

Article

UK foreign direct investment: trends and analysis: summer 2017

Analysis of foreign direct investment (FDI) using initial estimates for 2016 and new research on: country and industry, exchange rate impacts and experimental results from linking FDI microdata.

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Correction

10 July 2017

A correction has been made to Figure 24. This was due to a small error when an incorrect version of the data was uploaded. You can see the original Figure 24 in the superseded version.

We apologise for any inconvenience.

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1 . Main points

- First estimates of foreign direct investment (FDI) based on the quarterly survey show that both net earnings and stock of FDI improved in 2016 overall.
- While both the values of UK overseas FDI earnings and stocks increased, the implied rate of return continued to decline in 2016 and reached the same rate as the returns on investments in to the UK (at 4.3%) for the first time since 2008.
- The rise in the value of both FDI credits and assets were supported by the depreciation in sterling throughout 2016; however, exchange rate effects only explain 15% of the rise in the value of FDI credits over the year.
- Returns on UK overseas FDI in mining and quarrying positions have declined across all regions between 2011 and 2015.
- Geographical breakdowns of inward FDI stocks using the ultimate controlling parent concept indicate that 30.7% of FDI stocks held in the UK by overseas investors originated ultimately from the EU, compared with 45.4% when presented using the immediate counterpart; in contrast, all other continents see an increase in their proportions of inward FDI stocks.
- Initial research suggests that financial centres play an important role for inward FDI in the UK, with nearly three-fifths of special purpose entities (SPEs) immediate parents of UK companies located in one of these centres.
- Experimental Statistics from linking FDI micro-data to other ONS business surveys identifies that businesses in receipt of FDI accounted for 18% and 28% of the UK's total employment and gross value added (excluding financial services and other smaller industries) respectively; businesses in receipt of FDI were also found to be more productive.
- Experimental Statistics show that over 2 million employees work for businesses in receipt of FDI from the European Union.

2 . Overview

Foreign direct investment (FDI) statistics provide information about the value of cross-border investment that result in control or influence in a business.

FDI refers to cross-border investments made by residents and businesses from one country in to another, with the aim of establishing a lasting interest in the country receiving investment¹. Outward FDI, or assets, captures the investments made by UK companies abroad, whereas inward FDI, or liabilities, covers investments made in the UK made by foreign companies².

In addition to the direction of investment, FDI statistics can be analysed in terms of positions (total stock of investment at a given point in time), income (earnings generated by underlying assets over a specific period of time), or flows (value of cross-border FDI transactions over a specific period of time). This article focuses on FDI stocks and income.

FDI statistics can also be presented using different measurement principles: the asset and liability principle and the directional principle. While both principles differ when focusing on a specific direction of investment, net values should be the same.

Statistics used in this analysis are presented using the asset and liability principle³ unless otherwise stated. This is in line with internationally-agreed best practice for presenting Balance of Payments statistics; therefore making the analysis presented consistent with the Balance of Payments (Pink Book) . Sections of the micro-data analyses that use the directional principle are consistent with data presented in the [Foreign direct investment statistical bulletin](#).

Notes for: Overview

1. A minimum of 10% of the voting power is the basic criterion used to distinguish FDI relationships from portfolio investment.
2. Inward investment is made in the UK by non-resident companies.
3. The [Organisation for Economic Co-operation and Development \(OECD\)](#) has produced a comparison of these two approaches.
4. FDI data for 2014 presented throughout this article are based on revised estimates, which were published in the latest annual FDI bulletin. The revised estimates for 2014 are yet to be incorporated into Balance of Payments and will be incorporated into Pink Book and Balance of Payments in October 2017.

3 . Foreign direct investment in 2016

Initial Balance of Payments estimates for Quarter 4 (Oct to Dec) 2016 were published in March 2017. This allows for the analysis of foreign direct investment (FDI) data to be extended to 2016 using these provisional results. For FDI, statistics for the 2016 reference period are based on results from the quarterly surveys, which have a smaller sample designed to provide a timely estimate of quarterly movements.

FDI statistics for the 2016 reference period will be subject to revisions in December 2017, when data from the annual surveys are published. These have a larger sample and the timing of which allows companies to respond using information from audited accounts rather than using estimates from monthly management accounts.

The downward trend in net FDI earnings has flattened, ending the negative impact FDI had on the current account balance since 2011

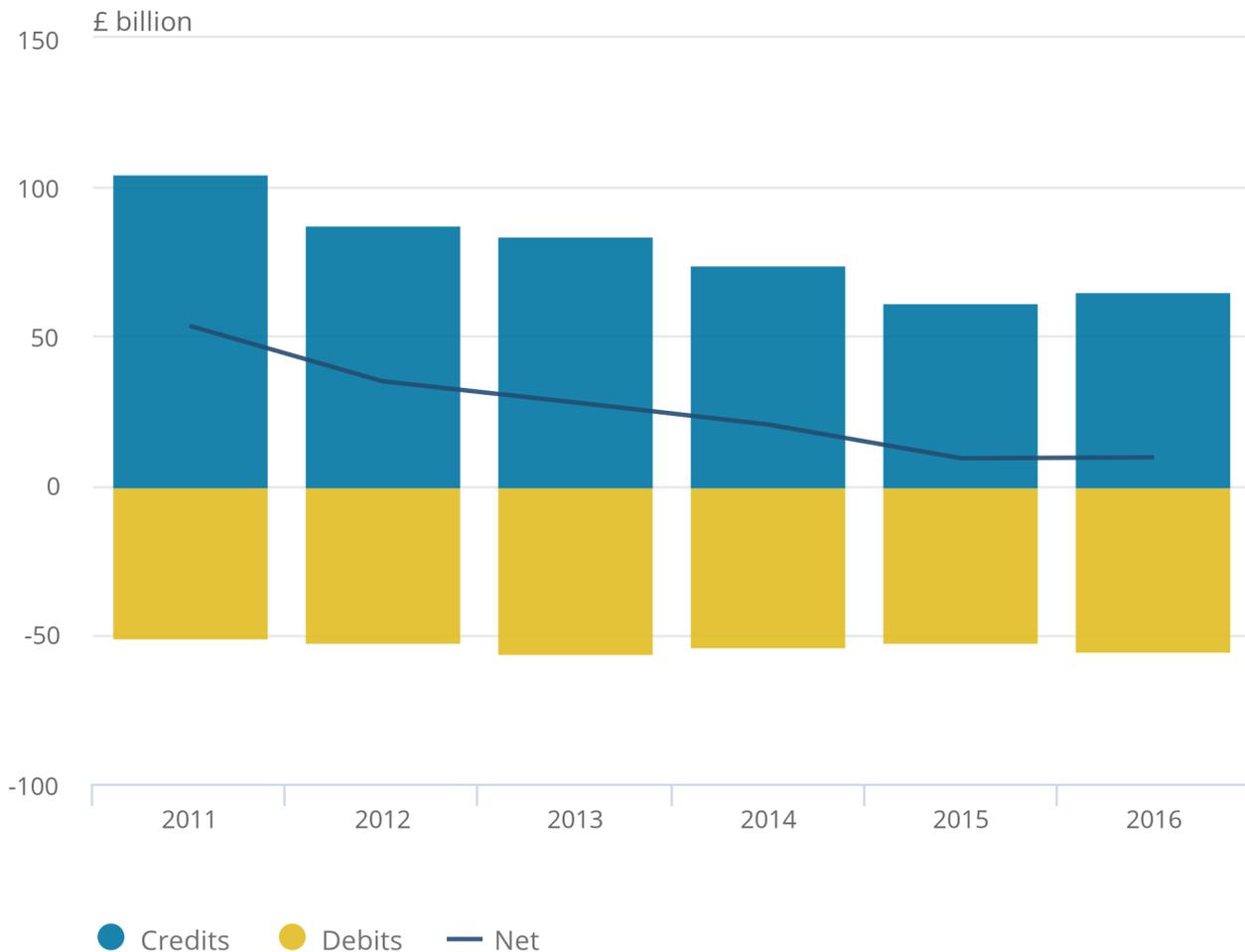
The values of FDI credits and debits in 2016 were similar to those in 2015. Credits rose by £3.4 billion over the year, softening the downward trend in the value of credits observed since 2011. The value of credits was £104.6 billion in 2011 and had fallen to £62.0 billion by 2015 and £65.1 billion in 2016 (Figure 1).

In contrast, FDI debits have remained fairly constant since 2011, varying between £51 billion and £58 billion, and increased by £3 billion in 2016 to £55.7 billion. The similar increase in both credits and debits in 2016 implies that net FDI earnings were also similar in 2016 from 2015, at £9.3 billion and £9.0 billion respectively.

Early estimates based on the smaller quarterly sample size suggest that there was a particularly large increase in credits with the EU in 2016. This was partially offset by lower credits from the North Americas, non-EU European countries and Asia. Similarly, the main source for the increase in debits was the EU. This was partially offset by a decrease in debits in the South and Central (SC) Americas; all other geographical regions remained close to values reported in 2015.

Figure 1: Net UK foreign direct investment (FDI) credits and debits with net FDI earnings, 2011 to 2016

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Source: Office for National Statistics

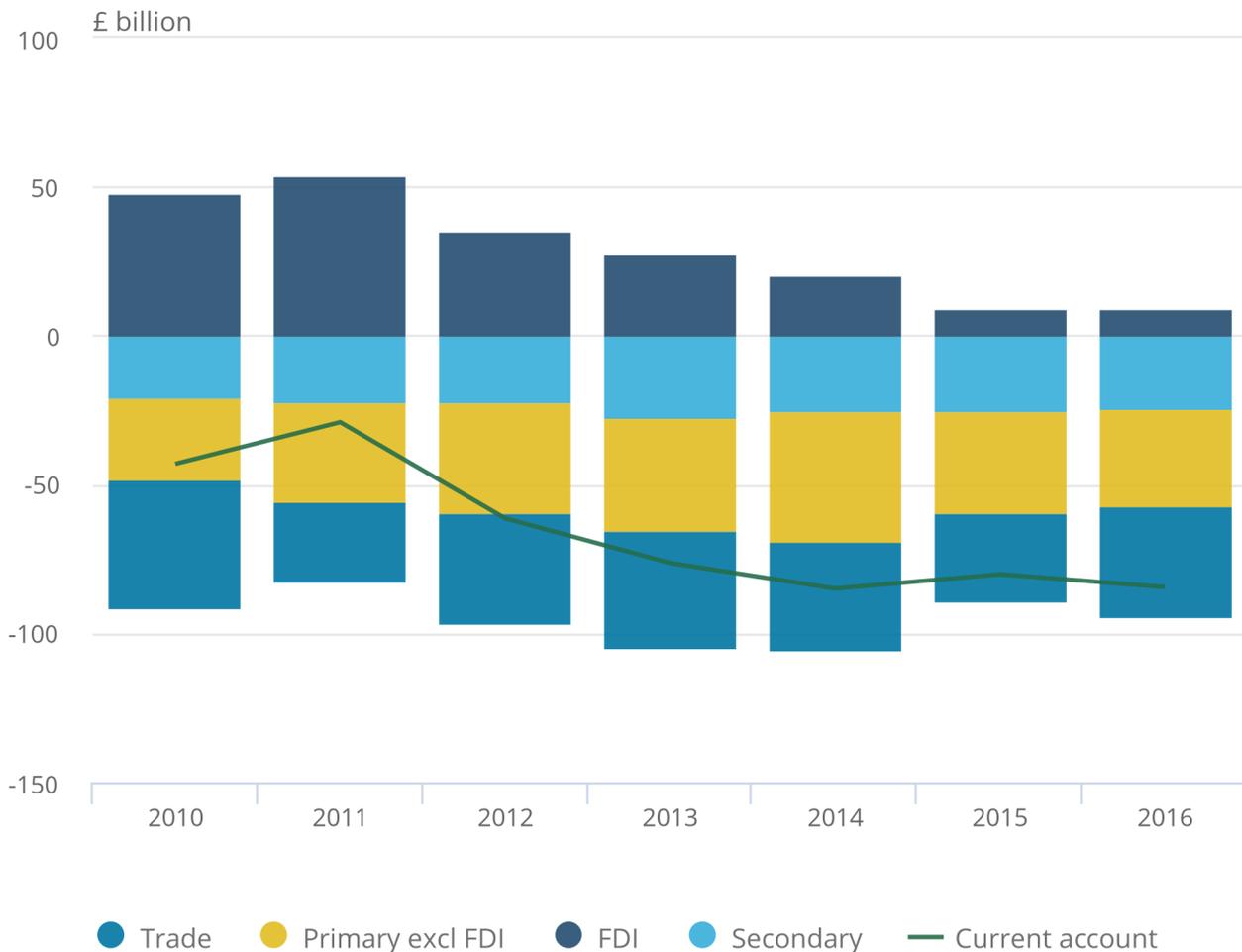
Source: Office for National Statistics

FDI is a component of the three main accounts in the Balance of Payments and international investment position (IIP) suite. FDI earnings are part of primary income in the current account, FDI flows are part of the financial account, and FDI positions are part of the IIP.

The UK's current account balance (Figure 2) has been negative (that is, in deficit) in every year since 1983. Net FDI earnings have been positive in every year since comparable series began in 1997. While positive, changes in net FDI earnings can improve or worsen the current account balance.

Figure 2: The UK current account balance and its components, 2010 to 2016

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Source: Office for National Statistics

Source: Office for National Statistics

The current account balance has been relatively stable in 2014 and 2015, seeing a small increase. This period of relative stability continued into 2016. In the years preceding 2014 the current account deficit deteriorated markedly since 2011, reaching a record low in 2014. This was predominantly due to falling FDI earnings.

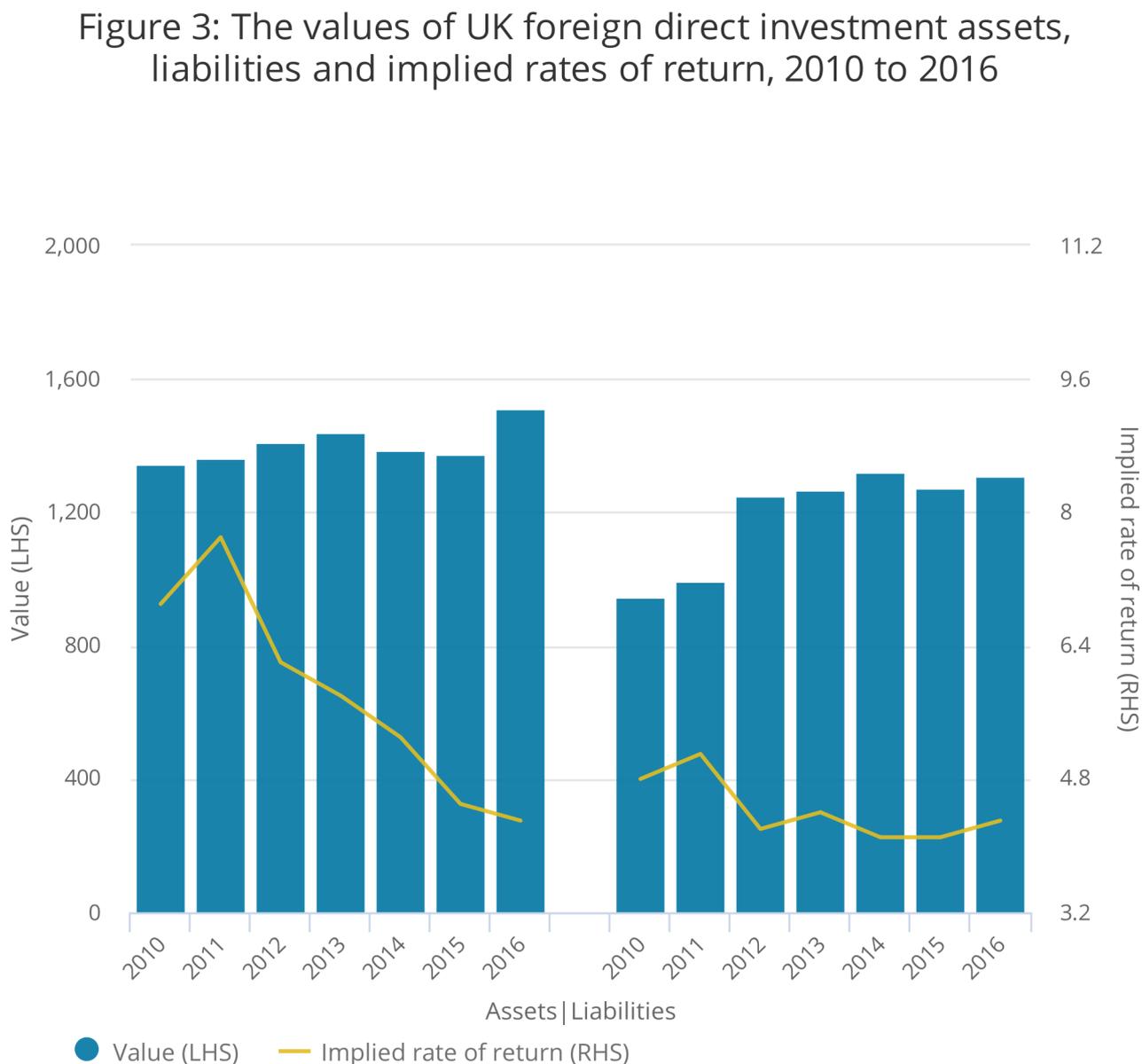
While falling FDI earnings provided further downward pressure in 2015, increases in the trade balance and other components of primary income led to a small improvement in the overall current account balance. While the downward trend in net FDI earnings appears to have paused in 2016, the overall current account balance saw a small deterioration due to trade.

The increase in the value of UK FDI assets exceeded the increase in liabilities in 2016

The longer-term trend in the value of UK FDI assets shows that these have been relatively stable over recent years; however, the value of FDI assets saw notable growth in 2016, increasing by £133.6 billion, or 10% compared with 2015.

While the value of FDI liabilities had experienced year-on-year increases between 2009 and 2014, they experienced a small decrease in 2015. FDI liabilities saw a small increase in 2016, rising by £33.6 billion. The larger rise in assets may be partly reflecting exchange rate effects, which are discussed in more detail in section 4 of this article.

Figure 3: The values of UK foreign direct investment assets, liabilities and implied rates of return, 2010 to 2016



Source: Office for National Statistics

Initial estimates show that the value of UK FDI assets from all continents grew in 2016 from 2015, contributing to the larger rise in assets displayed in Figure 3. As with credits, this increase is mainly due to growth in EU asset values. For liabilities, the increase in values with the North Americas was greater than that with the EU. Asia also observed a small rise in the value of liabilities too.

Trends in earnings relative to the stock of investment can also be analysed in respect to changes in the implied rate of return. This captures how much income is generated per pound of investment. Therefore, if the UK receives £50,000 on an asset in Germany valued at £1 million, then this implies that the rate of return is 5%; every £100 invested generates £5 of income. The implied rates of return on UK assets and liabilities are also shown in Figure 3.

Implied rates of return on assets have fallen year-on-year since 2011. The further decline in 2016 reflects the larger proportional increase in assets relative to credits. Our analysis of the largest investors' currency holdings suggests this is because a larger proportion of credits are denominated in sterling than that of assets; therefore, depreciations in sterling, as seen throughout 2016, are likely to inflate stocks by more than credits.

