

Article

Bilateral asymmetries in UK foreign direct investment statistics: July 2019

This article summarises the main results of our research into bilateral asymmetries in UK foreign direct investment statistics with mirror statistics produced by other countries, particularly Luxembourg, the Netherlands, Germany and Belgium.

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1 . Main points

- Bilateral asymmetries occur when mirror statistics produced separately by two countries do not match; the UK is not alone in having bilateral asymmetries in foreign direct investment (FDI) statistics.
- The aim of this research is to develop our understanding of why such asymmetries exist by identifying which are the most likely reasons for asymmetries between UK FDI and counterpart statistics.
- Comparing UK-derived microdata for the FDI positions of the top 20 largest companies with mirror data from Luxembourg, the Netherlands, Germany and Belgium reveals that the reasons for these asymmetries vary by country and the direction of the investment (inward or outward).
- Reasons for FDI asymmetries include different values in the UK FDI results for some companies compared with those recorded by our counterpart countries, as well as instances where these FDI relationships are not present in the relevant UK population.
- Other reasons that could contribute to bilateral asymmetries in FDI statistics include varying approaches to surveying FDI companies, different valuation principles and different geographical definitions for economies.
- Insights from this research – such as sampling different levels within groups, data sources and population coverage – have helped to inform the FDI Transformation Programme.

2 . The aim of this research is to develop our understanding of differences in bilateral FDI statistics involving the UK

Foreign direct investment (FDI) refers to cross-border investments made by residents and businesses from one country into another, with the aim of establishing a lasting interest in the country receiving investment.

A minimum of 10% of the voting power is one criterion used to distinguish FDI relationships from portfolio investment; direct investments are also expected to last for more than one year whereas portfolio investment tends to be made for shorter durations. FDI statistics can be analysed in terms of:

- positions – the stock of investment at a given point in time
- income – earnings generated on that stock over a specific period of time
- flows – value of cross-border FDI transactions over a specific period of time

Detailed annual statistics are available in the [FDI statistical bulletin](#) with further insights found in [UK foreign direct investment: trends and analysis, July 2019](#).

Every country can have its own inward and outward FDI populations. These populations are a collection of all businesses identified as having a cross-border investment relationship.

The outward population is for all companies resident in the reporting country that directly control or influence other companies abroad.

The inward population is for all resident companies that are directly controlled or influenced by foreign parent companies.

It is these populations that could be used to produce FDI statistics. The options for collecting information include a survey of all companies in the population (a census) or selecting a representative random sample upon which to base estimates. Alternatively, there could be direct reporting as part of a regulatory framework for foreign investors making it a legal requirement for FDI companies to provide this information. The [Foreign direct investment Quality and Methodology information report](#) provides further details of the UK approach.

Bilateral asymmetries occur when mirror statistics produced separately by two countries do not match

The cross-border nature of FDI means that the same activity is often measured twice by the countries on either side of the transaction.

In theory, one country's outward investment should equal the partner country's measurement of inward investment, and the other way around; the counterpart country's estimate is often referred to as the mirror statistic.

In practice, however, asymmetries arise where these values are not equal to each other. This can occur in estimates for FDI positions, income and flows. Such differences can also exist in other statistics, including [international trade](#).

Asymmetries in FDI statistics have been a long-standing issue, present in most years and for the majority of countries for which statistics are available¹. This partly reflects the challenges of measuring cross-border activities, including direct investment. Evolving business practices also mean that it is more difficult for international statistics to continue to measure these activities.

The Office for National Statistics (ONS) has recently created its own large cases unit – the International Business Unit (IBU) – to work closely with some of the UK's largest companies, developing our understanding of their operations and enhancing the way that we collect information from them. More information on the IBU and FDI statistics can be found in the [Economic review, January 2019](#).

It will not be possible to completely eradicate asymmetries from bilateral FDI statistics. Instead, the aim of this research is to develop our understanding of the reasons why such asymmetries exist. However, the UK cannot act alone in addressing bilateral asymmetries in FDI statistics. Thus, the ONS has been very active in international meetings and has compared UK-derived microdata for FDI positions with mirror microdata of the top 20 largest companies from Luxembourg, the Netherlands, Germany and Belgium involving the UK. FDI positions statistics are used throughout this article.

Notes for: The aim of this research is to develop our understanding of differences in bilateral FDI statistics involving the UK

1. This can be seen in the IMF working paper on [Asymmetries in the Coordinated Direct Investment Survey: What Lies Behind?](#) (2017) or the [Co-ordinated Direct Investment Statistics \(CDIS\) database](#).

3 . The UK is not alone in having large FDI asymmetries

The UK has some of the largest foreign direct investment (FDI) values in the world and therefore, unsurprisingly, it has higher values of FDI asymmetries.

The UK had the fourth-largest value of outward FDI position and the fifth-largest inward FDI position with the rest of the world in 2015, according to International Monetary Fund (IMF) statistics . In that year, the UK had the fourth-largest outward absolute asymmetry of \$767.5 billion, as shown in Table 1.

This was a lower value than the absolute asymmetries for Luxembourg, the Netherlands and the United States, yet was still equivalent to nearly half (47.8%) of the UK's total outward FDI position.

