom information on international financial transactions, as "information about financing flows is central to understanding the evolution of assets and liabilities and thus the nature of the financial vulnerabilities" ([Independent Review of UK Economic Statistics, 2016 (PDF, 5.1MB)](#)). Whilst the financial account captures the changes in international ownership of financial assets and liabilities between the UK and the rest of the world, it does not provide granular whom-to-whom information on these financial transactions. Granular information on assets and liabilities, including counterparty information, is essential for the purposes of monitoring the risks to financial stability.

The purpose of the flow of funds is to capture all these lender-borrower relationships in the UK, including those with the rest of the world. In a joint initiative with the Bank of England, ONS is working on a fully integrated set of flow of funds statistics in the national accounts. This will provide much richer information on the financial flows taking place in the UK, capturing the inter-connectedness of the UK financial system and identify those parts of the economy that may be exposed to the build-up of financial vulnerabilities. Recent analysis by ONS showed [how the flow of funds can be analysed](#) to provide insights that could have been important during the build-up to the crisis, potentially giving early warning signs of a rise in financial instability.

Notes for: Global measurement challenges

1. While Mode 3 is recognised as trade in services by GATS, it is not included as part of trade in services in balance of payments due to the latter's focus on residency rather than nationality of ownership.

2. FDI and domestic investment statistics are different conceptually, where FDI focuses on financial investment flows (equity, loans, and so on), whereas capital expenditure statistics focus on investment in non-financial assets (for example, dwelling, machinery, IP, and so on). While FDI may be used to fund new capital investment – or acquire existing capital through M&A – foreign-owned businesses can also raise finances externally through other means unrelated to FDI (portfolio investment, domestically-raised funds, and so on). These other sources may also be combined with FDI to fund capital investment. FDI therefore only records the financial relationship between a parent company and its subsidiary, rather than all the activities of the subsidiary. As such, headline FDI and business investment statistics cannot be considered as components of each other since the concepts that underpin each measurement are different.

4 . Conclusions

In recent years, the UK current account deficit has widened to levels that are high by historical and international standards. This has raised concerns around whether the UK can rely on high levels of external financing, which has further increased following the EU referendum. As such, there has been increasing attention paid to trends and developments in the UK's Balance of Payments.

However, the increasingly globalised nature of economic activity poses many challenges to how national statistical institutes (NSIs) measure economic activity.

The cross-border activities of people and businesses have resulted in international borders becoming increasingly blurred. This is particularly true in the case of multinationals, whose decisions, operations, value chains, trade, corporate structures, and economic ownership are rarely confined to a single economy. This requires statisticians to increase their efforts not only to ensure existing statistics are fit for purpose, but also to develop new ones that describe how cross-border transactions are conducted so that there is a deeper understanding of their true nature.

This has been coupled with the increasing user demand for improved and more detailed bilateral UK trade and investment statistics following the EU referendum, to help provide a better understanding of the UK's relationship with the rest of the world.

We have implemented an ambitious transformation programme, collaborating with data providers, analysts and users. This transformation is now delivering a wide range of outputs and insights that outstrips anything previously possible, which is helping improve our understanding of emerging trends and developments, including insights into some of the challenges covered here. We have also been involved in international collaboration, engaging with initiatives aimed at developing international guidance that address these new phenomena.

Examples include:

- Strong collaboration with HM Revenue and Customs (HMRC) and development of the data sources and methods that underpin our trade in services statistics have allowed us to dramatically increase the number of trade statistics we publish over the last two years, from around 1,000 to just over 100,000 series.

- we have provided innovative new tools for users to access and analyse the data – we now publish interactive maps that show 234 countries' trading relationships with the UK, broken down by 125 types of goods – which are updated each month

- we have delivered wide-reaching analysis of the UK trade asymmetries, providing context and explaining some of the reasons behind the asymmetries, which have highlighted cases where other countries are moving to revised international standards at a slower pace compared with the UK

- we have also collaborated with the academic community, demonstrating that UK trade in goods asymmetries are similar to those of other developed economies and to provide valuable information about the causes of our asymmetries; as this work progresses, we anticipate that we and other producers of these statistics may revise data as appropriate to begin to reduce the asymmetries

- we have recently produced fuller experimental estimates of trade in services, covering all industries, by type of service and country; these estimates cover the whole of the UK's services trade down to a very detailed level

- we have also used HMRC microdata on trade in goods to produce experimental estimates by industry to enable users not only to see what goods are exported, but what areas of the economy are involved in this trade

In addition, the increasing reach, dominance and complexity of multinationals raises challenges to how cross-border investment is measured. The increasingly complex corporate structures of multinationals and their use of financial centres often distorts the geographical breakdowns of FDI.

Such developments require new statistics on the ultimate ownership of investments and improved measures of special purpose entities and financial engineering. Furthermore, new statistics on the impacts of FDI on the real economy that go beyond the reporting of inter-company finances are increasingly sought by policy-makers. We have produced analysis in this space to further our understanding of these new trends, while remaining committed to further research in this area.

The topics covered in this article present just some of the challenges statisticians face today, whilst highlighting the reason why we continue to invest in developing our international trade and investment statistics. This is to ensure they continue to provide users with a reliable and comprehensive evidence base on which to assess the economy and develop policy.

We are delivering at pace against an ever-expanding demand, investing in a range of developments to help meet the new measurement challenges outlined in this article. Our transformation has already delivered data and analysis that are informing the debate and enabling better decisions, while we are looking to continue undertaking further research into these areas. We have set out some of these developments in this article, with further analysis included in other articles in this Economic review.

5 . Authors

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6 . Annex: Savings, investment and the current account

Gross domestic product (GDP) is a production concept that records output that is produced in a country. There are three ways to measure GDP: production, income, and expenditure. The expenditure concept is estimated as the sum of private consumption (C), investment (I), government consumption (G), investment (I) and net exports (X-M).

$$GDP = C + I + G + (X-M)$$

Gross national income (GNI) includes the final value of incomes flowing to UK-owned factors of production – irrespective of whether these are located in the UK or overseas. As such, it also records net income from abroad (NIFA). These capture the flow of income that is received on UK assets, net of income that is payable on UK liabilities.

$$GNI = GDP + NIFA$$

Savings (S) captures the difference between GNI and private and public consumption.

$$S = GNI- (C+G)$$

The current account records international trade, investment income and current transfers.

$$CA = (X-M) + NIFA$$

It is possible to re-arrange these national accounts identities, so that:

GNI = C + I + G + (X-M) + NIFA

GNI - (C + G) - I = (X-M) + NIFA

S - I = CA

This shows that the current account can be expressed in two ways:

- it is the differences between the value of exports and imports, covering trade, investment income and current transfers
- it is it the differences between national savings and investment

Analysis of how much the UK is a net borrower from the rest of the world through the savings and investment relationship helps reinforce the concept that it is macroeconomic drivers that help explain movements in the current account.

Compendium

Understanding multinational enterprises: insights from the International Business Unit and foreign direct investment statistics

The activity of the International Business Unit in Office for National Statistics and the role of foreign direct investment companies in the UK.

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5. [Acknowledgements](#)

1 . Challenges of measuring globalised businesses in National Statistics

Globalisation has created new opportunities and competitive challenges for multi-national enterprises (MNE), for instance, driving producers to seek more efficient ways to manufacture their products. However, in more recent years, recording the rapidly changing globalised production arrangements in National Statistics has become very difficult in terms of data collection, production and analysis.

This has become even more challenging with the requirement to adopt the concept of economic ownership (as opposed to legal ownership) within the System of National Accounts and balance of payments manual. This has especially affected the measurement of cross-border flows of goods and services.

An example of the impact that a large business restructuring and the adoption of economic ownership can have on how economic activity is recorded is the Republic of Ireland's Central Statistics Office (CSO), who published an annual real GDP growth figure of 26.3% in 2015. This striking figure can be largely attributed to a number of large multinational corporations who relocated their economic activities to Ireland, specifically their underlying intellectual property. The principle of economic ownership says that sales that are generated from the use of intellectual property now contribute to Irish GDP rather than to other countries' GDP, inflating the figure of real activity in Ireland.

The International Business Unit

To try to address such challenges, Office for National Statistics (ONS) has set up a new team (initially as a pilot) called the International Business Unit (IBU). The IBU is working closely with a small group of large MNE groups to ensure that ONS is appropriately capturing the impact of globalisation through the collection of data from our business surveys and administrative data. A multi-skilled team including a qualified accountant, national accounts and surveys expert and account managers compare all sources of available data for each MNE. This includes administrative, survey data, annual reports and financial statements to identify and resolve data discrepancies brought about through globalisation.

However, these data sources only provide part of the picture in terms of understanding the global operations of the MNEs and so this is supplemented with having well-informed and detailed conversations with representatives at the businesses. Each account manager takes responsibility for a number of MNEs, building close working relationships with the respondents. This model proposes that regular contact will be maintained by visiting the businesses on a face-to-face basis at least once a year. Such businesses will be closely monitored, allowing account managers to become experts in those groups and specific industries. Some industries have operational characteristics in common regarding how they structure themselves, and therefore it is beneficial to develop industry-specific expertise.

Working closely with these MNEs provides us with a much deeper and richer understanding of the nature of their international transactions and how these should be treated for National Accounts and Balance of Payments. For example, IBU is collecting additional information to understand the complete picture of an MNE's global operations, including mapping all the flow of goods and services between the UK and other countries. This includes tracking both the physical movements and economic ownership of these goods and services throughout the global value chain and ultimately capturing the true value added to the UK economy.

IBU is still very much in its infancy and up until this point has been run as a pilot exercise. The long-term goal for the unit is to take responsibility for data collection and validation, relationship management and consistency checking for a number of carefully defined and prioritised MNEs. Ideally, these will be the MNEs that have the greatest impact on important outputs such as gross domestic product (GDP) and Balance of Payments. ONS is drawing on the experiences of other statistical institutes who have already established similar "Large Cases Units", such as in Ireland's CSO and the Netherlands' Central Bureau of Statistics (CBS). It is important to note here, that the UK economy is very different to both those countries mentioned and so while we can learn from them, we have to adapt the IBU to what best suits the UK.

What are the main aims of the IBU?

In summary, the aims of IBU are:

- to thoroughly understand the issues involved with the restructuring of MNEs, particularly where there is the potential for a notable impact on UK economic statistics

- to gain a better understanding of the scale and extent of globalisation issues, such as contract manufacturing and cross-border use of intellectual property, and the impact that has on important data collected by ONS

- to ensure that there is consistency and coherency across all the survey and administrative data collected for every MNE in scope

- to take proactive action to understand future changes in legal regulations (for example, tax and accountancy) that are likely to have an impact on data collected, ensuring that ONS adapts accordingly

- to ensure that ONS asks the appropriate questions of the MNEs, tailored to their individual business model and to reduce the questionnaire burden placed on them.

The benefits of an IBU for ONS and external users

The main benefit is that a multi-skilled account management team will ensure the collection of more timely and accurate data from the most important MNEs at the very beginning of the economic statistical production process. This will enable a prompt reaction to data changes and the resolution of potential anomalies before they are processed by any of the statistical domains. Comparisons could be made analysing all data received from different surveys and potential issues addressed at the first receipt of data.

Another important benefit of such a unit is that a closer working relationship with the MNEs will encourage a more proactive approach by the businesses to inform ONS of potential and upcoming business structure or data changes. This will allow ONS to better understand and prepare for any impact which may result. It is important to note that changes to one MNE can affect a number of ONS economic outputs.

