China-Britain Business Council

UK jobs dependent on links to China

Phase 2 report:
Subnational jobs analysis

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1 Introduction

This report estimates the number of jobs supported by UK links to China, at a UK subnational level

Cambridge Econometrics (CE) was commissioned by the China-Britain Business Council (CBBC) to estimate the number of UK jobs that are dependent on economic links to China. The study comprises:

- Phase 1: Estimates of jobs supported by trade, foreign direct investment, tourism and education in the UK; which was published in July 2020[1]
- Phase 2: Consideration of how those jobs are distributed across regions and local areas of the UK

Phase 1 found that UK-China links had grown substantially, leading to accompanying increases in the number of jobs supported by the UK-China relationship. From that earlier work we found that the UK-China relationship supported over 100,000 jobs; possibly more depending on the degree of double-counting and other factors (see Table 1.1).

Table 1.1: FTE jobs supported by links to China

	Value (£bn)	Jobs ('000 FTEs)	Comment
Trade	30	80-95	Goods: £25bn (2019) / 50,000-60,000 jobs Services: £5bn (2019) / 30,000-35,000 jobs
Tourism	2	16	Data for 2019
Students	2	18	Data for 2018/19 academic year, excluding income from tuition fees
TOTAL	**34**	**114-129**	**Perhaps 103,000-118,000 under (relatively strong) assumptions about double counting**

Notes(s): Phase 1 also considered jobs linked to Foreign Direct Investment (FDI) but these could not be confidently assembled on a like-for-like basis. UK Department for International Trade analysis suggests that Chinese FDI may have 'created or safeguarded' over 9,000 jobs based on figures for 2016/17, 2017/18 and 2018/19.
Source(s): Cambridge Econometrics (2020) 'UK jobs dependent on links to China: Phase 1 – Macroeconomic and sectoral analysis'.

In most cases, jobs have been estimated at a regional level, with further analysis of selected local areas

This report (Phase 2) concerns the geographic distribution of those jobs around the UK, focusing on economic activities for which there are data at a subnational level:

- **trade in goods** (but not services) exported to China, by 12 UK regions[2];
- **tourist expenditure** by region, as well as individual areas that are especially frequented by Chinese tourists; and
- **expenditure by Chinese students** by region but also, where relevant, unitary authorities and local authority districts.

These subnational jobs have been estimated by disaggregating the figures from Phase 1. Reflecting the availability of data to support a disaggregation

[1] Cambridge Econometrics (2020) 'UK jobs dependent on links to China: Phase 1 – Macroeconomic and sectoral analysis'
http://www.cbbc.org/news/uk-jobs-dependent-on-links-to-china-cbbc-report-wi/

[2] Here, 'regions' refers to the: nine former government office regions of England; Wales, Scotland and Northern Ireland.

exercise, the focus of Phase 2 is on: trade in goods (but not services); tourism; and higher education. Subnational jobs linked to Chinese FDI are not estimated in Phase 2, owing to a lack of readily available FDI data at the subnational level. If it were possible to estimate jobs supported by Chinese FDI and trade in services with China by region, the total jobs supported by links to China by region would be higher than those reported here.

We supplement the quantitative analysis with more detailed assessments of specific areas, drawing on desk research and consulting businesses and trade associations.

This report is structured as follows:

- Chapter 2: Summary – provides a summary of key findings from the report.
- Chapter 3: Approach – provides a summary of the methods applied to estimate the numbers of jobs supported by links to China. Further detail on the methods can be found in Appendix A.
- Chapter 4: Jobs by region – presents an overview of jobs supported by the three economic activities considered, highlighting the relative importance of each to different UK regions.
- Chapter 5: Trade – presents the results for jobs supported by UK exports of goods to China in different regions.
- Chapter 6: Tourism – presents the results for jobs supported by Chinese tourist expenditure in different regions, as well as selected sub-regions.
- Chapter 7: Students – presents the results for jobs supported by expenditure by Chinese students attending higher education institutions, also grouped by local authority and region.

The data analysis in this report is supported by information provided by businesses and trade associations to shed further light on the nature of these activities and jobs, as well as the influence of recent and future trends on the UK-China relationship.

Further details of the approach, source data and further results are in the appendices.

2 Summary

Regional jobs supported by links to China

Figure 2.1 and Table 2.1 summarise the jobs by region supported by UK links to China related to trade in goods, tourism and (higher) education.

Jobs supported by links to China are highest in London

- London has the highest number of jobs supported by links to China (15,900-16,900 FTE jobs):
  - most of these jobs are linked to Chinese tourism (8,300 FTE jobs);
  - 4,000-5,000 FTE jobs are linked to goods exports to China; and
  - 3,600 FTE jobs are supported by expenditure by Chinese students.

Trade with China supports the majority of jobs in other regions

- In contrast to London, trade in goods with China supports the majority of jobs in other regions.
- Scotland, the South East, West Midlands and North West also have a large number of jobs supported by links to China (7,000-10,000 FTE jobs each).
  - most of these jobs are linked to trade in goods with China, with 4,000-7,000 FTE jobs supported in each region by trade with China.

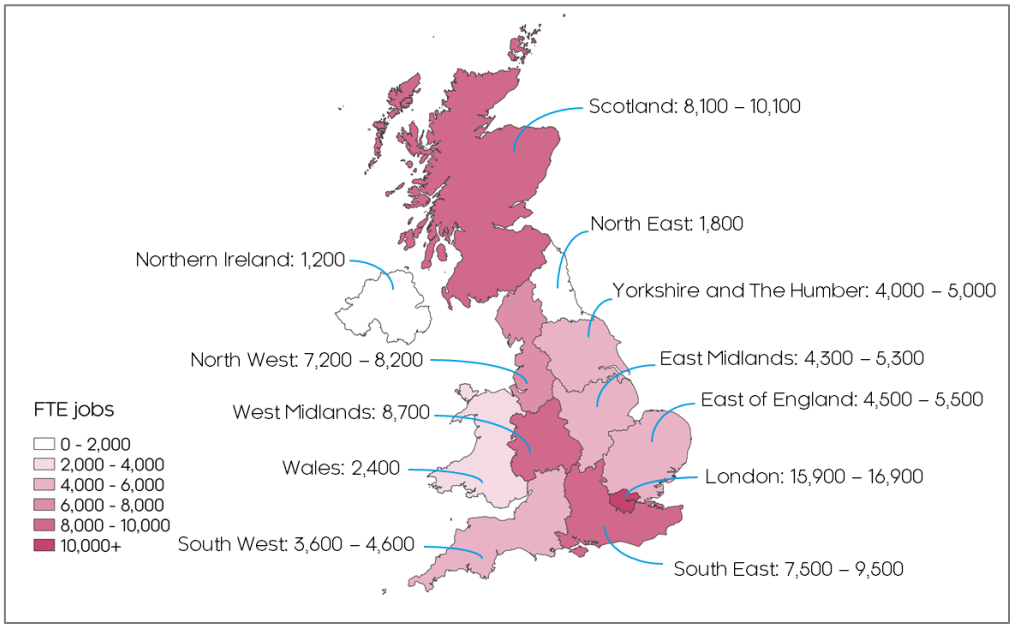
Scotland is most reliant on exports to China

- Scotland is most reliant on goods exports to China:
  - goods exports to China support 1.5% of FTE employment in goods-producing sectors in Scotland.

Chinese tourism and students support a large number of jobs in other regions

- Outside London, regions that have a large number of jobs supported by Chinese tourism include the North West (1,200 FTE jobs), of which 700 FTE jobs are supported by Chinese tourists in Manchester; Yorkshire and The Humber (1,000 FTE jobs); and the South East (1,000 FTE jobs).
- Expenditure by Chinese students in Yorkshire and The Humber, the North West and the West Midlands supports around 2,000 FTE jobs in each region.
  - Manchester, Birmingham and Coventry each have 900 FTE jobs supported by expenditure by Chinese students.

Figure 2.1: FTE jobs supported by links to China, by region



Note(s): The underlying sample sizes of the data used to estimate the tourism jobs estimates for Wales, Northern Ireland, East Midlands and North East are very small and have been omitted from these totals.
Source(s): CE analysis.

Table 2.1: FTE jobs supported by links to China, by region

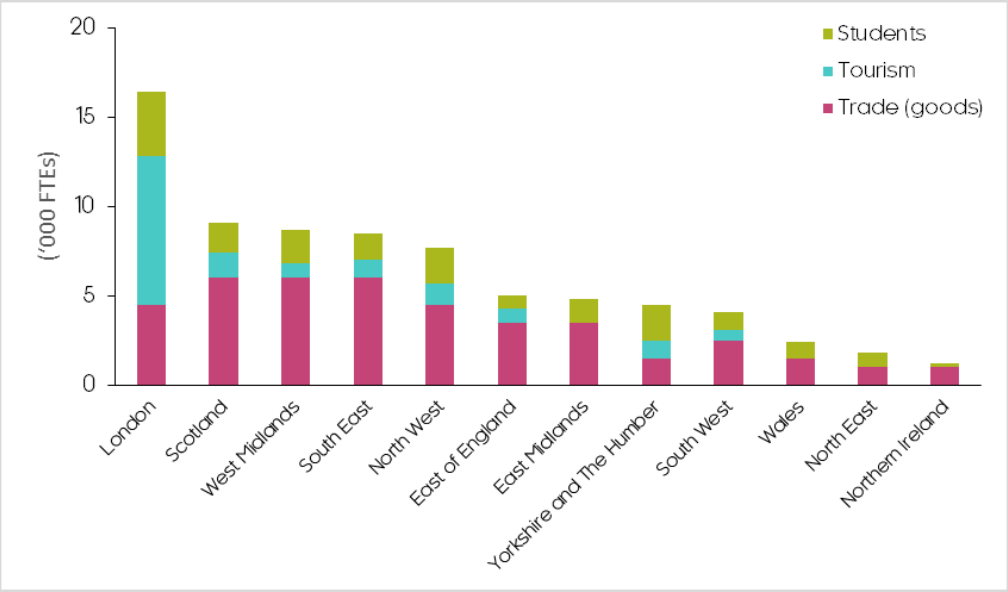
	'000 FTEs			
	Trade in goods	Tourism	Students	**Total**
London	4 - 5	8.3	3.6	**15.9 - 16.9**
Scotland	5 - 7	1.4	1.7	**8.1 - 10.1**
South East	5 - 7	1.0	1.5	**7.5 - 9.5**
West Midlands	6	0.8	1.9	**8.7**
North West	4 - 5	1.2	2.0	**7.2 - 8.2**
East Midlands	3 - 4	-	1.3	**4.3 - 5.3**
East of England	3 - 4	0.8	0.7	**4.5 - 5.5**
Yorkshire and The Humber	1 - 2	1.0	2.0	**4.0 - 5.0**
South West	2 - 3	0.6	1.0	**3.6 - 4.6**
Wales	1.5	-	0.9	**2.4**
North East	1	-	0.8	**1.8**
Northern Ireland	1	-	0.2	**1.2**

Note(s): The underlying sample sizes of the data used to estimate the tourism job estimates for Wales, Northern Ireland, East Midlands and North East are very small and have been omitted from the results.
Source(s): CE analysis.

Different regions rely to different degrees on the three economic activities linked to China

Compared with the UK-level analysis in Phase 1, where trade with China was the most important economic activity in terms of jobs it supported, the regional analysis shows that different regions rely to different degrees on the three economic activities linked to China (see Figure 2.2).

Figure 2.2: Composition of FTE jobs supported by links to China, by region



Note(s): The trade jobs estimates exclude jobs supported by trade in services.
The trade jobs estimates presented for London, Scotland, South East, North West, East of England, East Midlands, Yorkshire and The Humber and South West are the midpoints of an estimated upper and lower range.
The underlying sample sizes of the data used to estimate the tourism job estimates for Wales, Northern Ireland, East Midlands and North East are very small and these figures have been omitted from the results.
Source(s): CE analysis.

Most regions are relatively more reliant on trade with China

In ten regions, trade in goods accounts for 65-85% of jobs supported (of those that could be allocated to a region in our analysis). So, while trade in goods is often the largest source of jobs supported, there are two exceptions: London and Yorkshire and The Humber.

London and Yorkshire and The Humber are more reliant on tourism and students

Over 50% of the jobs in London supported by links to China (8,300 FTE jobs) are supported by Chinese tourism, compared with 10-20% in other regions. While in Yorkshire and The Humber, trade in goods with China only supports about 30% of the total jobs supported by links to China and, instead, 45% of the jobs (2,000 FTE jobs) are supported by expenditure by Chinese students. In most other regions, 15-25% of jobs are supported by spending by Chinese students.

Individual summaries

Trade (goods only)

6,000 jobs in Mining & quarrying are linked to exports to China

- Almost 1% of all UK FTE jobs in goods-producing sectors are supported by trade with China. Our best estimate of jobs supported is 53,400 jobs.
- Most jobs linked to goods exports to China are in Mining & quarrying. The sector's 6,500 jobs supported by China equate to 12% of the sector's total employment in the UK.