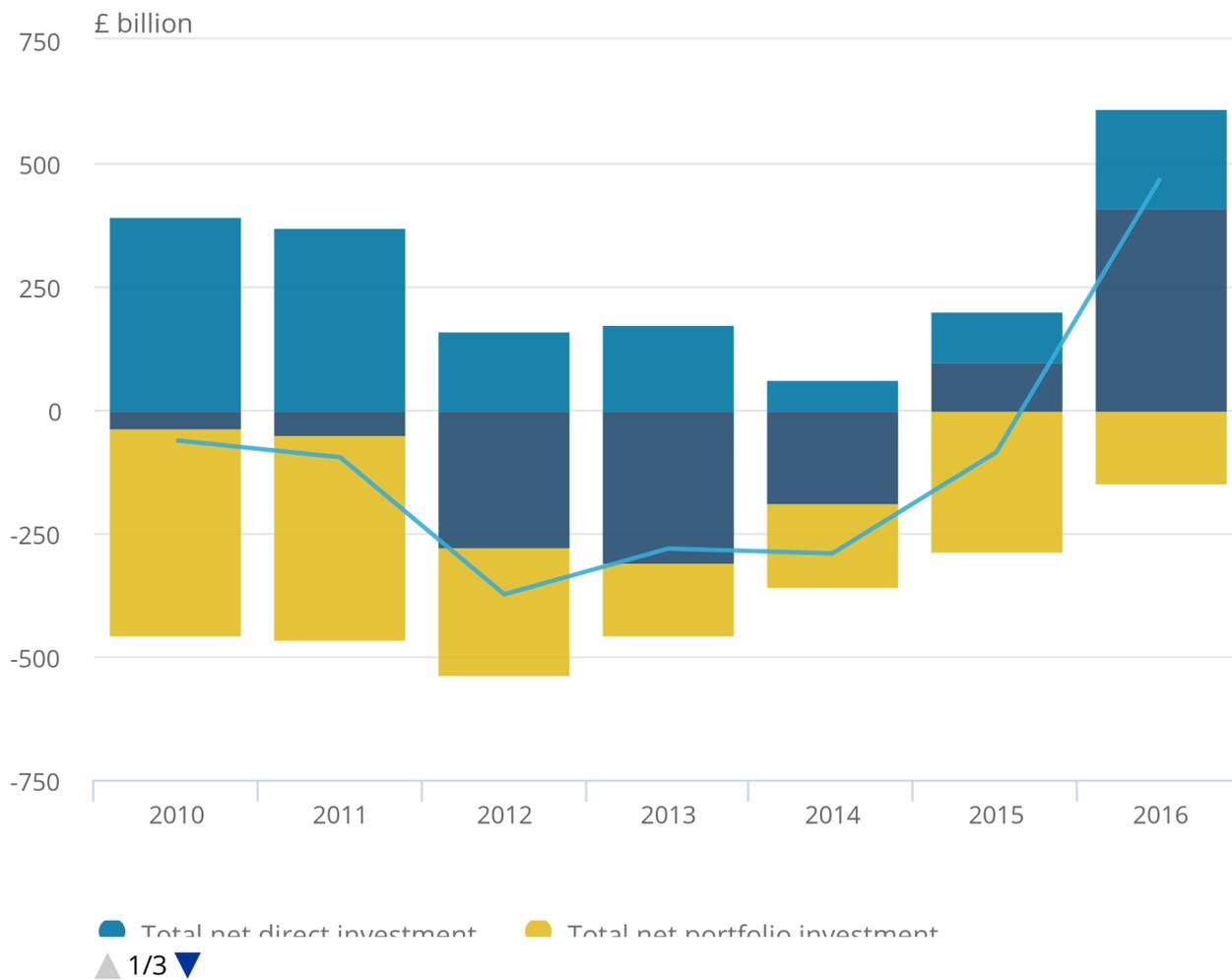
A further notable observation is that the fall in the implied rate of return on assets in 2016 moves them to the same level as liabilities (4.3%) for the first time since 2008. In contrast, the rates of return on liabilities have remained largely constant, with levels typically varying between 4.0% and 4.5% from 2012 onwards.

Similar to earnings, positive net FDI positions imply they have supported the UK's overall net international investment position (IIP). Figure 4 presents the components of the UK's IIP and highlights that net FDI positions have not been the largest component of UK IIP over the period from 2010 to 2016. However, FDI positions have partially offset the negative net positions from the other components.

The value of net FDI positions in 2016 was the highest level (£201.1 billion) since 2011, reflecting the notable rise in FDI assets. Together with a large rise in other investment, the rise in net FDI positions contributed to the UK IIP becoming positive in 2016 – referred to as a creditor nation.

Figure 4: UK net international investment position (IIP) and its components, 2010 to 2016

Figure 4: UK net international investment position (IIP) and its components, 2010 to 2016



Source: Office for National Statistics

Source: Office for National Statistics

4 . The impact of exchange rate changes on foreign direct investment in 2016

The [January 2017 foreign direct investment \(FDI\) analysis article](#) estimated that the recent depreciation in the sterling exchange rate will have had an impact on annual and quarterly FDI statistics. This article updates the quarterly analysis to include Quarter 4 (Oct to Dec) 2016 alongside further research to improve these estimates. Some of these improved methods include changing the exchange rates used for earnings from quarterly averages to end-of-quarter rates. This makes this analysis consistent with that on other parts on the Balance of Payments in the [July 2017 Economic Review](#).

We also approached 200 of the largest companies engaged in both inward and outward FDI in the UK to collect voluntary information on the currency composition of their FDI earnings and positions. Around one-quarter of those companies provided information which showed that just over half of FDI assets could be denominated in sterling and close to three-fifths for FDI credits.

As suggested in previous articles, a larger proportion of liabilities and debits are expected to be denominated in sterling, reflecting UK operations. Our most recent research confirms this, suggesting that slightly below 90% of liabilities are held in sterling and just over 90% of debits. Therefore, while FDI liabilities and debits are affected by the devaluation in sterling, the impact will have been notably smaller than for assets and credits. These results are used to calculate adjusted counterfactual series.

There are three important considerations related to the adjusted counterfactual estimates for UK assets and credits. Firstly, the voluntary responses of UK direct investors will have its own sampling variation; repeating this survey again may yield different results. Therefore, the actual exchange rate impact could be greater or lower than that presented in this analysis.

The second consideration is that the currency composition of FDI involving the UK is likely to change over time. These results are accurate for 2016 and therefore can be less relevant for other periods of sterling depreciation (or appreciation).

The third consideration is that the counterfactuals only attempt to capture the price effect of an exchange rate movement – that is, the impact of converting non-sterling denominated earnings and assets into sterling. Other effects, such as increases or decreases in investment due to changes in the profitability of investments after the exchange rate has depreciated, are not captured.

The sterling exchange rate depreciating over 2016 will have inflated the value of UK credits and assets

As shown in previous articles, the sterling exchange rate began to depreciate from Quarter 3 (July to Sept) 2015 and fell further following the EU referendum in mid-2016. The Bank of England's effective exchange rate continued to show that sterling depreciated over Quarter 4 (Oct to Dec) 2016, albeit at a slower rate than some of the other quarters of the year. This suggests that the FDI-weighted value of sterling finished the year roughly 15% lower than at the end of 2015.

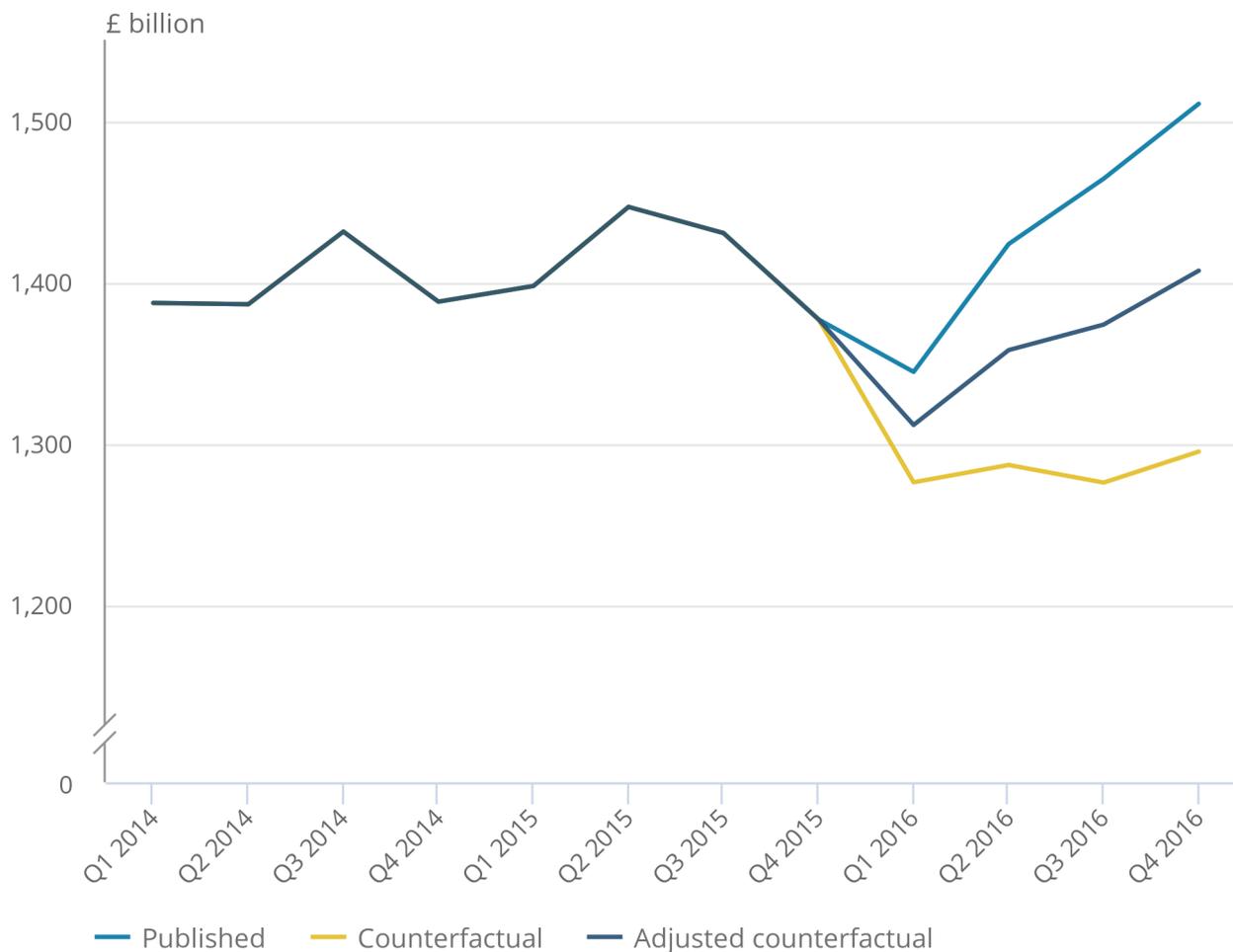
Figure 5 shows the published quarterly FDI asset values alongside the original and adjusted counterfactual estimates. The original counterfactual assumes all UK FDI assets are denominated in the domestic currency of where the investment is, while the adjusted counterfactual makes adjustments for the proportion of the assets believed to be denominated in sterling. Exchange rates have been fixed to the end-2015 (31 December 2015) rate to allow for analysis of trends in FDI asset values over each quarter of 2016 when controlling for exchange rate effects.

Figure 5: Foreign direct investment assets and counterfactual values

Quarter 1 (Jan to Mar) 2014 to Quarter 4 (Oct to Dec) 2016

Figure 5: Foreign direct investment assets and counterfactual values

Quarter 1 (Jan to Mar) 2014 to Quarter 4 (Oct to Dec) 2016



Source: Office for National Statistics

Source: Office for National Statistics

Notes:

- 1. Q1 refers to Quarter 1 (Jan to Mar)
- Q2 refers to Quarter 2 (Apr to June)
- Q3 refers to Quarter 3 (July to Sept)
- Q4 refers to Quarter 4 (Oct to Dec)

The initial counterfactual estimates assume that all UK FDI assets are denominated in foreign currency and indicate that the value of assets remained broadly flat following a notable decline in Quarter 1 (Jan to Mar) 2016. Comparing the asset values between Quarter 4 2015 and Quarter 4 2016 (also the annual asset values) indicates that asset values declined by 5.6% according to this extreme counterfactual, compared with growth of 9.7% reported in published statistics.

The adjusted counterfactual provides a more realistic estimate of the underlying value of FDI assets as it makes adjustments for the proportion of assets believed to be denominated in sterling. The voluntary survey revealed that just over half of UK assets are valued in sterling in company accounts. This effectively halves the area between the published FDI series and counterfactual, which is reflected in Figure 5. The results indicate that, while the exchange rate depreciation during 2016 will have supported the value of UK FDI assets, the upward trend in these assets over 2016 is likely to still be present even if the exchange rate had remained at end-2015 rates.

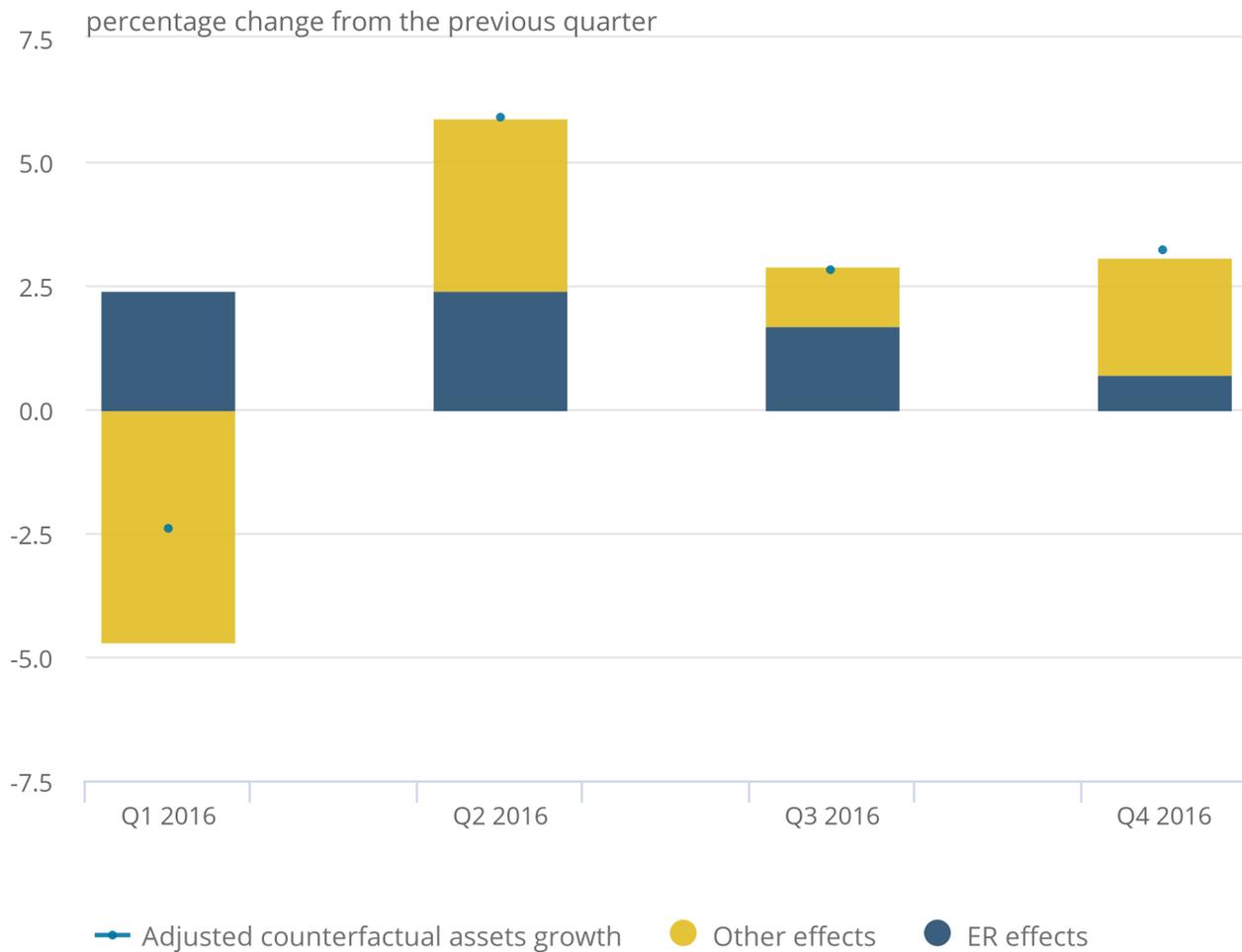
Comparing the asset values between Quarter 4 2015 and Quarter 4 2016 (also the annual asset values) indicates that FDI assets grew by 2.6% according to the adjusted counterfactual, compared with 9.7% reported in published statistics.

Figure 6 presents the quarterly growth rates of the adjusted counterfactual series to break down changes in asset values between those attributable to exchange rate effects to those due to other effects, such as increased investment or revaluation effects. Figure 6 highlights that exchange rate effects inflated the value of FDI assets in each quarter in 2016, while other effects contributed negatively in Quarter 1 2016.

Interestingly, quarterly growth of other effects was larger than exchange rate effects in Quarter 2 2016 and Quarter 4 2016. These results indicate that the value of UK FDI assets would have continued to grow over 2016, yet the depreciation of sterling over the course of the year helped to support asset values even after adjusting for the proportion of those assets denominated in sterling.

Figure 6: Growth in the value of UK foreign direct investment assets using the adjusted counterfactual for each quarter of 2016

Figure 6: Growth in the value of UK foreign direct investment assets using the adjusted counterfactual for each quarter of 2016



Source: Office for National Statistics

Source: Office for National Statistics

Notes:

1. Q1 refers to Quarter 1 (Jan to Mar)
 Q2 refers to Quarter 2 (Apr to June)
 Q3 refers to Quarter 3 (July to Sept)
 Q4 refers to Quarter 4 (Oct to Dec)

The exchange rate impact is smaller on the value of UK FDI credits than on assets in 2016 due to the larger proportion of earnings denominated in sterling

Similar analysis to that undertaken for assets is presented for the value of UK credits in Figure 7. It shows that the upward trend in FDI credits during 2016 is also reflected in the counterfactual and adjusted counterfactual estimates.

Using the original counterfactual – which assumes that all UK credits are in the foreign currency of where they are generated – suggests that UK FDI credits would have increased by £4.9 billion between Quarter 4 2015 and Quarter 4 2016, rather than by the £7.6 billion reported in published statistics. This indicates that exchange rate effects only accounted for 36.6% of the increase. Adjusting the counterfactual reduces the impact of exchange rate effects further, suggesting that FDI credits would have increased by £6.5 billion if exchange rates remained constant.