It can also be seen that the UK is the only country with a negative asymmetry among the 10 countries with the largest outward asymmetries. This implies that the UK under-estimates direct investments in the rest of the world, relative to rest of the world estimates of direct investments received from the UK.

Table 1: Top 10 differences in FDI outward statistics
2015, \$ billion unless otherwise stated

Country	Outward position	Outward derived	Asymmetry	Asymmetry (percentage outward position)
Luxembourg	4529.9	2333.3	2196.6	48.5
Netherlands	5047.4	3126.5	1920.8	38.1
United States	5289.1	4105.7	1183.4	22.4
United Kingdom	1606.3	2373.9	-767.5	-47.8
Australia	389.0	198.2	190.7	49.0
Russian Federation	282.7	113.0	169.7	60.0
Irish Republic	909.6	742.3	167.4	18.4
Brazil	184.9	43.3	141.6	76.6
Italy	468.4	329.7	138.6	29.6
France	1268.2	1135.0	133.2	10.5

Source: International Monetary Fund - Coordinated Direct Investment Statistics, and Office for National Statistics

Notes

1. The IMF calculate the outward derived FDI values from the corresponding inward FDI statistics of the counterpart country which in this case is all other countries in the world. [Back to table](#)
2. The asymmetry is the value of the outward position less the outward derived position (mirror statistic). [Back to table](#)

UK asymmetries were greater for inward FDI than they were for outward FDI in 2015.

The UK had the second-highest absolute FDI asymmetry of \$1,303.1 billion (see Table 2). The UK is also one of five countries to have an absolute inward FDI asymmetry with the rest of the world above \$1,000 billion. For the UK, this was equivalent to 85.2% of the total inward position.

The UK also had a negative inward FDI asymmetry in 2015, implying that the UK estimates that it received less investment from the rest of the world than the rest of the world estimated that it held in the UK.

Table 2: Top 10 differences in FDI inward statistics in 2015
\$ billion unless otherwise stated

Country	Inward position	Inward derived	Asymmetry	Asymmetry (percentage inward position)
China	2579.6	1163.8	1415.7	54.9
United Kingdom	1530.1	2833.1	-1303.1	-85.2
Luxembourg	3717.7	2430.9	1286.8	34.6
Netherlands	4074.1	2895.9	1178.3	28.9
Hong Kong	1395.3	292.0	1103.4	79.1
United States	3354.9	4028.0	-673.1	-20.1
Singapore	954.3	647.7	306.6	32.1
Mexico	502.0	290.8	211.2	42.1
Switzerland	887.3	1092.1	-204.8	-23.1
Mauritius	279.1	76.4	202.7	72.6

Source: International Monetary Fund - Coordinated Direct Investment Statistics, and Office for National Statistics

Notes

1. The IMF calculate the inward derived FDI values from the corresponding outward FDI statistics of the counterpart country which in this case is all other countries in the world. [Back to table](#)
2. The asymmetry is the value of the inward position less the inward derived position (mirror statistic). [Back to table](#)

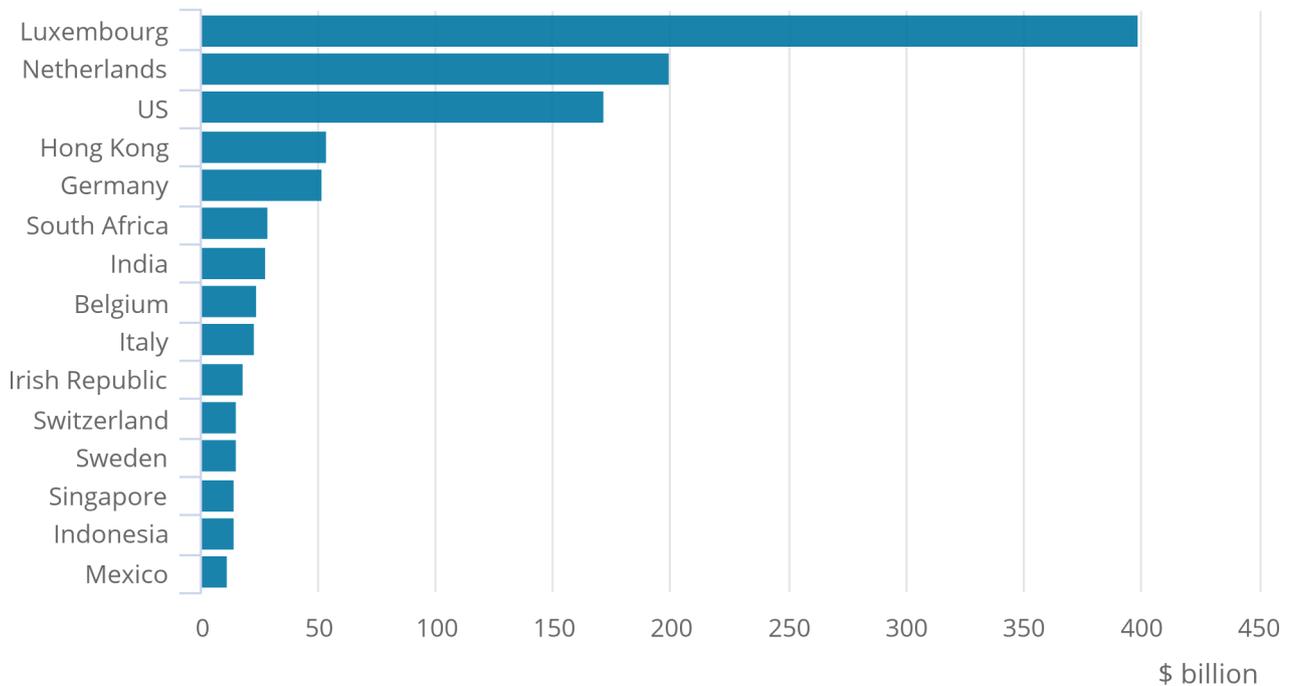
The UK's bilateral FDI asymmetries were greatest with Luxembourg, the Netherlands and the United States