Exports to China support a large number of jobs in Electronics, Machinery, Motor vehicles and Pharmaceuticals

- Trade with China also supports:
  - 6,300 jobs in Electronics (5% of the sector's total employment in the UK);
  - 5,700 jobs in Machinery (3% of the sector's total employment in the UK);
  - 5,300 jobs in Motor vehicles (3% of the sector's total employment in the UK); and
  - 1,600 jobs in Pharmaceuticals (4% of the sector's total employment in the UK).
- China is of increasing importance as an export destination for Metals & metal products and Other transport equipment. Strong increases in export volumes over 2016-19 have led to exports to China supporting an additional 4,600 jobs in Metals & metal products (an increase of 50%) and 1,800 jobs in Other transport equipment (an increase of over 60%).

Relatively more of the jobs are in Scotland and the South East

- Of the jobs supported by exports of goods to China, relatively more are in Scotland and the South East, which each account for around 15% of total FTE jobs supported. In Scotland, most of these jobs are in Mining & quarrying (the consequence of increasing crude oil exports), whereas the jobs in the South East are spread over sectors including Electronics, Motor vehicles, Other transport equipment and Electrical equipment.

Exports to China also support a large number of jobs in London

- Despite London being a services-oriented region, a substantial 4,000-5,000 FTE jobs in goods-producing sectors (about half of which are in Other manufacturing and repair) are linked to the capital's exports to China.

Tourism

The majority of tourism-related jobs are in London, as well as Edinburgh, Greater Manchester and Oxfordshire

- Half of the jobs supported by Chinese tourists are concentrated in London:
  - there are 8,300 jobs supported by Chinese tourists in London, accounting for 51% of jobs supported by Chinese tourists nationally.
- 1,400 jobs are supported by Chinese tourists in Scotland, with most of the jobs concentrated in Edinburgh.
- Other areas that appear to have a strong concentration of jobs supported by Chinese tourists are Greater Manchester (700 jobs) and Oxfordshire (400 jobs).

Students (higher education only)

Universities have a large and increasing proportion of Chinese students

- Some universities have a large proportion of students from China:
  - at the Royal College of Art, 24% of students are from China, while at the University of Liverpool and the University of the Arts London the figures are 19% and 17% respectively.
- Student numbers have increased rapidly at some universities, with the highest increase at University College London, where there are 3,800 more Chinese Students in 2018/19 compared with 2014/15.
- With 24,300 Chinese students across 35 institutions, London has the most jobs supported by expenditure from Chinese students (3,600 FTE jobs).
- The North West, Yorkshire and The Humber and the West Midlands also have a large number of jobs supported by Chinese student expenditure (around 2,000 FTE jobs in each region in 2018/19).
  - in the North West, over 75% of the jobs supported by expenditure from Chinese students are associated with Chinese students at the University of Manchester and the University of Liverpool.

Outside London, Chinese students support the most jobs in Manchester, Birmingham and Coventry

- Outside London, Manchester, Birmingham and Coventry are the local authorities with the highest numbers of jobs supported by spending by Chinese students in 2018/19.
  - Chinese students at the Universities of Warwick and Coventry, which together had 6,400 Chinese students enrolled in 2018/19, support 900 FTE jobs in Coventry.

3 Approach

This chapter provides a brief overview of the methods used to estimate the numbers of jobs by region supported by trade in goods, tourism and students.

'Jobs supported' are our estimates of the number of jobs that would have been required to meet a given amount of Chinese demand/expenditure each year. In principle, had Chinese demand been lower (higher), the jobs figures would also have been lower (higher) and may instead have been supported by (employed to meet) demand from other sources, whether in the UK or abroad.

Jobs supported are reported on a full-time equivalent (FTE) basis i.e. weighted to account for the fewer hours worked by a part-time employee.

Full details of the approach can be found in Appendix A of this report.

3.1 Trade

In Phase 1, jobs figures were derived from the volume of goods and services exported by the UK to China each year. Trade volumes were converted to an implied number of jobs based on assumptions about the ratio of jobs to output, differentiated by industry.

Regional jobs estimates for goods make use of HMRC Regional Trade Statistics

In this report, we disaggregate these results by deriving export shares by region and sector from HMRC's Regional Trade Statistics (RTS). The RTS records exports of products (merchandisable goods) only, which precludes any disaggregation of jobs in UK services.

We have mapped the RTS products to industries identified in Phase 1 according to the definitions in the respective RTS (SITC) and industrial (SIC 2007) classification systems.[3] The derived shares are then applied to the Phase 1 FTE jobs numbers.

As with our Phase 1 analysis, while there is evidence of growing numbers of UK jobs supported by trade in goods with China, these figures are quite volatile. As such, for trade, while our analysis does produce annual figures for jobs supported by region and sector, we use the annual series to inform an assessment (our best estimate) of the number of jobs 'currently' supported. This considers recent trends in the figures and also the possibility of outliers in particular years. Given the nature of the series and various accompanying uncertainties, this is, in our view, a better reflection of the likely jobs supported than simply using the numbers direct. This is especially the case given a large increase in UK-China trade in goods in 2019 compared with recent trends. In light of the heightened uncertainty in 2020 and whether this (strong) upward trend might continue, we have opted to be more conservative, rather than just take the large 2019 figures at face value.

[3] The HMRC data follow the Standard International Trade Classification (SITC), Revision 4, which is a classification of *products*. In contrast, our employment analysis is broken down by *industry* and conforms to the Standard Industrial Classification (SIC), 2007 revision. For the disaggregation, we have mapped SITC products to SIC industries.

3.2 Tourism

We construct regional and sub-regional tourism figures by combining our Phase 1 analysis with data from VisitBritain

In this report, our estimates of jobs supported by Chinese tourists are based on our analysis from Phase 1, which estimated jobs at a national level. In Phase 1, estimates for jobs supported by Chinese tourism were calculated by first estimating the jobs supported by all international tourism. These jobs were split out from the ONS Tourism Satellite Account (TSA) based on international tourism expenditure as a share of total tourism expenditure in the UK (from the TSA). Jobs supported specifically by Chinese tourism were then estimated by applying Chinese tourism expenditure as a share of international tourism expenditure (from Travelpac) to the jobs figures from the first step.

The ONS International Passenger Survey (IPS) Travelpac data do not provide a detailed regional or sub-regional breakdown. Therefore, data from VisitBritain, which is also based on the IPS, are used to apportion our Phase 1 job estimates to regions and sub-regions based on the share of total Chinese expenditure in an area.

3.3 Students

Jobs supported by students' expenditure follows the same method as from Phase 1

Detailed data on student numbers by higher education institution allow us to estimate jobs supported by Chinese students by region and local authority consistent with Phase 1.

This approach uses student expenditure figures taken from earlier research for the UK Department for Education (the Student Income and Expenditure Survey) on student weekly expenditure by category and mode of study (full-time or part-time). Expenditure on a per-student basis by mode of study (and adjusted for the possibility that part-time students might be working, and thus spending income earned in the UK) is multiplied by student numbers at each institution (in Phase 1 we multiplied this by total UK students). These figures are then converted to jobs using jobs-to-output ratios, calculated from the ONS input-output analytical tables for 2015.

The calculated jobs estimates by higher education institution are mapped to local authorities and regions based on the registered address of each institution.

4 Trade

Summary

- Almost 1% of all UK FTE jobs in goods-producing sectors were supported by trade with China. Our best estimate of jobs supported is 53,400 jobs.
- Most jobs linked to goods exports to China are in Mining & quarrying. The sector's 6,500 jobs supported by China equate to 12% of the sector's total employment in the UK.
- Trade with China also supports 6,300 jobs in Electronics (5% of the sector's total employment in the UK), 5,700 jobs in Machinery (3% of the sector's total employment in the UK) and 5,300 jobs in Motor vehicles (3% of the sector's total employment in the UK).
- Trade in Pharmaceuticals with China supports 1,600 jobs (4% of the sector's total employment in the UK).
- China is of increasing importance as an export destination for Metals & metal products and Other transport equipment sectors.
- Of the 12 regions in the UK, relatively more of the jobs are in Scotland and the South East which each account for around 15% of total FTE jobs supported by trade in goods with China.
- Despite the opportunities provided by a growing Chinese market, there are some regulatory and geopolitical risks that indicate that sustained future growth in UK trade with China is not guaranteed.

4.1 Introduction

China's trade importance has grown rapidly and now supports 50-60,000 FTE jobs

In Phase 1, we found that UK exports to China had grown substantially since 1999, to 4.5% of total UK gross exports by value in 2019. We estimate that these exports now support 80,000-95,000 full-time equivalent (FTE) jobs, 50,000-60,000 of which are related to goods production. In this chapter, we regionalise the employment figures for goods using HMRC's Regional Trade Statistics (RTS) data to apportion our Phase 1 FTE jobs results to 12 UK regions: the nine former government office regions of England; and Wales, Scotland and Northern Ireland.

There are no comparable data with which to similarly disaggregate jobs related to services.

In this chapter we present the breakdown of UK jobs by sector and then region. We then present in more detail the sectoral composition of each region's employment.

As with the Phase 1 analysis, because of the volatility from year to year in the original trade statistics (albeit with an apparent upward trend), we are careful to interpret the annual figures to derive a reasoned estimate of how many jobs might be supported by UK trade with China. We do this to take account, as best as we can, of recent trends and the possibility of outliers, especially in the

last year of data, 2019, when trade in goods with China was high relative to its recent trend and with no guarantee that such an increase would be sustained in 2020. In this sense, the figures we report below represent our assessment of the jobs currently supported, based on more information than just 2019 alone.

4.2 Total UK jobs supported by exports of goods to China

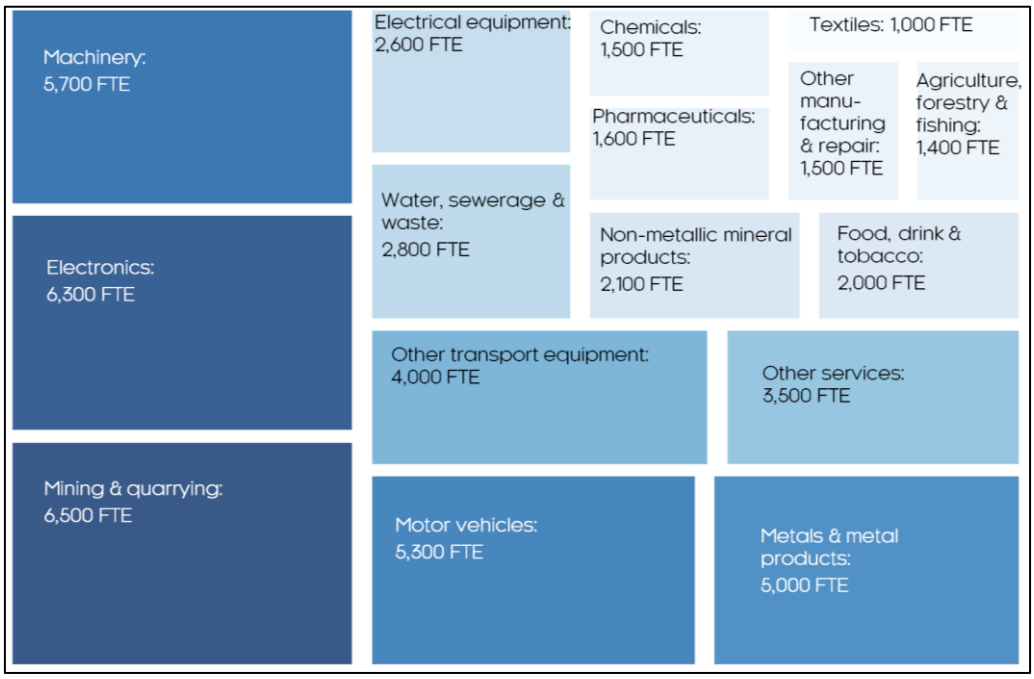
China accounts for almost 1% of all UK FTE jobs in goods-producing sectors

The total number of FTE jobs in goods sectors across the UK supported by trade with China has tended to increase over time, though with much volatility from year to year (as shown in Phase 1). For 2019, we find that trade in goods with China accounted for almost 1% of all UK FTE jobs in goods-producing sectors: we estimate that this equates to some 53,400 jobs.[4,5] The concentration of these jobs across sectors and regions of the UK differs, and is the focus of this analysis.

Sector breakdown

Figure 4.1 summarises our estimated FTE jobs by sector. It is important to note that these values represent our best assessment of each sector's employment supported by goods exports to China, accounting for recent sector trends, volatility and outliers, in order to derive a 'current' estimate.

Figure 4.1: FTE jobs supported by goods exports to China, by sector



Note(s): Reported figures are those assessed from recent trends.
Only sectors with more than 3% of its total jobs supported by China are highlighted.
Source(s): CE analysis of OECD, and ONS trade data; CE employment data; CE analysis of Regional Trade Statistics (HMRC).

[4] These figures have been built up from our assessments of individual industries from the Phase 1 analysis. Our analysis is carried out at this level of precision but, in interpreting the results, we prefer to round the estimates and, as needed, present ranges to reflect the uncertainty at these levels of detail (trade with China by UK region and industry).

[5] By 'goods-producing sectors', we refer to industries that we consider to be goods-producing, as evidence by export values in the data. In practice this cover the first 20 industries in our 46-sector classification.