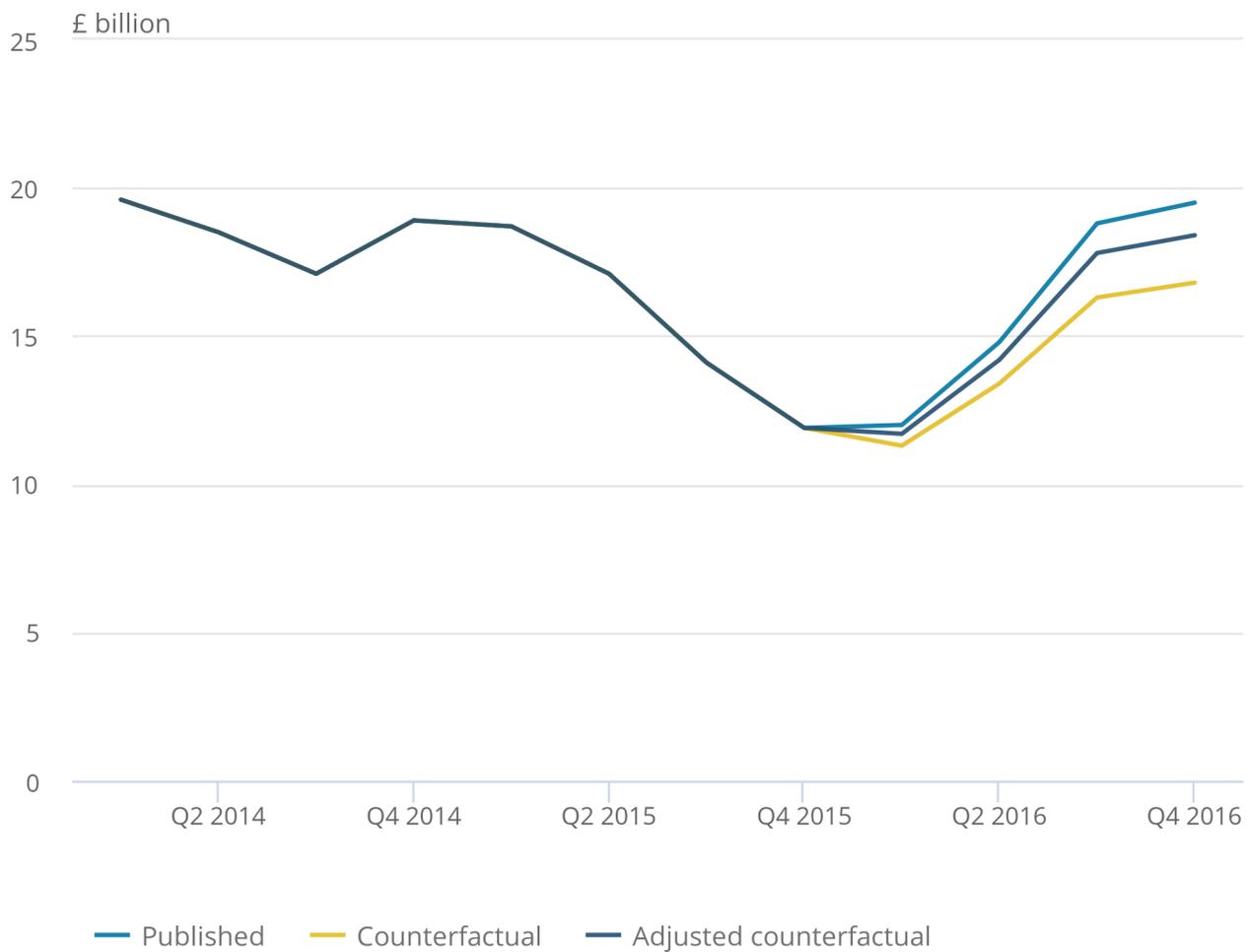
The adjusted counterfactual attributes less of the increase to exchange rate effects, which are estimated to have accounted for 15.0% of the increase in the published value of FDI credits over the period. This analysis shows that while FDI credits were supported by exchange rate effects, an increase in the underlying profitability of assets had a greater role.

Figure 7: Foreign direct investment credits and counterfactual values

Quarter 1 (Jan to Mar) 2014 to Quarter 4 (Oct to Dec) 2016

Figure 7: Foreign direct investment credits and counterfactual values

Quarter 1 (Jan to Mar) 2014 to Quarter 4 (Oct to Dec) 2016



Source: Office for National Statistics

Source: Office for National Statistics

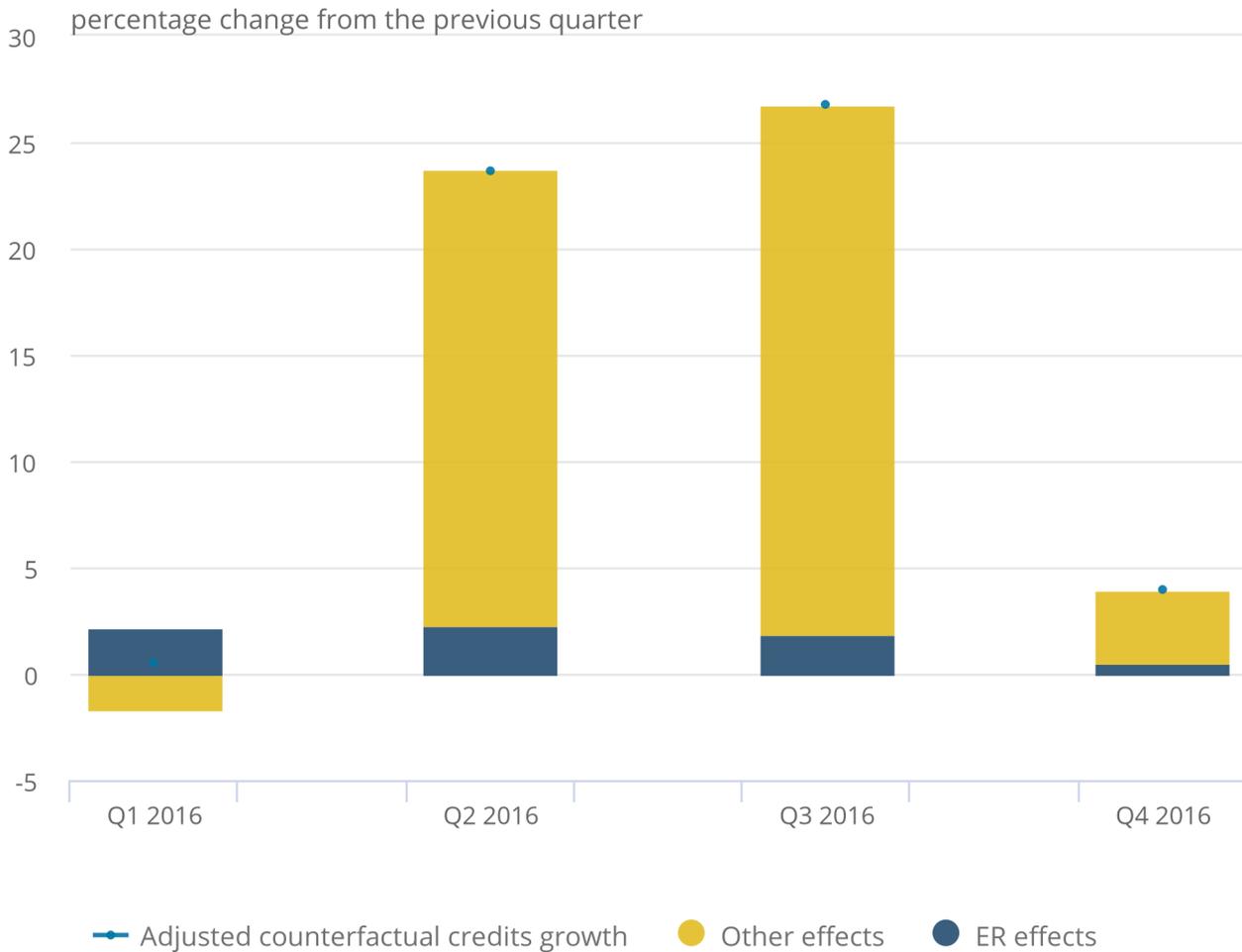
Notes:

1. Q1 refers to Quarter 1 (Jan to Mar)
Q2 refers to Quarter 2 (Apr to June)
Q3 refers to Quarter 3 (July to Sept)
Q4 refers to Quarter 4 (Oct to Dec)

The quarterly growth rates of UK credits in 2016 are presented in Figure 8, with an estimated breakdown between the contributions from exchange rate effects and other effects. Figure 8 highlights that, while exchange rate effects did have a positive impact, this was small relative to other effects in the final three quarters of 2016; although they did offset losses due to other effects during the first quarter.

Figure 8: Growth in the value of UK foreign direct investment credits using the adjusted counterfactual for each quarter of 2016

Figure 8: Growth in the value of UK foreign direct investment credits using the adjusted counterfactual for each quarter of 2016



Source: Office for National Statistics

Source: Office for National Statistics

Notes:

1. Q1 refers to Quarter 1 (Jan to Mar)
 Q2 refers to Quarter 2 (Apr to June)
 Q3 refers to Quarter 3 (July to Sept)
 Q4 refers to Quarter 4 (Oct to Dec)

The UK's net FDI positions and earnings were both supported by the depreciation in sterling

As discussed, the impact of exchange rate movements are expected to be much smaller for FDI liabilities compared with assets, due to the greater proportion of liabilities denominated in sterling (around 90%). The extreme counterfactual of all UK debits and liabilities being denominated in foreign currencies suggests that these values would have been over 14% lower had the sterling exchange rate remained at the end-2015 rate.

Using the more realistic adjusted counterfactual, that accounts for the proportion of FDI liabilities and debits denominated in sterling, implies that the effect would have been much lower; the adjusted counterfactual suggests that debits would have been around 1.5% lower while liabilities would have been 2.0% lower than actual values.

The asymmetric effect of exchange rate movements on FDI assets and liabilities indicates that exchange rate movements will have affected the UK's net FDI position and net earnings. Since the devaluation of sterling inflated the value of assets by more than liabilities, the adjusted counterfactual net positions level is lower (Figure 9). These results suggest that of the £100.0 billion increase in net FDI positions between Quarter 4 2015 and Quarter 4 2016, 77% of this increase can be explained by exchange rate movements.

Figure 9: Value of the UK net foreign direct investment position using the published and adjusted counterfactual estimates

Quarter 1 (Jan to Mar) 2014 to Quarter 4 (Oct to Dec) 2016

Figure 9: Value of the UK net foreign direct investment position using the published and adjusted counterfactual estimates

Quarter 1 (Jan to Mar) 2014 to Quarter 4 (Oct to Dec) 2016



Source: Office for National Statistics

Source: Office for National Statistics

Notes:

1. Q1 refers to Quarter 1 (Jan to Mar)
Q2 refers to Quarter 2 (Apr to June)
Q3 refers to Quarter 3 (July to Sept)
Q4 refers to Quarter 4 (Oct to Dec)

Similarly to positions, the exchange rate depreciation over 2016 had a bigger effect on UK credits than on debits, implying that removing exchange rate effects would result in the value of credits decreasing by more than debits. Therefore, the value of the UK's net FDI earnings would have been lower according to the adjusted counterfactual (Figure 10). The results suggest that 9.9% of the £9.8 billion rise in net FDI earnings between Quarter 4 2015 and Quarter 4 2016 is attributable to exchange rate movements.

Figure 10: Value of the UK net foreign direct investment earnings using the published and adjusted counterfactual estimates

Quarter 1 (Jan to Mar) 2014 to Quarter 4 (Oct to Dec) 2016

Figure 10: Value of the UK net foreign direct investment earnings using the published and adjusted counterfactual estimates

Quarter 1 (Jan to Mar) 2014 to Quarter 4 (Oct to Dec) 2016



Source: Office for National Statistics

Source: Office for National Statistics

5 . Foreign direct investment by continent and industry

[Our analysis published in January 2017](#) presented information on the composition of UK foreign direct investment (FDI) variables by industry and by continent separately. This article combines these analyses to present FDI by industry for each continent. The countries included in each continent are listed in Annex A and the industrial groups are defined in Annex C. All analysis in this section is for 2015 unless otherwise stated, as the smaller quarterly sample informing the 2016 estimates is not designed to provide breakdowns at this level of granularity.

The EU and North Americas account for the majority of the UK's FDI assets and liabilities. The EU is the continent with the highest overall value, accounting for two-fifths of the total assets and liabilities. The North Americas then account for a further one-quarter of assets and liabilities. Taken together, this leaves approximately one-third of assets and liabilities for the remaining continents combined. Therefore, while some industries may be a small component as a proportion of the total in the EU, these could still have a higher value relative to a greater proportion in non-EU Europe for example.

Table 1: UK foreign direct investment assets and liabilities by continent, 2015

	Assets		Liabilities	
	Value (£ billion)	% total assets	Value (£ billion)	% total liabilities
EU	550.9	40.0	533.2	41.8
North Americas	323.4	23.5	338.2	26.5
Asia	142.5	10.4	92.4	7.2
Non-EU Europe	126.4	9.2	152.5	12.0
SC Americas	147.0	10.7	117.3	9.2
Rest of the World	86.4	6.3	42.0	3.3
Total	1376.6	100.0	1275.6	100.0

Source: Office for National Statistics

Note:

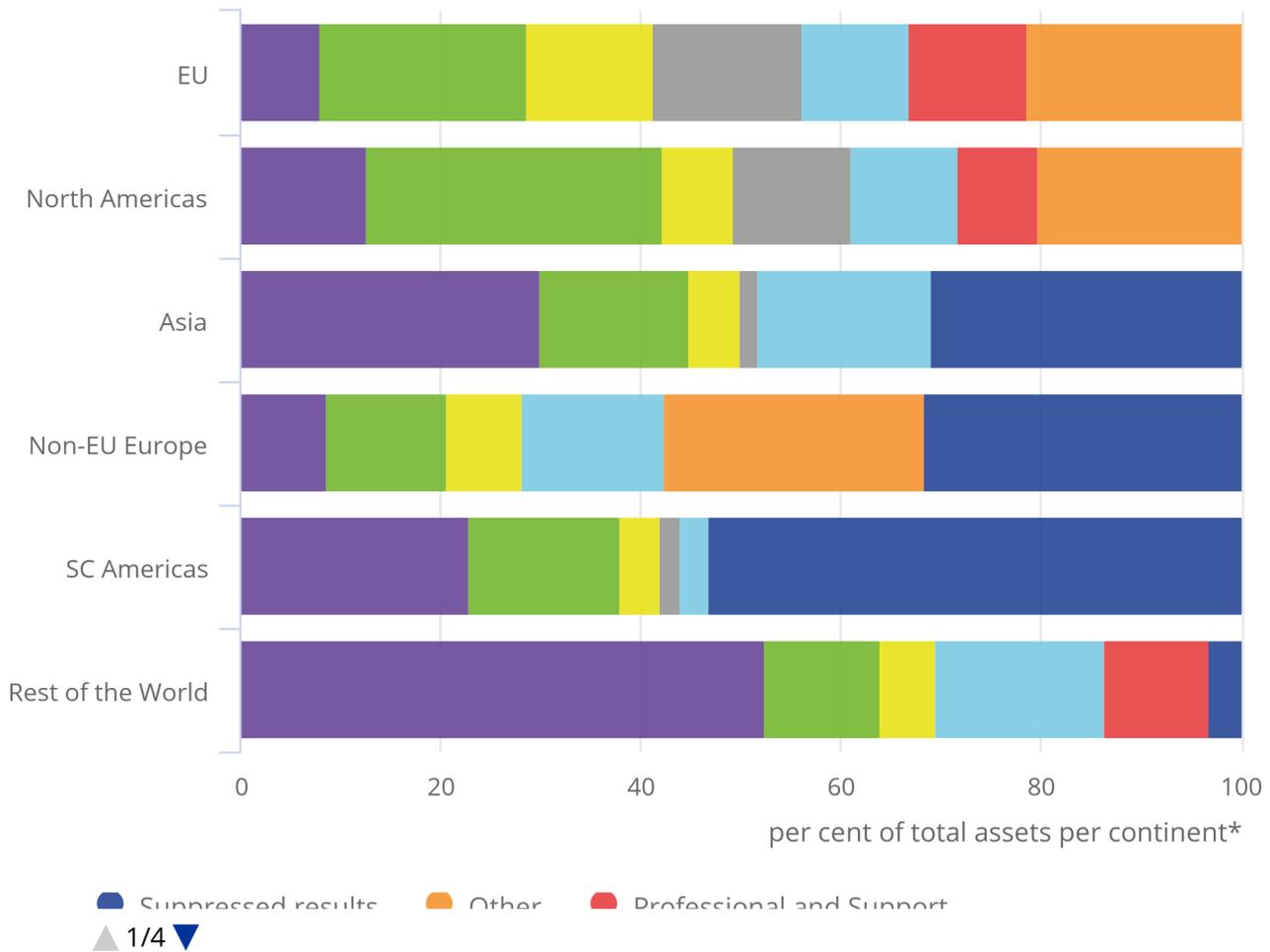
1. Values for property, bank holding companies and public corporations have not been included in this analysis.

Mining and quarrying, and manufacturing tend to be the largest industry groupings for UK FDI assets in most continents

The three main industries for UK FDI overseas by continent are mining and quarrying, manufacturing, and information and communication¹. Together, these accounted for nearly half of all UK-owned FDI assets overseas in 2015. Industry distributions for UK FDI assets are presented by continent in Figure 11. A notable proportion of UK FDI assets in Asia, South and Central (SC) Americas, and the rest of the world are focused in mining and quarrying, whereas UK FDI into manufacturing industries is more dominant in the EU and North Americas. UK investment into the information and communication industries is notable in non-EU Europe relative to the other industries for that region, although this has been suppressed from Figure 11 due to disclosure rules.

Figure 11: UK assets by industry and continent in 2015

Figure 11: UK assets by industry and continent in 2015



Source: Office for National Statistics

Source: Office for National Statistics

Notes:

1. Suppressed results category to show that these should sum to 100

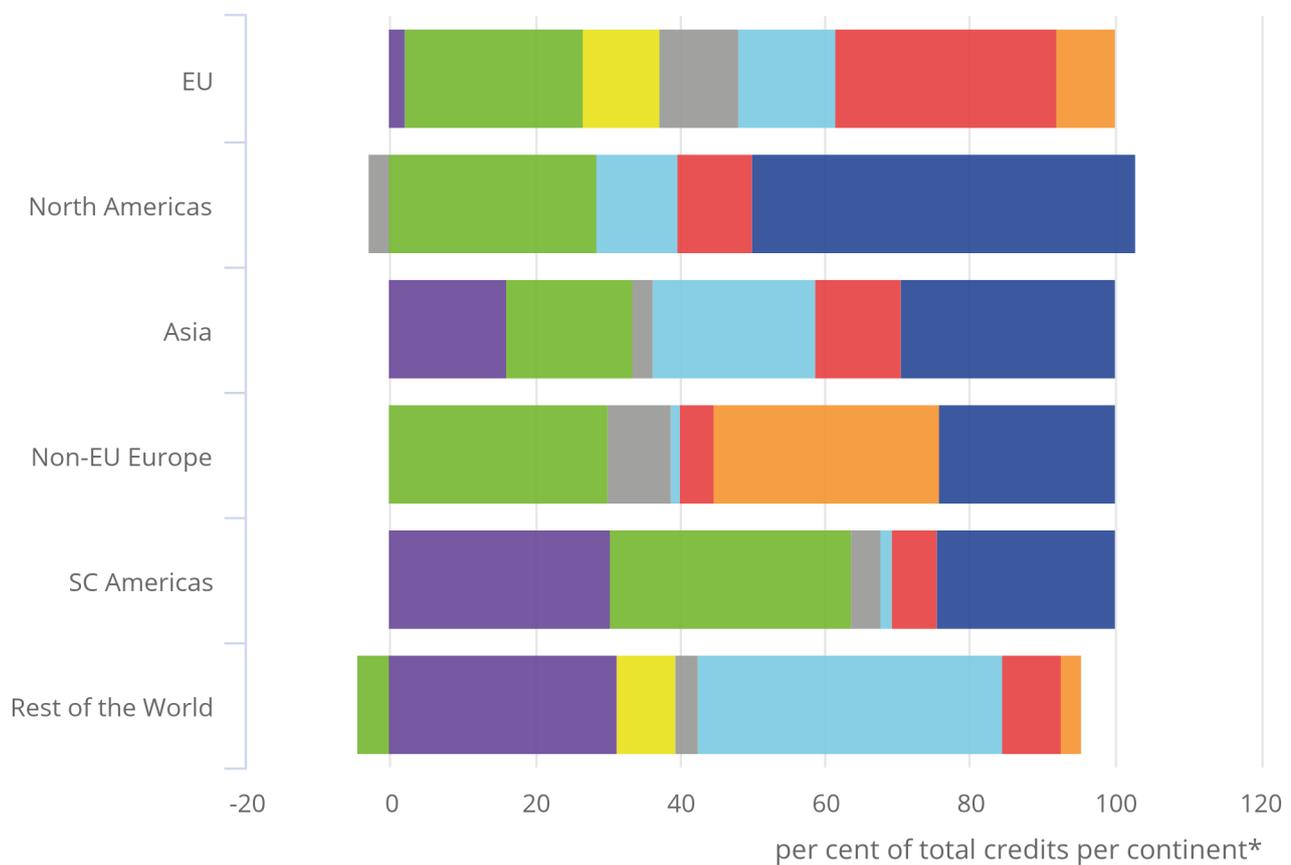
While not the largest industry grouping, investment into finance and insurance industries accounted for between 11% and 18% of UK FDI assets in all regions. The highest shares were in Asia and the rest of the world. The one exception was investment into finance and insurance assets in the SC Americas, which were far below the range of proportions of the other continents. Part of this is because “other industries” account for a large proportion of total UK assets in the SC Americas, of which assets in water, sewerage and waste management industries accounted for the majority of other industries’ assets.