In 2015, the UK's absolute outward asymmetries were greatest for FDI with Luxembourg, the Netherlands and the United States. Our analysis uses information for 2015 since this was the latest year for which complete FDI statistics were available at the time we started this research.

Figure 1 presents the absolute value for the UK with the top 15 outward FDI position asymmetries in 2015. The UK's absolute bilateral asymmetry with Luxembourg was \$398.8 billion using [IMF mirror statistics](#). This was also double the UK's second-highest absolute asymmetry, of \$199.3 billion, with the Netherlands and the third-highest was with the US of \$171.4 billion. These three countries alone accounted for 64.1% of the UK's total absolute asymmetry in outward FDI positions in 2015.

Figure 1: UK outward FDI position absolute asymmetry, largest 15 values in 2015

Figure 1: UK outward FDI position absolute asymmetry, largest 15 values in 2015



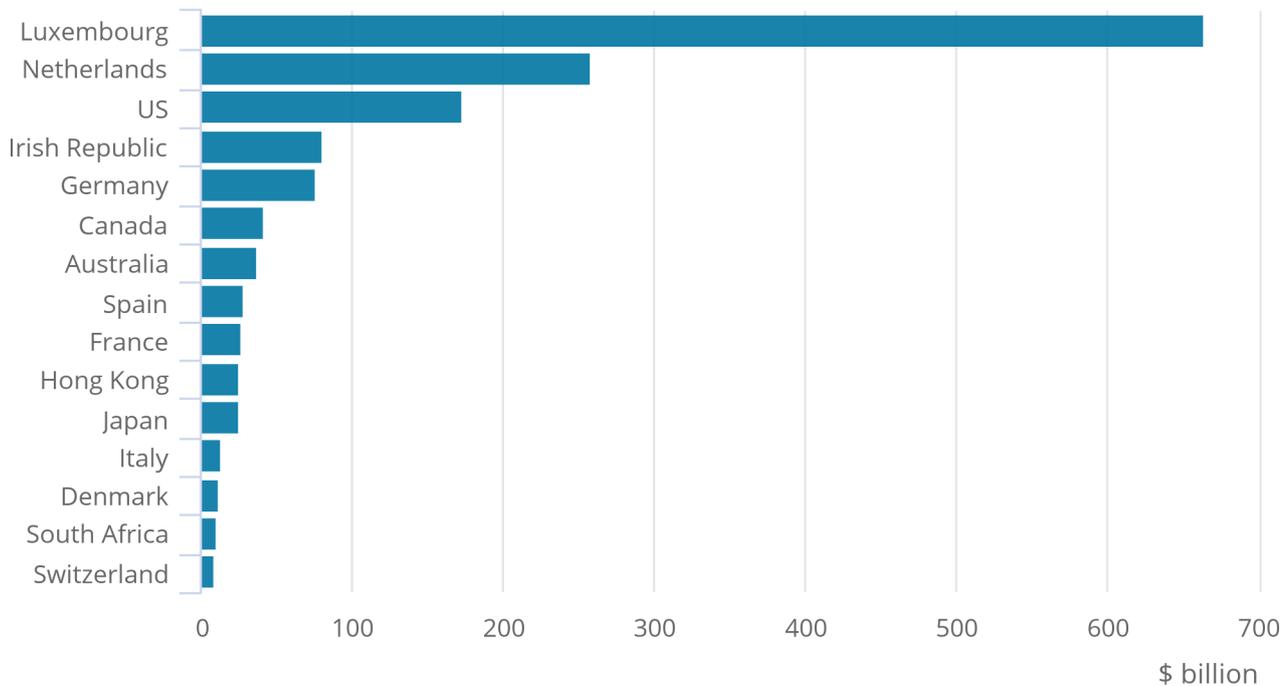
Source: International Monetary Fund - Coordinated Direct Investment Statistics

A similar picture emerges for asymmetries on UK inward FDI positions in 2015. Once again, the UK had the largest absolute FDI asymmetries with Luxembourg (\$664.5 billion), the Netherlands (\$257.7 billion) and the United States (\$173.5 billion).