The sector with the most jobs supported by Chinese trade in goods is Mining & quarrying

Figure 4.1 shows that the sectors with the highest number of FTE jobs linked to goods exports to China are Mining & quarrying (predominantly exports of crude oil) as well as high-value manufacturing sectors such as Electronics, Machinery, and Motor vehicles. As Table 4.1 shows, our estimated 6,500 jobs supported in Mining & quarrying make up 12% of employment in this sector (using total UK jobs numbers for 2019). Along with Electronics and Machinery, this sector has seen some growth in demand from China over time and together they now account for over one-third (18,500 jobs) of the total 53,400 UK FTE jobs supported by trade in goods with China. In contrast, the importance of China to the Motor vehicles sector has declined markedly since 2013, from 9,000 to 5,000 FTE jobs.

Jobs in Metals & metal products and Other transport equipment have grown especially strongly

Fast growing sectors over 2016-19 with relatively high numbers of FTE jobs supported include Other transport equipment as well as Metals & metal products. For the former, strong increases in export volumes starting in 2016 have led to exports to China supporting an additional 1,800 FTE jobs (an increase of over 60%). In Metals & metal products, 50% more FTE jobs (4,600) were linked to exports to China in 2019 than in 2016.

Table 4.1: FTE jobs supported by goods exports to China, by sector

Sector	Jobs supported ('000 FTEs)	Share of total UK sector employment (%)
Mining & quarrying	6.5	11.6%
Electronics	6.3	5.3%
Pharmaceuticals	1.6	3.9%
Electrical equipment	2.6	3.2%
Motor vehicles	5.3	3.1%
Machinery	5.7	3.0%
Other transport equipment	4.0	2.9%
Chemicals	1.5	1.4%
Metals & Metal products	5.0	1.2%
Textiles	1.0	1.0%

Note(s): Excludes sectors whose FTE jobs supported by China share (of total FTE jobs) is less than 1%. These equate to a further 13,400 FTE jobs.
Source(s): CE analysis of ONS and OECD trade data; CE employment data; CE analysis of Regional Trade Statistics (HMRC)

Regional breakdown

Almost 1% of UK jobs in goods-producing sectors are supported by China

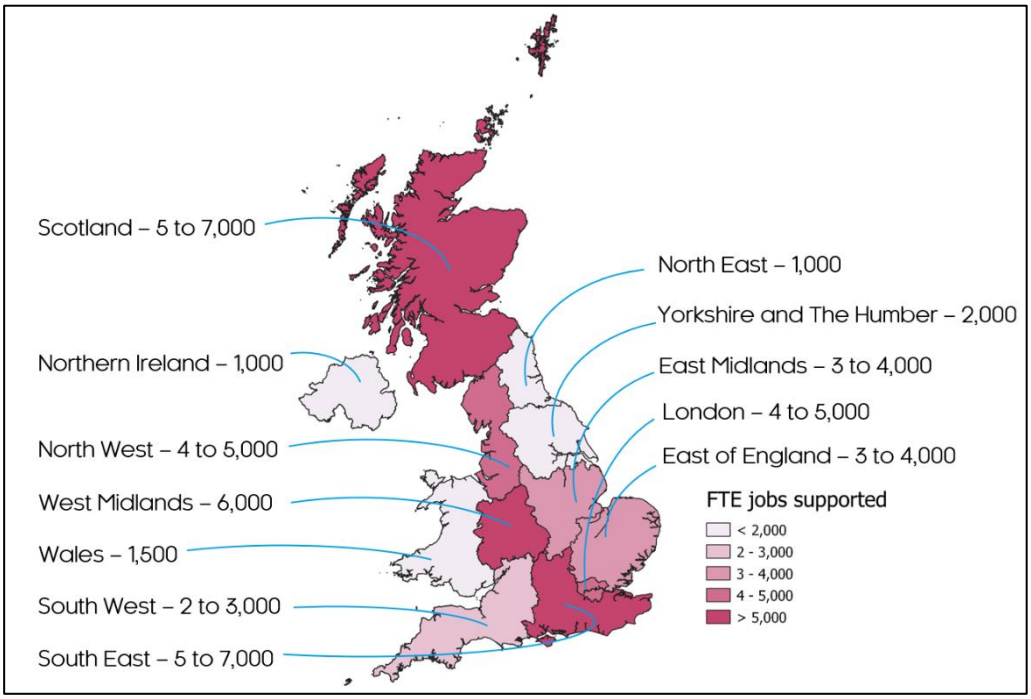
Not all HMRC trade in the RTS data is allocated to a region. An average of 6% by value over 2013-19 is unallocated and, because we look at recent trends (which are often volatile) to produce our best estimate of current jobs supported, we are able to regionalise perhaps some 80% of the jobs from Phase 1.[6] While this accounts for a small share of total UK employment (barely 0.2%), in goods-producing sectors specifically (remembering that our focus here is on goods exports), the share is closer to 1%. Figure 4.2 shows the pattern of that employment across the UK, for 12 regions:[7,8]

[6] In what follows, we have produced ranges of estimates by region, which sum to 37,500-46,500 (70-90%).

[7] Regions refers to the 12 regions of the UK, consisting of: the nine former government office regions of England; Wales, Scotland and Northern Ireland.

[8] For detailed values see Appendix Table B.1.

Figure 4.2: FTE jobs supported by goods exports to China, by region



Note(s): Excludes trade that could not be allocated to a region, and trade that could not be mapped to a sector (ranging from 1,800-3,800 jobs).
Source(s): CE analysis of Regional Trade Statistics (HMRC); CE employment data; OECD data; ONS trade data.

Scotland and the South East account for 15% of jobs linked to China

At 5,000-7,000 jobs apiece, the regions with the most jobs supported by goods exports to China are Scotland and the South East. Each accounts for around 15% (perhaps more) of the total number of jobs linked to China. Scotland has experienced a significant increase in the figure of jobs supported since 2016, so that current employment linked to China is likely higher.

The West Midlands' economy has experienced a marked decline in the number of jobs supported by goods exports to China since 2017. It now sees around 6,000 jobs supported, and is thus the region with the third most FTE jobs reliant on exports to China.

The East of England stands out as being at the beginning of an upward trend in employment linked to China. FTE jobs range between 3,000 and 4,000 but totalled 5,500 in 2019. Regions with the fewest trade in goods links to China are the North East and Northern Ireland, which each account for nearly 2% (or 1,000 FTE jobs) of our estimated 53,400 jobs linked to exports to China. The full regional jobs values are in Appendix Table B.1.

In percentage terms, Scotland is the most reliant on goods exports to China

The region most reliant on goods exports to China is Scotland, with goods exports supporting 1.5% of FTE employment in goods-producing sectors. Scotland is followed by the West Midlands and London; in both cases, around 1% of regional FTE jobs are linked to trade in goods with China. In the next section, we consider each region's employment by sector.

4.3 Regional jobs supported by trade in goods with China

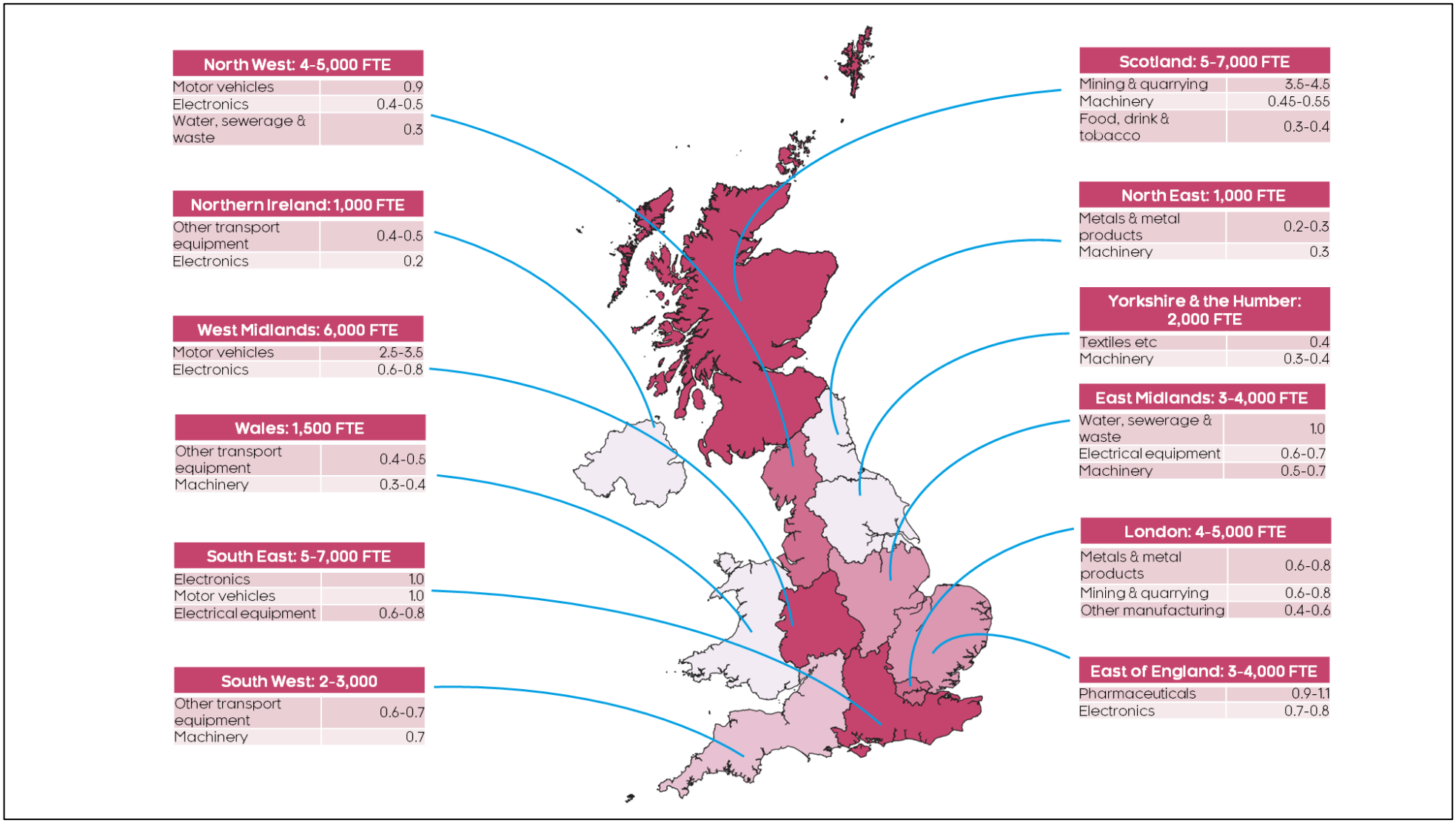
Reliance on goods exports to China in each region differs owing to different industrial mixes. Table 4.2 and Figure 4.3 show each region's key sectors and the recent trend in their respective employment linked to China.

Table 4.2: FTE jobs supported by goods exports to China, by region and key sector

Region	Total jobs supported by China ('000 FTEs)	Key sectors	Number of jobs in key sector ('000 FTEs)
Scotland	5-7	Mining & quarrying	3.5-4.5 (~)
South East	5-7	Electronics	1.0 (=)
		Motor Vehicles	1.0 (=)
		Other transport equipment	0.6-1.0 (↓)
		Electrical equipment	0.6-0.8 (↑)
West Midlands	6	Motor vehicles	2.5-3.5 (↓)
		Electronics	0.6-0.8 (↑)
London	4-5	Metals & metal products	0.6-0.8 (~)
		Mining & quarrying	0.6-0.8 (~)
		Other manufacturing &	0.4-0.6 (~)
North West	4-5	Motor vehicles	0.9 (↓)
		Electronics	0.4-0.5 (↑)
		Water, sewerage, and waste	0.3 (↓)
East Midlands	3-4	Water, sewerage, and waste	1.0 (~)
		Electrical equipment	0.6-0.7 (↑)
		Machinery	0.5-0.7 (↑)
East of England	3-4	Pharmaceuticals	0.9-1.1 (↑)
		Electronics	0.7-0.8 (=)
South West	2-3	Machinery	0.6-0.7 (=)
		Other transport equipment	0.7 (↑)
Yorkshire and The Humber	1-2	Textiles	0.4 (=)
		Machinery	0.3-0.4 (=)
Wales	1.5	Other transport equipment	0.4-0.5 (=)
		Machinery	0.3-0.4 (=)
North East	1	Machinery	0.3 (↓)
		Metals & metal products	0.2-0.3 (=)
Northern Ireland	1	Other transport equipment	0.4-0.5 (↑)

Note(s): CE assessed values for 2019.
(=) refers to stable, (↑) to growing, (↓) to declining, and (~) to volatile.
Source(s): CE analysis of Regional Trade Statistics (HMRC); CE employment data; OECD data; ONS trade data.

Figure 4.3: FTE jobs supported by goods exports to China, by region and key sector



Note(s): Excludes trade that could not be allocated to a region, and trade that could not be mapped to a sector (ranging from 1,800-3,800 jobs).
Tables show key sectors in each region.
Source(s): CE analysis of Regional Trade Statistics (HMRC); CE employment data; OECD data; ONS trade data.

Scotland

Scotland is the UK region most dependent on goods exports to China, with this trade now accounting for around 1.5% of all goods-producing FTE jobs. While not discernible in our own analysis, conversations with businesses and trade associations indicate that this trade is concentrated in a small number of large companies.

As a share of total UK jobs linked to China, Scotland accounts for about 15%. This share has been increasing over time (2013-19) and is hence one of the drivers of increasing jobs supported by UK goods exports to China. Scottish employment is most reliant on goods exports to China from the Mining & quarrying sector (the consequence of increasing crude oil exports). This employment has been volatile, but now accounts for 70% of the nation's jobs supported, or 12% of the sector's entire (FTE) employment in the UK.