The industrial composition of UK FDI credits are presented by geographical region in Figure 12. Similarly to assets, mining and quarrying, and manufacturing together tend to comprise a large proportion of total credits by continent. Credits from manufacturing were negative in the rest of the world – indicating that these investments generated net losses in that period.

Despite being the third-largest industry in terms of assets, the value of credits from information and communication industries were a smaller proportion of total credits in the EU and North Americas. Some of the observations from Figure 10 could be affected by the operational performance of a small number of large multinationals, which make credits harder to interpret in any one year alone.

Figure 12: UK credits by industry and continent in 2015

Figure 12: UK credits by industry and continent in 2015



■ Suppressed results
 ■ Other
 ■ Professional and Support
▲ 1/4
 ▼ 1/4

Source: Office for National Statistics

Source: Office for National Statistics

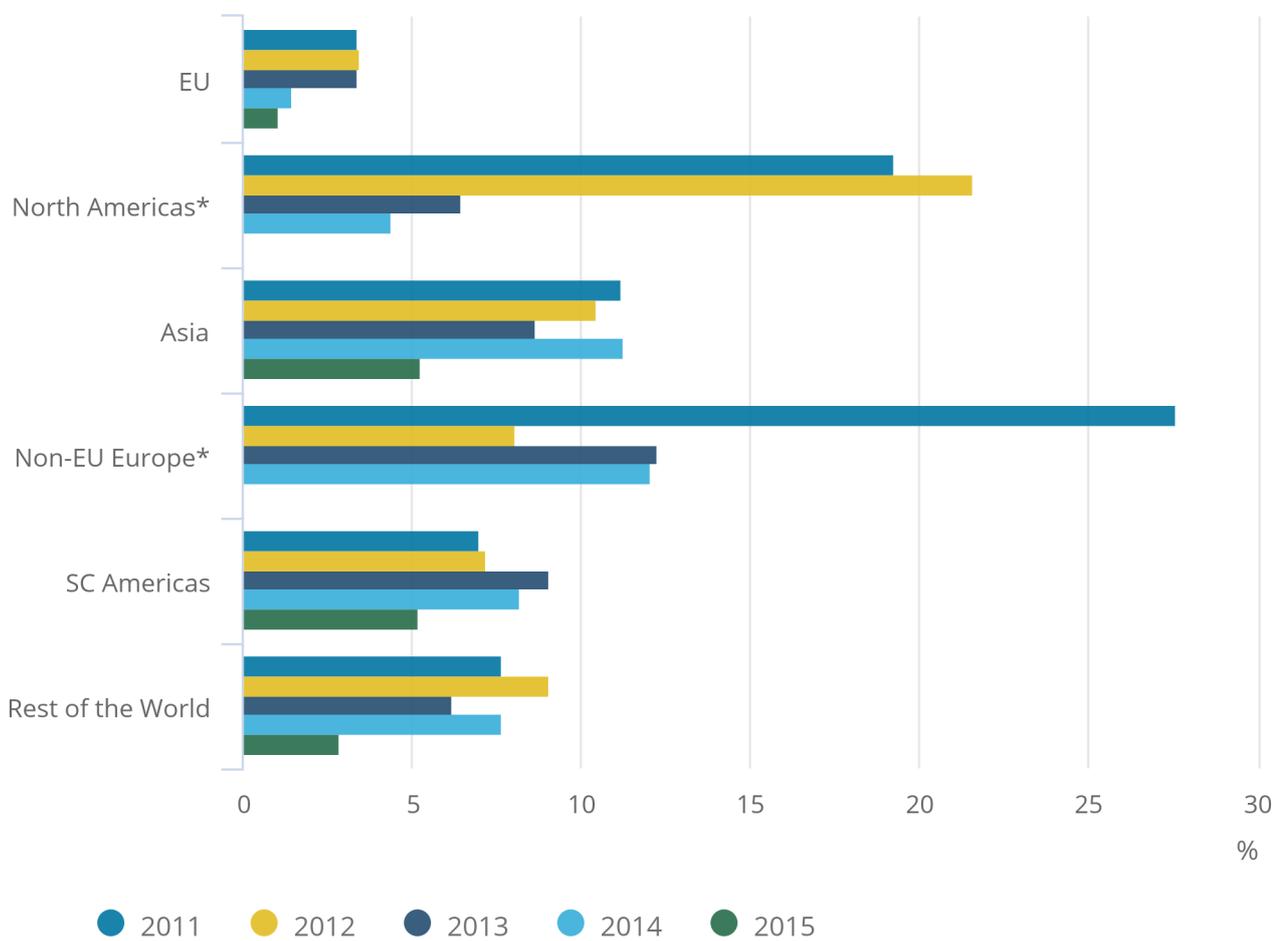
Notes:

1. (*) Some results have been suppressed to mitigate disclosure.

Implied rates of return can be used to assess the link between FDI earnings and positions. If the rate of return is constant, then the value of earnings should increase with the value of assets and vice versa. Figure 13 shows how the implied rates of return have changed by continent for mining and quarrying industries between 2011 and 2015. Implied rates of return on these assets in North America non-EU Europe have been among the highest in 2011. However, rates for both continents have fallen consistently. The implied returns for the other continents have changed by relatively less, although all rates for return were lower in 2015 than in 2014. As presented in [previous articles](#), these trends coincide with a fall in world commodity prices.

Figure 13: Outward foreign direct investment implied rates of return for mining and quarrying industries by continent, 2011 to 2015

Figure 13: Outward foreign direct investment implied rates of return for mining and quarrying industries by continent, 2011 to 2015



Source: Office for National Statistics

Source: Office for National Statistics

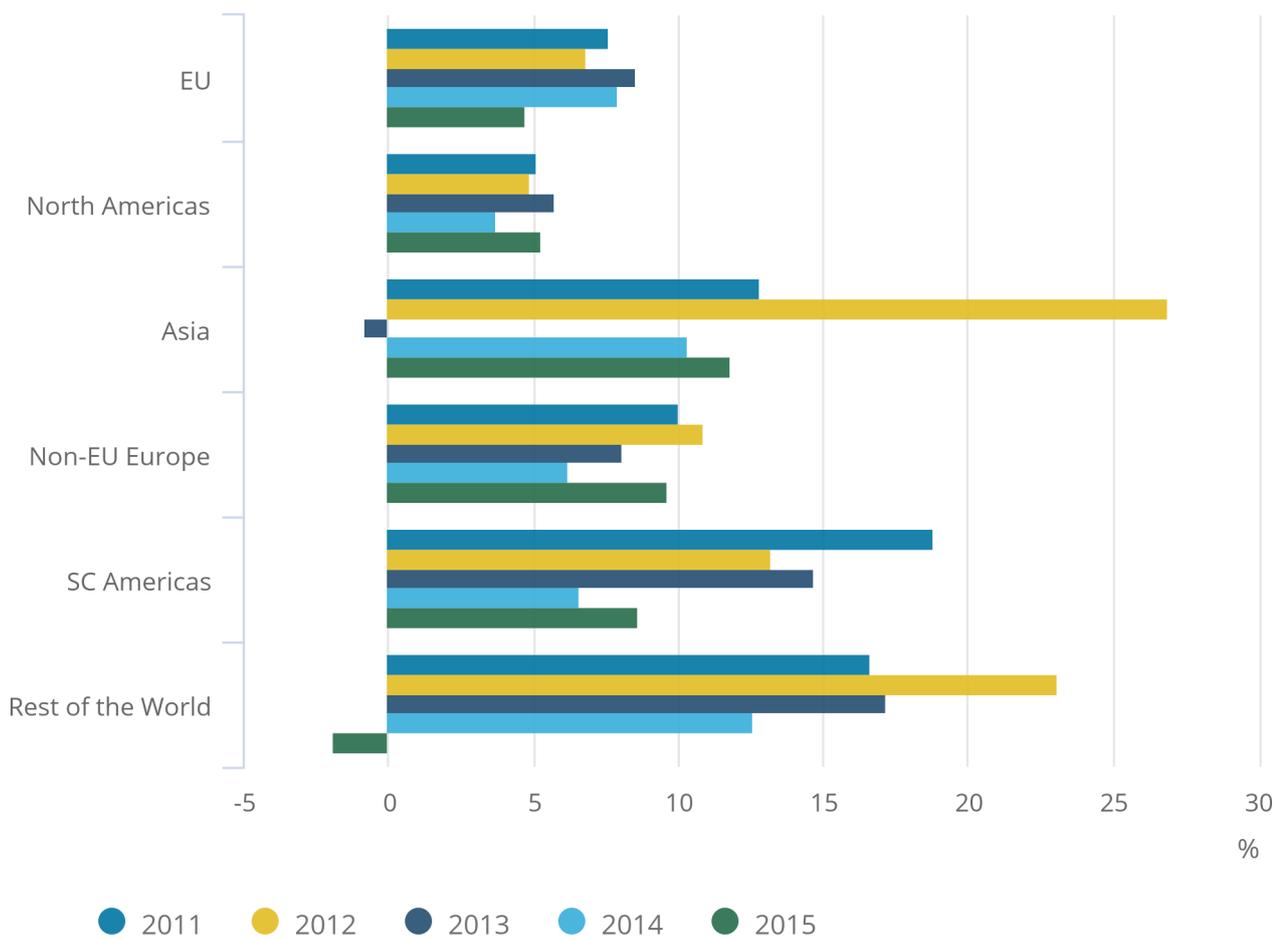
Notes:

1. (*) Values for 2015 suppressed to mitigate disclosure.

The other industrial group that comprises a large proportion of assets and credits for most continents is manufacturing. Implied rates of return for these industries have also been falling for most continents, making these rates lower in 2015 than in 2011 (Figure 14). The main exception has been those from the North Americas, which had a flat trend over these years. This would have supported net FDI earnings for these industries as well as for overall outward FDI, given the large proportion of UK assets in that continent.

Figure 14: Outward foreign direct investment implied rates of return for manufacturing industries by continent, 2011 to 2015

Figure 14: Outward foreign direct investment implied rates of return for manufacturing industries by continent, 2011 to 2015



Source: Office for National Statistics

Source: Office for National Statistics

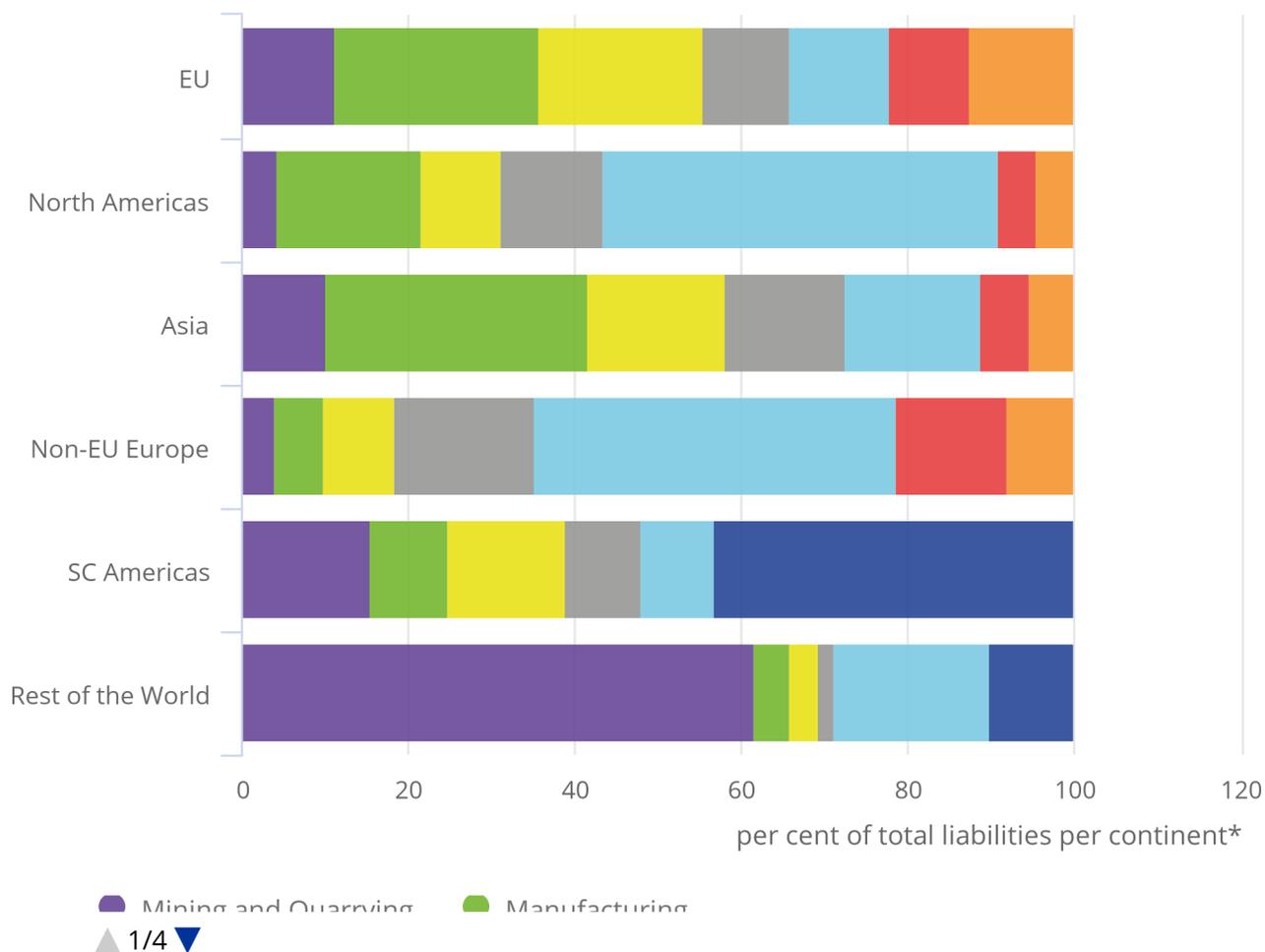
The financial and insurance industrial grouping plays a bigger role for liabilities than in FDI assets

Overseas direct investments in UK mining and quarrying or manufacturing industries were also large components for most continents. For mining and quarrying, liabilities tended to have the greatest shares of total liabilities in the Southern Hemisphere such as the SC Americas and the rest of the world (Figure 15).

On the other hand, manufacturing liabilities have greater shares in the Northern Hemisphere regions of the EU, North Americas and Asia. Part of this could be reflecting the geographical concentrations of advanced relative to emerging and developing economies, as well as those closer to the UK in terms of distance.

Figure 15: UK Liabilities by industry and continent in 2015

Figure 15: UK Liabilities by industry and continent in 2015



Source: Office for National Statistics

Source: Office for National Statistics

Notes:

1. (*) Some results have been suppressed to mitigate disclosure.

FDI in finance and insurance industries is more prominent with inward than outward FDI. These industries were one of the top three groupings by value per continent for all continents except the SC Americas. Furthermore, liabilities in financial and insurance industries were nearly half of all UK FDI liabilities with the North Americas and slightly lower with non-EU Europe.

It is also worth noting that the value of financial and insurance liabilities with the EU was the third-largest in 2015, after the North Americas and non-EU Europe. Therefore, even though liabilities for these industries were a higher share of continental liabilities in Asia and the rest of the world, the EU remained an important source of inward FDI in finance and insurance industries.

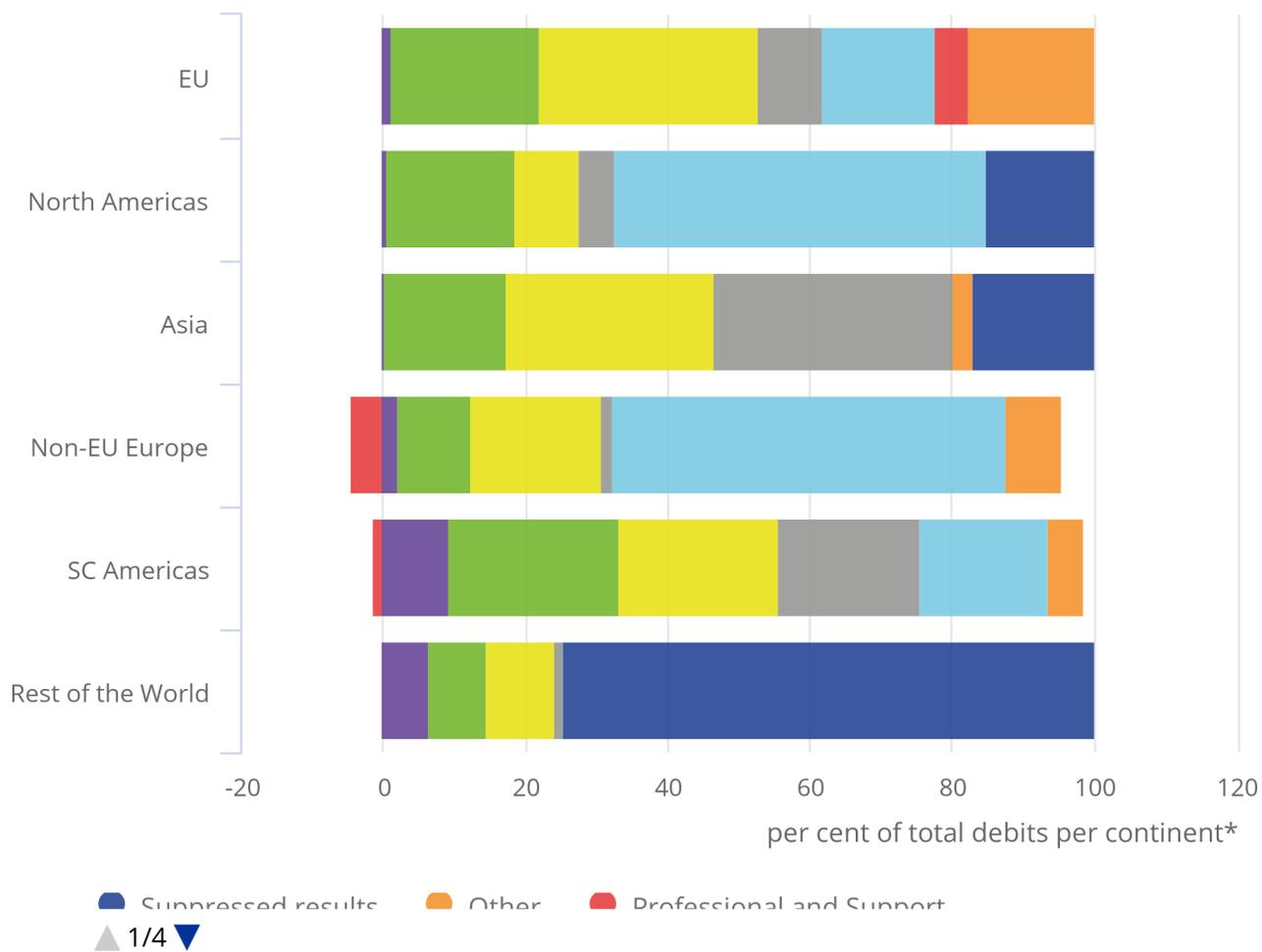
Unlike outward FDI, the continental distribution of debits was less reflective of the distribution of UK liabilities from the different regions in some cases. The proportion of debits from mining and quarrying was below 10% for all continents, as shown in Figure 16. Instead, debits from wholesale, transport and accommodation, alongside manufacturing, industries were among the top three for all continents.