This team will have the appropriate skills and capability present to fully understand these global MNE groups, their accounts and the underlying global activities in order to ensure that we are capturing the correct statistical data. Some of the globalisation and digitalisation models that we are aiming to identify and treat include:

- contract manufacturing

- toll processing

- transfer pricing

- factory-less goods production (FGP)

- merchanting of goods and services

- foreign direct investment (FDI) and related income flows

- internet-related activity

- stocks and flows of intellectual property products

- special purpose entities (SPEs)

Annex 1 provides further explanations of each of these concepts and how these create measurement challenges for national statistics.

This is very complex work as IBU have identified MNEs that are involved in all such globalisation models. For example, one MNE confirmed that they have many different ownership models in place, representing hundreds of component parts in the production process.

What progress has been made?

A small IBU team (six staff) has been up and running for 18 months. We have been learning and increasing our understanding of how and why large MNEs structure as they do, and how this has an impact on the data collected, analysis and dissemination to national accounts.

The strong relationships that we are building with our most important MNE respondents is proving to be very valuable in terms of supporting many ONS transformational projects and developments across ONS.

Important work that IBU has supported

We worked with the International Trade teams to provide guidance regarding the different global production scenarios in place and how they impact on the import and export of goods and services and their contributions to some of the trade asymmetries.

We improved the quality of the sample frame and data collated for the FDI Survey by ensuring that the correct legal ownership structure is in place for the largest MNE groups. This included collating information on minority and associate shareholdings.

We provided advice and guidance regarding the potential impact of the changes to the International Financial Reporting Standards (IFRS) 15 and 16 by asking businesses what impact this will have on data collected and suggested methods to account for this.

One of the areas where we have made a great deal of progress is applying practical treatment to collating data on an economic ownership basis rather than legal ownership. A clear distinction between the physical movement of goods and the transfer of ownership of goods is needed. This has implications for the way ONS measures value-added and productivity, particularly surrounding the following areas.

Economic ownership of goods and services within a MNE

IBU have identified cases where the entity selling the goods is not the economic owner of the goods. This has obvious implications for data collection and measurement.

Capturing the import and export of goods

National accounts captures processing carried out across borders based on the transfer of ownership principle. Thus, the physical movement of goods across borders may not reflect actual import or export of goods.

Business activities and supply arrangements with third parties

MNEs engage in several supply arrangements, mostly to minimise operating costs. For example, firms engaged in contract or factory-less manufacturing could be classified as wholesale traders or as part of other service industries, rather than manufacturing. This has obvious implications for measuring the "correct" industrial composition of an economy.

Economic ownership of IP

Part of the production of MNEs and of their capital stock should be assigned to the country of residence of the subsidiary which holds the intellectual property (IP), even if the actual assembling of the product takes place in its entirety in a foreign country. However, understanding the economic ownership of IP is not always straightforward as the producer of the IP may be different from the economic owner.

Measurement of employment

Economic ownership creates issues in terms of the measurement of employment as value added can be credited to an entity even if it does not carry out any actual production. Therefore, it is possible to record high value added with very few or without any employed personnel. It is also possible to record high employment figures but low value added (toll processors).

Activities of foreign branches in the UK

Some MNEs provide goods and services across borders through foreign branches. Therefore, understanding the economic ownership of goods and services between legal entities and branches is important for data collection. This also happens in reverse where we have foreign branches of UK entities resident abroad.

Initial IBU results show that the majority of MNEs are engaged in a variety of global operational models and as a result a more tailored data collection model would ensure the adoption of better measurement of these activities. IBU is working collaboratively with many national accounts experts across the different statistical areas within ONS to map existing survey data requirements to business-friendly variables. We are taking into consideration the MNE's global model; IBU tailors the questions and data variables to suit each MNE.

IBU are also part of the ONS's Census and Data Collection Transformation Programme (CDCTP), exploring potential options for offering a tailored approach (bespoke) collection service for the largest businesses. This also includes testing the feasibility of collecting direct data feeds from the MNE's internal financial accounts systems. First results from testing a tailored approach with a small number of MNEs are very promising.

IBU requires international collaboration

Using existing European regulations, IBU has been collaborating and sharing some limited MNE microdata with counterpart European statistical institutes. The UK is involved with two European initiatives; Early Warning System (EWS), which is designed to take a proactive approach informing other NSIs of potential large business restructures; and the GNI MNE Pilot work, which is sharing microdata for 25 of Europe's most important MNEs to ensure consistency in data treatment.

Challenges faced

The IBU has had good success during a short period, however, it has also faced a number of challenges.

Complexity

The complexity associated with understanding MNEs operational models, including mapping out all the flows of goods and services by their economic ownership, should not be underestimated. There are often hundreds (in some cases thousands) of legal entities operating within just one MNE and IBU needs to understand the relationships between them all. IBU staff are required to understand all survey data that are collected and all national accounts and balance of payments data requirements.

Careful implementation of changes

As each MNE delivers a set of new challenges to address, often with no precedent in terms of practical treatment, it can be challenging to ensure the correct implementation. Treatment is often achieved on a case-by-case basis. It is part of IBU's responsibility to ensure consistent treatment of changes across the different statistical domains. In some cases, these large businesses dominate the industry in question and therefore this needs careful implementation given potential disclosure issues.

Legal barriers and data sharing

Unlike the collection of data, which is governed by the Statistics of Trade Act 1947, there is currently no legal requirement for these companies to share any associated information such as their global group with ONS. The IBU account manager is required to convince the company by showing the long-term benefits of working closely with IBU (mainly reducing burden and having a tailored approach to each MNE). It is important to recognise that building relationships will take time and again is a long-term aim.

The right engagement with MNEs

Ensuring that IBU engages with the correct people at the MNE has also been challenging. IBU has met a complete mixture of skills and level of staff ranging from Directors, tax directors, group accountants, junior accountants, financial analysts and in some cases spoken to many different staff representing different segments of the MNE.

2 . The International Business Unit can help deepen our understanding of multi-national enterprises for foreign direct investment statistics

Foreign direct investment (FDI) measures the cross-border investments of companies based on control relationships. FDI occurs when a parent company acquires more than 10% of the voting power (ordinary shares) of a business in a different country. Outward FDI refers to UK-owned companies abroad while inward FDI refers to foreign-owned companies in the UK. FDI statistics typically capture the value of the stock of FDI, the earnings on that stock and flows between parent companies and their affiliates. Therefore, insights from the International Business Unit (IBU) that increase our understanding of how some of the larger multi-national organisations are structured should help enhance these statistics further, in addition to the IBU working with businesses to develop data collection.

Our [foreign direct investment involving UK companies](#) bulletin is the main source of statistics in this area. We have also published [other analytical articles](#) that provide more detail on UK FDI trends. This includes assessing the impact that trends in FDI earnings have had on the UK's current account balance, the effects of sterling exchange rate movements on FDI values and [experimental statistics from micro-data linking FDI with other Office for National Statistics (ONS) micro-data](#). It is these experimental statistics, first published in July 2018, upon which most of this section is based. This highlights the extent to which corporate structures can affect FDI statistics in addition to comparing the characteristics of companies with FDI links.

The largest 25 FDI companies accounted for half of the UK's outward stock of FDI and over one-third of the inward stock in 2016

The importance of the largest companies in UK FDI can be seen by looking at the distribution of these investments by company size. This shows that the 25 UK companies with the highest value assets from direct investments held abroad accounted for half of the total value of FDI assets in 2016 (Figure 1). This then increased by 10 percentage points to 60% when the next 25 largest outward FDI companies are added. The impact of adding each group continues to diminish despite the number of businesses within the later groups increasing. All outward FDI businesses accounted for 82% of total UK FDI assets in 2016, with the rest held by monetary financial institutions (MFIs) and other categories of investment that are counted separately.

Figure 1: Distribution of UK foreign direct investment assets grouped by asset values in descending order

2016

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2016
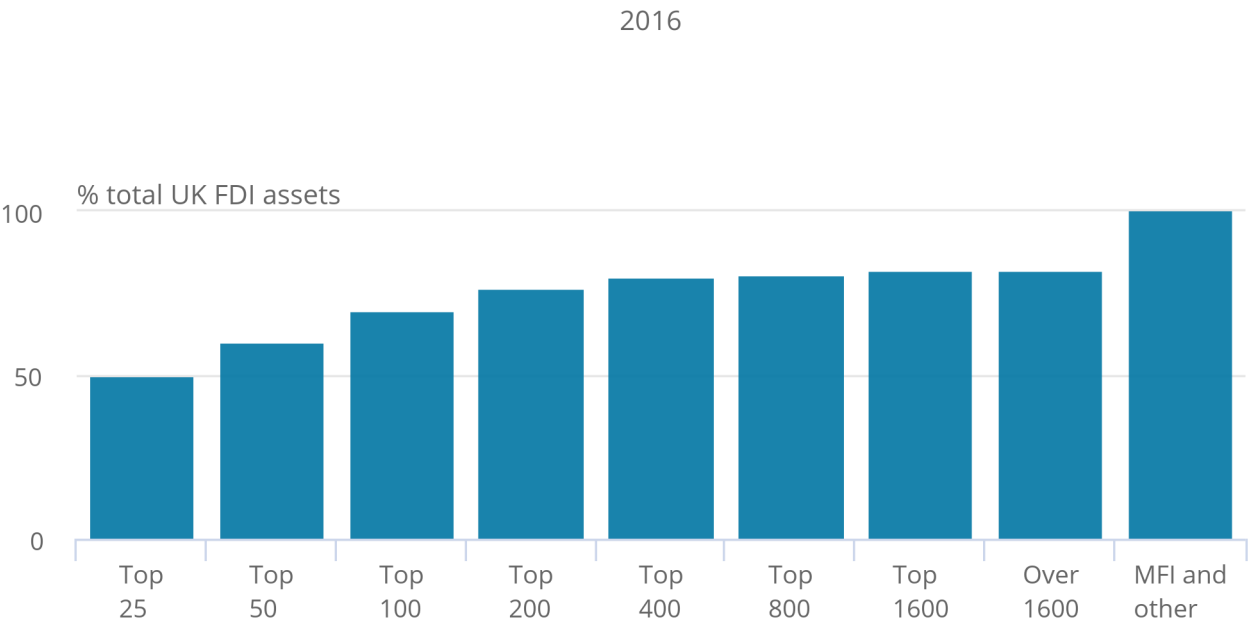
Source: Office for National Statistics – Foreign Direct Investment Survey

Notes:

1. These statistics were first published in [Foreign direct investment, trends and analysis, January 2018](#) and have not been updated to reflect any subsequent revisions to our 2016 estimates.

A similar situation exists for UK liabilities – the stock of FDI in the UK controlled by non-UK companies – but the stock is less concentrated among the biggest UK companies. The largest 25 companies by value of inward investment accounted for over one-third (38%) of total UK liabilities in 2016 (Figure 2). This increased by 13 percentage points, to 51% when the next 25 largest companies are added. All inward FDI businesses accounted for 93% of total UK liabilities, with MFIs and other categories of investments comprising the remaining seven percentage points of UK liabilities.

Figure 2: Distribution of UK foreign direct investment liabilities grouped by liabilities values in descending order

2016

Figure 2: Distribution of UK foreign direct investment liabilities grouped by liabilities values in descending order

2016

% total UK FDI liabilities

[Bar chart showing cumulative % total UK FDI liabilities with categories on the x-axis: Top 25, Top 50, Top 100, Top 200, Top 400, Top 800, Top 1600, Over 1600, MFI and other. Values increase from approximately 38% to 100%. Y-axis ranges from 0 to 100.]