Other sectors of note in Scotland include Machinery (around 500 jobs) and Food, drink and tobacco (300-400 jobs). Discussions with businesses and trade associations identified these sectors as rising in importance, noting in particular exports of Scotch whisky and Scottish salmon.

South East

Similar to Scotland, the South East accounts for some 15% of total FTE jobs supported by trade in goods with China. Unlike Scotland, however, employment in the South East is not dominated by a single sector. Rather, there are several sectors with strong ties to China, such as Electronics and Motor vehicles, each of which accounts for around 1,000 jobs supported by Chinese trade.

We estimate that some 5% of total UK employment in Electronics is related to exports to China, of which one-fifth is in the South East – the highest share of any region in this particular sector. Trade with China in Other transport equipment remains important in the South East, but its share of total UK employment in the sector supported by trade with China has been declining over time. On the other hand, Electrical equipment in this region is rising in importance, now accounting for 1% of overall UK employment in this sector.

West Midlands

There used to be more jobs in the West Midlands supported by trade in goods with China (over 9,500 around 2017), but this has since fallen as Chinese demand for Motor vehicles has decreased (though total global demand for UK motor vehicles continues to rise). We estimate that some 6,000 FTE jobs in the West Midlands are supported by goods exports to China. While employment in Motor vehicles fell between 2013 and 2019, this sector remains the region's most important in terms of jobs supported by Chinese trade in goods. Currently, half of the UK's Motor vehicles jobs linked to China are located in the West Midlands, which equates to 1.5% of total UK employment in Motor vehicles.

While the number of Motor vehicles jobs in the West Midlands supported by Chinese demand has fallen, the importance of Electronics appears to be growing. Electronics jobs are accounting for an increasing share of the region's jobs linked to China, and now stand at over 10%.

London

Despite London being a services-oriented region, a substantial 4,000-5,000 FTE jobs in goods-producing sectors are linked to the capital's exports to China, as shown in Table 4.2. While the jobs figures are quite volatile, around half of these jobs are in Other manufacturing and repair.

In addition, the Mining & quarrying sector is also closely linked to China, with 600-800 FTE jobs supported. This is partially supported by the headquarters of certain oil companies in London[9]. However, the key export good in the sector in London seems to be aggregates, which dominate the respective subsection in the SITC mapped to this CE sector.

North West

We estimate that 4-5,000 jobs in the North West are supported by goods exports to China. This is a decline over time, with some 6,700 jobs estimated previously (around 2013). This decline has been driven primarily by a reduction in exports from the Water, sewerage and waste sector, which accounted for 1,400 jobs in 2013, but has fallen to its current level of 300 FTE jobs.

Motor vehicles sector remains a key industry in the region, with 900 FTE jobs supported by China. This is, however, also less than previously (1,700 jobs in 2013).

A growing industry is the Electronics sector, which has become more reliant on trade with China, currently making up over 10% of the region's total FTE jobs supported.

East Midlands

The number of East Midlands FTE jobs linked to goods exports to China has remained broadly stable over time, at 3,000-4,000 FTE jobs. Despite some volatility in the employment supported, a key industry remains Water, sewerage and waste, which accounts for 1,000 of the region's total jobs supported by China.

Other industries in the region for which goods exports to China are important are the growing Machinery sector and Electrical equipment, with around 700 jobs in each.

East of England

We estimate that 3,000-4,000 FTE jobs linked to trade in goods with China are located in the East of England. The region has seen a strong upward trend in the number of supported jobs over 2013-19, which is driven primarily by two high-skill sectors, Pharmaceuticals and Electronics.

Some 1,000 jobs in Pharmaceuticals are supported by trade with China, and trending upward over time. The East of England's trade with China is important for the UK Pharmaceuticals sector as a whole accounting for 3.5% of total UK employment in Pharmaceuticals.

The other key sector in the East of England is Electronics, which has had over 700 jobs linked to China since 2016. While figures for 2019 do suggest an increase (to over 900), it is not yet clear if that can be taken as a longer-term increase in the number of jobs supported.

South West

Less than 1% of employment in goods-producing sectors in the South West is supported by trade with China, amounting to some 2,000-3,000 FTE jobs. Key industries are Machinery (around 700 jobs) and Other transport equipment (600-700 jobs).

Yorkshire and The Humber

In Yorkshire and The Humber, total employment supported by goods exports to China amounts to some 2,000 FTE jobs, of which 400 are in each of the Textiles and Machinery sectors. Yorkshire and The Humber is an important

[9] The underlying dataset (RTS) allocates oil exports out of the UK via ship to the region where the business is registered.

Textiles region, consistently accounting for 40% of all Textiles FTE jobs linked to exports to China in the UK over 2013-19.

Wales

Wales is one of the UK's regions least reliant on goods exports to China, with around 1,500 FTE jobs supported. Other transport equipment and Machinery are key industries, with the former remaining steady over 2013-19. However, Other transport equipment has more than doubled by 2019, where jobs totalled 1,200, after a steady performance from 2013 onwards.

North East

Together with Northern Ireland, we estimate that the North East accounts for the lowest number of FTE jobs reliant on goods exports to China. The region's key sectors are Machinery and Metals and metal products, collectively accounting for 60% of the region's total FTE jobs. The former has been in decline, but the latter remained stable until 2019, when the Metals and metal products sector has seen an increase in its reliance on exports to China, with 550 FTE jobs supported in 2019.

Northern Ireland

Dominated by the Other transport equipment industry, Northern Ireland has 1,000 FTE jobs linked to goods exports to China. The emphasis on Other transport equipment has grown over time and now accounts for around 80% of those jobs.

4.4 Past trends and future prospects

While UK jobs growth has historically been rapid as the Chinese market has developed…

The number of jobs supported by trade in goods with China has grown rapidly over time as China has become a global consumer. Surging disposable incomes, as well as opportunities to travel abroad, the attractiveness of goods produced in the West, and a notion of equating a high price with quality have led to increased Chinese demand for Western products (Prange, 2019). The continued development of the Chinese market also suggests that there remains much potential for demand (including for UK goods and services) to increase in the future.

Our conversations with businesses and trade associations, however, highlighted that growth in the Chinese market, by itself, is not guaranteed to translate into sustained future growth in UK trade and jobs, despite the opportunities afforded by a growing Chinese market. Concerns raised included:

- the need to adapt business and business models in the face of Chinese regulatory requirements, including those that are new and/or fast-changing[10]
- geopolitical risks

…regulatory requirements were mentioned as continued challenges…

Recent examples of regulatory challenges include new e-commerce laws in China (enacted in January 2019), which apply to cross-border e-commerce, including retail sales to Chinese consumers. E-commerce is a key channel for Western firms wanting to tap into the Chinese market. The importance of e-commerce has grown over time and, by 2019, this trade accounted for over 20% of China's total retail sales volume (National Bureau of Statistics of China 2020). These new laws require such businesses to register with Chinese customs through a China-registered firm, and to provide real-time transaction

[10] More generally, Froese *et al* (2019) identify various challenges for businesses looking to operate in China, including regulatory requirements.

data about retail imports. These requirements restrict exports (in the form of sales) from the West to Chinese shoppers. Many Western companies rely on these Chinese shoppers buying foreign products, which they resell in China – the Chinese concept of Daigou, or 'buy in the name of'. In addition, the new requirements are more likely to disadvantage smaller companies in terms of the effort required to comply. But, as was also noted, this may create opportunities for other companies to provide supporting services to facilitate such trade.

Similarly, while Chinese demand for low-cost recycled raw materials led to strong growth in global shipments in the early 2000s, the subsequent implementation and forthcoming expansion of 'Operation Green Fence' has started to restrict the import of these products. Of the businesses consulted during this research, the impacts on the UK paper industry and paper trade were especially noted. While there remain opportunities in other market segments (e.g. higher-value paper products), and trade with China has continued to grow, in any case, there was some suggestion that such industries may be looking to pursue a more diversified strategy for Asia, rather than China, specifically.

…as were concerns about wider geopolitical risks

Businesses also highlighted their concerns about geopolitical risks and the implications of regulatory action around the world. This has the potential to disrupt existing supply relationships, possibly to the detriment of UK businesses.

4.5 Limitations and implications

Limitations from Phase 1 apply to these current results

The limitations of our analysis from Phase 1 carry through to these regionalised results. Specifically, the jobs figures presented above are estimated as those jobs supported by Chinese demand for UK goods. In this analysis we do not consider, for example, the potential effect of global competition, nor do we attempt to disentangle the UK and China's respective positions in global supply chains. Furthermore, the Phase 1 FTE jobs figures assume an average level of productivity for each industry. This contrasts with the argument put forward by economic theory that industries more exposed to (global) competition would probably be more productive. With no easy way of identifying the productivity differential, there is little alternative and, in this respect, it is possible the jobs figures represent something of an over-estimate. This may, however, be counterbalanced by a relatively conservative interpretation of the resulting figures.

Not all HMRC trade data are assigned to a region, leading to an overall underestimate

The statistics we use for the regional disaggregation do not allocate all trade to a region: in 2019, around 5% of the trade by value is unallocated. With no easy way to determine the location or terms of this trade (some should, in principle, involve employment in a UK region, but some may not), we are unable fully to allocate the jobs figures from Phase 1 to individual regions. Were we able to do so, at least some of the reported figures earlier in this chapter would be higher.

HMRC's (quite reasonable) method for allocating trade flows limits the precision of our estimates

Furthermore, to match export flows from businesses to individual regions, HMRC allocates the trade values according to the proportion of a business's employment in each region. This does not directly reflect the value of the goods produced in each region, but could, equally, better reflect the role of different job functions in the sale of the final product, e.g. if manufacture is located in one region but sales are in another. But this proportional-employment approach could also mask differences in job or business functions, e.g. if only individual sites serve Chinese demand direct. Similarly, the implicit assumption is one of common productivity per employee, whereas different proportions of a job role may be supported by trade with China. These implications should be borne in mind, though there is no easy way of determining a more precise distribution of regional employment given the data available.

5 Tourism

Summary

- Half of the 16,300 jobs supported by Chinese tourists are concentrated in London:
  - there are 8,300 jobs supported by Chinese tourists in London, accounting for 51% of jobs supported by Chinese tourists nationally.
- In Scotland, 1,400 jobs are supported by Chinese tourists, with most of the jobs concentrated in Edinburgh.
- Other areas with high concentrations of jobs supported by Chinese tourists are Greater Manchester and Oxfordshire.

5.1 Introduction

In Phase 1, we estimated that there were 16,300 FTE jobs supported by Chinese tourists, which represents substantial growth over the past ten years. In this chapter we estimate the distribution of these jobs across the UK and identify the areas most reliant on Chinese tourism. Just over half of all jobs supported by Chinese tourism are in London, with Chinese tourism also supporting a large number of jobs in Scotland (especially Edinburgh) and the North West (notably Greater Manchester).

5.2 Jobs supported by Chinese tourism

The numbers of jobs supported by Chinese tourist expenditure at the regional and sub-regional levels are estimated using jobs and expenditure data from: the ONS UK Tourism Satellite Accounts; Chinese tourism expenditure data from the ONS International Passenger Survey (IPS); and Chinese expenditure data by region and sub-region from VisitBritain. The detailed Chinese tourism expenditure data from VisitBritain are used to apportion our UK results from Phase 1 to regions and sub-regions[11].

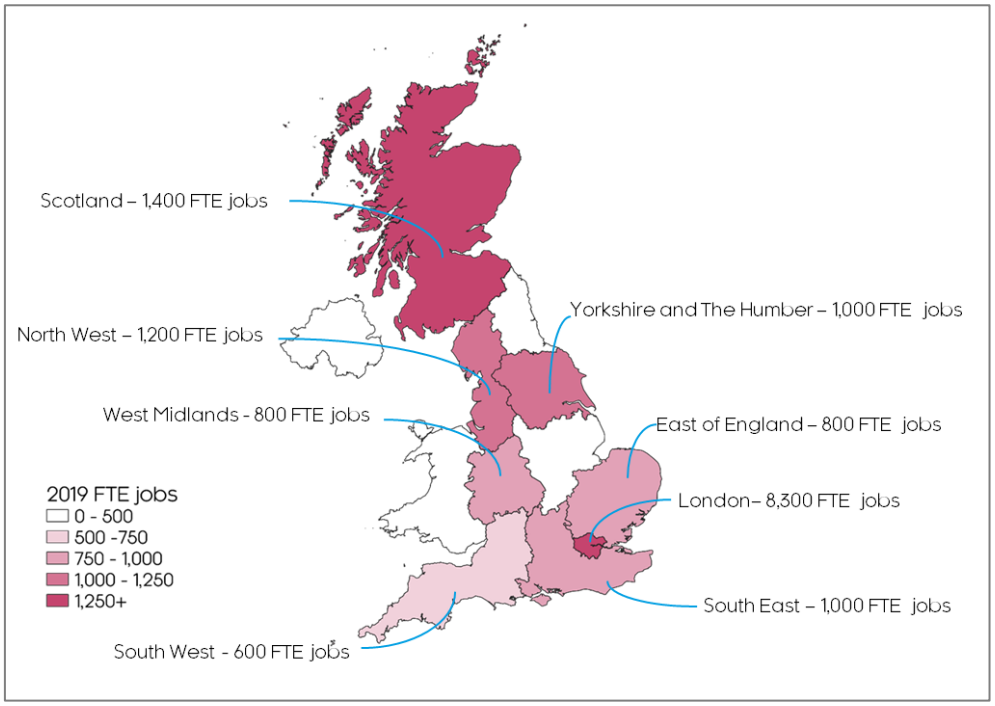
Jobs supported by Chinese tourism are concentrated in London

Figure 5.1 shows the FTE jobs supported by Chinese tourism by region while Figure 5.2 highlights jobs in selected sub-regions[12]. In 2019, London was the region most reliant on Chinese tourism, with an estimated 8,300 FTE jobs supported. This accounts for 51% of all the jobs in the UK that are supported by Chinese tourism. The average Chinese visitor spends £165 per night in London. This figure is higher than in all other sub-regions considered.