In the case of the EU and the SC Americas, this grouping had a greater share of total debits than manufacturing. That said, the proportion of debits from financial and insurance industries were more aligned with the proportions of liabilities, with shares in North American and non-EU European debits being nearly 50%.

A further observation shows that debits from information and communication industries comprised a large share of Asian debits in particular, which is also reflecting Asian liabilities in these industries (Figure 16).

Figure 16: UK debits by industry and continent in 2015

Figure 16: UK debits by industry and continent in 2015



Source: Office for National Statistics

Source: Office for National Statistics

Notes:

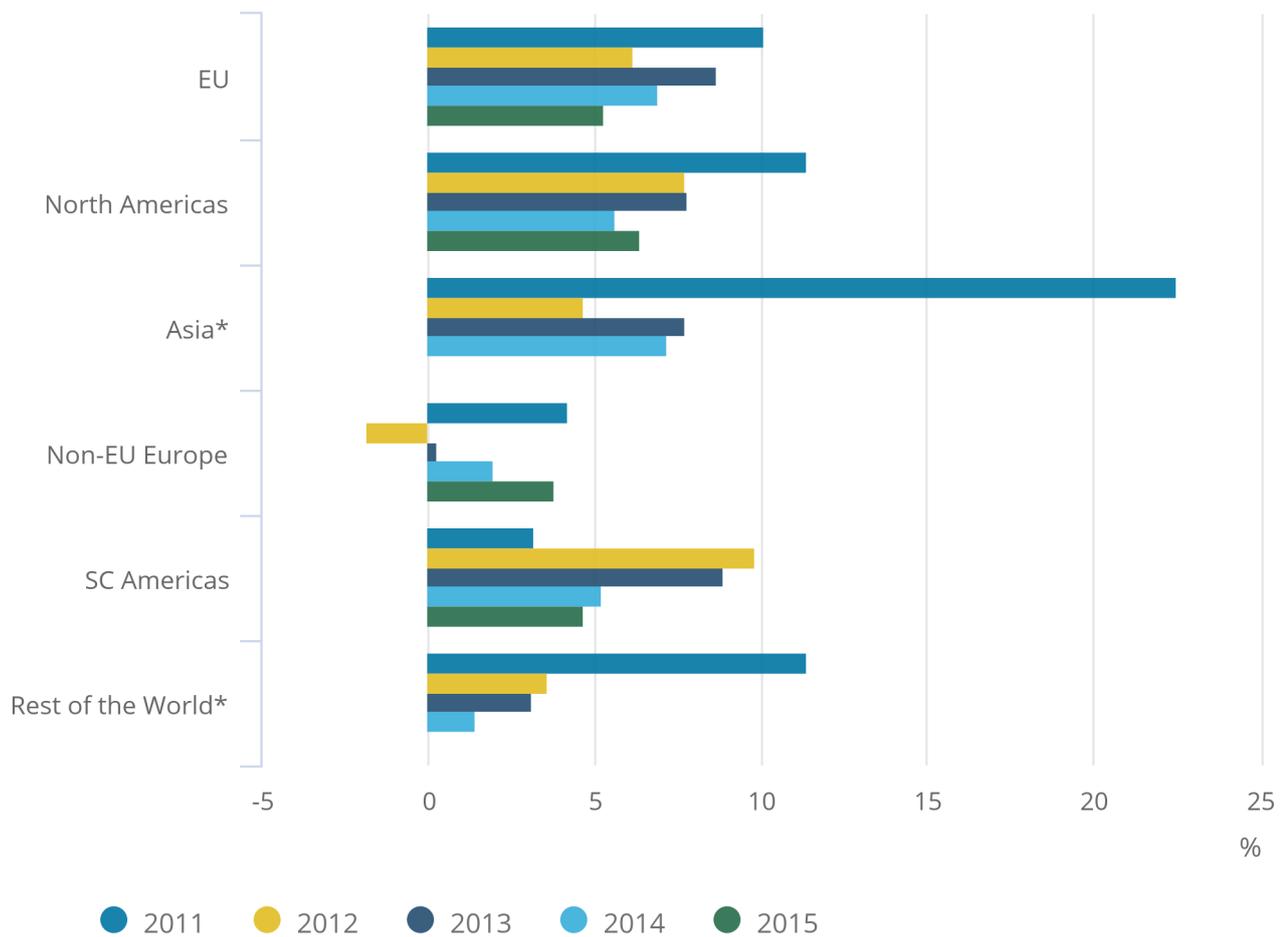
1. (*) Some results have been suppressed to mitigate disclosure.

The analysis so far highlights the importance of financial and insurance industries for inward FDI in addition to mining and quarrying. Implied rates of return for financial and insurance have generally remained above 5% in the three main continents: EU, North Americas and Asia (Figure 17). This will have supported the overall implied rate of return for UK inward FDI in any given year, even though these too were lower in 2015 than the implied rates in 2011.

By contrast, implied rates of return for mining and quarrying have fallen over this period, so that all rates were below 2% in 2015 (Figure 18). Among these, the highest implied rates are on liabilities with non-EU Europe and the SC Americas, while the 21 percentage point fall in debits from North American liabilities has been notable.

Figure 17: Inward foreign direct investment implied rates of return for financial and insurance industries by continent, 2011 to 2015

Figure 17: Inward foreign direct investment implied rates of return for financial and insurance industries by continent, 2011 to 2015



Source: Office for National Statistics

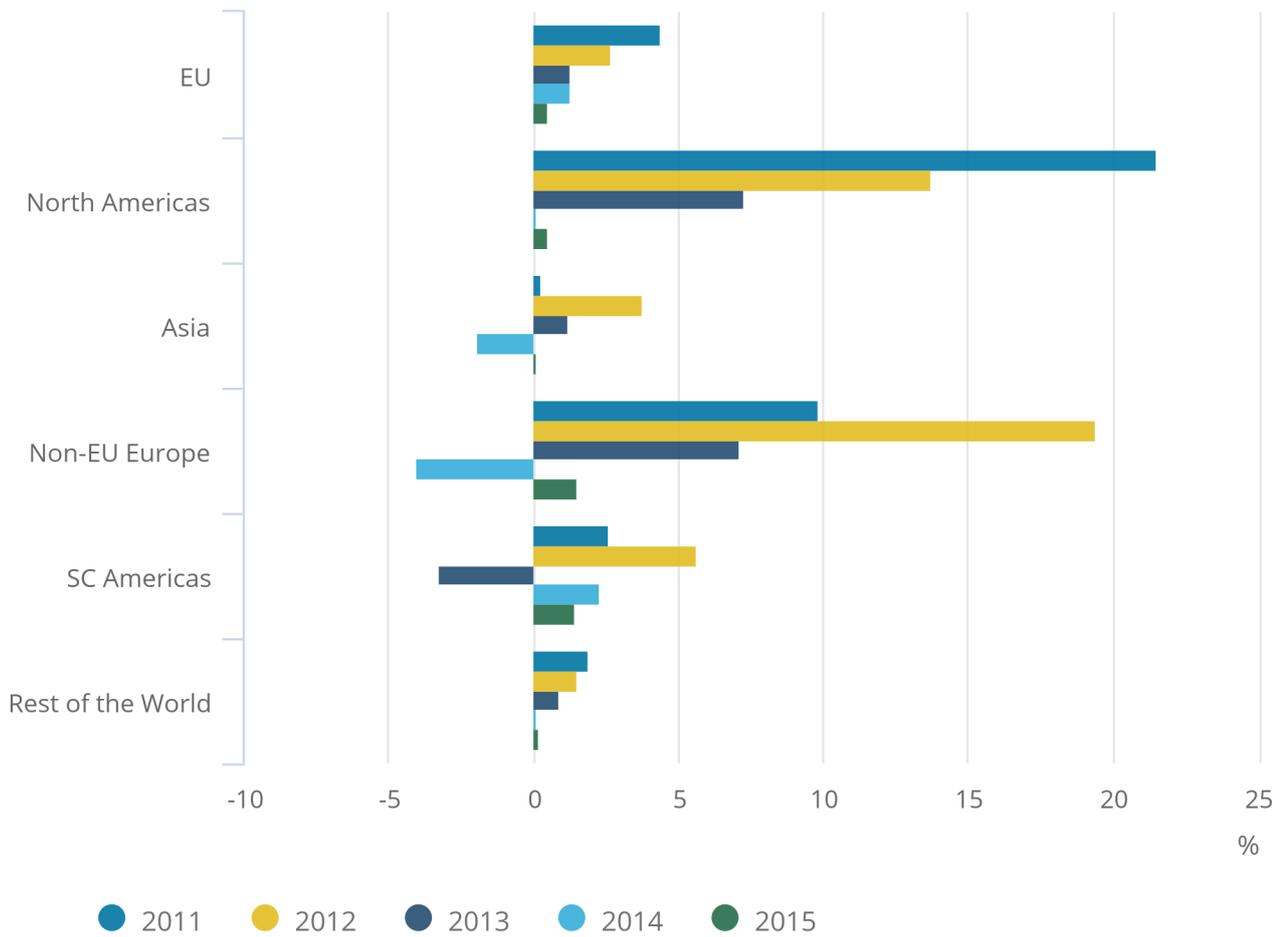
Source: Office for National Statistics

Notes:

1. (*) Values for 2015 suppressed to mitigate disclosure.

Figure 18: Inward foreign direct investment implied rates of return for mining and quarrying industries by continent, 2011 to 2015

Figure 18: Inward foreign direct investment implied rates of return for mining and quarrying industries by continent, 2011 to 2015



Source: Office for National Statistics

Source: Office for National Statistics

Notes for: Foreign direct investment by continent and industry

1. Excluding property, bank holding companies and public corporations.

6 . Ultimate controlling parent

In line with international guidance, UK foreign direct investment (FDI) statistics are presented on an immediate parent country basis; as such, geographical compositions reflect direct relationships between investing parties rather than the residence of the ultimate parent companies or transactors.

Large multinationals often have complex corporate structures, where a parent company controls a large network of interlinked affiliates and branches across the globe. Since published statistics report the immediate country partner or transactor, geographical compositions can be distorted in cases where a parent company channels investment through one or more countries before the investment reaches its final destination. It is important to note that, while affecting geographical compositions, aggregate FDI statistics are unaffected by whether they are presented on an immediate or ultimate basis.

This section discusses experimental statistics that present inward FDI by the ultimate controlling parent's country. The analysis has been undertaken using the directional principle; therefore, position values refer to the net FDI received by UK companies from overseas. This is in contrast to other sections in this article, which use the asset and liability measurement principle, where liabilities refer to the gross investment received by UK entities, including reverse investment by foreign affiliates into their UK parent companies.

Experimental statistics presented in this section have been produced by linking FDI micro-data with information on the ultimate company ownership from the Inter-departmental Business Register (IDBR). By linking these two sources at the micro-data level, it is possible to identify the ultimate controlling country of foreign-owned companies in the UK. The data-linking methods adopted and their limitations are presented in Annex D and should be considered when interpreting these results.

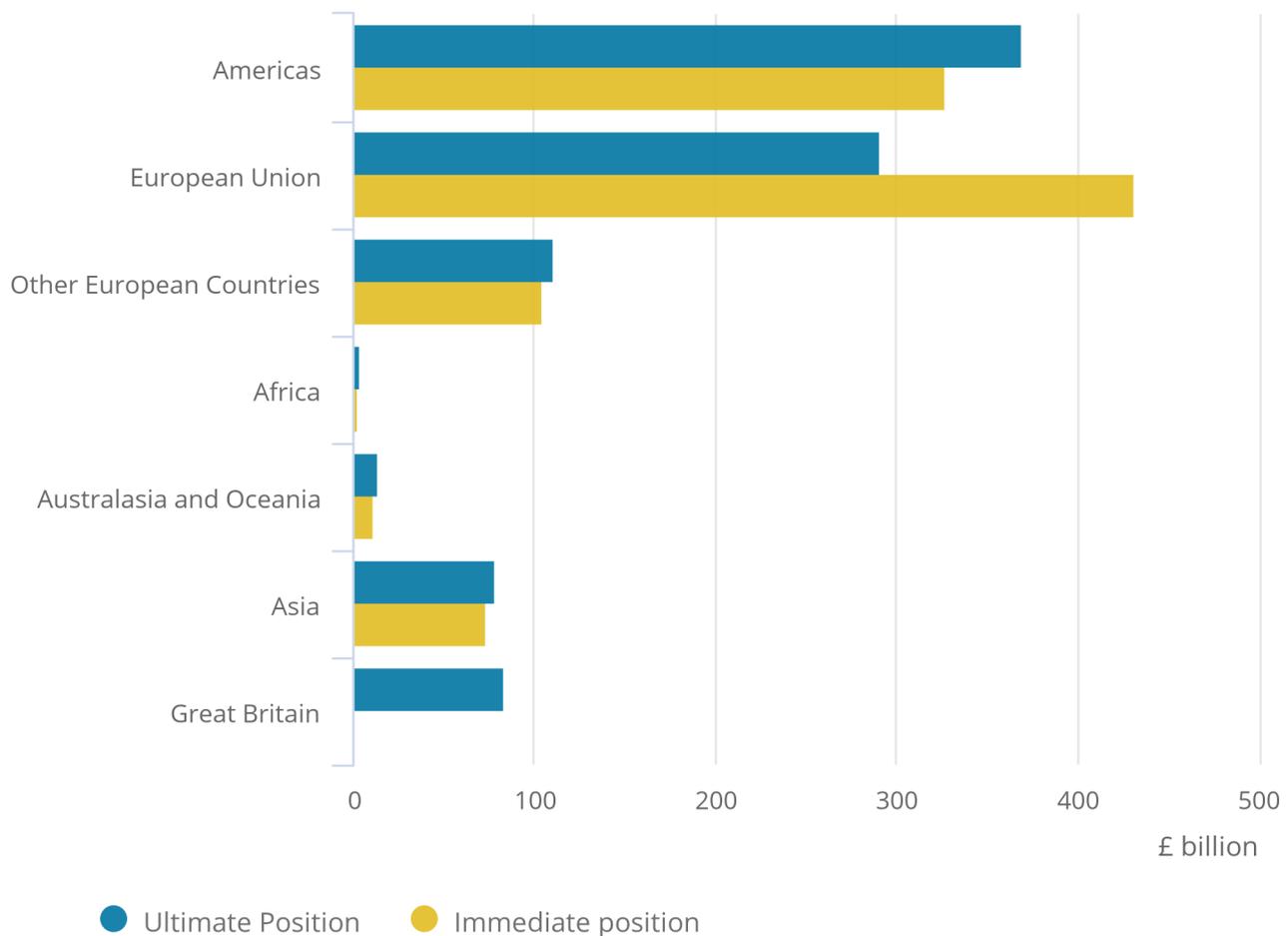
The US inward stock of FDI in the UK overtakes that of the EU when linking to the ultimate controlling parent country

Figure 19 compares the composition of UK inward FDI positions by continent using the immediate parent and ultimate controlling parent countries. The EU is the largest source of UK inward FDI positions when using the immediate parent country, accounting for 45.4% of total inward positions. Linking to the ultimate controlling parent country results in the EU becoming the second-largest source of UK FDI behind the Americas.

A further finding is that £82.8 billion of FDI that enters the UK from overseas on an immediate basis is transferred through the international subsidiaries, which are ultimately controlled by parent companies based in Great Britain. This reflects "round-tripping", whereby British companies use other parts of their company structures to invest in the domestic economy.

Figure 19: Inward foreign direct investment positions by continent on an immediate and ultimate parent company basis, 2015

Figure 19: Inward foreign direct investment positions by continent on an immediate and ultimate parent company basis, 2015



Source: Office for National Statistics

Source: Office for National Statistics

The largest continental increase when comparing the ultimate and the immediate country of investment is from the Americas. The results suggest the stock of FDI held by American companies in the UK is £42.0 billion higher than on an immediate basis. The second-largest region to see an increase is among other European countries, where inward FDI stocks are £6.9 billion higher. The value of UK FDI from Asia, Australasia and Oceania, and Africa is also higher. The only geographical region to see a decline when presented using the ultimate controlling parent is the EU, where positions decline by £139.7 billion; of which, 59.3% is re-distributed to Great Britain

The US, France and Germany each have a large inward investment position in the UK using both reporting bases. The ultimate position for the US would be 20.3% higher than using the immediate position, whereas that for Germany increases by 30.9%.

The ultimate basis also underlines the role of British companies investing in the domestic economy through their overseas subsidiaries, which becomes the second-largest investor – second only to the US. The biggest decreases between the two bases are for financial centres, including the Netherlands and Jersey as presented in Table 2. The ultimate positions of Luxembourg and Belgium each decrease so that they are no longer among the largest 10 inward investors, as they would be using immediate positions.

Table 2: Top 10 countries with the largest inward UK foreign direct investment positions on an ultimate basis, 2015, £ billion or %

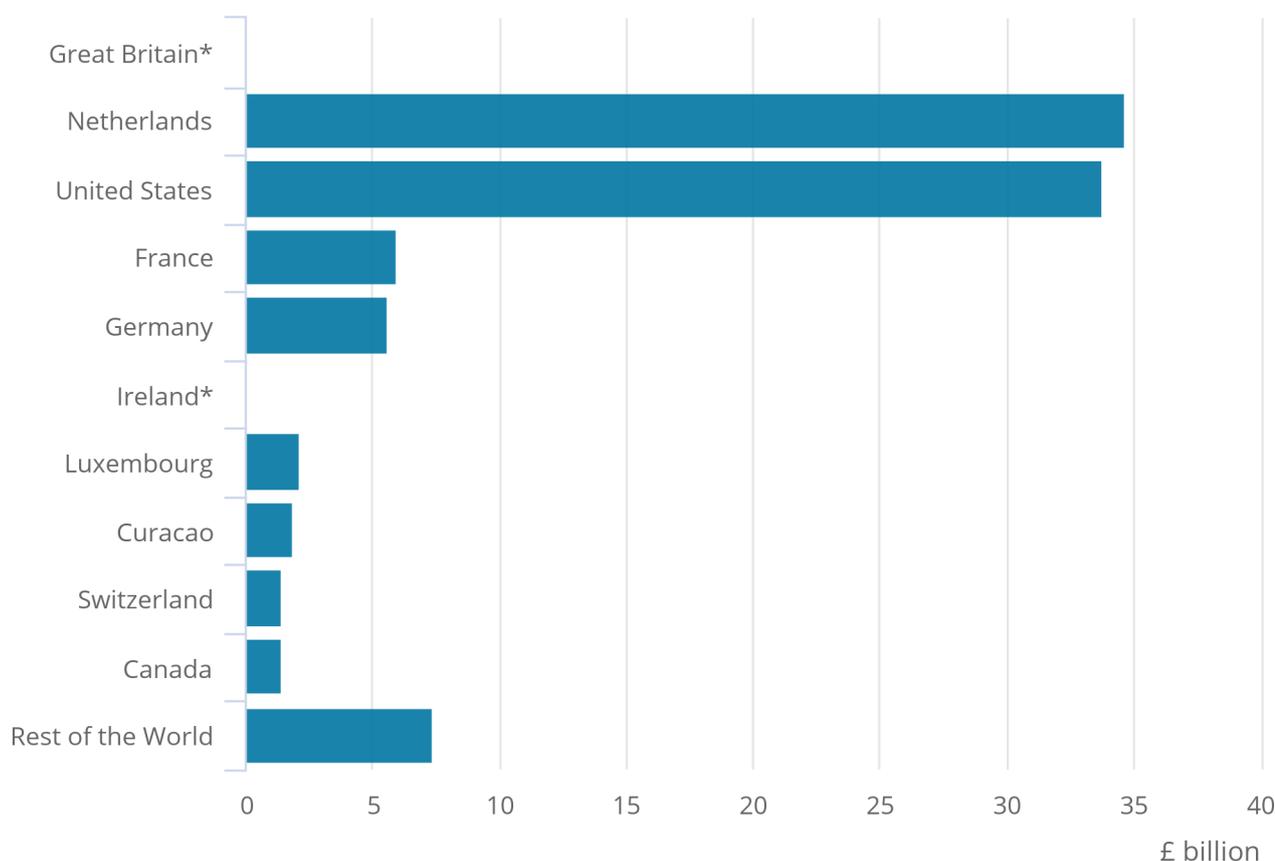
Country	Ultimate Position	Immediate Position	Percentage change from immediate position
United States	303.2	252.1	20.3
Great Britain	82.8	Not applicable	-
France	78.2	66.4	17.8
Germany	66.1	50.5	30.9
Netherlands	48.3	139.8	-65.5
Japan	44.3	40.5	9.4
Switzerland	37.7	37.8	-0.3
Spain	36.4	37.2	-2.3
Canada	35.2	16.7	110.6
Jersey	32.2	46.9	-31.2
Rest of the World	185.8	262.3	-29.2

Source: Office for National Statistics

The 65.5% decline in the Netherlands' ultimate investment position in the UK was due to investment from other countries being transited through the Netherlands. The majority of investment coming from the Netherlands on an immediate basis comes from just three countries on an ultimate basis – Great Britain, the Netherlands and the United States.