Source: Office for National Statistics – Foreign Direct Investment Survey

Notes:

1. These statistics were first published in [Foreign direct investment, trends and analysis, January 2018](#) and have not been updated to reflect any subsequent revisions to our 2016 estimates.
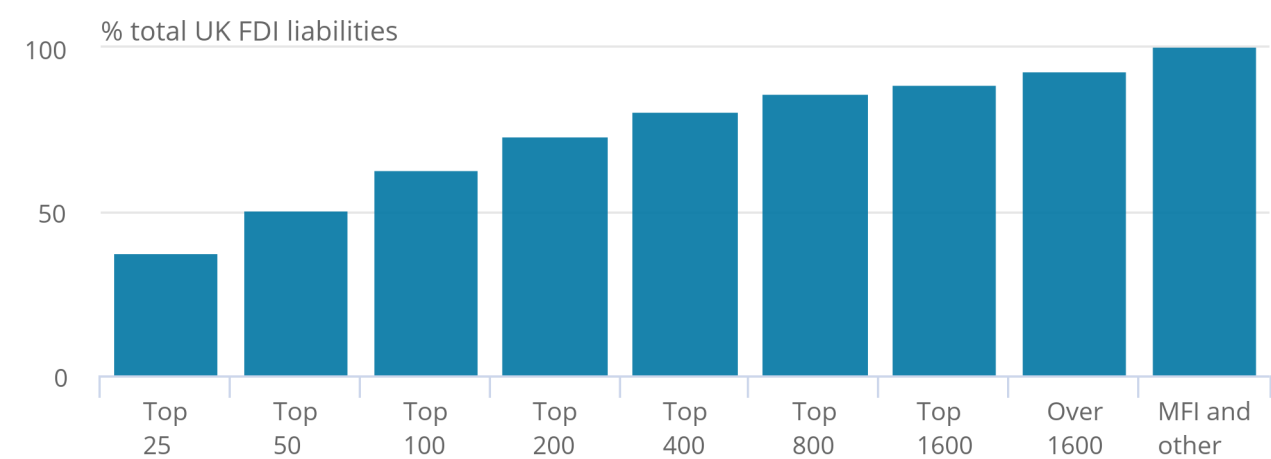
The different distributions for outward and inward positions can be partly explained by the structure of global multi-national companies. However, this also underlines the importance of the IBU in working with the largest UK companies to understand their business structures and international activity better. This in turn should help to develop the information that we receive from them and the FDI population from which we select samples to produce our FDI statistics.

Multi-national business structures can affect the geographical composition of UK FDI

International guidelines on compiling FDI statistics require these to be presented using the country of the immediate parent company. Thus, geographical compositions reflect immediate relationships between investing parties rather than the residence of the ultimate parent or final destination of the investment. Multi-nationals often have complex corporate structures, where a parent company controls a large network of inter-linked affiliates and branches across the globe. Since published statistics report the immediate partner country, geographical compositions can be distorted in cases where a parent company invests through one or more countries before the investment reaches its final destination. While affecting geographical compositions, aggregate FDI statistics are unaffected by whether they are presented on an immediate or an ultimate basis.

We have investigated these corporate structures further by linking our FDI results with information on the country of the ultimate parent company on the Inter-Departmental Business Register (IDBR). The IDBR is a comprehensive list of UK businesses used by government for statistical purposes. It provides the main sampling frame for surveys of businesses carried out by Office for National Statistics (ONS) and other government departments. It is also an important data source for analyses of business activities.

Moving from the immediate to the ultimate parent increases the value of FDI held in the UK by US companies but lowers it considerably on that from Luxembourg, the Netherlands and Jersey

The United States was the country that directly held the greatest stock of FDI in the UK. This was valued at £308.1 billion in 2016, and was closely followed by FDI from the Netherlands (£212.1 billion) and Luxembourg (£114.8 billion). These are the only countries holding more than £100 billion of direct investment in the UK using the immediate parent company. Figure 3 shows the top 20 countries by value of the inward FDI position based on the country of the immediate parent company and the ultimate parent company.

Figure 3: UK foreign direct investment (FDI) by country of the immediate and ultimate parent company, top 20 by inward FDI position, 2016

The US remains the country with the greatest value of inward FDI in the UK in 2016 on an ultimate basis. The position increased by £105.8 billion to £413.9 billion, making FDI from the US equivalent to over one-third of the UK's total inward investment position in 2016, and up from being around one-quarter of the total position on an immediate basis. Belgium becomes the country with the second-largest value of inward FDI stock in the UK, up from being the twelfth-largest on an immediate basis. Both France and Germany had similar immediate positions in the UK in 2016, of £59.9 billion and £59.8 billion respectively, ranking them fifth and sixth. The value of these respective FDI positions increased on an ultimate basis, where that from Germany rose by £15.9 billion to become the fourth-largest value and the French inward position increased by £12.5 billion to remain the fifth-highest country value.

There are 10 countries in the top 20 that had a lower ultimate position than immediate in 2016. Of these, by far the largest changes are for the Netherlands, Luxembourg and Jersey. The value of FDI from the Netherlands more than halves when moving from the immediate to the ultimate parent company, falling by £124.1 billion to £88.0 billion. Despite this, the Netherlands remains one of the largest inward investors in the UK, with the third-largest ultimate position. The inward FDI position from Luxembourg decreased by almost two-thirds to £43.2 billion, £71.6 billion lower. The ranking of Jersey falls considerably, going from the fourth-largest county on an immediate basis, to the thirteenth on an ultimate basis. The biggest change in the ranking of a country is for Singapore, moving from fourteenth to thirty-first.

These lower values of FDI on an ultimate compared with immediate position – and from the Netherlands, Luxembourg and Jersey in particular – reflects the role of corporate structures and the amount of FDI that comes to the UK through these countries from elsewhere. There are many reasons why companies may choose to channel their investments through other countries. Taxation is one of the reasons, although legal protection, clustering of similar businesses and corporate functions are also important.

There is also a role for direct investments in the UK with a foreign immediate parent but also a UK ultimate controlling parent. This is also known as "round-tripping", where UK companies can use the wider corporate functions through which to invest in the domestic economy. In 2016, UK companies held a stock of £30.7 billion in the UK with a foreign immediate parent; this was equivalent to 2.6% of the UK's inward FDI stock.

Values of the inward stock of FDI in the UK from the North Americas and EU become very similar when linking to the country of the ultimate controlling parent.

FDI in the UK can also be presented by continent on both an immediate and ultimate controlling parent basis. The majority of FDI held in the UK between 2014 and 2016 was controlled by companies in the EU. UK companies with an immediate parent in the EU accounted for £541.6 billion (or 45.2% of the total inward FDI stock). This decreased by £90.8 billion to £450.8 billion (37.6%) using the country of the ultimate controlling parent. This pattern for the EU is also repeated in every year presented in Figure 4, where the ultimate position held in the UK is lower than the immediate position.

Figure 4: UK inward foreign direct investment positions by continent of the immediate and ultimate controlling parent company

2014 to 2016

Figure 4: UK inward foreign direct investment positions by continent of the immediate and ultimate controlling parent company

2014 to 2016
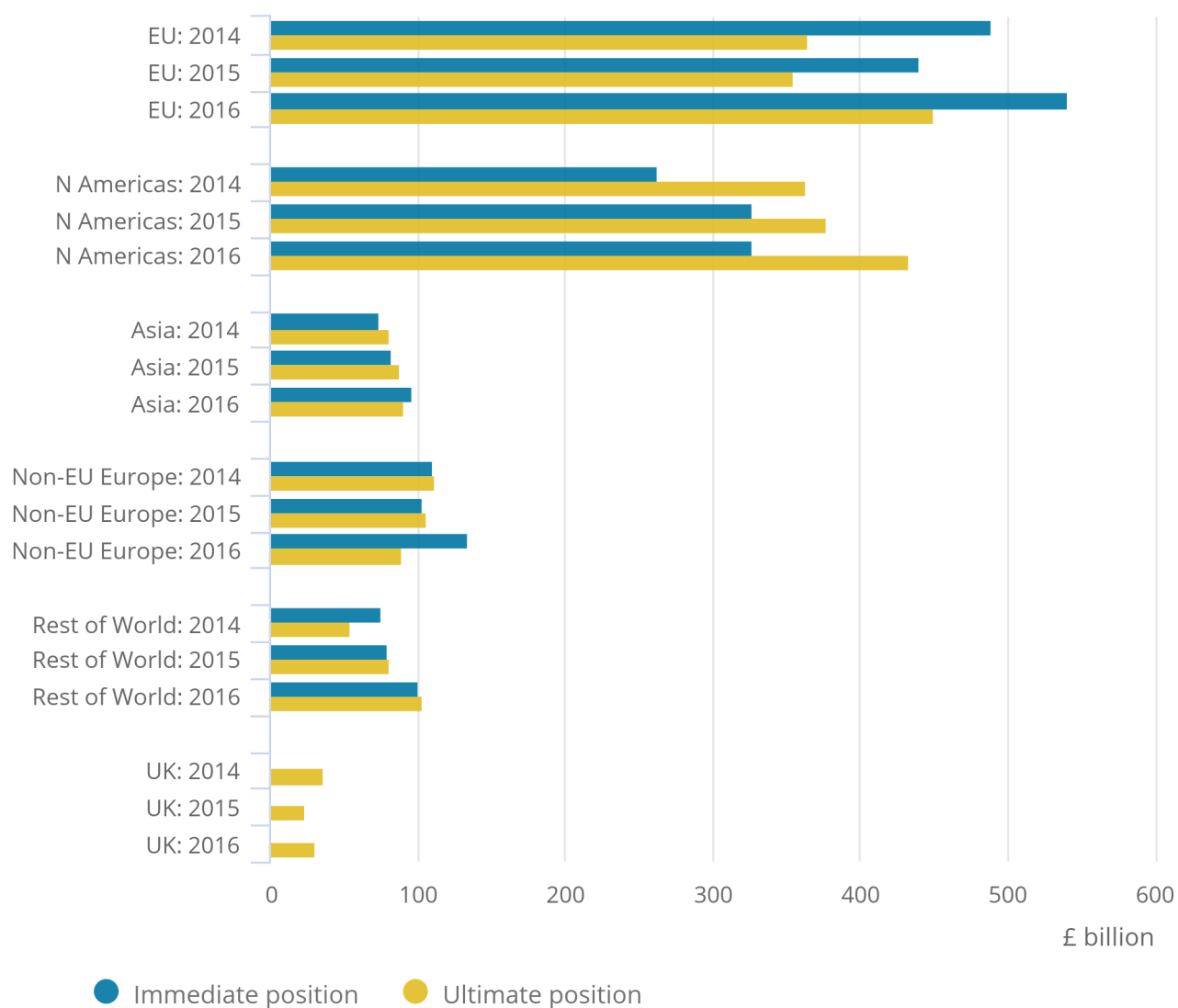
Source: Office for National Statistics – Foreign Direct Investment Survey

The North Americas was the only continental group where the stock of FDI in the UK was higher on an ultimate compared with immediate basis in every year since 2014. In 2016, FDI from the North Americas was £326.7 billion on an immediate basis (or 27.2% of the UK's inward FDI position). That value was the same as the one reported in 2015. However, allocating FDI to the country of the ultimate controlling parent saw the value increase by more in 2016 than in 2015; up by £107.3 billion to £434.0 billion in 2016 compared with an increase of £50.5 billion to £377.2 billion in 2015. Reporting UK inward FDI stocks on an ultimate basis saw the values for the EU and North Americas become very similar in 2016: £450.8 billion for the EU compared with £434.0 billion for the North Americas. This is much smaller than the £214.9 billion difference using the country of the immediate controlling parent.