These were the only countries for which the inward absolute asymmetry was above \$100 billion (Figure 2) and alone accounted for 71.3% of the UK's total absolute inward FDI asymmetries.

Figure 2: UK inward FDI position absolute asymmetry, largest 15 values in 2015

Figure 2: UK inward FDI position absolute asymmetry, largest 15 values in 2015



Source: International Monetary Fund - Coordinated Direct Investment Statistics

4 . The reasons contributing most to UK FDI asymmetries were different across partner countries

The UK has been working closely with Luxembourg, the Netherlands, Germany and Belgium to investigate the reasons for bilateral asymmetries in foreign direct investment (FDI) positions.

Eurostat's FDI Network enables the secure exchange of microdata between central banks and national statistics institutes in the EU solely for statistical purposes. The UK has exchanged microdata on the 20 largest inward and outward FDI companies by position values with each partner country. We received equivalent microdata in return.

EU member states are required to routinely share information with the relevant counterpart country on cross-border direct investment positions above €3 billion. Our approach takes this a step further by systematically reviewing the FDI positions of the 20 companies with the highest values of FDI with the UK reported by other countries.

The distribution of UK FDI suggests that the largest companies account for a disproportionate amount of FDI stocks and could also generate the greatest value of FDI asymmetries. More information on the distribution of FDI positions can be found in [UK foreign direct investment, trends and analysis: May 2019](#).

Our approach uses the microdata from each of the four partner countries and compares these with the UK results for the same companies. Therefore, we can only see the mirror microdata for the enterprises with the highest value FDI positions. The matching exercise looks for each of these companies in the entire UK FDI population, including for both directions (inward and outward). The results from comparing these top 20 outward investors to the UK and top 20 inward investors from the UK of each partner country are summarised in the rest of this section.

The results of the microdata comparisons can be grouped into six broad reasons

The microdata matching presented in this article are completed from a UK perspective. This research showed six broad reasons that highlighted from where bilateral FDI asymmetries were generated among the 20 largest FDI companies for each counterpart country.

No subsidiary in UK FDI population

These are companies that are not present in the UK FDI population but have an affiliate reported by the partner country. For outward FDI, the UK parent company would have overseas subsidiaries in other countries but not the one for which we are comparing microdata.

A similar situation can exist for inward FDI, where we can find no subsidiaries of the overseas parent company in the UK population. In both cases, the UK value is zero, leading to a negative FDI asymmetry.

Sampled and matched

Companies that have been matched to the relevant UK population and that were sampled in 2015. The asymmetry here is the difference between the UK sample results and those for the same company in the partner country microdata. A positive asymmetry indicates that the FDI position reported in the UK survey was higher than that from our partner country and the other way around for a negative asymmetry.

Unsampled and matched

The UK does not survey every company in the outward and inward FDI populations. Therefore, we only have detailed results for the proportion of the population that were sampled. FDI values for the remaining companies are estimated using the results from sampled companies. Any company sampled that does not respond to the survey in time has their results imputed from their previous returns. Likewise, we estimate FDI values for unsampled companies using the results of similar businesses that have been sampled.

Therefore, these companies are present in both the UK and partner country populations but the difference in values stems from the UK's imputed or estimated results. A positive value indicates that the UK's value for that company was higher than that recorded by our partner country for the same company and the other way around for negative.

Unmatched for 2015, matched in different years

Company structures can change over time and so the FDI population alters to reflect these changes. However, there can be differences in when these changes appear in the FDI population relative to our partner countries.

This category is used when we cannot find the precise outward (UK parent and overseas affiliate) or inward (UK affiliate with overseas parent) relationship in 2015 but that relationship is present in other years before or afterwards. In this case, the asymmetry is negative because the FDI position for the UK is zero.

Unmatched but present in the other population

While the UK has two separate populations for outward and inward FDI, there are a number of companies that have both inward and outward links. These can be both UK parent companies controlling other direct investments in the UK through overseas subsidiaries or UK companies that are in a chain of control with both foreign parent and affiliate companies.

The asymmetry here stems from only one of these relationships being present. In this case, it is a negative asymmetry because the UK value is zero.

Unmatched

These are companies where the precise FDI relationship reported by our partner country cannot be identified in the relevant UK population. The UK records FDI results consolidated at the enterprise group level. Therefore, several large legal units in our partner country's FDI population might not appear in the UK population as these are consolidated with other affiliates in the UK's results. In this case, the UK's value is zero, creating a negative FDI asymmetry.

Different reported values and companies not in the UK FDI population accounted for the highest proportions of outward and inward FDI asymmetries with Luxembourg

The UK recorded very large FDI positions asymmetries with Luxembourg in 2014, 2015 and 2016. The UK had large negative FDI asymmetries with Luxembourg in all three years, showing that UK estimates for FDI with Luxembourg were lower than the Luxembourg mirror statistics.

Exchanging information on the 20 largest inward and outward investors by value of the FDI stock shows different reasons contributed the most to the outward and inward bilateral FDI asymmetry in 2015 among Luxembourg's largest 20 direct investors (Table 3).