The investment that is ultimately coming from the Netherlands is the second-largest origin for UK inward investment (Figure 20). The value of this ultimate Dutch investment is one-quarter of the investment attributed to the Netherlands on immediate basis.

Figure 20: The largest ultimate investing countries for UK companies with a Dutch immediate parent, 2015



Source: Office for National Statistics

Source: Office for National Statistics

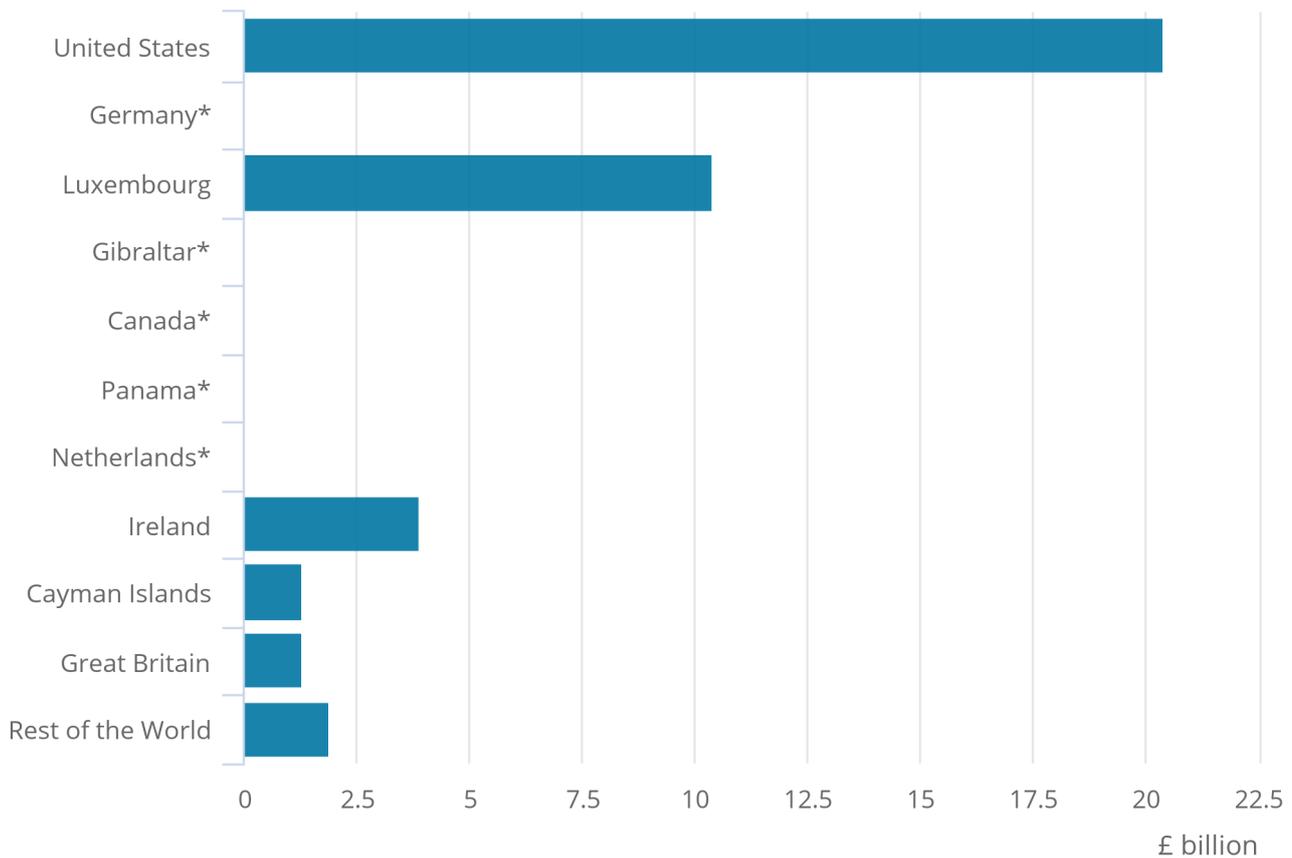
Notes:

1. (*) Values suppressed to mitigate disclosure.

Luxembourg saw an 80.0% fall in its position in the UK on an ultimate basis, taking it outside the largest 10 origins for inward investment in 2015. This is also due to investment from other countries being transited through Luxembourg. The US accounted for 27.4% of the investment coming from Luxembourg on an immediate basis. The investment that is ultimately originating from Luxembourg accounted for just 13.9% of the investment attributed to the country on immediate basis, giving it the third-largest inward position value on this basis.

Figure 21: The largest ultimate investing countries for UK companies with a Luxembourg immediate parent, 2015

Figure 21: The largest ultimate investing countries for UK companies with a Luxembourg immediate parent, 2015



Source: Office for National Statistics

Source: Office for National Statistics

Notes:

1. (*) Values suppressed to mitigate disclosure.

7 . Introduction to special purpose entities (SPEs)

ONS collects some survey data on SPEs involving UK companies

As the previous section highlighted, multinationals operating in the UK often operate under complex operational structures, in some cases spanning a number of countries and industries.

Some of these structures include the use of special purpose entities (SPEs)¹, such as financing subsidiaries, shell companies and conduits. These SPEs typically do not conduct any notable operations in the country in which they are resident, other than to pass through investments from their parent company to an affiliate in another country. The previous section noted how current internationally-agreed guidelines for compiling foreign direct investment (FDI) statistics use the country of the immediate parent company. This implies that some UK companies could have a SPE immediate parent company with ultimate ownership originating from somewhere else.

Our FDI quarterly and annual surveys include questions on SPEs. These can help identify whether a UK business is controlled by, or controls, SPEs.

This short section presents some initial stylised facts from micro-data analysis of inward FDI from SPEs to help aid in understanding why the geographical composition of FDI can be affected when linking to the immediate parent or ultimate controlling parent. This looks at the geographical location of the SPE and non-SPE immediate parent companies to identify any similarities and differences.

Research is at an early stage and there are many other analyses to be considered on both inward and outward FDI involving SPEs. We plan to publish a more detailed analytical article using SPE micro-data in due course.

Financial centres play an important role for inward FDI

A financial centre is typically one that is internationally-focused rather than operating for the domestic economy. These can offer favourable tax incentives for non-resident businesses in addition to being a regional hub that locates similar companies together. This article uses the Eurostat definition of offshore financial centres, as listed in Annex B. The Netherlands and Luxembourg are also added as EU-based financial centres. Analysis produces the following stylised facts:

- nearly three-fifths of SPE immediate parent companies with a UK affiliate are based in a financial centre; of this, two-fifths are from EU financial centres – Luxembourg and the Netherlands – which is greater than the SPE share from the other 25 countries of the EU
- a greater proportion of SPEs outside financial centres are in the North Americas than the EU countries excluding the Netherlands and Luxembourg
- all SPEs in the South and Central (SC) Americas are located in regional financial centres
- financial centres become less important for UK-based companies with a non-SPE immediate parent; just over one-quarter of non-SPE immediate parent companies are located in a financial centre, of which half are located in Luxembourg and the Netherlands
- the largest continent excluding financial centres for non-SPE inward investment is the EU with over one-third of all non-SPE-owned immediate parent companies
- there are more non-SPE parents from non-EU Europe and SC American financial centres than the rest of the respective continents
- there are more than double the number of non-SPE Asian immediate parent companies outside Asian financial centres than there are within

Notes for: Introduction to special purpose entities (SPEs)

1. Also known as special purpose vehicles (SPVs), with both terms used inter-changeably.

8 . Insights from linking foreign direct investment and Annual Business Survey data

While this and previous articles analysing foreign direct investment (FDI) trends provide a comprehensive insight into FDI statistics and their effect on Balance of Payments, there has been growing demand for statistics that help explain the importance of globalisation to the real economy.

The analysis in this section presents experimental results of linking FDI micro-data with both our main structural business survey, the Annual Business Survey (ABS), and the business register, the Inter-departmental Business Register (IDBR).

It is important to note a number of points when interpreting statistics presented in this section. First, the FDI survey is designed to collect consolidated accounts for business groups in the UK, while the ABS collects granular information on business units further down in the ownership structure. As such, the micro-data linking exercise was conducted at a business group level¹, where all units within a business group were marked as having an “FDI-relationship” if any part of the group was identified as receiving FDI.

Second, in contrast to other authors’ micro-data linking exercises, this analysis links the entire population of both the FDI and ABS and therefore includes both sampled returns and estimation.

Third, these statistics cannot be used alone to determine the direction of causality between FDI and the real economy; for instance, while FDI-related firms are found to be more productive, these statistics cannot be used in isolation to deduce whether firms in receipt of FDI become more productive or whether productive firms attract FDI.

Fourth, note that there are a number of industry groupings that are omitted from the analysis in this section – most notably financial services – due to the industry coverage of the ABS².

In addition to this, please note that all data presented in this section are for the 2014 reference period and FDI statistics are for inward only and use the directional measurement principle. Annex E contains further details on the methods for this analysis.

Despite only 1.2% of UK businesses being in receipt of FDI, they accounted for 18% of employment and over one-quarter of GVA in 2014

While only 1.2% of UK businesses on the ABS were found to have an FDI relationship, these few companies represent a number of multinationals who control large proportions of UK economic activity. Table 3 presents the extent to which firms with FDI relationships contribute to several macroeconomic indicators as a share of major industrial groupings.

The contribution of firms with FDI relationships appears to be largest within the agriculture³, production and construction industry groupings across all variables presented, with 26% of employment, 35% of approximate gross value added⁴ (GVA), 43% of acquisitions of capital expenditure, and 33% of gross wages and salaries. In contrast, firms with FDI relationships account for 16% of employment within the services industries, 25% of GVA, 22% of acquisitions of capital expenditure, and 23% of salaries.

Table 3: Shares of employment, aGVA, acquisitions of capital expenditure and salaries attributable to firms with foreign direct investment links by operating industry , 2014, %

	Employment	aGVA	Acquisitions of capital expenditure	Gross wages & salaries
Agriculture, construction and production combined	26	35	43	33
Services	16	25	22	23
Total UK companies with FDI relationship	18	28	30	25

Source: Office for National Statistics

Note:

1. Employment figures presented in this section differ from those presented in the Annual Business Survey release as they are based on microdata from the Inter-Departmental Business Register, which uses a combination of business survey returns and administrative sources to populate employment estimates for every individual UK business.

2. GVA data use 2014 basic prices.

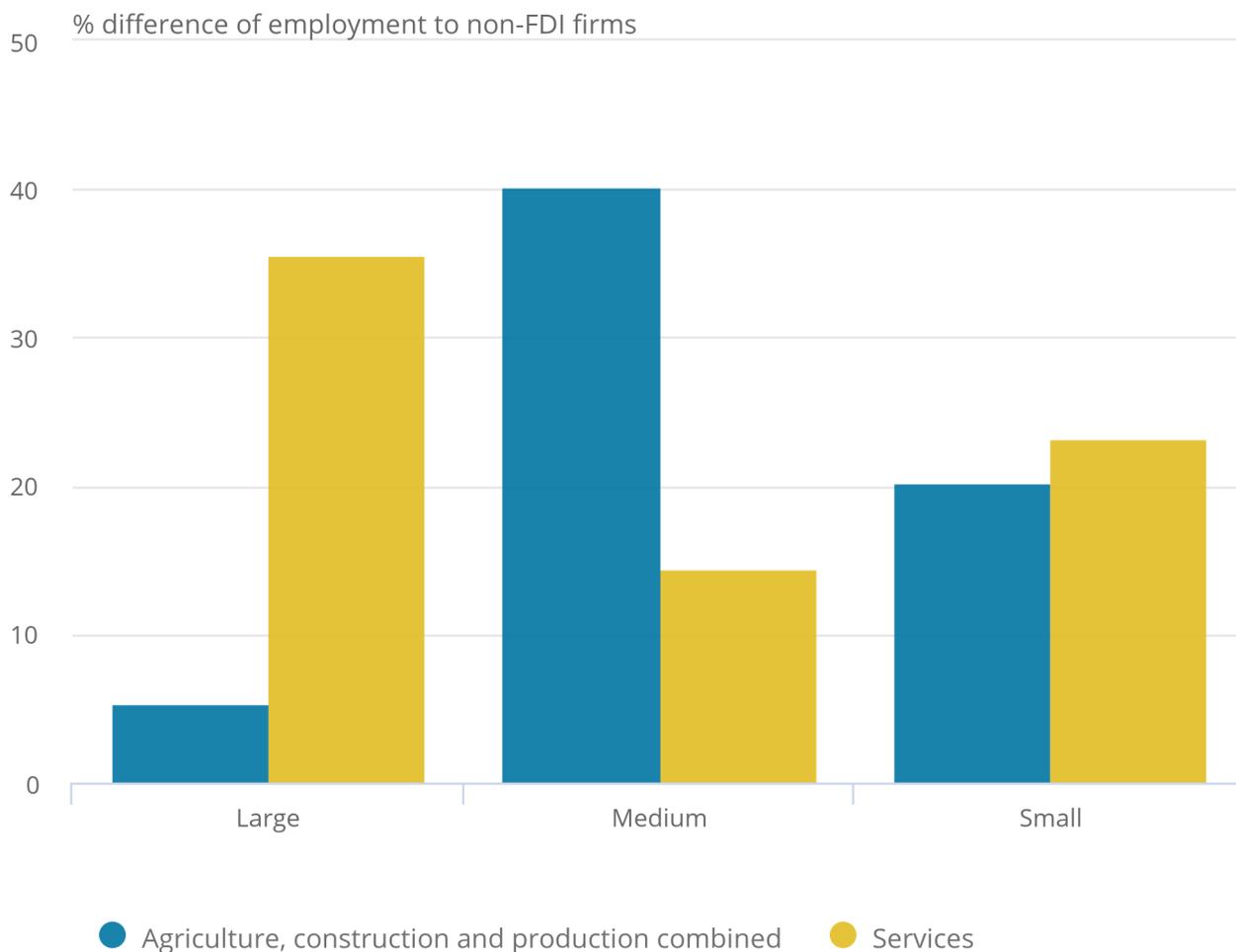
In addition to looking at aggregate proportions, it is useful to compare differences between businesses with and without FDI relationships. To ensure the results are not skewed by different distributions of firm size, comparisons are made between businesses of similar size. In the following figures, the categories “large”, “medium” and “small” are used to refer to businesses with more than 250 employees, between 50 and 249 employees and fewer than 50 employees respectively.

Figure 22 presents the percentage difference between the average employment of businesses with an FDI relationship by size and by industry grouping for 2014. Positive percentages would indicate that the FDI-related businesses have a higher average employment, while negative percentages would indicate FDI-related firms have a lower average employment.

As can be seen, businesses with a FDI relationship tend to have higher employment than their counterparts without a FDI link. The difference is greatest among medium-sized agricultural, construction and production firms, whereby those with a FDI link employ 40.2% more staff on average. For large and small-sized businesses, it is those in services industries that have the greater difference in employment on average. Large companies with a FDI link typically have 35.5% higher employment whereas the difference is 23.2% between small businesses.

Figure 22: Employment of firms with foreign direct investment links relative to firms with no FDI links by operating industry, 2014

Figure 22: Employment of firms with foreign direct investment links relative to firms with no FDI links by operating industry, 2014



Source: Office for National Statistics

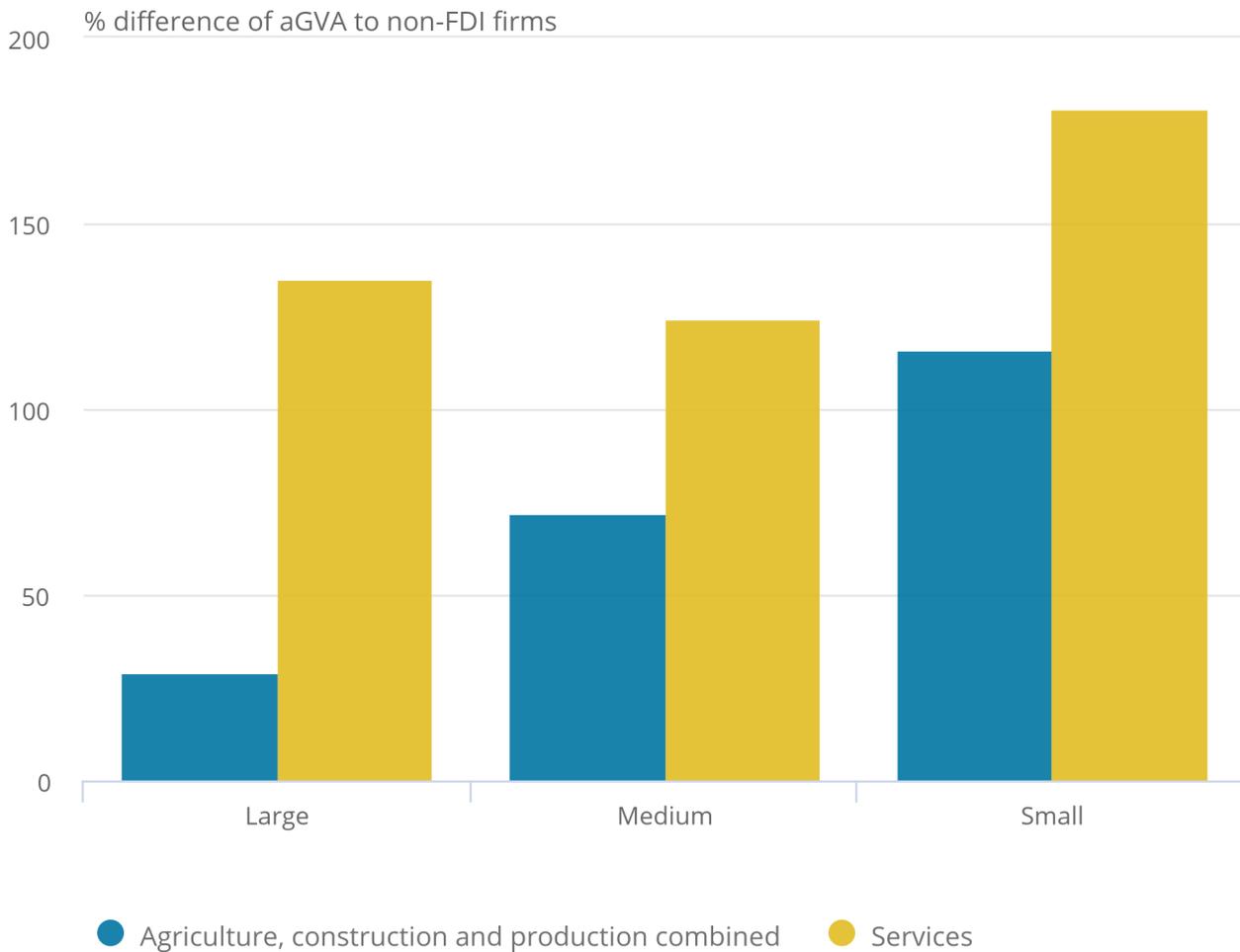
Source: Office for National Statistics

Similarly to employment, the GVA of businesses with a FDI link is higher on average than those without any FDI links. Figure 23 presents the percentage difference between the average GVA produced by firms with a FDI relationship compared with firms without a FDI relationship in 2014. The biggest differences between those companies with and those without FDI links are in services across all sizes of business. The GVA for each of these is more than double that of firms with no FDI links, with GVA of FDI businesses being 180.8% higher among small services firms.