Reporting FDI statistics on the ultimate rather than the immediate basis also has an impact on the other continental groups. The largest change among these was for FDI from non-EU Europe in 2016. This decreased by £44.5 billion using the ultimate controlling parent, further highlighting the role of non-EU European financial centres in corporate structures. There was also a slight fall (£5.4 billion) in 2016 in the ultimate position compared with the immediate for Asia. However, the ultimate position was higher than the immediate for both Asia and non-EU Europe in 2014 and 2015, perhaps signalling a shift in the control structures through a wider range of countries with foreign-owned direct investments in the UK.

Companies with FDI links display different characteristics to those without such links on average

The current FDI survey only collects information from sampled companies to enable the estimation of FDI statistics. While this does include the industry and country within which this investment takes place or originates, it cannot describe the economic activity of these enterprises. However, such insights become possible by taking the FDI to IDBR linked data set and further linking this to results from the Annual Business Survey (ABS [1]). These statistics can also benefit from the IBU through any changes that are made to the ABS, IDBR and the FDI survey.

Companies with FDI links in both directions were the most productive on average in 2016

It is possible to distinguish between the different types of FDI links. We can identify companies that receive FDI from overseas, however some of those companies will also be outward direct investors as well. To this, we can also add the UK parent companies that only hold investments abroad. The proportion of UK businesses with any of these FDI links was 1.8% in 2016. Yet these businesses accounted for 29.4% of UK employment and approximate gross value added [2] (aGVA) of 40.1% of the total.

Combining output with employment produces a measure of productivity. This shows that companies with any FDI link were more productive on average than those businesses without such links. In 2016, they had £73,800 mean aGVA per worker compared with £45,900 (Table 1) for those without FDI links. However, there are also differences between the types of FDI link. Companies with both inward and outward FDI links were the most productive on average, with £87,300 aGVA per worker. Despite accounting for a lower amount of employment and aGVA, inward FDI businesses are more productive on average than outward direct investors; £81,400 aGVA per worker compared with £63,300 aGVA per worker. These results could be partly due to knowledge transfers from overseas parent companies to their UK affiliates making those businesses more productive, in addition to those productive UK companies being more attractive target companies for mergers and acquisitions.

Table 1: Productivity of UK companies based on form of foreign direct investment link, aGVA per employee, £ thousands, 2016

	Mean productivity of UK companies (aGVA per worker, £ thousands)
1) Firms with any FDI link	73.8
of which:	
only inward FDI link	81.4
only outward FDI link	63.3
both inward and outward FDI links	87.3
2) Firms with no FDI link	45.9

Source: Office for National Statistics

Notes

1. Productivity refers to approximate gross value added (aGVA) per worker. Back to table

Businesses that have FDI relationships are more likely to trade internationally in goods

The ABS also collects information on whether or not a UK business trades internationally, either through exports, imports or both. Businesses that invest abroad or that are in receipt of FDI are exposed to international investors, who may have either invested to set up a UK presence or acquired UK businesses to access local markets. The international focus of these businesses is also extended to trade, as many FDI-related businesses are part of multinationals' global value chains.

Analysing the trade in goods status of companies reveals that a higher proportion of companies with FDI links also engage in trade compared with firms without such links. In 2016, 18% of businesses with any FDI link were both an importer and an exporter of goods (Table 2). This is much higher than the 2% of businesses that trade internationally but do not have any FDI links. Separating importers and exporters reveals that UK companies are more likely to import than export. This also applies to those without any FDI links, where 7% of non-FDI businesses imported compared with 5% that exported in 2016. Yet the differences were still large compared with companies with FDI links, 29% of them exported and 24% imported. Furthermore, companies with both inward and outward links also had the greatest proportion of exporters or importers, followed by those companies with only inward FDI links.

Table 2: Trade in goods status of firms based on form of foreign direct investment link, percentage of UK total, 2016

	Exporter	Importer	Importer and exporter
1) Firms with any FDI link	24	29	18
of which:			
only inward FDI link	23	29	16
only outward FDI link	22	26	17
both inward and outward FDI links	37	41	30
2) Firms without any FDI link	5	7	2

Source: Office for National Statistics

Notes

1. If one reporting unit from an enterprise group is an exporter, importer or both, then this status has been given to the whole enterprise group. Back to table

Notes for: The International Business Unit can help deepen our understanding of multi-national enterprises for foreign direct investment statistics

1. Further information on the ABS can be found in the ABS Quality and Methodology Information (QMI).

2. Approximate gross value added (aGVA) measures the value of goods and services produced and is closely linked to gross domestic product (GDP), although GDP includes taxes minus subsidies in production.

3 . We will continue the role of the International Business Unit in economic statistics and developing our foreign direct investment statistics

Office for National Statistics (ONS) has recognised the value and importance of the International Business Unit (IBU) and plans to continue the work of the IBU through defining the scope (including the number of multi-national enterprises (MNEs)), resources and responsibilities of the unit. In the meantime, the team are continuing to build relationships with important MNEs and improving the quality of survey data collated.

Foreign direct investment statistics (FDI) can be presented using the asset and liability or directional measurement principle. A new statistical bulletin for Foreign direct investment statistics involving UK companies (asset and liability): 2017 will be published on 11 April 2019. This bulletin will use the same tables as our directional bulletin, but present FDI statistics using the asset and liability principle, which is used in the balance of payments and Pink Book. Both measurement principles meet international standards on compiling FDI statistics and use the same survey inputs. The difference between FDI calculations on a directional and an asset and liability basis can be found in Foreign direct investment measurement principles explained. While the two measurement principles are different, estimates of net values (outward less inward, or assets less liabilities) are broadly comparable.

We are also planning to update our statistics on FDI by the country of the ultimate controlling parent company and on the characteristics of companies with FDI links by summer 2019.

4 . Annex 1: Globalisation and digitalisation concepts explained

Contract manufacturing

A contract manufacturer is a manufacturer (principal) that contracts with a firm for components or products. It is a form of outsourcing where a principal supplies raw materials or components to a processor (a toll processor) who carries out manufacturing services on the supplies. The processor is only carrying out a manufacturing service (mostly for a fee), while the economic ownership of the finished product remains with the principal who owns the raw materials, finished goods and intellectual property (IP).

A real example of a simple contract manufacturing case that IBU have researched can be described as follows:

The manufacturing principal is a UK entity. It owns all of the intellectual property relating to the goods, the raw materials and the final produced goods. A legal entity in Indonesia manufactures the goods under a contract with the UK entity. In this case, the raw materials (owned by UK) are physically sourced from France to Indonesia for manufacturing. The finished goods are sold across the world.

In this scenario, aspects of trade data will not be captured in current data sources. The finished goods do not cross the UK border, however the goods are sold by the UK entity to a global market so Office for National Statistics (ONS) will miss this customs export data. It may also have been picked up as an import if transferred from Indonesia to the UK but this will need to be excluded from trade data as there has been no change of economic ownership.

Toll processing

A toll processor manufactures a product on behalf of the manufacturing principal who owns all of the raw materials and the IP. In the National Accounts, the company that owns the materials, and IP of the goods and the output (manufacturing principal) is viewed as the manufacturer, while the other toll manufacturer is providing services as a contract manufacturer. Where this happens across international boundaries, it means activity undertaken outside a country can be counted towards its gross domestic product (GDP). Figure 5 provides a relatively simple example of a toll processing model.

Figure 5: Example of a simple toll processing model

Factory-less goods producer

A factory-less manufacturer only provides manufacturing IP. Parts of production (value added) can be assigned to the economic owner of the IP. Such models can be extremely difficult to identify given that they often have very small employment and could be classified to holding companies or be special purpose entities (SPEs).

Merchanting

Merchanting is usually referred to in the context of global wholesaling services or commodity trading where a trader resident in country A purchases goods in country B and sells the goods – without substantial transformation - to a third party in country C without the goods ever crossing the border of country A.

Merchanting can also be a global manufacturing arrangement in which a parent enterprise in country A arranges for goods to be delivered from a manufacturing affiliate in country B to an affiliate in country C without the goods passing through country A. The ownership of the goods is transferred from B to A and from A to C and the goods are not subject to any transformation while owned by the enterprise in country A.

The difference with the processing arrangements of contract manufacturing is that the principal does not own the material inputs and does not control the production process. The goods are not transformed during the period in which the merchant or principal owns the goods.

In national accounts, these arrangements can affect related economic measures because the goods involved do not cross the principal's national border.

Transfer pricing

When companies engage with their customers or suppliers ("third parties") it is assumed that each party is out to get the best deal possible for themselves and that the resulting prices set for the trade will reflect that fact. These are called "arm's length prices". However, when two companies are under common ownership, the best overall result for the multinational company to which they belong often includes minimising their tax liabilities. Under transfer pricing rules, companies are obliged to set "arm's length prices", meaning a "fair market" value for goods and services they trade within the group. This is believed to result in a just allocation of profit to the country where it was generated.

Multinational companies trading between two subsidiaries of the same group can choose to adjust "arm's length" transfer pricing rules by reducing the cost of products and services sold from higher tax regime countries to another company in a lower tax regime country and then increasing the costs of the same products sold on from the new country, which pockets the difference as reduced-tax profit.

There may be no way of determining the market price for some products transferred across international borders, such as the price of a part-finished component that will never be sold in that state to a customer or the cost of using a company's logo.

E-commerce businesses

Traditionally, multinational corporations have sought to penetrate foreign markets by setting up physical intermediaries within the targeted markets. The picture changes with the availability of e-commerce opportunities. Many multi-national enterprises (MNEs) now effect the greater part of their market research, advertising, marketing and sales through a website.

The anonymity of internet transactions means that internet activity is difficult to trace. Businesses are constantly changing their business models; it is quite easy lose the ability to classify and measure these businesses accurately.

Cross border use of intellectual property

One of the challenges that MNEs present for macroeconomic measurement is the issue of assigning economic ownership of Intellectual Property (IP) to the various fractions of a global value chain and therefore to domestic economies.

MNEs may use IP assets as vehicles for tax planning. The goal of such tax planning is to shift revenue to units within the MNE structure that are tax resident in low tax jurisdictions and therefore minimise the global tax liability of the MNE. This is often achieved through the use of royalty and licence agreements linked to IP assets.

Units of an MNE will typically be required to pay a royalty charge to another unit within the MNE for the right to produce or use assets intrinsic to the production process. In doing so profit from sales in higher tax jurisdictions can be transferred to units in lower tax jurisdictions, minimising the global tax liability for an MNE. The lack of a physical presence of IP assets lends themselves to such constructions as they can be easily located and relocated around the world at little cost.

In national accounts, these arrangements can affect production and related income measures such as GDP and operating surplus because legal ownership of intellectual property is an important factor in determining economic ownership for practical purposes. Furthermore, part of the production of MNEs and of their capital stock should be assigned to the country of residence of the subsidiary which holds the IP, even if the actual assembling of the product takes place in its entirety in a foreign country. Thus, understanding and identifying the economic ownership of IP is very important even though it is not always straight forward, as the producer of an IP may be different from the economic owner.

Special purpose entities

A trend in the last couple decades is for MNEs to include holding companies or special purpose entities that are created for purposes other than production.

Companies set up what are called intermediate holding companies or special purpose entities. The intermediate location is chosen for having low tax rates on dividend or royalty income received. Little or nothing happens in the intermediate locations, except that they collect income from the subsidiary companies they own and then usually loan, but not pay as dividends.

One common arrangement among MNEs is a series of sublicensing transactions or cost sharing arrangements on intellectual property that results when the intellectual property is legally owned, in whole or in part, by a special purpose entity in a low-tax jurisdiction. In national accounts, these arrangements can affect production and related income measures such as GDP and operating surplus.