[11] See Appendix A for details.

[12] The sub-regions with a sample size in the IPS of 30 and above in 2019 were selected.

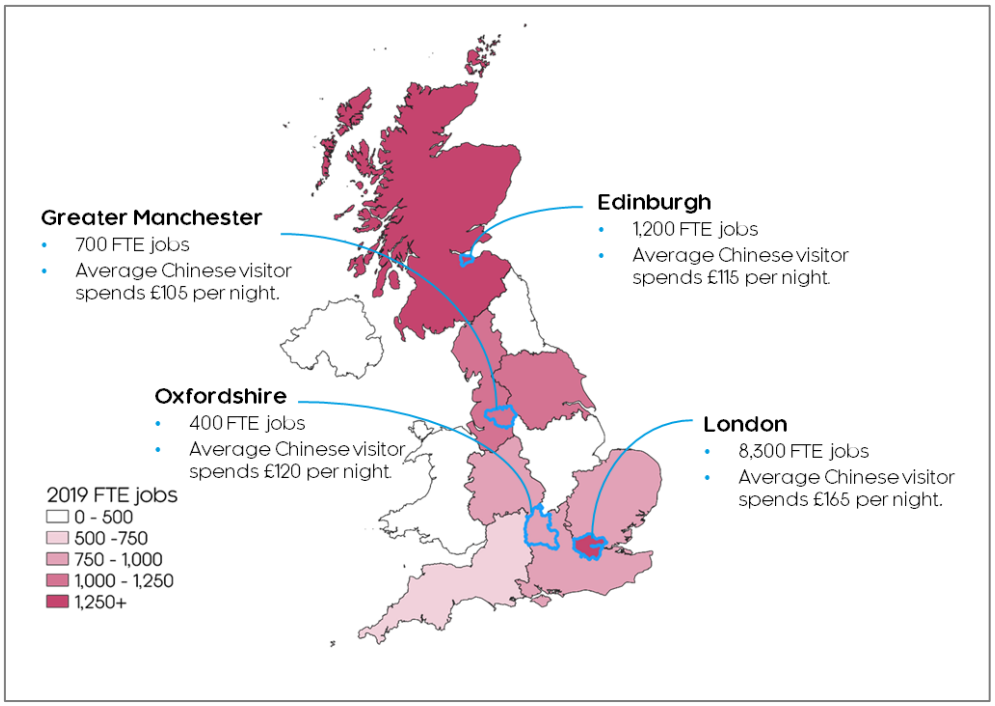
Figure 5.1: FTE jobs supported by Chinese tourism, by region



Note(s): The underlying sample sizes for Wales, Northern Ireland, East Midlands and North East are very small (less than 15) and have been omitted from the results. Annual visitor numbers and expenditure in certain regions fluctuate in the IPS.

Source(s): ONS (2020) International Passenger Survey Travelpac dataset; ONS (2017, 2018 and 2019a) Tourism Satellite Accounts; ONS (2019b) UK input-output analytical tables; Visit Britain (2020).

Figure 5.2: FTE jobs supported by Chinese tourism, by selected sub-regions



Note(s): The underlying sample sizes for Wales, Northern Ireland, East Midlands and North East are very small (less than 15) and have been omitted from the results. Annual visitor numbers and expenditure in certain regions fluctuate in the IPS. Estimates of visitor spend per night are based on the average annual spend per night over 2015-19.

Source(s): ONS (2020) International Passenger Survey Travelpac dataset; ONS (2019) Tourism Satellite Accounts; and Visit Britain (2020).

Scotland (more specifically, Edinburgh) also has a large number of jobs supported by Chinese tourists

After London, Chinese tourism supports the next-largest number of jobs in Scotland: 1,400 FTE jobs (8.5%). Most of these jobs (1,200) are in Edinburgh, where, over 2015-19, the average Chinese visitor is estimated to have spent £115 per night. This may include day trippers visiting areas outside of Edinburgh but staying in accommodation in Edinburgh. From our discussions with CBBC contacts, the importance of Edinburgh to Chinese tourism is recognised. Those discussions mentioned initiatives by, for example, Edinburgh Tourism Action Group to support local businesses to better cater for Chinese visitors.[13]

Conversations with CBBC contacts also suggested that long-haul visitors from places like China were unlikely to visit Scotland without also visiting other major tourist spots across the UK. As an example, in June 2018, a direct flight between Edinburgh and Beijing was established, but, owing to lower than expected passenger numbers, the service was temporarily suspended in autumn 2019. With the Covid-19 pandemic, it is not clear if this route will restart. Our analysis is not able to discern how this direct link to China affected the volume of Chinese tourism in Scotland (as tourists could enter Scotland direct from China, elsewhere in the UK or Europe), but lower-than-expected passenger numbers, despite a general upward trend in Chinese visitor numbers, may indicate that Chinese tourists often come to the UK and Europe to visit multiple destinations and not just a particular region or city, with implications for tourism in other parts of the country.

Elsewhere, other regions that have a large number of jobs supported by Chinese tourism include:

- the North West: 1,200 FTE jobs
  - of those jobs, 700 of those jobs are in Manchester, where the average Chinese visitor spends £105 per night;
- Yorkshire and The Humber: 1,000 FTE jobs; and
- the South East: 1,000 FTE jobs.

Oxfordshire is the most visited local area in the South East

In the South East, the most visited county by Chinese tourists is Oxfordshire, where there are an estimated 400 FTE jobs supported by Chinese tourists who stay overnight in Oxfordshire. The average Chinese visitor in Oxfordshire spends £120 per night. This does not include day trippers, who may spend additional money in the local economy, and which is not captured by the data. For example, Bicester village is a popular attraction for Chinese tourists in Oxfordshire, with many of them taking day trips to the area to buy luxury goods and designer clothing.

5.3 Other impacts from Chinese tourists

Chinese tourism encourages investment in real estate…

In our conversations with businesses, Chinese tourism has been identified as a recent driver of investment in property for accommodation and retail, especially in central London. For example, multimillion-pound renovations of central London hotels have been made, with Chinese tourists who are willing to spend on luxury goods and services in mind. Such activities may in turn support jobs in construction and associated sectors.

[13] https://www.etag.org.uk/china/

…and potentially further trade with China

Conversations with businesses also identified the potential positive effect Chinese tourists have on trade links with China. For example, Chinese tourists are becoming more familiar with Western products when they visit the UK. They may promote these products through word of mouth when they return to China, encouraging further UK exports.

5.4 Future outlook

Chinese tourism could be important to the post Covid-19 recovery

The future fate of Chinese tourism in the UK is uncertain. The Covid-19 pandemic will clearly have a significant short-term impact. But, in our conversations with businesses, it was suggested that there is a lot of pent-up demand for tourism in China. There is some hope that the previous period of rapid growth might thus resume after the pandemic. Chinese tourism could well be important to the future recovery of the UK tourism sector.

Chinese tourism could be spread more widely across the UK in the future

Businesses also noted that Chinese tourists had started to explore beyond the major tourism hubs identified in our estimates, of London, Edinburgh, Greater Manchester and Oxfordshire. For example, in one of our conversations with a hotel group, it was noted that Chinese tourists staying in London have grown rapidly over the past ten years. London has remained an increasingly popular destination for Chinese visitors, accounting for 56% of the nights spent by Chinese tourists in its hotels in 2019 (up from 53% in 2011). But other cities, such as Manchester, Birmingham, Edinburgh, Dublin, Reading, Liverpool, Glasgow, Oxford, Newcastle and Leicester have also seen similarly strong growth in Chinese visitors, together accounting for 23% of the nights spent by Chinese tourists in its hotels in 2019 (up from 17% in 2011). If this trend were to continue in the future, the jobs supported by Chinese tourism would be spread more widely across the UK. Outside of the major hubs, the UK tourism sector has seen relatively little of the rapid increase in Chinese tourists to date.

5.5 Limitations and uncertainties

Our estimates assume common expenditure patterns by all tourists

In our analysis, we assume that the pattern of expenditure by Chinese tourists across spending categories is identical to that of the average international visitor, and that this is also identical across regions and sub-regions (irrespective of what spending opportunities there are in these areas). In practice, Chinese tourists may have different spending patterns both relative to other tourists and across areas. Were Chinese tourists actually spending more in sectors with higher productivity (lower labour input per unit of output), the jobs estimates would be accordingly lower.

There is some potential for double counting with the students figures

The IPS dataset used in this chapter defines a tourist as someone who visits and stays in the country for less than a year. This includes Chinese students who come to the UK to study, but report that they have been in the UK for less than a year. This could create an issue of double counting when aggregating the jobs supported by tourism and students in higher education in Chapter 6.

Many of the students in the IPS will be participating in short-term education courses such as language courses or summer school programmes. Such tourists (from an IPS perspective) would not be counted in the estimates of jobs supported by students (in Chapter 6), which focus only on students in higher education. But there may be some students in higher education on one-year postgraduate courses who stay in the country for less than a year. As a

result, these students could be double counted in both the tourism and student jobs estimates. As we noted in Phase 1, the scale of this double counting is not fully known, but even strong assumptions about double counting do not alter the core conclusion of the UK-China relationship supporting over 100,000 UK jobs.

Sample sizes for Chinese tourists in regions and sub-regions can be small

In the VisitBritain data, when looking at regions, and especially sub-regions, the sample sizes of Chinese tourists can be very small. Some regions do not have large enough sample sizes to be interpreted robustly and have thus been excluded from the analysis. However, this does not mean that there are no jobs supported by Chinese tourists in those regions, but rather that it is not possible to produce robust estimates for those regions. Similarly, only a handful of sub-regions can be analysed to produce reliable results.

Expenditure in the IPS data is only associated with nights spent in an area, so excludes day trips

In the IPS, expenditure is recorded in the area where tourists spend the night. No information is recorded about where overnight visitors go for day trips. Therefore, our local area jobs estimates may be over- or underestimated depending on the number of day trippers who spend money in an area but do not spend a night there, and vice versa (visitors spending the night in an area who make day trips to other areas where they spend money). If an area has many overnight visitors who leave the area for the day, our jobs estimates may be overestimated. For example, London may be a base for many visitors, who make day trips to other nearby cities, such as Oxford and Cambridge.

6 Students

Summary

- Between 2014/15 and 2018/19, the number of Chinese students studying in the UK grew by 35%, from 90,000 to 120,000.
- Some universities have a large proportion of students from China:
  - at the Royal College of Art, 24% of students are from China, while at the University of Liverpool and the University of the Arts London the shares are 19% and 17%, respectively.
- Student numbers have increased rapidly at some universities, with the highest increase at University College London, where there were 3,800 more Chinese Students in 2018/19 compared to 2014/15.
- London has the most jobs supported by expenditure by Chinese students (3,600 FTE jobs).
- The North West and Yorkshire and The Humber also saw a large number of jobs supported by Chinese student expenditure: 2,000 FTE jobs each in 2018/19.
- Manchester, Birmingham and Coventry are the local authorities with the highest numbers of jobs (900 FTE jobs in each) supported by expenditure by Chinese students in 2018/19.

6.1 Introduction

In 2018/19, there were 120,000 Chinese students studying in higher education institutions in the UK. From our analysis in Phase 1, this supported 17,600 jobs through non-tuition expenditure alone. While tuition fees from Chinese students accounted for £2.1bn in 2018/19[14], it is difficult to estimate the jobs associated with Chinese tuition fees, because of the complications in developing jobs-to-output ratios for the education sector (the sector does not produce direct output in the same way as other sectors).

In this section, we estimate the number of jobs supported by the non-tuition expenditure of Chinese students at a regional and local authority level. Our findings show that London has the highest number of jobs supported by expenditure from Chinese students (3,600 FTE jobs), because it has the highest number of Chinese students. London is followed by the North West and Yorkshire and The Humber (both with 2,000 FTE jobs). At the local authority level, outside of London there are large numbers of jobs supported by expenditure by Chinese students in several cities in the North and the Midlands, such as Coventry, Birmingham, Manchester and Liverpool.

[14] CE calculation based on HESA data on tuition fees and education contracts by domicile (HESA, 2019b).

6.2 Trends in Chinese students

There has been a 35% increase in Chinese students in the UK

Between the 2014/15 and 2018/19 academic years, the number of Chinese students studying in the UK grew by almost 35%, from 90,000 to 120,000. From our conversations with universities, this recent growth in Chinese students was attributed to an increase in demand for high-quality education from China (particularly for places at high-ranked universities), along with a cheaper pound after the Brexit referendum. Some universities have also developed in-country teams who actively recruit Chinese students in China, further contributing to the considerable growth in Chinese students.