Small firms in agriculture, construction and production are the only ones for that industrial category where average GVA for firms with an FDI link is more than double that of those with no FDI links, at 115.9% larger on average. Therefore, services businesses in particular tend to have the greater differences in average GVA between firms with and without FDI links.

Figure 23: The aGVA of firms with foreign direct investment relative to firms with no FDI links by operating industry, 2014

Figure 23: The aGVA of firms with foreign direct investment relative to firms with no FDI links by operating industry, 2014



Source: Office for National Statistics

Source: Office for National Statistics

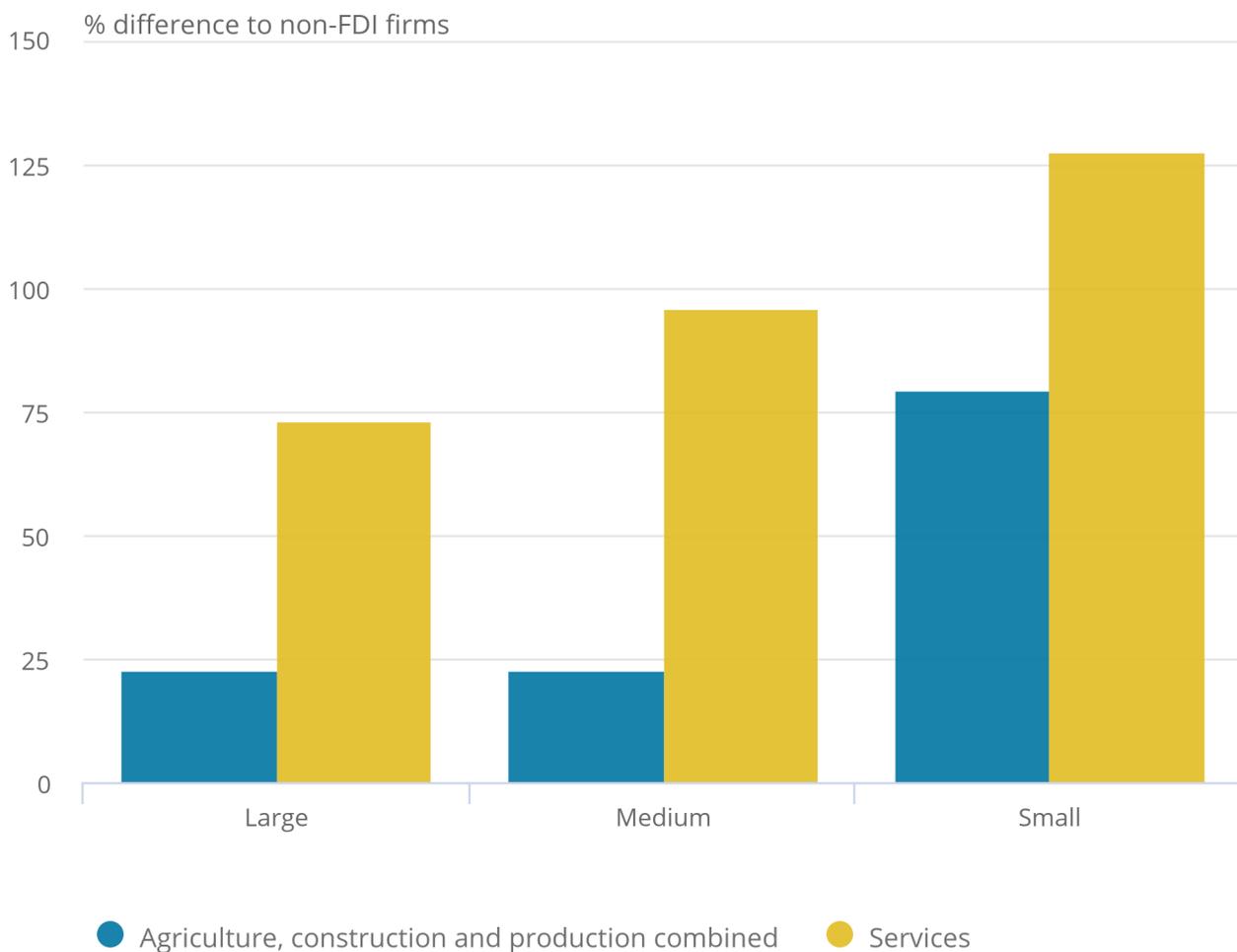
The productivity of businesses with and without FDI relationships can also be compared. This article uses the average amount of GVA per employee. Studies have shown that businesses in receipt of FDI tend to be more productive, as foreign businesses tend to incur higher costs than domestic firms, such as information costs relating to the local market, or the cost incurred in establishing relationships with local suppliers. As such, businesses overcoming such barriers must possess unique productivity advantages that offset these costs in order to compete.

These productivity advantages may include better organisational and management practices, the control of profitable intellectual property rights, and technological benefits. In addition, productive businesses may attract investment as large multinationals look to access new markets or acquire productive assets. As such, the productivity of UK businesses in receipt of FDI is expected to exceed that of businesses with no FDI relationships.

These experimental statistics suggest that UK businesses in receipt of FDI are indeed more productive on average. The differences are greatest among small firms in both of the industry categories for 2014 presented in Figure 24. The average productivity of firms with an FDI link was 127.9% higher for services and 79.6% higher among agriculture, construction and production industries. The difference in average productivity is very similar between large and medium-sized firms in agriculture, construction and production, where firms with a FDI link are 22.7% and 22.8% more productive than their respective non-FDI counterparts.

Figure 24: Productivity of firms with foreign direct investment (FDI) links relative to firms with no FDI links by operating industry, 2014

Figure 24: Productivity of firms with foreign direct investment (FDI) links relative to firms with no FDI links by operating industry, 2014



Source: Office for National Statistics

Source: Office for National Statistics

Businesses with an FDI relationship are more likely to both export and import

In addition to comparing businesses with and without FDI relationships, businesses that trade internationally can also be compared with those that do not.

Table 4 presents the proportion of businesses with and without a FDI relationship that engage in international trade. Businesses 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 UK markets. The international focus of these businesses is also extended to trade, as many FDI-related businesses are part of multinationals' global value chains.

This is demonstrated in Table 4, where the proportion of businesses that export and import was far higher for businesses with an FDI relationship (16%) than for those who do not (2%). What is also noteworthy is that FDI-related businesses are more likely to import than export – potentially indicating the number of multinationals who set up UK-based affiliates to trade directly with the UK.

Table 4: Trade status of firms with and without a foreign direct investment relationship, 2014, %

	Exporter	Importer	Importer and Exporter
Firms with FDI relationship	26	32	16
Firms without FDI relationship	5	7	2

Source: Office for National Statistics

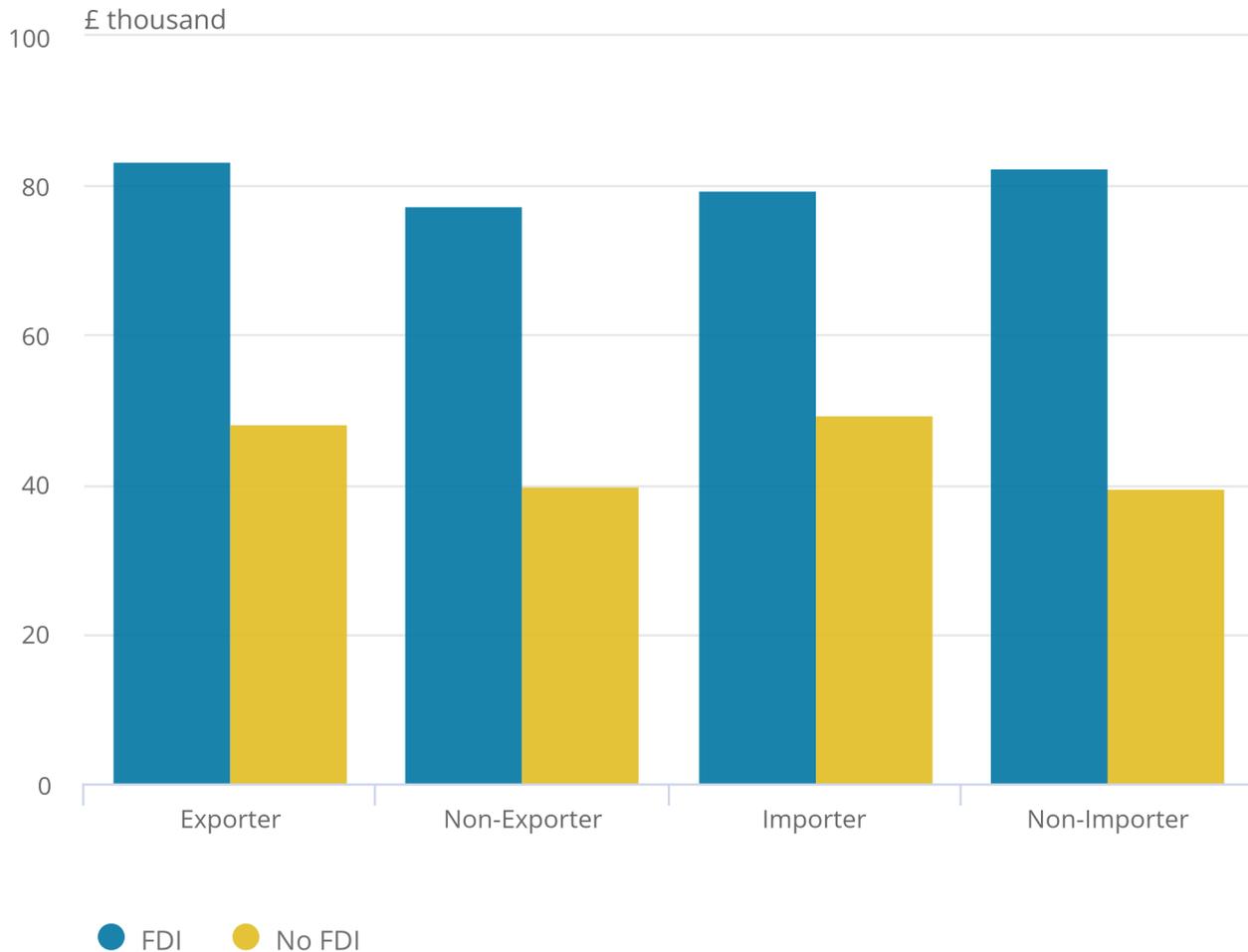
Notes:

1. A business group is marked as being an exporter, importer or both if any part of the enterprise group is engaged in such activities.

Figure 25 extends the earlier productivity analysis to compare exporters and importers with and without an FDI relationship. As can be seen, the productivity gain of exporters with an FDI relationship exceeds that of FDI-related businesses that do not export. Interestingly, FDI-related businesses that import have a lower productivity than those who do not import – potentially indicating that many of these foreign- owned importers are set -up by multinationals as distribution vehicles for goods and services produced elsewhere.

Figure 25: Productivity by exporter and importer status, 2014

Figure 25: Productivity by exporter and importer status, 2014



Source: Office for National Statistics

Source: Office for National Statistics

Also presented in Figure 25 is the productivity of businesses without FDI relationships. The chart highlights that the productivity of non-FDI related businesses engaged in either exporting or importing exceeds that of businesses not engaged in trade. Furthermore, the productivity gain of being a FDI-related importer narrows when compared with exporters, although the difference remains large.

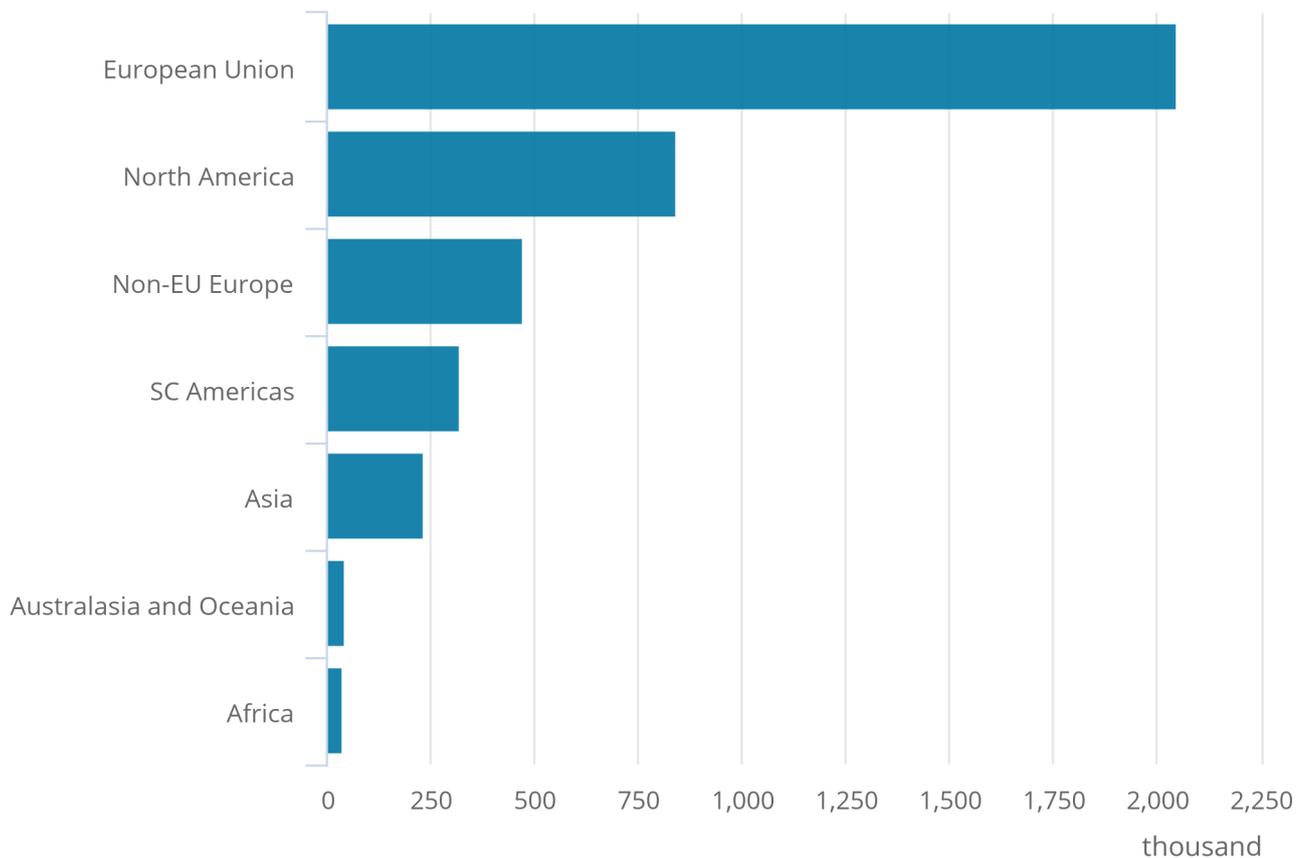
Over 2 million employees worked for businesses in receipt of FDI from the European Union in 2014

In addition to determining the number of UK jobs, GVA and other macroeconomic variables accounted for by UK businesses in receipt of FDI, micro-data linking can also indicate these proportions by geographical composition of where the investment is received from.

Figure 26 breaks down the 4 million jobs accounted for by UK businesses with an inward FDI relationship by geographical region in 2014. As can be seen, slightly above 50% of the employment accounted for by businesses in receipt of FDI received that investment from EU countries. The Netherlands (632,000), Luxembourg (321,000), France (319,000), and Germany (271,000) are the four largest in terms of employment in businesses in receipt of FDI from the EU.

The North Americas accounted for the second-largest geographical region, with 21% of the employment by firms in receipt of FDI. The majority of this is linked to businesses in receipt of FDI from the US, who account for 779,000 jobs. The remainder of the geographical regions represent under one-third of the overall employment of businesses in receipt of FDI.

Figure 26: Employment in the UK of foreign-owned firms by continent of immediate parent company, 2014



Source: Office for National Statistics

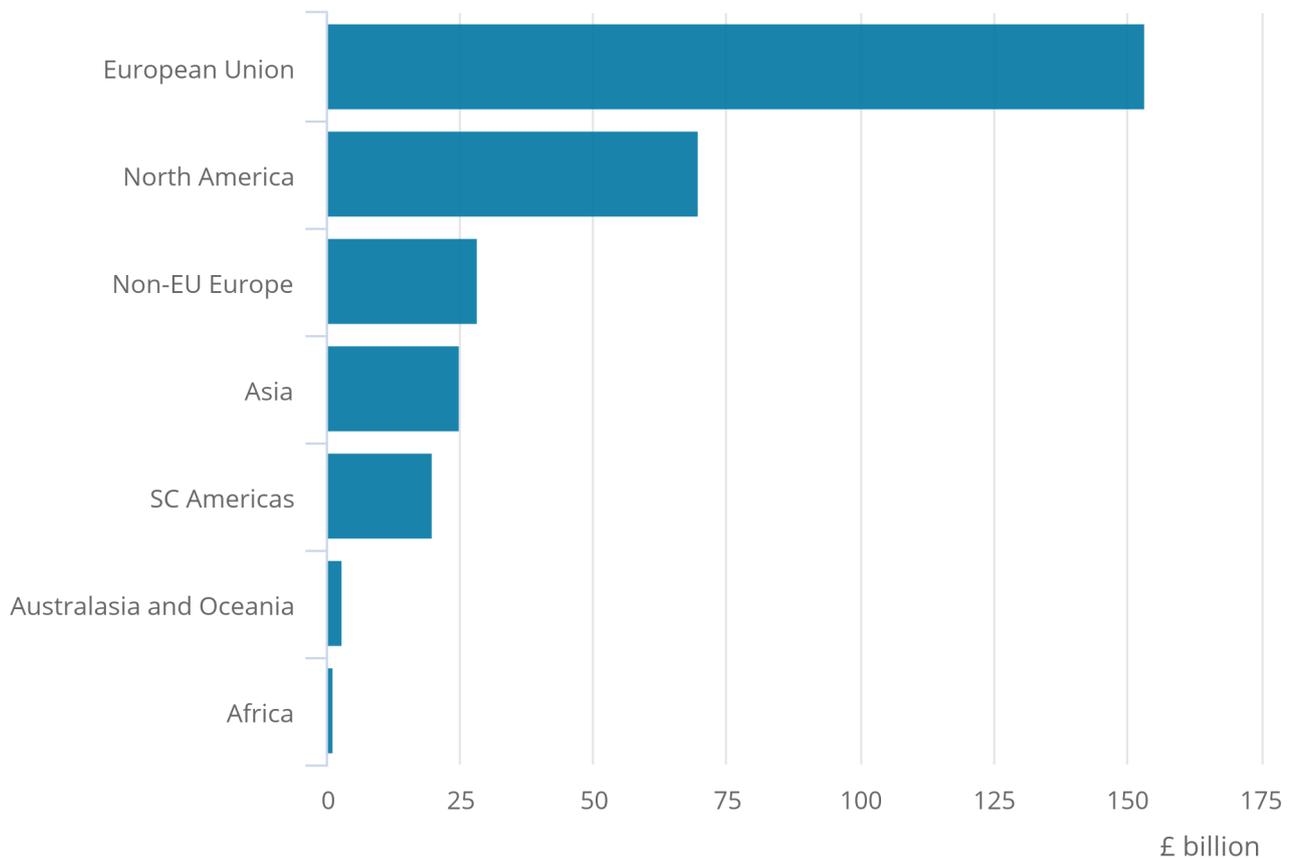
Source: Office for National Statistics

Figure 27 presents a geographical composition of the GVA accounted for by UK businesses in receipt of FDI. Similarly to employment, slightly more than half of the GVA accounted for by businesses in receipt of FDI received that investment from the EU. The Netherlands (£42.1 billion), Luxembourg (£27.8 billion), France (£26.7 billion) and Germany (£19.9 billion) once again produced the largest amounts of GVA for businesses with inward FDI relationships from the EU.