Table 3: Reasons for FDI asymmetries with Luxembourg among the top 20 outward and inward investors by counterpart FDI position value, 2015, percentage of the top 20 asymmetry

	Outward	Inward
Overall asymmetry (UK less Luxembourg value)	Negative	Negative
Reason:		
no Luxembourg subsidiary in UK FDI population	6.4	29.3
sampled & matched	63.7	0.8
unsampled & matched	15.2	2.9
unmatched for 2015, matched in different year(s)	3.1	0.0
unmatched but present in the other population	0.0	61.8
unmatched	11.6	5.2

Source: Office for National Statistics

Notes

1. If the overall asymmetry is negative then this means that the value of the FDI position of the top 20 companies of the other country was higher than that for the same companies in the UK FDI population. [Back to table](#)
2. Negative percentages imply a movement in the opposite direction to the overall asymmetry. Therefore a negative proportion of a negative overall asymmetry indicates a positive value for the UK, or the UK FDI position for those companies was higher than that reported by the counterpart country. [Back to table](#)
3. These percentages are calculated for the asymmetry among the top 20 Luxembourg companies with links to the UK and not the total value of the bilateral asymmetry. [Back to table](#)

The largest proportion of the asymmetry with UK outward investors in Luxembourg was from sampled companies. For the top 20 companies, 63.7% of the negative FDI asymmetry was from the UK having lower FDI positions than those reported by Luxembourg for the same companies.

A further 15.2% of the asymmetry was from companies matched in the UK population but they were not sampled or did not respond to the survey. For these companies, the UK estimated or imputed values for outward FDI. This implies that the top 20 outward FDI companies are well-matched to the inward population in Luxembourg but that the reported or estimated values were lower.

These two results accounted for over three-quarters (78.9%) of the FDI asymmetry among the largest UK outward investors in Luxembourg. In addition, 6.4% of the asymmetry among the top 20 outward investors were from UK companies investing overseas but with no Luxembourg subsidiary in our population, though they were reported by Luxembourg.

The matching rate in the UK population is much lower for Luxembourg companies investing in the UK. Companies that appeared in the Luxembourg outward FDI population but not in the UK inward population accounted for 61.8% for the inward asymmetry among the top 20 companies. There was also a further 29.3% of the asymmetry from Luxembourg outward investors to the UK that had no subsidiary according to the UK inward FDI population.

Taken together, these two reasons accounted for the majority (91.1%) of the inward FDI asymmetry, where the Luxembourg mirror statistics were higher than those recorded in the inward UK FDI population. Overall, this suggests that inward asymmetries between the UK and Luxembourg are mainly related to the UK FDI population, whereas the outward differences stem more from the values recorded in the UK compared with those from Luxembourg.

Unmatched companies in the UK FDI populations contributed to asymmetries with the Netherlands for UK outward positions more than for inward positions

The UK also recorded a negative outward and inward FDI position asymmetry with the Netherlands in every year between 2014 and 2016.

The majority of the outward FDI asymmetry with the Netherlands was from companies that were not present in 2015 or only present in the UK's inward FDI population instead. These two reasons accounted for 29.3% and 27.0% respectively of the FDI asymmetry of the top 20 UK outward investors in the Netherlands, with a further 11.9% of the asymmetry from UK outward investors in the Dutch population but with no Dutch subsidiary in the UK population.

This was offset by higher values from UK companies investing in the Netherlands that were estimated or imputed in the UK population. This is shown as negative 24.5% of the asymmetry, which itself is a negative value overall, creating a positive asymmetry.

Table 4: Reasons for FDI asymmetries with the Netherlands among the top 20 outward and inward investors by FDI counterpart position value, 2015, percentage of the top 20 asymmetry

	Outward	Inward
Overall asymmetry (UK less Netherlands value)	Negative	Negative
Reason:		
no Dutch subsidiary in UK FDI population	4.0	32.6
sampled & matched	3.1	-2.6
unsampled & matched	-24.5	46.8
unmatched for 2015, matched in different year(s)	29.3	0.0
unmatched but present in the other population	27.0	0.0
unmatched	11.9	17.9

Source: Office for National Statistics

Notes

1. If the overall asymmetry is negative then this means that the value of the FDI position of the top 20 companies of the other country was higher than that for the same companies in the UK FDI population. [Back to table](#)
2. Negative percentages imply a movement in the opposite direction to the overall asymmetry. Therefore a negative proportion of a negative overall asymmetry indicates a positive value for the UK, or the UK FDI position for those companies was higher than that reported by the counterpart country. [Back to table](#)
3. These percentages are calculated for the asymmetry among the top 20 Netherlands companies with links to the UK and not the total value of the bilateral asymmetry. [Back to table](#)

For the largest inward FDI companies from the Netherlands to the UK, the greatest proportion of the asymmetry came from companies that were unsampled in 2015. This implies that the estimates in the UK FDI population were lower than the reported values of those companies in the Dutch outward population, accounting for 46.8% of the top 20 asymmetry.

This was followed by a further 32.6% of the inward top 20 asymmetry from companies in the Netherlands but not showing any FDI links in the UK population. However, of the Dutch inward investors to the UK that were matched and sampled, the UK reported higher FDI positions than those in the Dutch microdata, contributing negative 2.6% to the negative inward FDI asymmetry of the top 20 companies.