Another common arrangement is the characterisation of a financial instrument as debt in one jurisdiction and as equity in another jurisdiction to take advantage of differences in taxability of interest and dividend flows. In this case, national accounting measures such as gross national income (GNI) can be affected as a result of interest and dividend flows.

The consequences of these and similar arrangements is a wedge between the location of production, the location of underlying factors of production, and the location of means for financing production, which affects the interpretability of important national accounting measures.

5 . Acknowledgements

Compendium

New frontiers in trade analysis

Summarises recent developments to UK trade in goods and services statistics.

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Next release:
N/A

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1 . Introduction

The recent developments in trade statistics have allowed the number of data series we publish to increase 100-fold over the last two years, from around 1,000 to just over 100,000 series and has been described as a "game-changer" by our users. This improvement was crucial in responding to the significantly increased demand for more detailed trade statistics following the UK's vote to leave the European Union. These data were necessary to help provide a better understanding of the UK's trading relationship with the rest of the world and has enabled analysis to be undertaken at a level of detail never previously possible. For example, that we import more travel services (UK residents' expenditure whilst travelling abroad) from Spain than any other country in the world and export more cars to the US than any other country.

We are delivering against an ambitious trade development plan which is currently in its third phase. At the start of the development project in 2016, we were publishing around 1,000 data series across Trade in Goods and Trade in Services. In 2016, Trade in Goods was produced by country and by one-digit commodity on an annual basis for 234 countries, and Trade in Services was being produced on an annual basis across the same countries, split by 12 service types. By the end of Phase 1, we had expanded the International Trade in Services (ITIS) survey to enable the publication of country by service type data for the industries measured by the ITIS survey (which represents approximately 58% and 45% of total trade in services exports and imports, respectively). We also started to publish analysis on Trade Asymmetries, where different countries' data can often paint differing pictures with each other.

By the end of Phase 2 in the Autumn of 2018, we moved to publishing around 100,000 data series on new and improved trade IT systems. This includes Trade in Goods now being produced on a monthly basis split by 234 countries and 125 commodities, as well as an annual by-industry dataset, and Trade in Services now produced on a quarterly basis split by 67 countries and 31 service types, a level of granularity never available before.

2 . Developments to trade in services

Services represent approximately 80% of the UK economy's output, therefore their accurate and detailed measurement is crucial to fully understanding the UK economy. However, this comes with many measurement challenges. Whilst trade in goods is largely measured using comprehensive administrative data, trade in services is compiled using over 20 data sources, with the primary source being the ITIS survey, which accounts for approximately half of total UK trade in services.

The International Trade in Services (ITIS) survey collects information quarterly and annually, with the annual survey having a much bigger sample size than the quarterly survey. Until recently, the quarterly sample size was not suitable for calculating statistics by country and service type. This meant detailed data could only be released annually. There therefore remained interest in providing detailed trade in services statistics more frequently.

The first stage for improving trade in services statistics required increasing the sample for the quarterly ITIS survey. The sample was doubled from approximately 1,100 businesses to 2,200 businesses, with the first results collected for Quarter 1 (Jan to Mar) 2017. Estimates compiled using the increased size were published following the collection of data for Quarter 2 (Apr to June) 2017. The International trade in services by partner country, UK: April to June 2017 statistical bulletin included quarterly estimates of UK trade in services statistics by 54 countries, whereas previously the smaller sample meant only nine non-EU countries could be calculated.

The ITIS survey does not collect information for all industries of the UK economy. Notable exclusions from the survey include travel, transport and banking. This means that the survey covers approximately 58% of UK exports of services, and 45% of services imports. Information on these industries come from the International Passenger Survey (IPS) and the Bank of England, among other sources. Therefore, our development plan included combining this information together to produce detailed statistics covering trade in services for the whole UK.

In October 2018, trade in services data were published at a level of detail and frequency that has never been available before, with quarterly data by 31 service types and 67 countries. This was a significant improvement, with service type by country UK trade in services data previously only published on an annual basis in the UK Balance of Payments, The Pink Book, which includes 12 top-level service types by 68 countries. This improvement in service type detail was enabled by making significant quality improvements, through using the improved quarterly country breakdown derived from the increased and optimised quarterly ITIS survey. This release will continue to be updated on a quarterly basis, with the latest estimates published in January 2019.

We are also starting to collect information for trade in services based on modes of supply. This categorises services by the way in which they are traded:

- Mode 1: cross-border supply, where the service is traded remotely

- Mode 2: Consumption abroad, where the consumer travels abroad for the service

- Mode 3: Commercial presence, where subsidiaries provide the service of the foreign parent in the host economy

- Mode 4: Presence of natural persons, where the supplier travels to provide the service to the consumer

The quarterly ITIS survey tested specific questions on Mode 1 in some surveys sent in September 2018. This was a pilot of around 100 companies, collecting information for Quarter 3 (July to Sept) 2018. Following the pilot, we plan to add modes of supply questions to the next annual survey, which would collect information for 2018. Meanwhile, the pilot results will be used to inform our next steps towards developing statistics on modes of supply.

3 . Explore the new trade in services data with our interactive tools

We have produced some interactive tools to help explore the data.

Data are provided in as much detail as possible without disclosing the details of any individual companies, however, this means that some figures have been suppressed to protect confidentiality. The interactive will show no data available if the data are zero, suppressed or unavailable at this level of detail.

By hovering over a country, you can see the amount of total services the UK trades with that country. For example, hovering over the USA shows that other business services was both the top service type imported to the UK from the USA, and exported from the UK to the USA.

Figure 1: UK trade in services with the rest of the world, exports and imports, 2017

If however, you are interested in trade in services by service type then you can explore our new more detailed dataset, which was published on 23 January 2019; UK trade in services by partner country experimental data: July to September 2018. This interactive tool allows you to explore the different levels of service type data for both imports and exports. For example, clicking on the block transportation shows that in 2017, air transportation was the largest service type exported in that category.

Figure 2: UK services exports, 2017

Figure 3: UK services imports, 2017

4 . Developments to trade in goods

Over the past year we have delivered more granular data for the UK's trade in goods, providing detail of trade in goods by country and commodity and developing for the first time estimates of UK trade in goods by country, commodity and industry.

Our trade in goods by country and commodity data provide granular detail of the UK's exports and imports in 125 commodities with 234 countries, on a monthly, non-seasonally adjusted basis, from 1998 to the latest period that we publish monthly.

The balance of payments statistics of trade in goods that we compile are derived principally from data provided by HM Revenue and Customs (HMRC) on the physical goods exported from and imported to the UK. However, such data are on a different basis from that required for balance of payments statistics. HMRC trade data are collected on an Overseas Trade Statistics (OTS) basis, that is, the physical movement of goods, whereas trade figures within the balance of payments (BoP) are based on the change of economic ownership; sometimes goods move across a border but do not change economic ownership, so are not considered to be an export. Adjustments are applied to the data so that they are consistent with the BoP and the wider UK National Accounts. Additional coverage and valuation adjustments are made to ensure estimates are BoP-consistent, along with the removal of non-monetary gold.

In addition, by using linkages between HMRC data and data from the UK Inter-Departmental Business Register (IDBR) we have created an experimental dataset that, for the first time, provides estimates of UK trade by industry as well as country and commodity, on an annual basis from 2008 to 2016. Information provided on the IDBR allows us to identify the industry that traders operate in, allocating trade to industry, then aggregating to provide detail of trade by Standard Industrial Classification. These data are consistent with balance of payments and national accounts outputs. Work is ongoing to develop the matching method used in the compilation of these experimental statistics, for more information on the methodology see UK trade in goods by industry, country and commodity: 2008 to 2016.

5 . Explore the new trade in goods data with our interactive tools

What goods do the UK trade with the rest of the world? Our data break down UK trade in goods with 234 countries by 125 commodities.

Use our map to get a better understanding of UK trade in goods with a particular country. Select a country by hovering over it or using the drop-down menu.

Figure 4: UK trade in goods by commodity and country, exports and imports, 2017

Use our interactive tools to understand UK trade of a particular commodity. Select a commodity from the drop-down menu, or click through the levels to explore the data.

Figure 5: UK goods exports, 2017

Figure 6: UK goods imports, 2017

Use our interactive map to get a better understanding of UK trade in goods by a particular industry with a particular country. Select a country by hovering over it or using the drop-down menu.

Figure 7: UK trade in goods by industry and country, exports and imports, 2016

6 . Using our new trade in goods datasets to explain recent movements in exports and imports of road vehicles

Introduction

The UK's trade in road vehicles changed in the latest 12-month period to November 2018, compared with trade across most of the past decade, as total exports and imports fell for the first time in nine years compared with the same period in previous years.

Using our new trade by industry and country by commodity datasets, published for the first time in 2018, we firstly show the importance of the motor industry to the UK economy and then highlight trade with the countries that explain the fall in exports and imports of road vehicles in the latest 12-month period.

For the first time, we are able to report industry statistics for the motor industry from the Annual Business Survey (ABS) alongside our new trade by industry figures, providing an indication of how important the industry is to the UK economy. The statistics are based on the Standard Industrial Classification (SIC) and show production output, approximate gross value added (aGVA), the number of enterprises, the number of people employed by those enterprises, the percentage of exporting enterprises, and exports and imports by industry.

We then use our country by commodity dataset to show that, while overall exports and imports of road vehicles fell in the 12 months to November 2018, the picture is very different when looking at trade with the EU and countries outside the EU. This analysis shows that the fall in exports and imports is mostly explained by trade with the EU, as exports to countries outside the EU continued to grow.

The motor industry is an important contributor to the UK economy

Using our trade in goods by industry dataset, we are now able to look at the value of UK exports and imports alongside wider industry-related statistics on a consistent industry basis. Further information on the SIC classification is available.

Table 1 shows 2016 statistics for industry SIC 29 manufacture of motor vehicles, trailers and semi trailers and SIC 45 wholesale and retail trade and repair of motor vehicles and motorcycles, from the Annual Business Survey (ABS). Data for these two industries include the following:

- SIC 29 manufacture of motor vehicles, trailers and semi trailers includes manufacture of motor vehicles for transporting passengers or freight, various parts and accessories, along with manufacture of trailers and semi-trailers

- SIC 45 wholesale and retail trade and repair of motor vehicles and motorcycles includes all activities (except manufacture and renting) related to motor vehicles, including wholesale and retail sale of new and second-hand vehicles, repair and maintenance of vehicles and wholesale and retail sale of parts and accessories

The ABS data show the combined turnover of industries SIC 29 and SIC 45 was £267.8 billion in 2016, which represents 7% of total industry turnover in the UK. Industry SIC 29 manufacture of motor vehicles, trailers and semi trailers accounted for 28% of the combined turnover for industry SIC 29 and SIC 45, along with 4% of the combined number of enterprises and 21% of the total people employed within industry SIC 29 and SIC 45.

According to the ABS there was a total of 78,000 enterprises operating within industries SIC 29 and SIC 45 in 2016, make up 3% of the total number of UK businesses. These enterprises employed a combined 750,000 people, which made up 3% of total UK employment in 2016.

The ABS also shows that the percentage of UK exporting enterprises from industry SIC 29 was 27% in 2016, compared with 6% for industry SIC 45.

Table 1: Economic indicators related to SIC 29: manufacture of motor vehicles and SIC 45: wholesale and retail trade and repair of motor vehicles and motorcycles, 2016

	Industry SIC 29	Industry SIC 45
Turnover	£74.4 billion	£193.4 billion
aGVA	£17.0 billion	£32.4 billion
Number of enterprises	3,235	74,675
Number of people employed	159,000	591,000
Percentage of exporters	26.70%	6.00%

Source: Office for National Statistics

Notes

1. aGVA is an approximate measure of GVA which is a measure of the income generated by the surveyed businesses (and the industry or sector they represent) less their intermediate consumption of goods and services used up to produce their output. Back to table

2. Percentage of exporters estimates are based on experimental data. Back to table

Using our new trade by industry exports and imports datasets, we can now show UK trade data alongside wider SIC industry statistics. Table 2 shows exports and imports for SIC industries 29 manufacture of motor vehicles and 45 wholesale and retail trade and repair of motor vehicles and motorcycles in 2016. These exports and imports are shown to and from the EU and countries outside the EU.