Many of the institutions with high proportions of Chinese students are in London

Out of the ten institutions with the largest *shares* of Chinese students, five are in London. In 2018/19, the Royal College of Art in London had the highest proportion of Chinese students (24%), although this represented a relatively small number of students (600). The University of Liverpool had the second highest share of Chinese students (19%), followed by the University of the Arts London (17%). The other universities in the top ten by share of Chinese students are all large Russell Group universities, with shares ranging from 12% to 16%.

University College London had the highest *number* of Chinese students in the UK, with 6,200 Chinese students making up 15% of all students enrolled at the university.

Some institutions have seen a substantial increase in Chinese students in the past five years

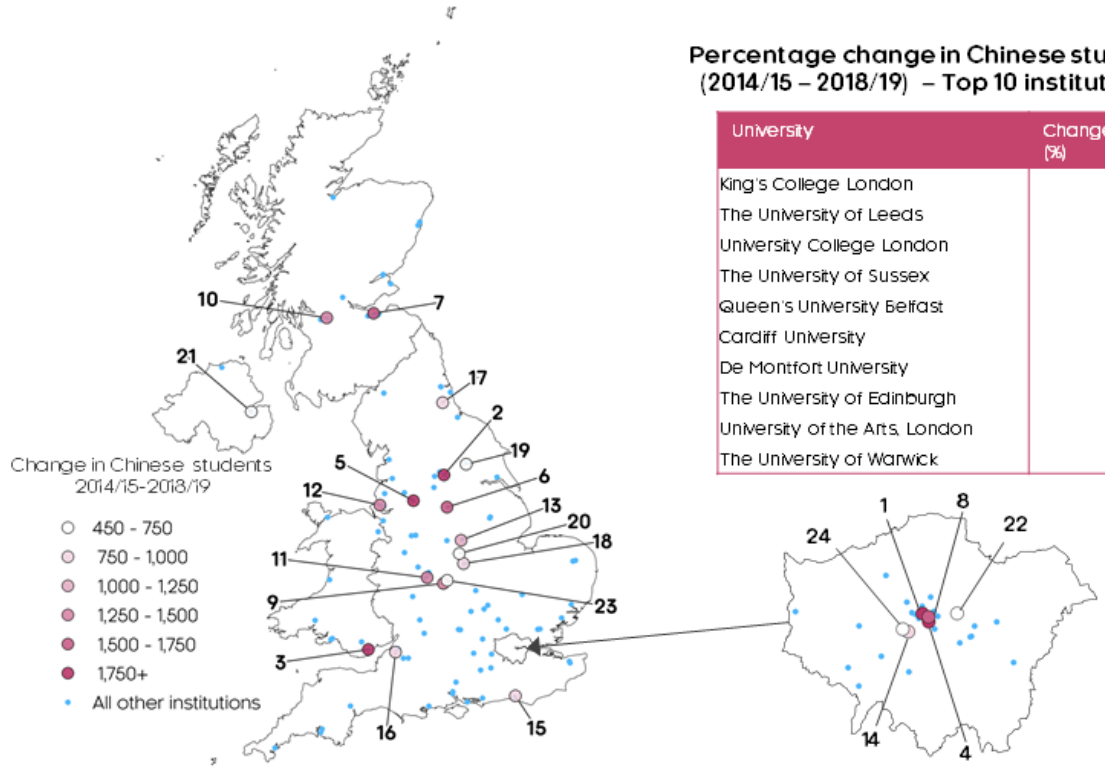
Some institutions have seen very rapid growth in Chinese students in recent years. Figure 6.1 ranks higher education institutions based on the absolute and percentage change in enrolled Chinese students. University College London recorded, by far, the largest increase in Chinese students, with 3,800 more Chinese students enrolled in the 2018/19 academic year compared with 2014/15. In relative terms, this amounts to a 153% increase in Chinese students.

Other institutions that have also recorded considerable increases, of more than 2,000 students, include: the University of Leeds, Cardiff University and King's College London. In percentage terms, the increase in Chinese students at King's College London is 244%, which is the highest of all institutions across the UK with at least 500 Chinese students. The University of Sussex and Queens' University Belfast both saw large percentage increases in the number of Chinese students, of over 100%, despite not appearing among the top institutions in terms of an increase in the absolute numbers of Chinese students. This highlights the growing importance of Chinese students to some institutions over the last five academic years.

Figure 6.1: Changes in Chinese students by institution

Absolute change in Chinese students (2014/15 – 2018/19) – Top 10 institutions

University	Change (students)
University College London	3,775
University of Leeds	2,430
Cardiff University	2,040
King's College London	2,040
The University of Manchester	1,870
University of Sheffield	1,745
University of Edinburgh	1,570
University of the Arts, London	1,535
University of Warwick	1,435
University of Glasgow	1,420



Percentage change in Chinese students (2014/15 – 2018/19) – Top 10 institutions*

University	Change (%)
King's College London	244%
The University of Leeds	176%
University College London	153%
The University of Sussex	118%
Queen's University Belfast	105%
Cardiff University	96%
De Montfort University	91%
The University of Edinburgh	89%
University of the Arts, London	88%
The University of Warwick	85%

1	University College London	7	The University of Edinburgh	13	University of Nottingham	19	The University of York
2	The University of Leeds	8	University of the Arts, London	14	Imperial College	20	Loughborough University
3	Cardiff University	9	The University of Warwick	15	The University of Sussex	21	Queen's University Belfast
4	King's College London	10	The University of Glasgow	16	The University of Bristol	22	Queen Mary University of London
5	The University of Manchester	11	The University of Birmingham	17	University of Durham	23	Coventry University
6	The University of Sheffield	12	The University of Liverpool	18	De Montfort University	24	Royal College of Art

Note(s): The key ranks institutions by change in the number of Chinese students in 2018/19
* Only institutions with more than 500 students in 2014/15 are ranked in table for percentage change.
Source(s): HESA (2019a

6.3 Jobs supported by Chinese students

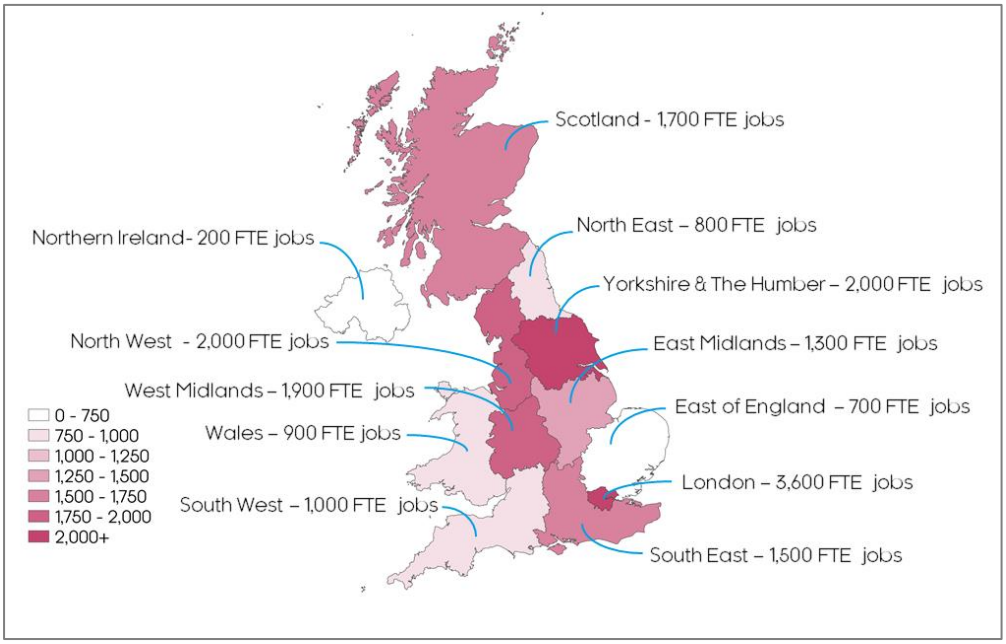
We have estimated the number of jobs supported by expenditure by Chinese students studying at higher education institutions using data from the UK Higher Education Statistics Agency (HESA). Specifically, we use data on the number of Chinese students by higher education institution, and data from the English Student Income and Expenditure Survey for 2014 to 2015[15]. To estimate the jobs supported by expenditure by Chinese students by regions and local authorities, each institution is allocated to a local authority and region based on its registered address.

The region with the most jobs supported by Chinese students is London, followed by Yorkshire and The Humber, and the North West

Figure 6.2 shows the number of FTE jobs supported by expenditure by Chinese students in each region in the 2018/19 academic year. London had the largest number of jobs supported by Chinese students in 2018/19 (3,600 jobs). In total there were 24,300 Chinese students in London enrolled across 35 institutions. Half of the 3,600 jobs are associated with Chinese students studying at University College London; the University of the Arts, London; and King's College London.

Elsewhere, there are 2,000 jobs supported by expenditure by Chinese students in both Yorkshire and The Humber and the North West, with 1,900 jobs supported in the West Midlands. In the North West, over 75% of the jobs supported by expenditure from Chinese students are associated with Chinese students at the University of Manchester and the University of Liverpool.

Figure 6.2: FTE jobs supported by Chinese students, by region



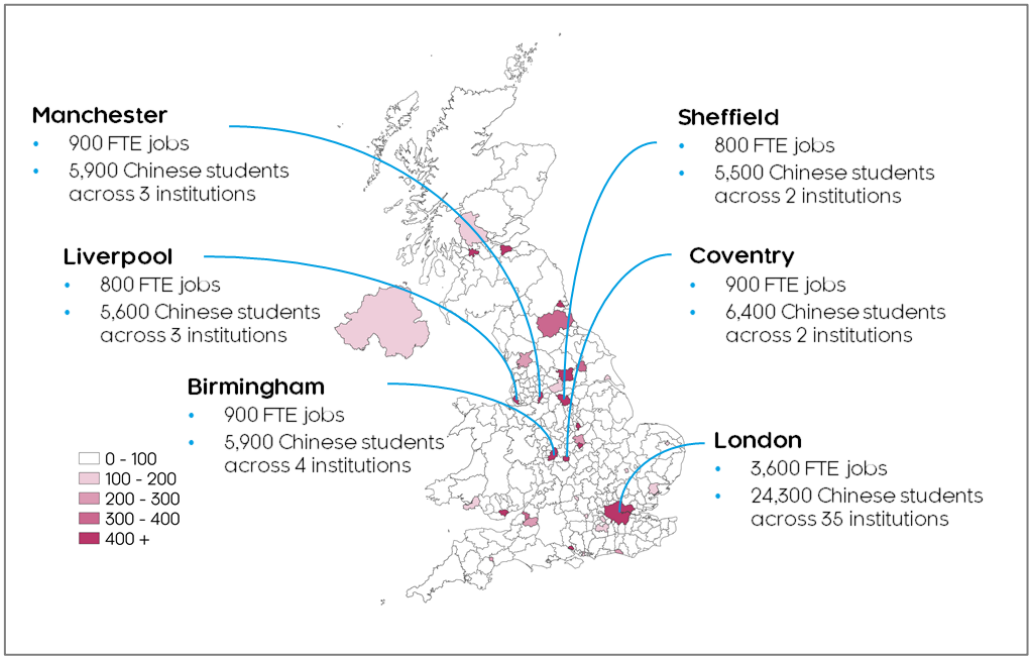
Source(s): HESA (2019a), Department for Education Student Income and Expenditure Survey 2014 to 2015 (March 2018).

[15] Published in March 2018.

Outside of London, by local authority, the number of jobs supported by Chinese students is highest in Coventry

Figure 6.3 shows the number of FTE jobs supported by expenditure by Chinese students by local authority in 2018/19[16]. Outside London, the local authority with the highest number of jobs supported by expenditure from Chinese students is Coventry, with an estimated 900 FTE jobs supported in the area. These jobs are associated with Chinese students at the Universities of Warwick and Coventry, which together, had 6,400 Chinese students enrolled in 2018/19. Both universities have seen a notable increase in Chinese students over 2014/15 – 2018/19, with the number of Chinese students increasing by 1,400 (85%) at the University of Warwick and by 500 students (19%) at Coventry University.

Figure 6.3: FTE jobs supported by Chinese students, by local authority



Note(s): Jobs figures are not allocated to local authorities in London and Northern Ireland. Jobs are allocated to a local authority based on the location of the registered addresses of higher education institutions.

Source(s): HESA (2019a), Department for Education Student Income and Expenditure Survey 2014 to 2015 (March 2018).

Other major cities in the Midlands and the North also have high numbers of jobs supported by Chinese students

Elsewhere, Birmingham and Manchester are both estimated to have 900 FTE jobs supported by expenditure by Chinese students. In these local authorities, the jobs figures are attributed mainly to students at one university in each area: the University of Birmingham and the University of Manchester, respectively.

In most areas outside London, apart from Coventry, Chinese students are concentrated in one dominant institution. A notable exception is Leicester. Here, the University of Leicester and De Montfort University both have a considerable number of Chinese students: about 1,600 students each. But in 2014/15 the University of Leicester had almost three times the number of Chinese students compared with De Montfort University. While there was a large increase in the number of Chinese students in De Montfort University over 2014/15 – 2018/19 (an increase of 800 students), the University of Leicester saw a large *decrease* of about 1,000 Chinese students over the

[16] We have not allocated jobs in London to local authorities, because it is likely that students who study in a borough will often live and spend money in other boroughs within London.

same period. This resulted in the total number of jobs supported by expenditure by Chinese students in Leicester remaining broadly unchanged.