Comparisons with German microdata for the top 20 investors by position presents a mixed picture

Asymmetries in UK FDI statistics with Germany were also negative in 2015, albeit to a much smaller extent than those with the Netherlands and Luxembourg.

The results for comparing the top 20 outward direct investors from the UK to Germany showed that 43.0% of the asymmetry was from differences in sampled company results (Table 5). Yet a further 22.0% of the asymmetry related to companies in the German inward FDI population but only appearing in the UK inward population instead.

There was also a sizeable proportion (14.8%) of the UK outward asymmetry from companies not in the UK outward population in 2015 but appearing in other years. This suggests mixed reasons lie behind the UK outward FDI asymmetry with Germany compared with the Netherlands and Luxembourg, which were more due to unmatched and matched instances respectively.

Table 5: Reasons for FDI asymmetries with Germany among the top 20 outward and inward investors by counterpart FDI position value, 2015, percentage of the top 20 asymmetry

	Outward	Inward
Overall asymmetry (UK less German value)	Negative	Negative
Reason:		
no German subsidiary in UK FDI population	13.7	2.1
sampled & matched	43.0	-5.7
un-sampled & matched	3.0	11.4
un-matched for 2015, matched in different year(s)	14.8	34.3
un-matched but present in the other population	22.0	33.5
un-matched	3.4	13.1

Source: Office for National Statistics

Notes

1. If the overall asymmetry is negative then this means that the value of the FDI position of the top 20 companies of the other country was higher than that for the same companies in the UK FDI population. [Back to table](#)
2. Negative percentages imply a movement in the opposite direction to the overall asymmetry. Therefore a negative proportion of a negative overall asymmetry indicates a positive value for the UK, or the UK FDI position for those companies was higher than that reported by the counterpart country. [Back to table](#)
3. These percentages are calculated for the asymmetry among the top 20 German companies with links to the UK and not the total value of the bilateral asymmetry. [Back to table](#)

By contrast to UK outward asymmetries, the inward FDI asymmetry was largely driven by the top 20 companies from Germany being unmatched in the UK population. Just over one-third of the negative asymmetry of the top 20 was from companies appearing in other years except 2015 (34.3%) and appearing in the UK outward FDI population only (33.5%).

These were by far the two main reasons for the asymmetry and were only slightly offset by UK survey responses being slightly higher than those recorded in Germany, accounting for negative 5.7% of the negative asymmetry.

Different population results accounted for most of the UK outward and inward FDI asymmetries with Belgium

UK FDI asymmetries with Belgium were much lower in 2015 than those with the other countries with whom we exchanged microdata.

The total outward FDI asymmetry was positive \$23.7 billion and the inward FDI asymmetry was negative \$3.7 billion, according to the IMF database. Those asymmetries with Belgium were the 8th- and 20th-largest absolute asymmetries for the UK. Exchanging microdata for the top 20 companies with Belgium enabled us to examine an instance where these differences were much lower (Table 6).

Table 6: Reasons for FDI asymmetries with Belgium among the top 20 outward and inward investors by counterpart FDI position value, 2015, percentage of the top 20 asymmetry

Overall asymmetry (UK less Belgian value)	Outward Inward	
	Positive	Negative
Reason:		
no Belgian subsidiary in UK FDI population	-0.8	0.0
sampled & matched	97.6	-0.9
unsampled & matched	0.9	49.7
unmatched for 2015, matched in different year(s)	0.0	4.0
unmatched but present in the other population	-0.7	44.8
unmatched	0.0	0.7

Source: Office for National Statistics

Notes

1. If the overall asymmetry is negative then this means that the value of the FDI position of the top 20 companies of the other country was higher than that for the same companies in the UK FDI population. [Back to table](#)
2. Negative percentages imply a movement in the opposite direction to the overall asymmetry. Therefore a negative proportion of a negative overall asymmetry indicates a positive value for the UK, or the UK FDI position for those companies was higher than that reported by the counterpart country. [Back to table](#)
3. These percentages are calculated for the asymmetry among the top 20 Belgian companies with links to the UK and not the total value of the bilateral asymmetry. [Back to table](#)

The outward UK FDI population was the reason for almost all of the asymmetry with the top 20 Belgian inward investors from the UK. Companies that were matched and sampled accounted for 97.6% of the positive asymmetry in 2015. This implies that the UK generally had higher values for FDI positions of UK-owned companies in Belgium than recorded by Belgium.

A further 0.9% of the asymmetry then came from companies that were not sampled in the UK and the estimated values were higher than those recorded in the Belgian population.

Only negative 1.5 percentage points of the outward asymmetry were from companies that had no Belgian subsidiary in the UK population or were unmatched altogether. This shows that survey responses were the main contributor to the positive outward FDI asymmetry for the top 20 UK companies with FDI in Belgium.

However, the inward FDI asymmetry also shows differences to the results for outward FDI and the other countries included in this research. Unsampled or non-responding inward investors in the UK from Belgium accounted for 49.7% of the overall negative asymmetry of the top 20 companies. Therefore, these results in the UK were estimated with lower values than those recorded in Belgium.