The value of total exports for industry SIC 29 was three times greater compared with industry SIC 45 and was mostly explained by exports to the EU, that is, £12.5 billion in 2016; however, exports to EU and non-EU countries were fairly similar for industry SIC 45.

Imports by industry SIC 45 wholesale and retail trade and repair of motor vehicles and motorcycles were £5.9 billion larger than imports by industry SIC 29 in 2016; imports from both industries were primarily from the EU, which accounted for more than 75% of total imports from each industry.

Table 2: UK exports from SIC 29: manufacture of motor vehicles and semi-trailers and SIC 45: wholesale and retail trade and repair of motor vehicles and motorcycles, 2016

£ billion

	SIC 29	SIC 45
Total exports	22.0	7.3
EU exports	12.5	3.7
Non-EU exports	9.6	3.6
Total imports	27.3	33.1
EU imports	22.7	25.2
Non-EU imports	4.6	7.9

Source: Office for National Statistics

UK road vehicle exports and imports fell for the first time in nine years in the 12 months to November 2018

The Standard Industrial Trade Classification (SITC) is an international commodity classification and is the basis on which our regular monthly trade statistics are reported. More information on SITC is available.

Using our new country by commodity (SITC) dataset, we can show UK exports and imports of road vehicles, highlighting UK trade with countries that helps explain large changes in trade of road vehicles over the past 18 months. Cars accounted for the majority of road vehicle trade and represented 82% of total exports in 2016 (62% of imports), followed by 13% for road vehicles other than cars (intermediate) (24% of imports).

Figure 8 shows the nine largest contributors to the fall in total imports of road vehicles in the 12 months to November 2018. Figures 9 and 10 show the leading contributors to falling exports of road vehicles to the EU and rising exports to countries outside the EU respectively.

Total UK imports of road vehicles fell £1.6 billion in the 12 months to November 2018, which is the first time imports have fallen for nine years, with imports from the EU accounting for £1.4 billion of the decrease. Eight of the nine largest contributors to the downward movement in total imports were EU countries.

Imports of road vehicles from Germany, Spain and France combined fell £1.4 billion in the 12 months to November 2018, offsetting import growth of other EU countries, mainly Austria (£0.5 billion) and Romania (£0.3 billion). Japan and South Africa were the only non-EU countries included in the top nine contributors to the downward movement in total imports.

Apart from Spain, all nine countries included in Figure 8 showed a positive change in imports in the previous 12-month period to November 2017.

Figure 8: Change in value of imports of road vehicles from selected countries

12 months to November 2017 and 12 months to November 2018

Figure 8: Change in value of imports of road vehicles from selected countries

12 months to November 2017 and 12 months to November 2018

£ million, non-seasonally adjusted, current price
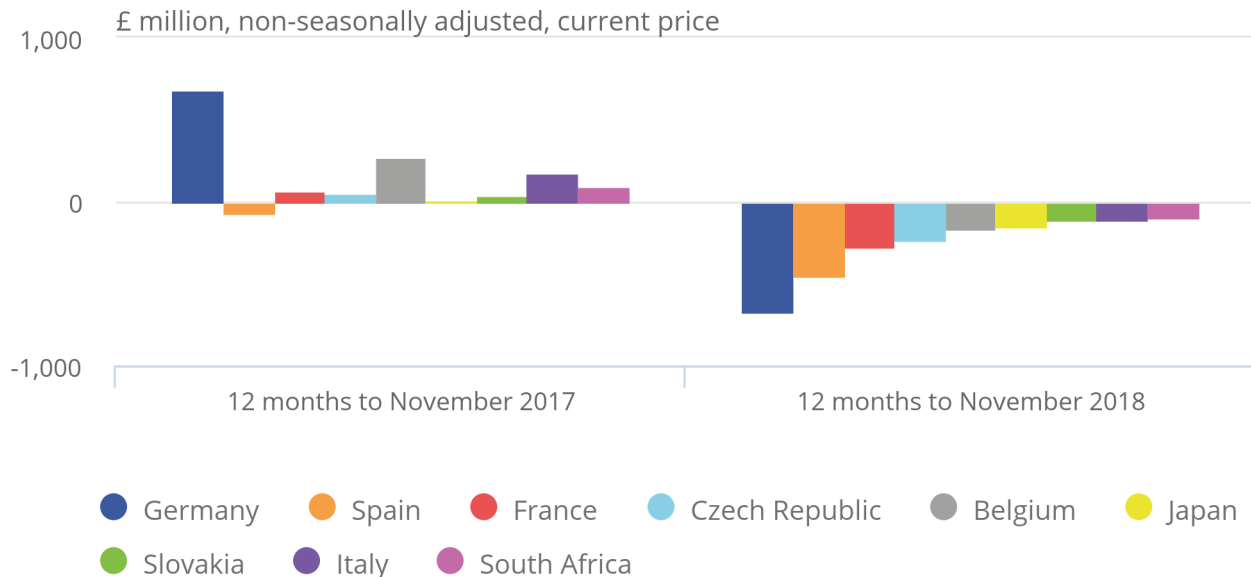
Source: Office for national statistics

According to the [Society of Motor Manufacturers and Traders (SMMT)](), new car registrations in the UK fell 6.8% in 2018. Diesel cars accounted for the majority of the decline, as new registrations of diesel cars fell 29.6% compared with a 8.7% rise for petrol cars.

A number of factors are likely to have played a part in the fall in UK imports of road vehicles in the 12 months to November 2018, such as:

- the UK government introduced a rise in [Vehicle Excise Duty (VED) in April 2017]() following the diesel emissions scandal, thereby increasing the cost of VED for cars registered after April 2017, particularly vehicles with large engine sizes, including diesel cars; this caused a large spike in demand in the run up to April 2017 as consumers and businesses brought forward future purchases to avoid paying the higher rate of VED

- the EU introduced Real Driving Emissions tests in September 2017 that require manufacturers to apply more stringent tests to new vehicles; this has caused supply issues across the EU as manufacturers have struggled to get new cars through the tests

- new car sales in the UK have likely also been impacted by the rising cost of buying a new car via a Personal Contract Plan (PCP); according to the Bank of England, around [80% of new car sales in the UK were financed via PCPs in 2017]() and the cost of these plans has been rising

Figure 9 shows the five largest contributors to the fall in exports of road vehicles to the EU in the 12 months to November 2017 and the 12 months to November 2018.

Exports of road vehicles to the EU fell £0.8 billion in the 12 months to November 2018, after growing £1.3 billion in the 12 months to November 2017. Exports to Germany fell £0.3 billion, followed by declines to Belgium, Italy, France and Spain, which combined accounted for a further £0.5 billion.

Some of the factors driving the fall in UK exports to the EU in the 12 months to November 2018 are similar to those for falling imports to the UK; the diesel emissions scandal has impacted demand for diesel cars across the EU and the same supply issues related to the EU's new Real Driving Emissions tests have also impacted UK manufacturers.

UK exports to all of the five countries included in Figure 9 grew in the previous 12-month period to November 2017.

Figure 9: Change in value of exports of road vehicles to selected EU countries

12 months to November 2017 and 12 months to November 2018

Figure 9: Change in value of exports of road vehicles to selected EU countries

12 months to November 2017 and 12 months to November 2018

£ million, non-seasonally adjusted, current price
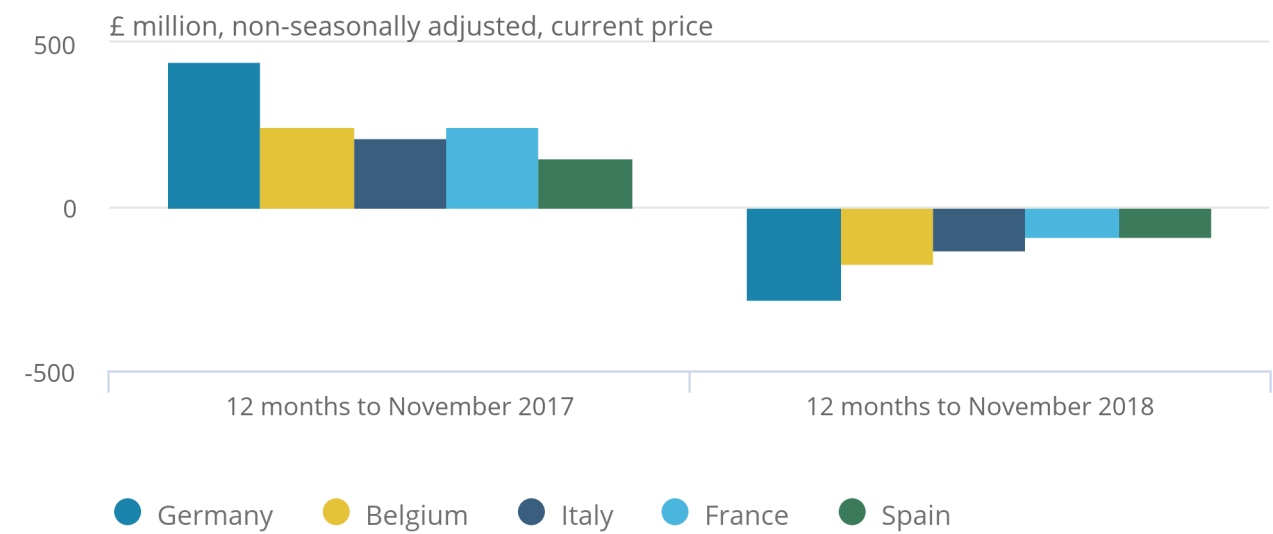
Source: Office for National Statistics

Figure 10 shows the top five largest contributors by country to the positive change in UK road vehicle exports to countries outside the EU in the 12 months to November 2017 and the 12 months to November 2018.

UK exports to countries outside the EU increased £0.7 billion in the 12 months to November 2018; this is despite a large fall in demand from China, which led to a UK export decline of £0.4 billion to China in the 12 months to November 2018.
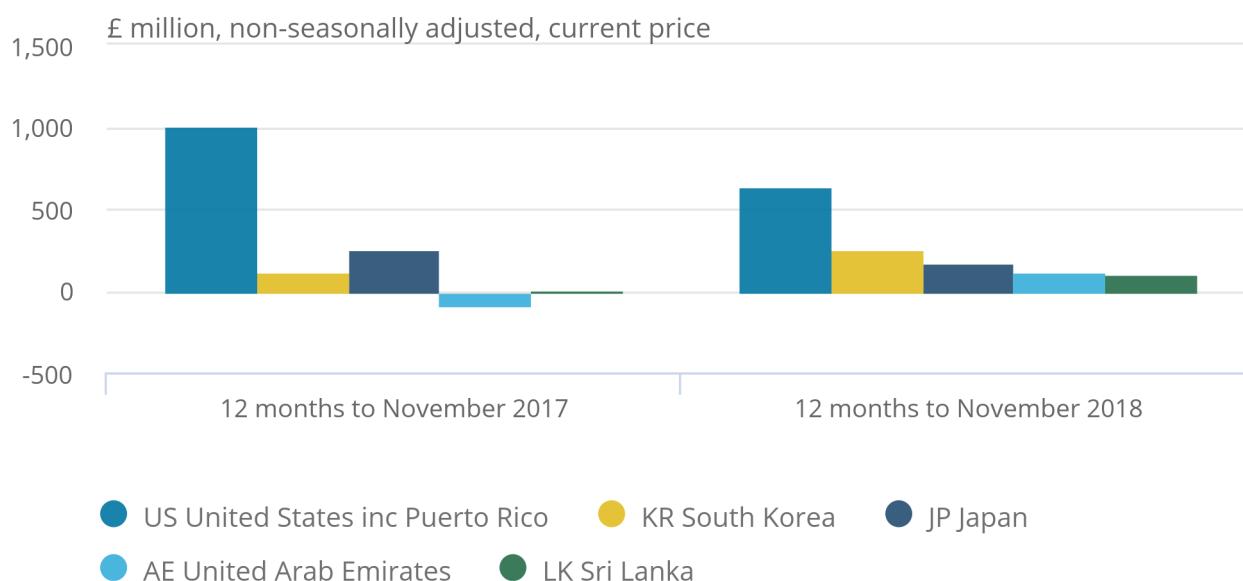
The main country driving UK export growth of road vehicles to countries outside the EU was the United States including Puerto Rico, as exports increased £0.6 billion in the 12 months to November 2018. However, while exports increased, growth was lower compared with the 12 months to November 2017, when exports increased by just over £1.0 billion. Exports to Japan followed a similar trend of slowing growth in the 12 months to November 2017, but still rose £0.2 billion in the 12 months to November 2018.