Chinese students may also contribute to the UK economy after they graduate

Our estimates only consider the jobs supported by expenditure by Chinese students during their studies. There could be additional economic benefits to the UK economy after the students complete their courses. For example, some Chinese students may choose to stay in the UK for employment once they graduate. According to data gathered for the International Graduate Outcomes (IGO) study, 14% of Chinese graduates reside in the UK after their studies[17][18]. Although this is a relatively low proportion compared to other countries, the large number of Chinese students who study in the UK means that this still represents a considerable number of graduates. Furthermore, Chinese graduates who return to China may generate benefits by creating new business links. According to the IGO study, 78% of Chinese students say they are more likely to do business or form professional relationships with the UK because of their study experience.

6.4 Future outlook

Medium-term impacts of the Covid-19 pandemic are already emerging

While the importance of the Chinese market to universities is clear, there are obstacles that may inhibit the future growth of Chinese students in the UK. One of the potential obstacles over the next few years is the impact of the Covid-19 pandemic. It is not clear yet how much this will affect the number of Chinese students who enrol in UK institutions over the coming years but, from our discussions with Coventry University, it is expected that the number of Chinese students enrolling this academic year (2020/21) is 60% less than the previous year. The university anticipates that it will take 2-5 years for the numbers of Chinese students to recover to the levels seen in 2019/20. Other universities we have talked to have also suggested that the number of Chinese students that have been recruited for a 2022 start is already down from what they would normally expect, as students now prefer to study closer to home.

Growing diplomatic tensions could also be a concern

Growing diplomatic tensions between China and the UK have also been highlighted as a potential issue that could impact universities in the future. Historically, UK universities have competed for Chinese students with countries like the US and Australia. In relative terms, links between China and the UK are perhaps not as strained as they are with these other two countries. This may prove beneficial for UK universities in the short term. However, universities we talked to highlighted that, despite diversifying their international student base, if the number of Chinese students were to fall substantially in the future, it is unlikely that they would be easily replaced by students from other countries, owing to the large numbers of Chinese students at their universities.

[17] Universities UK (2020) 'International Graduate Outcomes 2019'
https://www.universitiesuk.ac.uk/International/Documents/international_graduate_outcomes.pdf

[18] This is based on a sample of students who graduated between January 2011 and January 2016, who were surveyed in Autumn 2018.

6.5 Limitations and uncertainties

The jobs estimates focus solely on UK higher education and exclude income from tuition fees

The estimates of jobs supported by Chinese student expenditure do not include tuition fees paid by Chinese students. It is difficult to estimate the jobs associated with Chinese tuition fees, because of the complications in developing jobs-to-output ratios for the education sector (the sector does not produce direct output in the same way as other sectors). Students who attend institutions outside of higher education, such as those in private schooling, are also not included. As a result, not all student expenditure will be reflected in the jobs estimates. Job estimates for all Chinese students would be higher. Owing to the uncertainty of how many jobs are supported by Chinese student tuition fees, we prefer to present the more conservative estimate of jobs supported by Chinese student expenditure in this chapter.

Potential for double counting with the tourism figures

As mentioned in Section 5.5, there is a potential issue of double counting with tourism for students on a one-year postgraduate course who stay in the country for less than a year. As mentioned previously, even strong assumptions about double counting are unlikely to affect the underlying conclusions about numbers of jobs supported.

Jobs estimates assume Chinese students live and spend money in the local authority where their institution is based

The job estimates by local authority may not accurately reflect the number of jobs supported in the local authority in all cases, as we assume Chinese students live and spend money in the local authority where their institution is based. In fact, Chinese students may live and spend money outside the local authority area in which their university is registered. For example, the University of Warwick is on the edge of Coventry, and many students live in neighbouring towns outside Coventry. In light of this, the job figures can be thought of as representing jobs within the local authority and its surrounding area.

Institutions with more than one campus are assumed to be in the same local authority

We map each higher education institution to one local authority. Some institutions have multiple campuses spread across different local authorities. In these situations, there are no data on which campus students attend that can be used to better allocate students at institutions to more than one local authority. However, it appears to be the case that institutions with considerable numbers of Chinese students do not have multiple campuses, so the impact of this issue on our findings should be limited.

Given the above, we recommend that jobs figures are best interpreted at a regional level or, alternatively, at the level of higher education institutions.

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Appendices

Appendix A Approach

This appendix sets out the methods by which we estimate subnational breakdowns of UK jobs supported by each of:

1 Trade: UK exports of goods to China (in this phase of the work we do not consider subnational jobs in services supported by trade with China)

2 Tourism: Expenditure of Chinese tourists in the UK

3 Students: Expenditure by Chinese students registered at UK higher education providers

In all cases, our approach has been to disaggregate our jobs estimates from Phase 1. Further detail on these methods is set out in the sections that follow. See the Phase 1 report for the methods applied to estimate the initial UK-level figures.

As with the Phase 1 analysis, our focus is on:

Jobs supported

- *jobs supported*, to refer to the jobs associated with a particular amount of economic activity
  - these jobs can (and do) vary from year to year because of changing demands for UK output
  - while not necessarily specific to the UK-China relationship, we take these jobs as being relevant because they support UK production to meet Chinese demand
  - we take production as a signal of the degree to which jobs are oriented to meeting Chinese demand even if those jobs could, in principle, meet demand from other countries were expenditure patterns to change

Full-time equivalent basis

- jobs on a *full-time equivalent* (FTE) basis, counting:
  - one full-time or self-employed job as one FTE
  - a part-time job as a fraction of an FTE according to hours worked relative to a full-time worker: this differs by industry and has been calculated using data from the UK Annual Survey of Hours and Earnings

A.1 Trade (in goods only)

Our regional jobs estimates concern trade in goods only. There are no readily available data with which to carry out a similar exercise for services.

Data

Estimates of regional jobs supported by UK exports of goods to China combine our UK-level analysis from Phase 1 with Regional Trade Statistics (RTS) from HMRC.

HMRC publishes detailed quarterly data on trade in goods from 2013 onwards, by: region, product, and partner country (import origin / export destination).[19] These statistics include all merchandisable trade within the scope of HMRC's Overseas Trade Statistics (OTS), with the exception of trade in non-monetary gold. Exports are reported at their 'statistical value', referring to their value at the border of the UK, including all costs for transportation and

[19] https://www.uktradeinfo.com/Statistics/RTS/Pages/RTS-Downloads.aspx

insurance. Exports are grouped into nine broad product categories and various subcategories, as defined by the Standard International Trade Classification (SITC) Revision 4.

Export flows are allocated to 12 UK regions based on businesses' employee numbers in those regions.[20] Where a business has branches in more than one region, its trade is allocated proportionally to each region based on the proportion of employees in those regions.

Not all exports can be allocated to a specific region, which concerns (as listed by HMRC):

- trade going into or out of the Channel Islands or the Isle of Man
- trade carried out by the UK Government
- trade carried out by overseas based traders who have a VAT presence in the UK
- parcel post trade that is dealt with centrally
- trade where business details submitted are invalid
- unregistered businesses
- private individuals
- low value trade

Along with some rounding of figures and the fact that HMRC data are only one source of information for the final ONS trade statistics (as used in Phase 1), the above mean that the RTS totals for trade across industries and across regions do not match the totals for the value of goods reported in the UK trade figures from Phase 1, or even HMRC's own publications that summarise regional total exports to China (see, for example, the 2018 publication).

Method

The number of jobs supported by UK goods exports to China by region and sector are estimated as follows:

1 Sum each year's quarterly export flows from the RTS to produce annual trade figures (by value) for 2013-19.

2 Map the SITC products in the RTS to CE's 45-sector industry classification (which is based on SIC 2007 codes) based on the product descriptions in the respective manuals.

3 Apply the regional export shares from [2] (for each sector) to the FTE jobs figures (also by sector) from Phase 1.

Given the available data, the approach yields relatively aggregate jobs numbers e.g. jobs in Electronics in the South East. As a complement to this analysis, CBBC arranged calls with various contacts to improve our understanding of businesses' experiences of trade with China, what has driven that trade in recent years and prospects for the future. Elements of those conversations are presented in the main body of this report.

[20] These regions are the nine former government office regions of England; and Wales, Scotland and Northern Ireland.

Limitations

The limitations of the above method follow from the data i.e. the features of the RTS data that underpin our analysis:

1 The RTS excludes trade in services and intangibles, such that this method can only disaggregate jobs related to UK exports of goods (not services).

2 Not all figures in the RTS data are allocated to a region: in 2019, around 5% of the total trade was unallocated. There are various reasons why this trade is left unallocated (see above, under 'Data'), many of which imply an accompanying set of jobs figures. However, with no way of reallocating these trade figures ourselves, and because at least some of the reasons imply few (or no) jobs, we have opted not to regionalise the unallocated trade. The resulting figures in Chapter 4 of the report will thus tend to under-estimate regional employment.

3 To match export flows from businesses to regions, trade is allocated to a region based on the business's employment in each region. Where a business has branches in more than one region, its trade is allocated proportionally to each region based on the proportion of its employees in that region. Consequently, the export flow values do not necessarily reflect the value of goods that actually transit from a UK region to China but, equally, the true value of those products is not necessarily a reflection of the regional jobs involved. For example, if a company's headquarters are in one region, there may be fewer jobs reliant on this trade than is implied by our figures (the jobs may actually be in another region). In this way, this method of apportionment also does not allow us to identify a possible branch in a particular region that is responsible for meeting export demand in China. The validity of the assumption that export flows by region are proportional to regional employment depends on the extent to which operations across the entire country are needed to service Chinese export demand (e.g. administrative operations in one region versus production in another) and it is assumed that each job's contribution to trade is equal.

4 The quality of the RTS derives from the accuracy and completeness of HMRC's Overseas Trade Statistics (OTS). In turn, these OTS data feed into the ONS's final trade statistics as just one of many pieces of information. Consequently, the RTS figures are not entirely consistent with, or as complete as, the published ONS data. This introduces the potential for discrepancy at a regional level but, with no comparable regional ONS data, the implications of this cannot be established. In any case, it is not clear how an alternative method would do better with the available data.

5 The disaggregation exercise involves mapping HMRC data, defined by *product* (by the Standard International Trade Classification [SITC]), to our existing employment data, defined by *industry* (by the UK Standard Industrial Classification [SIC]). The correspondence between these classifications is imperfect with some SITC products, for example, covering multiple SIC industries. This leads to some ambiguities as to how best to allocate the products (because we do not know precisely which products are being exported). This introduces the potential for discrepancies but, in most cases, we find that the implied value by product, once mapped to industries, is reasonably close to the trade values from Phase 1. As a source of (additional) uncertainty, this further underlines our preference for carefully assessing the results to produce a best estimate, with ranges as appropriate.

A.2 Tourism

Our estimates of UK jobs dependent on Chinese tourism, disaggregated by regions and selected sub-regions, make use of:

1 the published ONS International Passenger Survey (IPS) Travelpac dataset, which provides data on the number of visits, nights spent and expenditure by Chinese tourists visiting the UK

2 the ONS Tourism Satellite Account (TSA), published for the years 2013, 2015, 2016 and 2017, which produces estimates for the total number of FTE jobs supported by all tourism in the UK (specifically, Table 7 of the TSA)

3 VisitBritain statistics derived from the IPS, containing a regional and sub-regional breakdown of nights spent and expenditure in areas of the UK

There are no data in the IPS Travelpac dataset at a regional or sub-regional level, but there are such data from VisitBritain. However, although the VisitBritain data is based on the IPS, the figures do not precisely match the aggregate IPS results published by ONS. As a result, we have used the regional and sub-regional proportions from the VisitBritain data to apportion our national level job estimates to regions and sub-regions, to ensure our results are consistent with the findings produced for the UK in Phase 1.

The national-level jobs estimates are not available specifically for Chinese tourism in the UK, and so are constructed in the following two-stage process:

1 Jobs supported by international tourism (as distinct from domestic tourism by UK residents) are first estimated by applying international tourism expenditure as a share of total tourism expenditure in the UK (calculated from Table 4 of the TSA) to jobs supported by all UK tourism.

2 Jobs supported specifically by Chinese tourism are then estimated by applying Chinese tourism expenditure as a share of international tourism expenditure (from the IPS) to jobs supported by international tourism from Step 1 above.

In years for which there are no data from the TSA, jobs figures are estimated using Chinese expenditure data from the IPS and the implied productivity ratios from the TSA's figures for jobs and expenditure, from an adjacent year. Specifically, figures for 2018 and 2019 are estimated using 2017 productivity ratios; figures for 2012 and earlier use 2013 productivity ratios; and figures for 2014 use 2013 productivity ratios.

The national level jobs estimates from Phase 1 are apportioned to regions and sub-regions based on the share of total Chinese expenditure within an area, based on the VisitBritain data.

A.3 Students

The estimates of UK jobs supported by Chinese students makes use of the following data sources:

- Data from the UK Higher Education Statistics Agency (HESA); specifically, 'Non-UK HE students by HE provider and country of domicile', which provides figures for the numbers of enrolled students by country of domicile, level of study (postgraduate or undergraduate) and mode of study (full-time or part-time). This is an administrative dataset of the number of students enrolled at higher education institutions in the UK at

the start of each academic year, covering the years from 2014/15 to 2018/19.