There was also a further 44.8% of the inward asymmetry that came from inward investors from Belgium that only appeared in the UK outward population.

Once again, the companies that were matched and sampled reported slightly higher results in the UK inward population than the Belgian outward population, comprising negative 0.9% of the overall negative FDI asymmetry.

5 . Metadata comparisons highlight some other reasons that could lead to bilateral asymmetries in FDI statistics

The outward foreign direct investment (FDI) microdata comparison of the top 20 UK companies highlighted differences in reported values in the UK sample with those reported by our partner countries.

Those companies that were matched and sampled in the UK outward population accounted for the highest proportion of the top 20 asymmetry in Belgium (97.6%), Luxembourg (63.7%) and Germany (43.0%). Of these, the UK values were higher than the same companies in the Belgian inward population and lower than those in the Luxembourg and German inward populations.

Estimation and imputation methods for non-sampled or non-responding companies in the UK also contributed to asymmetries in both directions with the Netherlands and the inward asymmetry with Belgium. Our estimated results for those companies were lower than those in the Belgian outward population, accounting for 49.7% of the negative UK inward asymmetry.

The comparison with the Netherlands is more mixed, with our estimated results for UK outward FDI being higher than the results in the Dutch inward population (negative 24.5% of a negative asymmetry) but lower in the UK inward and Dutch outward populations (46.8%). This comparison highlights the role that methods can play in FDI asymmetries.

There are different options for collecting FDI data

Metadata from the International Monetary Fund's (IMF's) Co-ordinated Direct Investment Statistics (CDIS) database provides qualitative information on different countries' FDI statistics. This can be used to identify possible reasons for UK bilateral asymmetries in FDI positions.

Table 7 compares how the UK approach to collecting information from FDI companies compares with each of these countries. We also include the US, with which the UK had among the largest FDI asymmetries in 2015.

Table 7: Comparison of FDI data sources from CDIS metadata

	UK	Luxembourg	Netherlands	US	Germany	Belgium
Are the data sources for OUTWARD direct investment based on a sample or a census for the following:						
o-1.1 Deposit-taking corporations	Census	Census	Census	Both	Census	Census
o-1.2 Other financial corporations	Sample	Sample	Sample	Both	Census	Census
o-1.3 Non-financial corporations	Sample	Sample	Sample	Both	Census	Sample
o-1.4 Other	Sample	Not covered	Sample	Both	Not covered	
	UK	Luxembourg	Netherlands	US	Germany	Belgium
Are the data sources for INWARD direct investment based on a sample or a census for the following:						
i-1.1 Deposit-taking corporations	Census	Census	Census	Both	Census	Census
i-1.2 Other financial corporations	Sample	Sample	Sample	Both	Census	Census
i-1.3 Non-financial corporations	Sample	Sample	Sample	Both	Census	Sample
i-1.4 Other	Sample	Not covered	Sample	Both	Not covered	

Source: International Monetary Fund - Coordinated Direct Investment Statistics

There are many approaches taken for collecting information from the respective inward and outward FDI populations. This ranges between surveying all businesses in that part of the population (census) to taking a sample, a mixture of the two or not covering some areas at all.

The UK's main source of information for FDI statistics is our quarterly and annual FDI surveys. The quarterly survey goes to roughly 680 outward and 970 inward enterprise groups per quarter and the annual survey to around 2,300 outward and 4,200 inward companies in the summer of each year.

While we might expect asymmetries to reduce if all countries used the same global FDI population, they would still exist in FDI statistics due to sampling variability. In other words, if different random samples were selected from the same population, these would each give slightly different results through selecting different companies.

Furthermore, response rates can also be affected by the legal framework within which this information is collected. Enforced mandatory reporting should increase response rates and therefore reduce the need for estimating the results of non-responding companies.

Metadata can also explain some of the reasons identified from our international collaboration

Our comparison of the positions of the 20 largest FDI companies with UK links according to Belgium, Germany, Luxembourg and the Netherlands categorised into six reasons. Each of these reveals information about the UK FDI populations relative to those of each partner country.

No subsidiary in UK FDI population

The counterpart country has an inward or outward link with the UK but this cannot be found in the UK population. This could be reflecting differences between sampled companies in the UK and those surveyed by the counterpart company.

A further difference could also stem from the company level at which FDI statistics are compiled. The UK records FDI relationships at the local enterprise group level, implying that the results for the same company within one country can be consolidated into one set of results. The CDIS metadata show that the US also takes this approach while Luxembourg, Germany and Belgium each collect FDI data at the enterprise level. The Netherlands use a mix of both enterprise group and enterprise reporting in their statistics.

Sampled and matched

This could reflect both different values reported by the same company to the UK and the counterpart country as well as different valuation principles used. For example, Table 8 shows that the UK uses own funds at book value for listed and unlisted equity, yet other principles can be used by other countries.