Figure 10: Change in value of exports of road vehicles to selected non-EU countries

12 months to November 2017 and 12 months to November 2018

Figure 10: Change in value of exports of road vehicles to selected non-EU countries

12 months to November 2017 and 12 months to November 2018

£ million, non-seasonally adjusted, current price

- US United States inc Puerto Rico
- KR South Korea
- JP Japan
- AE United Arab Emirates
- LK Sri Lanka

Source: Office for National Statistics

7 . Keeping pace with the demand

In response to user needs, one of our main priorities is to publish detailed trade figures across more dimensions than we do currently; for example, across industries, geographic trade partners and service types. A large focus for the trade development plan is also making improvements to the quality of the trade figures.

We have begun an intensive period of work researching methods and investigating new data sources to continue our expansion of trade in services. We will provide initial estimates of trade in services by industry in the first half of 2019 along with updated estimates of trade in goods by industry. We have also initiated a pilot study, asking more questions through our International Trade in Services (ITIS) Survey, to better understand the mode of supply of services. We expect early estimates from this pilot to be available in summer 2019.

Other developments and analysis we are pursuing are further analysis of trade in services asymmetries, trade in value added, digital trade, and further methodological reviews of our data processing. Our asymmetries work will focus on the main service accounts that show commonality across our datasets. We will share this analysis in spring 2019. Thomas Baranga is also repeating his analysis on global asymmetries, now with services data, which will give us an important insight into the international picture of trade in services asymmetries.

The next stage of the project will also see us work with other government departments to undertake initial work on digital trade, emerging as an important aspect of trade in services. We will undertake both expert user engagement and extensive literature and methodological reviews to begin to understand this complex topic.

Our annual releases in 2019 will see improved methodologies underpinning important statistical and conceptual adjustments, which we apply to our trade in goods data. These releases will also benefit from recent methodological improvements to our trade deflators, used to remove fluctuating price effects from our data series to allow analyses over time. Our methodological review work will continue in both these areas, as we strive to provide users with the highest quality data available to us.

We are delivering at pace against a pressing and ever-expanding demand. Our transformation of UK trade statistics has already delivered data and analysis that are informing the debate and enabling better decisions. We will continue our developments, working collaboratively and innovatively to meet users' demands as the UK leaves the EU and beyond.

We welcome feedback on our new trade statistics, developments and future plans. To provide your comments please email trade@ons.gov.uk referencing "UK trade statistics transformation" in the subject.

8 . Authors

James Wells, Hannah Denley, Chloe Gibbs and Freya Lawrence

Compendium

Recent publications featuring international trade and productivity statistics

Summarising our recent publications that feature services exports by UK region and by product, and how measures of productivity are compared across OECD countries.

Table of contents

1 . Introduction

This chapter summarises recent analysis of exports in services by UK country and region and research on the methods for making international comparisons of labour productivity contained in the following longer releases:

- [Estimating the value of service exports abroad from different parts of the UK: 2011 to 2016](#)

- [Improving estimates of labour productivity and international comparisons](#)

2 . Service exports from the UK by region, functional category and product

The [latest regional service exports release](#) provided estimates of the value of service exports arising from the NUTS countries and regions of the UK. In addition to this, for the very first time this analysis compiled product-based estimates for each NUTS[1] area in 2016, providing a more coherent picture of what specific services have been exported.

The total value of UK service exports is estimated at £254.0 billion in 2016, up from £229.4 billion in 2015, an increase of £24.5 billion. These values are on a current price basis and therefore do not account for the effects of inflation. Service exports from all NUTS1 areas in 2016, except the North West, increased compared with 2015; Northern Ireland's service exports grew by the highest percentage of 17.0%, followed by the North East (14.3%) and London (13.2%).

London and the financial services sector continue to dominate overall service exports

In Figure 1 we use a tree diagram to explore the breakdown of each NUTS1 area and its constituent functional categories[2]. We can clearly observe that almost half of service exports originate from London. The largest functional categories of exports from London were £32.7 billion of financial services, followed by £19.8 billion of real estate, professional, scientific and technical services.

Figure 1: Great Britain service exports by NUTS1 area and functional category, 2016

[Download the data](#)

Source: Office for National Statistics

Notes

1. Data for Northern Ireland by functional category are not included because selected categories had to be suppressed for reasons of confidentiality and reliability

In terms of growth in service exports by NUTS1 area between 2011 and 2016, the highest increase was seen in Scotland where service exports grew by 51.6%. This was followed by the North East (51.1%), Wales (45.1%), the West Midlands (44.5%) and the North West (42.2%), with the other six NUTS1 areas growing between 20% and 30%.

For real estate, professional, scientific and technical services, London, the South East and Scotland contributed the most to the 44.8% growth in this category between 2011 and 2016. All functional categories including information and communication, construction and retail saw an increase except wholesale and motor trades, which was the only category to experience a decline in exports of services between 2011 and 2016. It fell by 33.6%, and this decline was driven largely by London, accounting for 70.9% of the change.

In manufacturing service exports, the North West contributed more than 40.0% of the 55.9% growth in this category between 2011 and 2016, whereas London and the East of England contributed negatively. In financial services exports, even though London has the largest share (36.1%) of the 10.9% growth in exports between 2011 and 2016, it is followed very closely by Scotland, which contributed 29.6% to the change.

Excluding financial services, London and the South East still dominate services exports

New product level analysis excluding financial and some other services [3] showed that business services [4] was the most prominent type of service exported in 2016, accounting for £64.6 billion; over 60% of the business service exports came from London and the South East.

Telecommunications, computer and information services was the second-highest category of services exports for seven of the 11 NUTS1 areas. For three of the remaining four regions – the North West, Wales and the East of England – the second-largest product category exported was charges for the use of intellectual property services. Manufacturing, maintenance and repair services was the second-largest services export product category in the North East.

Figure 2: Share of selected product categories exported by each Great Britain NUTS1 area, 2016

Download the data

Source: Office for National Statistics

Figure 2 provides an interactive heatmap for selected product subcategories, to illustrate the share of each NUTS1 area in that category.

This graphic shows that 41.4% of research and development services were exported from the South East, whereas 18.4% were exported from the East of England and 13.2% from London. 62.3% of professional and management consulting services, the largest category within business services, were exported from London in 2016, followed by 13.5% from the South East. This product subcategory includes services such as accounting, legal services, business and management consulting, and advertising services, and it accounts for around 42.9% of exports of business services. This was followed by technical services, which accounted for 14.1% of business services and was primarily driven by engineering, but also includes architectural and other technical services.

Looking at the subcategories within professional and management consulting, London exported 84.9% of total legal services reported in the International Trade in Services (ITIS) survey, while the remaining NUTS1 areas had a small share of less than 3% each. Accounting, auditing, bookkeeping, and tax consulting services were also predominately exported from London (61.2%), followed by the South East (9.4%) and the West Midlands (5.2%). Advertising services, which accounted for 5.6% of the service exports reported in the ITIS survey, was mainly exported from London (73.4%), followed by the South East (11.6%) and the North West (4.8%).

Notes for: Service exports from the UK by region, functional category and product

1. The [Nomenclature of Units for Territorial Statistics](#) (NUTS) is a hierarchical classification of administrative areas, used across the EU for statistical purposes. There are 12 NUTS1 areas in the UK: Wales, Scotland, Northern Ireland, and the nine former English Government Office Regions.

2. Functional categories are defined using definitions from the Pink Book, and from the UK Standard Industrial Classification 2007: SIC 2007 classifications. For further detail see Table 1 in the [full article.](#)

3. This product analysis uses data from International Trade in Services (ITIS) excluding the finance, insurance, travel and transport categories. Therefore, in value terms, the analysis in this section only includes 45.0% of total UK service exports and covers only Great Britain.

4. We present 28 product classifications, which have been derived by aligning ITIS product codes from ITIS questionnaire returns with the Extended Balance of Payments Services (EBOPS) classification. For further information on these classifications, please refer to Table 2 in the [full article](#).

3 . International comparisons of productivity

Introduction

We have been producing international comparisons of productivity (ICP) statistics since October 2001, enabling domestic users to compare the UK against other G7 countries. We compare how much labour input is used (in hours worked and number of people) to produce the outputs (goods and services) in our economy and express this as output per hour and output per worker. The estimates throughout this period have shown significant differences in productivity between the UK and leading G7 countries, with output per hour worked in the UK being consistently lower than Germany, France and the USA. The long-standing trend in the data pointed to output being very low for the number of hours worked or the hours worked being very high for the output that was being produced. Whilst there may be structural differences across the economies (depending on whether they are production or service oriented), the magnitude of the differences in the levels meant that we needed to review our methodology and better understand how the data were compiled across the countries and how comparable they were.

This was particularly highlighted in 2014 when the Organisation for Economic Co-operation and Development (OECD) discontinued their Annual Labour Force Statistics (ALFS) database total employment measure, which we had historically used for estimating the employment measure in the ICP bulletin. For a limited period, we used alternative indicators from Eurostat and the OECD to estimate the missing values. However, this was not a sustainable strategy and in October 2018 we suspended the publication of ICP to review and explore potential new data sources to produce these statistics.

To review how other countries were compiling their labour inputs required international cooperation and so we initiated and partly funded a research project with the OECD, which resulted in the OECD's working paper [International productivity gaps: Are labour input measures comparable?](#).

This project issued a joint OECD and Eurostat questionnaire, across 41 countries, on understanding labour inputs recorded by countries. The questionnaire sought information on the methodologies used to compile labour inputs, the main and secondary sources used and which adjustments were applied to the labour inputs by each country to bring them in line with the national accounts concepts and the production boundary.

Main findings

Countries used the following four main sources as primary and secondary inputs to estimate labour inputs:

- labour force survey

- business statistics

- population statistics

- administrative sources

Although not all of these sources are used to estimate labour inputs within each country, the OECD drew the conclusion that no individual source was comprehensive and exhaustive enough to capture the three core concepts for aligning labour inputs. In fact, all four data sources had their own coverage and exhaustiveness constraints and so each on its own was insufficient to provide estimates of labour inputs that match the output concepts defined by the production boundary.