- The Department for Education's 'Student Income and Expenditure Survey 2014 to 2015 (March 2018)', which records the expenditure of a sample of UK domiciled students and provides a breakdown of expenditure by product category.

To estimate the number of jobs supported by expenditure from Chinese students by region and local authority, we first estimate the number of jobs supported by Chinese student expenditure for each higher education institution in the following steps:

1 Weekly expenditure is estimated using the breakdown of total expenditure by product category from the Student Income and Expenditure Survey 2014 to 2015 by mode of study (full-time or part-time).

2 The annual expenditure by product category for postgraduate and undergraduate students is calculated across both modes of study. It is assumed that non-EU undergraduate and postgraduate students spend 42 weeks and 52 weeks in the UK, respectively.

3 The number of Chinese students by level of study and mode of study at each institution from HESA is used to calculate total Chinese student expenditure (excluding tuition fees) associated with the institution.

4 This is then adjusted to reflect that some expenditure by part-time students will be funded through earnings from part-time employment in the UK. We assume that half of all part-time students will work for 20 hours a week and earn the minimum wage.

5 GDP deflators from HM Treasury are applied to convert prices from 2014/15 prices to 2019 prices.

6 The jobs associated with Chinese student expenditure associated with each institution are calculated using productivity assumptions by sector from the ONS 2015 detailed UK input-output analytical tables.

The expenditure figures cover all expenditure on goods and services, apart from tuition fees. The Student Income and Expenditure Survey 2014 to 2015 provides a detailed breakdown of student expenditure by many product categories across four main groups:

- living costs
- housing costs
- participation costs
- spend on children

The sample in the Student Income and Expenditure Survey 2014 to 2015 only includes UK domiciled students. As a result, our estimates assume that Chinese students have identical spending patterns to UK-domiciled students.

To estimate jobs supported by expenditure from Chinese students by local authority, each institution is mapped to a local authority based on the registered address of the institution according to HESA. This mapping process does not account for students that may have lived and spent money in neighbouring local authorities to where their institution is based, or whether an institution has multiple campuses across different local authorities.

Appendix B Results tables

B.1 Trade

Appendix Table B.1: FTE jobs supported by goods exports to China, by region

Region	Value of goods exports (£2019bn)	Jobs supported ('000 FTEs)	Total UK jobs in goods-producing sectors by region ('000 FTEs)	Share of jobs supported in goods-producing sectors (%)	Total UK jobs by region ('000 FTEs)	Share of total jobs (%)
Scotland	4.9	5-7	472	1.0-1.5%	2,407	0.2-0.3%
South East	2.0	5-7	716	0.7-1.0%	4,259	0.1-0.2%
West Midlands	2.4	6	584	1.0%	2,560	0.2%
North West	1.7	4-5	649	0.6-0.7%	3,282	0.1-0.2%
London	1.4	4-5	472	0.9-1.0%	5,263	0.1%
East Midlands	0.8	3-4	480	0.6-0.8%	2,082	0.1-0.2%
East of England	1.9	3-4	524	0.6-0.8%	2,736	0.1-0.2%
South West	0.7	2-3	520	0.4-0.6%	2,557	0.1%
Yorkshire and The Humber	0.9	2	485	0.4%	2,345	0.1%
Wales	0.4	1.5	310	0.5%	1,280	0.1%
North East	0.4	1	203	0.5%	1,040	0.1%
Northern Ireland	0.2	1	184	0.5%	775	0.1%
TOTAL	**18.7**	**37.5–46.5**	**5,600**	**0.7-0.8%**	**30,586**	**0.1-0.2%**

Note(s): Figures for FTE jobs supported by trade with China exclude trade that could not be allocated to regions.
Percentage of total regional FTE refers to regional FTE in goods-producing sectors only.

Source(s): CE analysis of: HMRC Regional Trade Statistics; CE regional employment database; UK Annual Survey of Hours and Earnings; OECD data; and CE estimates of jobs supported from Phase 1.

Appendix Table B.2: Assessed regional jobs figures ('000 FTEs)

	South East	Scotland	West Midlands	North West	London	East Midlands	East of England	South West	Yorkshire and The Humber	Wales	North East	Northern Ireland	TOTAL
Mining & quarrying	-	3.5-4.0	0.1	-	0.6-0.8	-	-	-	0.3	-	-	0.2	**4.7-5.4**
Food, drink & tobacco	0.2	0.3-0.4	-	0.2	0.2-0.3	-	0.2-0.3	-	0.1	-	-	-	**1.2-1.5**
Textiles etc.	-	-	-	0.1	-	-	-	-	0.4	-	-	-	**0.5**
Chemicals	0.2-0.3	-	-	0.3	-	-	0.1-0.2	-	-	-	-	-	**0.6-0.8**
Pharmaceuticals	0.2	-	-	0.3-0.4	-	-	0.9-1.1	-	-	-	-	-	**1.4-1.7**
Non-metallic mineral products	0.1-0.2	0.1	0.2-0.3	0.3	0.2	0.1	0.1-0.2	0.1	0.2-0.3	--	0.1-0.2	-	**1.5-2.0**
Metals & metal products	0.2	0.2-0.3	0.5-0.6	0.4-0.5	0.6-0.8	0.2-0.3	0.3-0.5	0.1-0.2	0.2-0.3	0.2	0.2-0.3	-	**3.1-4.2**
Electronics	1.0	0.2-0.3	0.6-0.8	0.4-0.5	0.4-0.5	0.3-0.4	0.7-0.8	0.3-0.4	0.1-0.2	0.1-0.2	-	0.2	**4.3-5.3**
Electrical equipment	0.6-0.8	-	0.5-0.6	0.2-0.3	-	0.6-0.7	0.1-0.2	0.1-0.2	-	-	-	-	**2.1-2.8**
Machinery	0.6	0.4-0.6	0.5	0.3-0.4	0.2	0.5-0.7	0.4-0.5	0.7	0.3-0.4	0.3-0.4	0.3	-	**4.5-5.3**
Motor vehicles	1.0	0.2	2.5-3.5	0.9	-	-	-	-	-	-	-	-	**4.6-5.6**
Other transport equipment	0.6-1.0	0.3-0.4	0.2-0.3	-	0.1-0.2	-	-	0.6-0.7	-	0.4-0.5	-	0.4-0.5	**2.6-3.6**
Other manufacturing & repair	0.2	-	-	-	0.4-0.6	-	0.1	-	-	-	-	-	**0.5-0.9**
Water, sewerage & waste	0.3-0.4	-	0.2	0.2-0.3	-	1.0	0.3-0.4	-	-	-	-	-	**2.0-2.3**
TOTAL	**5.0-7.0**	**5.0-7.0**	**6.0**	**4.0-5.0**	**4.0-5.0**	**3.0-4.0**	**3.0-4.0**	**2.0-3.0**	**2.0**	**1.5**	**1.0**	**1.0**	**37.5-46.5**

Note(s): '-' denotes estimated jobs numbers that are less than 100.
Sums of individual rows and columns do not match reported totals due to: rounding, small numbers not being reported and, in the case of regional totals, the exclusion of small industries.
Reported totals only concern jobs that could be allocated to a region. See Chapter 4 for sector breakdowns at a UK level.
Source(s): CE analysis of HMRC Regional Trade Statistics; CE regional employment database; OECD data; and CE estimates of jobs supported from Phase 1.

B.2 Tourism

Appendix Table B.3: Nights spent and expenditure by Chinese tourists by region in 2018/19

	Nights ('000s)	Expenditure (£2019m)
East Midlands	165	25
East of England	663	99
London	5,494	969
North East	560	97
North West	1,146	135
Northern Ireland	53	3
Scotland	2,203	159
South East	1,593	115
South West	277	67
Wales	704	21
West Midlands	1,275	91
Yorkshire and The Humber	1,352	118

Source(s): ONS (2020) International Passenger Survey Travelpac dataset and Visit Britain (2020).

Appendix Table B.4: FTE jobs supported by Chinese tourists, by region ('000s)

	2009	2014	2019
East Midlands	-	-	-
East of England	0.4	0.4	0.8
London	1.9	3.9	8.3
North East	-	-	-
North West	0.2	1.7	1.2
Northern Ireland	-	-	-
Scotland	0.2	1.5	1.4
South East	0.5	2.9	1.0
South West	0.1	1.1	0.6
Wales	-	-	-
West Midlands	0.1	0.3	0.8
Yorkshire and The Humber	0.2	0.3	1.0

Note(s): The underlying sample size for Wales, Northern Ireland, East Midlands and North East are very small (less than 15) and have been omitted from the results. Visitor numbers and expenditure in certain regions can fluctuate year-on-year in the IPS.

Source(s): ONS (2020) International Passenger Survey Travelpac dataset; ONS (2019) Tourism Satellite Accounts; and Visit Britain (2020).

B.3 Students

Appendix Table B.5: Top 15 higher education institutions ranked by share of Chinese students

	Share of Chinese students as a percentage of all students (%)	Number of Chinese students
Royal College of Art	24%	570
The University of Liverpool	19%	5,545
University of the Arts, London	17%	3,285
The University of Sheffield	16%	4,840
University College London	15%	6,240
Imperial College of Science, Technology and Medicine	14%	2,765
The University of Manchester	14%	5,605
Cardiff University	13%	4,155
London School of Economics and Political Science	12%	1,465
The University of Warwick	12%	3,130
The University of Southampton	12%	2,710
The University of Birmingham	12%	4,215
University of Durham	12%	2,235
The University of Leeds	11%	3,810
Glasgow School of Art	10%	240

Source(s): HESA (2020)

Appendix Table B.6: FTE jobs supported by Chinese students by region ('000s)

	2014/15	2015/16	2016/17	2017/18	2018/19
East Midlands	1.1	1.0	1.0	1.2	1.3
East of England	0.7	0.6	0.6	0.6	0.7
London	2.0	2.2	2.4	3.0	3.6
North East	0.9	0.8	0.7	0.8	0.8
North West	1.6	1.6	1.7	1.8	2.0
Northern Ireland	0.1	0.1	0.1	0.2	0.2
Scotland	1.1	1.2	1.3	1.4	1.7
South East	1.2	1.4	1.4	1.5	1.5
South West	0.8	0.8	0.8	0.9	1.0
Wales	0.7	0.7	0.8	0.9	0.9
West Midlands	1.4	1.5	1.6	1.7	1.9
Yorkshire and The Humber	1.5	1.4	1.4	1.6	2.0

Note(s): Years refer to academic years.
Source(s): HESA (2020), Department for Education Student Income and Expenditure Survey 2014 to 2015 (March 2018).

Appendix Table B.7: FTE jobs supported by Chinese students, by local authority district ('000s)

	2014/15	2015/16	2016/17	2017/18	2018/19
London	2.0	2.2	2.4	3.0	3.6
Coventry	0.7	0.7	0.8	0.9	0.9
Birmingham	0.7	0.6	0.7	0.8	0.9
Manchester	0.6	0.7	0.7	0.8	0.9
Sheffield	0.7	0.7	0.6	0.7	0.8
Liverpool	0.6	0.6	0.6	0.7	0.8
Cardiff	0.4	0.5	0.6	0.6	0.7
Glasgow	0.4	0.4	0.5	0.6	0.7
Edinburgh	0.4	0.4	0.5	0.5	0.6
Leeds	0.2	0.3	0.4	0.4	0.6
Nottingham	0.3	0.3	0.3	0.4	0.5
Leicester	0.5	0.3	0.4	0.5	0.5
Southampton	0.4	0.4	0.4	0.4	0.4
Newcastle upon Tyne	0.4	0.4	0.4	0.4	0.4
Bristol	0.2	0.2	0.3	0.3	0.4
County Durham	0.2	0.2	0.2	0.3	0.3
York	0.3	0.2	0.2	0.3	0.3
Brighton and Hove	0.1	0.2	0.3	0.3	0.3
Charnwood	0.1	0.2	0.2	0.2	0.2
Bath and North East Somerset	0.2	0.2	0.2	0.2	0.2
Lancaster	0.2	0.2	0.2	0.2	0.2
Exeter	0.2	0.2	0.2	0.2	0.2
Norwich	0.2	0.2	0.2	0.2	0.2
Northern Ireland	0.1	0.1	0.1	0.2	0.2
Oxford	0.1	0.2	0.2	0.2	0.2
Cambridge	0.1	0.1	0.1	0.1	0.2
Reading	0.1	0.1	0.1	0.2	0.2
Portsmouth	0.1	0.1	0.1	0.1	0.1
Colchester	0.1	0.1	0.1	0.1	0.1
Kirklees	0.1	0.1	0.1	0.1	0.1
Guildford	0.1	0.1	0.1	0.1	0.1
Swansea	0.1	0.1	0.1	0.1	0.1
Runnymede	0.1	0.1	0.1	0.1	0.1
Stirling	0.1	0.1	0.1	0.1	0.1
Kingston upon Hull	0.2	0.1	0.1	0.1	0.1

Note(s): Years refer to academic years.
Jobs figures are not allocated to local authorities in London.
Source(s): HESA (2020), Department for Education Student Income and Expenditure Survey 2014 to 2015 (March 2018).