Table 8: Comparison of FDI valuation principles from CDIS metadata

	UK	Luxembourg	Netherlands	US	Germany	Belgium
For OUTWARD, what is the primary valuation principle for equity investment?						
o-8.a.1 Listed Equity	Own funds at book value	Market value	Market value	Historic cost	Market value	Market value
o-8.a.2 Unlisted Equity	Own funds at book value	Other	Recent transaction price	Historic cost	Own funds at book value	Own funds at book value
For OUTWARD, what is the primary valuation principle for debt instruments?						
o-8.b.1 Debt securities	Fair value	Nominal value	Other	Historic cost	Other	Nominal value
o-8.b.2 Other debt instruments	Nominal value	Nominal value	Nominal value	Historic cost	Other	Nominal value
Is accrued interest included in the valuation of debt instruments (OUTWARD)?						
o-9.1 Debt Securities	Yes	Yes	Yes	No	No	No
o-9.2 Other Debt Instruments	Yes	Yes	Yes	No	No	No
	UK	Luxembourg	Netherlands	US	Germany	Belgium
For INWARD, what is the primary valuation principle for equity investment?						
i-8.a.1 Listed Equity	Own funds at book value	Market value	Market value	Historic cost	Market value	Market value
i-8.a.2 Unlisted Equity	Own funds at book value	Own funds at book value	Net asset value	Historic cost	Own funds at book value	Own funds at book value
For INWARD, what is the primary valuation principle for debt instruments?						
i-8.b.1 Debt securities	Fair value	Nominal value	Other	Historic cost	Other	Nominal value
i-8.b.2 Other debt instruments	Nominal value	Nominal value	Nominal value	Historic cost	Other	Nominal value
Is accrued interest included in the valuation of debt instruments (INWARD)?						
i-9.1 Debt Securities	Yes	Yes	Yes	No	No	No
i-9.2 Other Debt Instruments	Yes	Yes	Yes	No	No	No

Source: International Monetary Fund - Coordinated Direct Investment Statistics

Notes

1. More details on these valuation methods can be found in Annex 5 of the OECD Benchmark Definition of Foreign Direct Investment fourth edition. [Back to table](#)

Unsampled and matched

This could indicate that the way the UK samples FDI companies is not selecting enough of the largest companies or that imputation and estimation methods are under-estimating or over-estimating the values for non-responding or unsampled companies in the FDI population.

Other metadata shows that asymmetries can also be created by differences in methodology for estimating for the non-sampled population and businesses not responding to the survey. Some countries (the Netherlands and Germany) have a 100% response rate and therefore do not require imputation methods for non-response. Otherwise, there can be a range of approaches to compensate for non-responding and non-sampled enterprises. This includes using data from the previous period or combining this information with administrative data sources.

The UK is one of the few countries that uses ratio imputation where a non-responding business has provided information to a previous survey, or mean imputation for those FDI companies that have not been sampled previously. Both methods use a combination of previous responses and information from other businesses with similar characteristics to estimate values for these companies. More information on these methods can be found in the [Foreign direct investment \(FDI\) quality and methodology information report](#).

Unmatched for 2015, matched in different year(s)

This could reflect timing effects of when FDI links are added or updated in the UK FDI population relative to the counterpart country.

Once again, this could depend upon when a company responds to a survey – providing detailed information to update the UK FDI population – compared with times when it does not respond or is not selected. These differences could be most apparent compared with countries that have a census or 100% response rate.

Unmatched but present in the other population

This could also reflect differences between whether the relevant UK company has been sampled and responded or not, as well as matching the cross-border links of multinational enterprises within the UK population frame.

Unmatched

The asymmetry may reflect either unmatched results as the counterpart's reporting unit cannot be separated from the consolidated group included in the UK FDI population, or under-coverage in the UK FDI population frame.

FDI statistics for the UK do not include UK Crown dependencies, whereas some countries could include them within the UK

A further area in which the calculation of FDI statistics could lead to asymmetries from a UK perspective is from the geographic definitions used in these statistics. Differences can emerge in how a region is defined.

For the UK, this could be the difference between whether UK Crown dependencies – Isle of Man and the Channel Islands in particular – are included in FDI within the UK total or not. In line with international guidelines, the Office for National Statistics estimates exclude these territories from UK statistics and treats any FDI transactions the same as those with any other country. As such, countries including these offshore islands within their estimates of FDI with the UK will over-estimate FDI with the UK relative to our statistics. We know this contributes to asymmetries in other statistics as well, such as international trade and could also apply to other countries with overseas dependencies.

6 . There are ways in which this analysis can be extended further

The results of our own research in conjunction with that of other countries and international organisations have identified a number of reasons why asymmetries in foreign direct investment (FDI) statistics can occur.

The UK will continue to engage in international discussions to develop our knowledge of the broad causes of FDI asymmetries. We will also continue to collaborate with other countries to deepen our understanding of how the UK FDI population compares with those of our main counterparts. This can also extend to exploring specific case studies of companies active in our economies. The research also suggests that it may be informative to compare survey questions and the frameworks within which this information is collected.

We published a [development plan for FDI statistics](#) at the same time as this article. It outlines how we plan to transform FDI statistics from 2019. This includes reviewing the existing population frame, data collection processes and results systems. This forms part of our FDI Transformation Programme. Results from these developments could help us to match microdata from counterpart countries better.

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