Therefore, certain adjustments were necessary to bridge the gap. The first concerned periodicity, where the original data sources may be collected on a different frequency to the labour inputs. For example, the labour force survey and business statistics may be collected monthly but national accounts and productivity estimates are compiled quarterly or annually. Similarly, some administrative data may be available annually and it may be necessary to spline the data into a quarterly series. The second adjustment concerns aligning persons to jobs or jobs to persons.

When the units of measurement in the original data source differ from those used in the national accounts, it is important to align these as the ratio of persons to jobs can differ across countries. The third adjustment was the economic territory. This covered adjustments that aligned estimates of workers with the economic territory in which they work. For example, we may need to capture non-resided persons working in domestic (resident) production units and exclude those in the resident population that work in non-resident units such as foreign embassies, consulates, foreign military bases within the reporting country or work abroad. This is known as the difference between the domestic and national boundary. This also captures conceptual adjustments where some activities and institutions may be excluded. For example, the labour force survey may exclude military and collective households whilst business statistics may exclude non-market services such as education and health, as well as the self-employed and unpaid family workers. The fourth concept covered the unobserved economy, that is the economic activity that is not recorded. Most sources typically miss information on employment and hours worked in the unobserved economy, even though they are included in output, for example, construction, trade, catering and personal services.

Methods for estimating hours worked

The sources that were available to each country and the adjustments applied also determined the method that countries were using to estimate hours worked, though countries broadly followed one of three main methods.

The first is the direct method. This annualises the average weekly hours worked directly collected from the data source, usually the labour force survey, for all weeks of the calendar year. Typically, countries will multiply the number of actual hours worked in the reference week, which are likely to be self-reported in the survey, by the number of working weeks in the year, after adjusting for public holidays. The UK uses this method as the best conceptual match to the required concept available from routine data collections.

The second is the direct method with additional adjustments and this is an extension of the direct method. Some countries used the direct method and applied additional adjustments that were necessary to reflect the source coverage, for example, residents working abroad and bias issues in the labour force survey such as over-reporting hours worked.

The third is the component method, where the starting point is data on a normal, usual paid or contractual hours basis and then adjusting the differences derived from a variety of data sources as components, for example, annual leave, sickness, maternity hours and strikes.

The report concluded that different countries use variations of the three approaches and that this heterogeneity significantly impacted on comparative productivity estimates. Table 1 summarises the methods, main sources and adjustments applied by each of the G7 countries. It shows France and Germany adjusting down the hours worked by employees up to 18.8% and 12.4% respectively and Canada adjusting down the number of self-employed people sourced by the labour force survey by 41%.

Table 1: Labour input sources for G7 countries

| G7	Canada	France	Germany	Italy	Japan	UK	United States
Method	DM, WITH ADJ	CM	CM	CM	CM	DM	DM
Hours - main Employees	LFS	BS	AS	LFS/AS	BS	LFS	BS
Hours - main Self-employed	LFS	AS	LFS	LFS/AS	N/A	LFS	LFS
Hours - secondary Employees	AS	LFS/AS	LFS/BS/AS	BS/AS	LFS	AS	LFS/BS
Hours - secondary Self-employed	AS	LFS/AS	AS	BS/AS	N/A	N/A	N/A
Employment - main Employees	LFS	AS	BS/AS	LFS/BS/AS	LFS/PC	LFS	BS
Employment - main Self-employed	LFS	AS	LFS	LFS/BS/AS	LFS/PC	LFS	LFS
Employment - secondary Employees	PC/BS/AS	LFS/BS/AS	LFS/AS	AS	AS	BS/AS	AS
Employment - secondary Self - employed	PC/AS	LFS/AS	N/A	AS	AS	N/A	N/A
% change in average hours worked Employee	unquantified	-18.8%	-12.4%	N/A	1.0%	0.0%	0.0%
% change in average hours worked Self-Employed	unquantified	53.5%	-6.4%	N/A	0.0%	0.0%	0.0%
% total adjustment made to number of employees	10.0%	0.3%	6.3%	9.9%	3.3%	0.0%	2.6%
% adjustments made to number of self-employed	-41.0%	0.1%	0.9%	0.0%	8.6%	0.0%	0.0%

Source: Office for National Statistics

Notes

1. DM - Direct Method [Back to table](#)

2. CM - Component Method, ADJ - Adjustments, LFS - Labour Force Survey, BS - Business Survey, AS - Administrative Survey, PC - Population Census, N/A - Non-applicable [Back to table](#)

OECD recommendations

The OECD recognises the direct method of estimating hours worked is not necessarily inferior to the component-based approach but without the use of additional adjustments the data collected suggest it could potentially overestimate the actual hours worked. Looking across the countries submitting data, they recommend the component method as the best compromise strategy for estimating labour inputs, though they recognise that not all countries may be able to capitalise on administrative sources. When making international comparisons, they encourage countries that use the direct method without adjustments to consider adapting a "simple" component method as an interim step. Re-estimating the labour inputs using this simplified component approach increases the UK's relative productivity, narrowing the gap with the US by around 8 percentage points from 24% below US productivity to 16% below, because the UK currently uses the direct method.

Figure 3 shows the estimated labour productivity gaps in gross domestic product (GDP) per hour worked, measured using average hours worked from official national accounts and the OECD labour force survey-based simplified component method.

Figure 3: Estimated labour productivity gaps, selected OECD countries, 2016
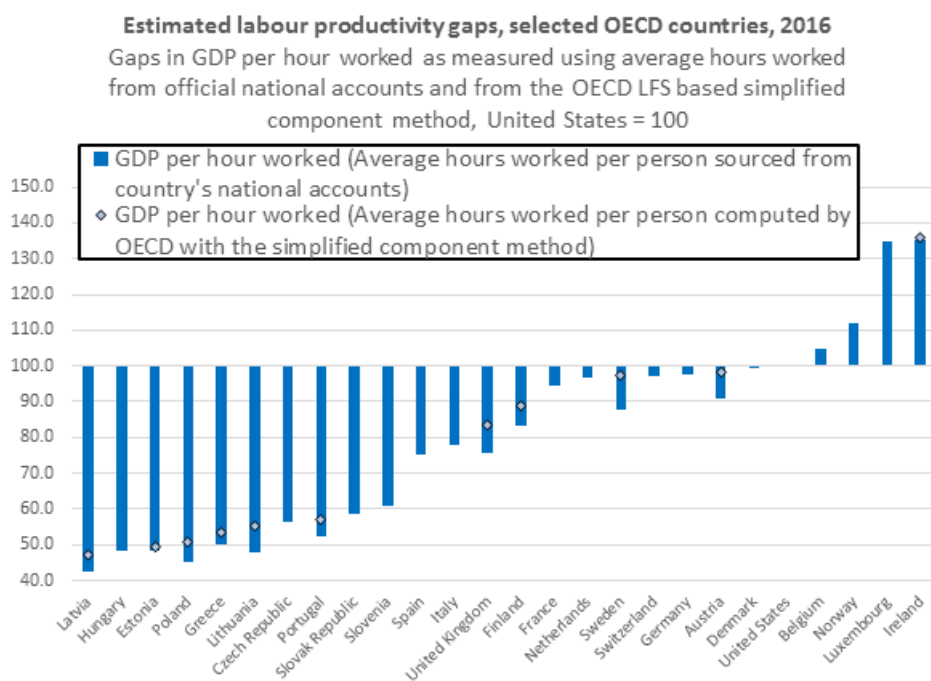
In light of these findings, the OECD is proposing to revise the country-specific labour inputs data presented in their productivity database using the following criteria:

1. For countries that apply the component method or the direct method with adjustments they will use the national accounts estimates.

2. For countries that apply the simple direct method, that is without any adjustments, the OECD will derive the employment estimates using a simplified component method with adjustments from the labour force survey.

Proposal for improving our international comparison of productivity estimates and wider impact on UK productivity inputs and National Statistics

When comparing labour productivity across countries we are faced with two options: Do we use the best estimate measured by each country, on the basis that the country understands its data better than any other or do we use a consistent method across all countries to produce estimates on the same basis?

Using data from the OECD's productivity database alongside a small number of adjustments with a component method can bring those countries using the direct method into a broadly comparable basis to those that already apply the component method. However, for countries that apply the simple direct method the database will contain OECD derived values and will only include adjustments for actual hours sourced from the EU Labour Force Survey (EU-LFS). The EU LFS is another set of questions countries collect from the national labour force survey. As the data are collected across the EU countries systematically it can provide a comparable basis across the countries including the UK.

The aim is to identify a source that is comparable across all countries. So when compiling estimates of ICP, we propose to review incorporating the OECD's proposed methodology in our ICP publication using the simplified component method, applying the same adjustment to estimates for deriving actual hours worked consistently across the countries. We recognise this may not necessarily be the best estimate of productivity across the countries as some may have better national sources such as administrative data to capitalise on; it is a more coherent method for making comparisons across countries.

Table 2 summarises the adjustments we propose to apply consistently to all countries when compiling ICP estimates. These are consistent with the OECD's simplified component approach. This proposal is subject to the availability of relevant data from other countries and we would need to gain access to the EU-LFS data. In the absence of sustainable data sources, we would need to review if it is meaningful to continue producing estimates of ICP drawn from heterogeneous methods, sources and adjustments applied by different countries.

Table 2: Proposals for improving international comparison of productivity (ICP) estimates

Average weekly hours	x	Annual weeks worked
+ usual hours in main job + extra hours in main job (= overtime + variable hours - flexi) + hours in additional jobs		52 weeks less - holiday weeks - full week absence (non-holiday) - part-time absence - absence due to sickness and/or maternity

Source: Office for National Statistics

These recent findings may also have a wider impact on the UK labour productivity estimates. The OECD findings do not on their own suggest that the UK should change its methodology, but the suggestion that the UK hours could be overstated is something we will investigate. We have estimated UK productivity using the direct method because it has historically been the best method given the data available in the UK. On a national level, it would not be possible to apply the component method in the short term. However, as work on administrative data is evolving, it may be possible to consider applying the component method in the long run.

In the interim we will complete a scoping study to identify sustainable sources to capture conceptual and exhaustiveness adjustments on the economic territory, the unobserved economy and any other adjustments that are consistent with the national accounts production boundary and Eurostat's tabular approach used in the gross national income (GNI) process table. The study will review dependencies with wider labour market statistics and the current availability of administrative sources for estimating variables to derive actual hours worked such as sick absences that will be analysed against the current Labour Force Survey responses.

As national labour productivity estimates are a National Statistic and therefore follow the UK Statistics Authority's Code of Practice for Statistics, which requires consultation with users, the final details of the feasibility study will be agreed after consultation with users.

Conclusions

We have seen significant differences in the productivity between the UK and other G7 countries with output per hour worked in the UK being lower than many G7 countries. With good international co-operation, we initiated a review that was led by the OECD, which concluded that although countries produced common variables of labour inputs, such as hours worked or employment in persons or jobs, the methodologies, data sources and adjustments varied significantly across countries. Actual hours worked across countries were significantly affected by the method used to estimate labour inputs.

When making international comparisons, a more harmonised method across all the countries is more favourable than the best estimate that is available by each country, as labour inputs can be compiled across countries using heterogenous methods and sources. The findings have also initiated a review of the current methodology used to compile our national labour productivity series.

The OECD recognises the direct method of estimating hours worked is not necessarily inferior to the component-based approach, though without the use of additional adjustments it could potentially overestimate the actual hours worked. The UK is particularly affected as it is one of the few countries using the direct method because it has historically been the best method to use given the data available. Although these methodological differences can partly explain the productivity gap between the UK and other G7 countries, it does not eliminate it. However, by improving our current methodology and reviewing the coverage and exhaustiveness of our data inputs, we can potentially make better informed comparisons of labour productivity.

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