The North Americas are the second-largest geographical region in terms of the GVA accounted by firms in receipt of FDI, with 23%. The majority of this was for businesses in receipt of FDI from the US (£63.1 billion).

Figure 27: GVA in the UK of foreign-owned firms by continent of immediate parent company, 2014

Figure 27: GVA in the UK of foreign-owned firms by continent of immediate parent company, 2014



Source: Office for National Statistics

Source: Office for National Statistics

As already discussed, caution is recommended when interpreting the results presented in this section, as these statistics merely describe the characteristics of UK businesses with an inward FDI relationship, rather than suggesting causality. With this in mind, the findings presented do support a widespread view that businesses in receipt of FDI tend to be larger and contribute substantial amounts of economic activity in the UK.

Furthermore, even when categorising by industry and business size, businesses in receipt of FDI are found to, on average, have larger workforces, contribute more to gross domestic product (GDP), have higher productivity, and are more likely to engage in international trade. Even when only comparing the productivity of UK businesses engaged in international trade, the productivity of those with an inward FDI relationship is higher – although the productivity gain does narrow.

Finally, the economic contributions of businesses in receipt of FDI can also be broken down by the geographical region the investment is received from. Doing so shows that the European Union accounted for just over 50% of the 4 million employees and £300 billion GVA of businesses in receipt of FDI in 2014, while the US was the single-largest country, accounting for 779,000 employees and £63.1 billion GVA.

Notes for: Insights from linking foreign direct investment and Annual Business Survey data

1. Further information on the structure of the IDBR can be found in [Evans and Welpton](#).
2. Further information on the ABS can be found in the [ABS Quality and Methodology Information \(QMI\)](#).
3. For the ABS, agriculture includes agricultural support services and hunting, forestry and fishing; crop and animal production are excluded.
4. Approximate gross value added (GVA) measures the value of goods and services produced and is linked to gross domestic product (GDP), which also includes taxes minus subsidies.

9 . Future research and developments

A number of the topics presented in this analysis reflect the initial results of on-going research and development work for foreign direct investment (FDI) statistics. Future areas include extending the data-linking of FDI data to different years. The special purpose entities (SPEs) analysis can also be extended and enhanced in a number of ways that should also feature in more detailed analysis published later this year.

In addition, we are working closely with international partners to develop our understanding of FDI asymmetries in addition to measures of FDI on an ultimate parent company basis and identifying new investment in an economy (greenfield FDI). We would be interested in receiving suggestions on other areas of analysis that users would find particularly useful for their work. Please send your suggestions via email to fdi@ons.gsi.gov.uk or by contacting Sami Hamroush on +44 (0)1633 455087

10 . Acknowledgements

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11 . Quality and methods

The [Foreign direct investment Quality and Methodology Information](#) report contains important information on:

- the strengths and limitations of the data and how they compare with related data
- uses and users of the data
- how the output was created
- the quality of the output including the accuracy of the data

12 . Annex A: Details of countries within each continent for foreign direct investment statistics

Asia:

Abu Dhabi, Afghanistan, Armenia, Azerbaijan, Bahrain, Bangladesh, Bhutan, Brunei Darussalam, Burma /Myanmar, Cambodia, China, Dubai, Georgia, Hong Kong, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Laos, Lebanon, Macao, Malaysia, Maldives, Mongolia, Nepal, North Korea, Oman, Pakistan, Palestinian Territory, Philippines, Qatar, Saudi Arabia, Singapore, South Korea, Sri Lanka, Syria, Taiwan, Tajikistan, Thailand, Timor-Leste, Turkmenistan, United Arab Emirates, Uzbekistan, Vietnam, Yemen.

EU Europe:

Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

Non-EU Europe:

Albania, Andorra, Belarus, Bosnia & Herzegovina, Faroe Islands, Gibraltar, Guernsey, Holy See (Vatican City State), Iceland, Isle of Man, Jersey, Liechtenstein, Macedonia, Moldova, Montenegro, Norway, Russian Federation, San Marino, Serbia, Switzerland, Turkey, Ukraine.

North Americas:

Canada, Greenland, United States.

Central & South Americas:

Anguilla, Antigua and Barbuda, Argentina, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Bonaire, Sint Eustatius and Saba, Brazil, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Curacao, Dominica, Dominican Republic, Ecuador, El Salvador, Falkland Islands, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Montserrat, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Lucia, Sint Maarten, St Kitts and Nevis, St Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks and Caicos Islands, Uruguay, Venezuela, British Virgin Islands, US Virgin Islands.

Rest of the World

Algeria, American Samoa, Angola, Antarctica, Australia, Benin, Botswana, Bouvet Island, British Indian Ocean Territory, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Christmas Island, Cocos (Keeling) Islands, Comoros, Congo, Cook Islands, The Democratic Republic of the Congo (Zaire), Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Fiji, French Polynesia, French Southern and Antarctic Lands, Gabon, Gambia, Ghana, Guam, Guinea, Guinea Bissau, Heard Island and McDonald Islands, Côte d'Ivoire (Ivory Coast), Kenya, Kiribati, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Marshall Islands, Mauritania, Mauritius, Micronesia, Morocco, Mozambique, Namibia, Nauru, New Caledonia, New Zealand, Niger, Nigeria, Niue, Norfolk Island, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn, Rwanda, Samoa, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Solomon Islands, Somalia, South Africa, South Georgia and The South Sandwich Islands, South Sudan, St Helena, Ascension and Tristan da Cunha, Sudan, Swaziland, Tanzania, Togo, Tokelau, Tonga, Tunisia, Tuvalu, Uganda, US Minor Outlying Islands, Vanuatu, Wallis and Futuna, Zambia, Zimbabwe.

13 . Annex B: Financial centres by continent

Asia:

Bahrain, Hong Kong, Lebanon, Philippines, Singapore.

EU Europe:

Luxembourg, Netherlands.

Non-EU Europe:

Andorra, Gibraltar, Guernsey, Isle of Man, Jersey, Liechtenstein.

North Americas:

None.

Central & South Americas:

Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Cayman Islands, Curacao, Dominica, Grenada, Montserrat, Panama, Saint Lucia, Sint Maarten, St Kitts and Nevis, St Vincent and the Grenadines, Turks and Caicos Islands, British Virgin Islands, US Virgin Islands.

Rest of the World

Cook Islands, Liberia, Marshall Islands, Mauritius, Nauru, Niue, Samoa, Seychelles, Vanuatu.

14 . Annex C: Details of Standard Industrial Classification 2007 (SIC 2007) industries for each foreign direct investment industrial grouping used

Table 5: Details of Standard Industrial Classification 2007 (SIC 2007) industries for each foreign direct investment industrial grouping used

Industry grouping	Section(s) within SIC 2007
Mining and quarrying	B Mining and quarrying
Manufacturing	C Manufacturing
Wholesale, transport and accommodation	G Wholesale and retail trade; repair of motor vehicles and motorcycles
	H Transportation and storage
	I Accommodation and food service activities
Information and communication	J Information and communication
Financial and insurance	K Financial and insurance activities
Professional and support	M Professional, scientific and technical activities
	N Administrative and support service activities
Other	A Agriculture, forestry and fishing
	D Electricity, gas, steam and air conditioning supply
	E Water supply, sewerage, waste management and remediation activities
	F Construction
	L Real estate activities
	O Public administration and defence; compulsory social security
	P Education
	Q Human health and social work activities
	R Arts, entertainment and recreation
	S Other service activities
	T Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U Activities of extra-territorial organisations and bodies	

Source: Office for National Statistics

15 . Annex D: Ultimate parent company analysis methods

This data-linking project involves matching company micro-data from the Inter-Departmental Business Register (IDBR) and Foreign Direct Investment (FDI) survey. The IDBR contains business-specific information such as the ultimate parent company obtained through survey data and procured from Dun and Bradstreet (D&B) – a commercial data source. The FDI survey contains information on companies' cross-border investment positions, financial flows and income flows on an immediate parent basis. By linking the two files, the project aims to establish from where inward foreign direct investment ultimately originates. This annex outlines how IDBR data were linked to the FDI population.

The Inter-Departmental Business Register (IDBR)

The IDBR is a comprehensive list of UK businesses used by government for statistical purposes. It is fully compliant with the EU regulation on harmonisation of business registers for statistical purposes (EC No 177 /2008).

The IDBR 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.

The IDBR covers 2.6 million businesses in all sectors of the UK economy, other than the very small businesses (those without employees and with turnover below the tax threshold) and some non-profit making organisations.

The two main sources of input are the Value Added Tax (VAT) system and Pay-As-You-Earn (PAYE income tax) from HM Revenue and Customs (HMRC). Additional input comes from Companies House, Dun and Bradstreet, our business surveys and contact with the largest multi-national businesses through profiling.

All data on the IDBR are treated as Official Sensitive and are protected by the Code of Practice for Official Statistics and by specific legislation.

The Foreign Direct Investment (FDI) Survey population

The FDI population is produced from four sources:

1. Data from the IDBR and Dun and Bradstreet (D&B) are combined to identify the target population and sampling frame for the FDI survey. Auxiliary variables, such as the number of affiliates, are not used to produce FDI estimates directly, but are used by ONS to stratify the outward survey sample. The D&B inputs are sourced from D&B's Who-owns-Whom database of world linkages of companies. An annual data extract is procured at the start of the calendar year. These are then adapted and matched to the IDBR. The resulting data extract provides information on majority share ownership only (more than 50% of ordinary shares).
2. We also maintain a separate database for enterprises that have previously been identified to be engaged in FDI either through the FDI or Mergers and Acquisitions surveys. This database includes minority share relationships (between 10% and 49% of ordinary shares) that are not included in the IDBR and D&B extract but are relevant for FDI statistics.
3. The FDI population is also updated regularly using information from the ONS Mergers and Acquisitions Survey, which is conducted on a quarterly basis and collects information on domestic and cross-border acquisitions and disposals involving UK companies.
4. Throughout the year our Business Profiling team (BPT) investigate the largest multi-national businesses to ensure the correct structure for all ONS surveys; there is a pool of 2,000 businesses for the profilers to maintain. A sub-section of BPT also maintains the linkages between businesses throughout the year. This information is obtained from ONS surveys, Companies House and data from HMRC.

In contrast to most ONS business surveys, where sampled returns are weighted to estimate for the non-sampled population, FDI estimation methods predict values for all non-sampled businesses, allowing for aggregate estimates to be derived simply by summing over the domains of interest. While uncommon in ONS, this method is not unique and has a sound, academic basis. This approach provides a rich micro-data set for the whole population, with returned and estimated values for each company.

Linking the IDBR to the FDI population

Data linking was carried out in R by binding the IDBR extract to the FDI population. The IDBR extract included the country code of the ultimate parent. As the IDBR holds information only on majority share ownership (above 50%) while FDI includes minority share ownership (between 10% and 49%) information as well, there are some gaps in the provided IDBR extract.

Moreover, the FDI survey includes Monetary Financial Institutions (MFIs), bank holding companies, public corporations and property data, which are collected from other sources such as the Bank of England and the Balance of Payments team in ONS. These do not contain business identifiers that can be linked to IDBR data (contributing to the gaps in the IDBR extract). These gaps were replaced with the immediate country code information from the FDI survey. This affected only 12.1% of the total FDI positions.

There is a limitation within this methodology as the IDBR collects information only on the majority shareholder of a company, which can lead to some country estimates being either overestimated or underestimated. This is a limitation faced internationally and it requires some caution when interpreting the results of this analysis.

16 . Annex E: Linking FDI with ABS methods

Overview

This data-linking project involves matching company microdata from the Annual Business Survey (ABS) and Foreign Direct Investment (FDI) Survey. The ABS collects information on business characteristics such as turnover, employment and gross operating surplus; while the FDI survey contains information on companies' cross-border investment positions, financial flows and income flows.

By linking the two files, the project aims to further develop understanding of the characteristics of businesses in receipt of FDI from overseas and answer some important questions such as:

- are UK companies in receipt of FDI more productive?
- are they more likely to be an exporter?
- do they invest more in fixed capital within the UK?

This annex outlines how the ABS sample was expanded to the IDBR before linking to the FDI population.

The Annual Business Survey (ABS) population

Following the collection and processing of the ABS results, these data are held as two separate files: a “universe” or population dataset, consisting of 2.1 million reporting units within the ABS sample frame; and the “contributor” or respondent dataset, which contains survey returns from the 56,000 reporting units who responded to the business surveys.

We collect data for Great Britain, which are combined with survey data from the Northern Ireland Statistics and Research Agency (NISRA) Annual Business Inquiry (ABI) survey to create a UK-wide measure. Each reporting unit is given a unique identifier so it is possible to link the two datasets.

The population file is extracted from the Inter-Departmental Business Register (IDBR) – which is the source for all Office for National Statistics (ONS) business surveys. It contains a small number of variables on the business’ core attributes, including the type of industry, regional location, employment and turnover measured at a point in time.

The industry, region (whether England and Wales, Scotland, or Northern Ireland) and size of the business are used to create the cells from which the ABS and ABI samples are selected. They are selected using a stratified random sample design; large businesses (with employment of 250 or more) are selected each year as they are dominant contributors to the estimated total values. Further information on our sample selection and ABS methodology can be found in the ABS Technical Report.

The respondent file contains nearly 2,000 variables extracted or derived from the completed survey form. Each business has a design weight that reflects the business’ probability of selection and a calibration factor to correct for any potential bias in the sample. To produce aggregated totals, a business’s response is scaled by the design weight and calibration factor.

For continuous variables, to expand the ABS population file to include value data for all businesses in the sample universe, the aggregated totals for each variable has to be distributed across the non-sampled businesses in the ABS universe, at a cell level. Where a business provided a response to the survey, their unweighted values are removed from the aggregated totals. The difference is then distributed across the non-sampled businesses in the cell, based on employment held for the business. This employment, extracted from the IDBR ahead of the ABS sample selection, provides an indication of each business’ relationship to other businesses within their sample cell.

Where the variable is a discrete or logical variable, the value for each non-sampled business has been based on a probability function. For example, if we had a cell with 20 businesses with 5 respondents, the ratio of the actual responses to a Yes or No question could be 3:2. In this instance, the probability of any of the non-sampled businesses being Yes is 0.6. Using a uniform random number function for each non-sampled business, if the random number for the business is less than 0.6, the estimated variable is recorded as a Yes. This differs from the methodology used for the “Annual Business Survey: Great Britain non-financial business economy exporters and importers” release, which sums the weighted values of any business with a Yes response, therefore assuming that the estimated response from all of the unsampled businesses that the respondent represents is “Yes”.

The Foreign Direct Investment (FDI) Survey population

The FDI population is produced from four sources:

1. Data from the IDBR and Dun and Bradstreet (D&B) are combined to identify the target population and sampling frame for the FDI survey. Auxiliary variables, such as the number of affiliates, are not used to produce FDI estimates directly, but are used by ONS to stratify the outward survey sample. The D&B inputs are sourced from D&B’s Who-owns-Whom database of world linkages of companies. An annual data extract is procured at the start of the calendar year. These are then adapted and matched to the IDBR. The resulting data extract provides information on majority share ownership only (more than 50% of ordinary shares).
2. We also maintain a separate database for enterprises that have previously been identified to be engaged in FDI either through the FDI or Mergers and Acquisitions surveys. This database includes minority share relationships (between 10% and 49% of ordinary shares) that are not included in the IDBR and D&B extract but are relevant for FDI.
3. The FDI population is also updated regularly using information from the ONS Mergers and Acquisitions survey, which is conducted on a quarterly basis and collects information on domestic and cross-border acquisitions and disposals involving UK companies.
4. Throughout the year our Business Profiling team (BPT) investigate the largest multi-national businesses to ensure the correct structure for all ONS surveys; there is a pool of 2,000 businesses for the profilers to maintain. A sub-section of BPT also maintains the linkages between businesses throughout the year. This information is obtained from ONS surveys, Companies House and data from HM Revenue and Customs (HMRC).

In contrast to the ABS and most ONS business surveys, where sampled returns are weighted to estimate for the non-sampled population, FDI estimation methods predict values for all non-sampled businesses, allowing for aggregate estimates to be derived simply by summing over the domains of interest. While uncommon in ONS, this method is not unique and has a sound, academic basis. This approach provides a rich micro-data set for the whole population, with returned and estimated values for each company.

Linking the ABS and IDBR population to the FDI population

Data linking was carried out in R by merging the expanded ABS and IDBR population to the FDI population. The FDI population used for the linking included only four variables – the Who-owns-Whom reference (wowent), the business unit reference number (ruref), the inward FDI position, and the Standard Industrial Classifications 2007 (SIC 2007). Multiple enterprise reference numbers can exist in the FDI population, which reflect an enterprise having more than one FDI investor.

Prior to data linking, businesses in the FDI population that were recorded as Monetary Financial Institutions (MFIs), bank holding companies, public corporations and property were removed. Data on these are collected from other data sources, such as the Bank of England and the Balance of Payments team in ONS, and do not contain business identifiers to allow linking with the ABS.

To overcome differences in which enterprise units return surveys for respective sampled businesses (FDI tends to sample the parent enterprise, while the ABS samples lower reporting units in the UK ownership tree), values relating to the subsidiaries of the same enterprise group are summed in the FDI population to make them unique (and therefore represent the inward investment relationship of the entire enterprise group).

The two files were then merged using the enterprise reference number. In instances where there were multiple subsidiaries with the same enterprise reference numbers on the ABS population, the inward investment relationship of the overall enterprise group is replicated for each reporting unit on the ABS; therefore, the FDI relationship on the final dataset represents the FDI relationship for the enterprise rather than that specific reporting unit.

The merged file was then separated into two – a dataset containing businesses that have been linked between the expanded ABS and IDBR population and FDI population, and a dataset containing businesses on the expanded ABS and IDBR population that are not in receipt of FDI.

Further merging exercises were undertaken between the unmatched FDI businesses to the unmatched expanded ABS and IDBR population, which involved utilising identifiers relating to unique reporting units lower down in the UK ownership tree.

Finally, the matched ABS and FDI file on an enterprise and reporting unit basis and the unmatched businesses were combined into one dataset, which provides the entire expanded ABS and IDBR population along with matched FDI values where relevant. The merging exercise successfully matched 71% of the approximately 23,000 enterprises in the FDI population to the expanded ABS and IDBR population.

There are some unmatched FDI businesses, which can be due to factors such as differences in the industry coverage of both surveys. ABS excludes: finance and insurance, public administration and defence, public provision of education, public provision of health and all medical and dental practice activities; while FDI excludes: MFIs, public corporations, bank holding companies and property data.