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The productivity gap across the channel: unpacking the sectoral drivers behind the France–UK productivity divide

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About this policy paper

This policy paper is part of a series examining the contribution of sectors to national economic performance across different contexts. It details a sectoral analysis that explores the productivity differences between France and the UK, focusing on how variations in productivity levels and sector sizes contribute to the overall productivity gap between the two countries. Despite their similar economic structures, for the past 15 years France has seen consistently higher productivity levels than the UK. In this paper we seek to understand this phenomenon using an original methodology to identify the sectoral drivers of productivity differences.

Author

Dr Mateus Labrunie

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About us

Cambridge Industrial Innovation Policy (CIIP) is a global, not-for-profit policy group based at the Institute for Manufacturing (IfM), University of Cambridge. CIIP works with governments and global organisations to promote industrial competitiveness and technological innovation. We offer new evidence, insights and tools based on the latest academic thinking and international best practices. CIIP operates in consultancy, professional education, and thought leadership projects through IfM Engage, the knowledge-transfer arm of the Institute for Manufacturing, University of Cambridge.

IfM Engage, 17 Charles Babbage Road, Cambridge, CB3 0FS, United Kingdom

www.ciip.group.cam.ac.uk

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Executive summary

This paper provides a sectoral analysis that explores the productivity differences between France and the UK, focusing on how variations in sectoral productivity levels and sector sizes contribute to the overall productivity gap between the two countries.

Despite having similar economic structures, aggregate productivity in France has consistently been higher than the UK over the past 15 years

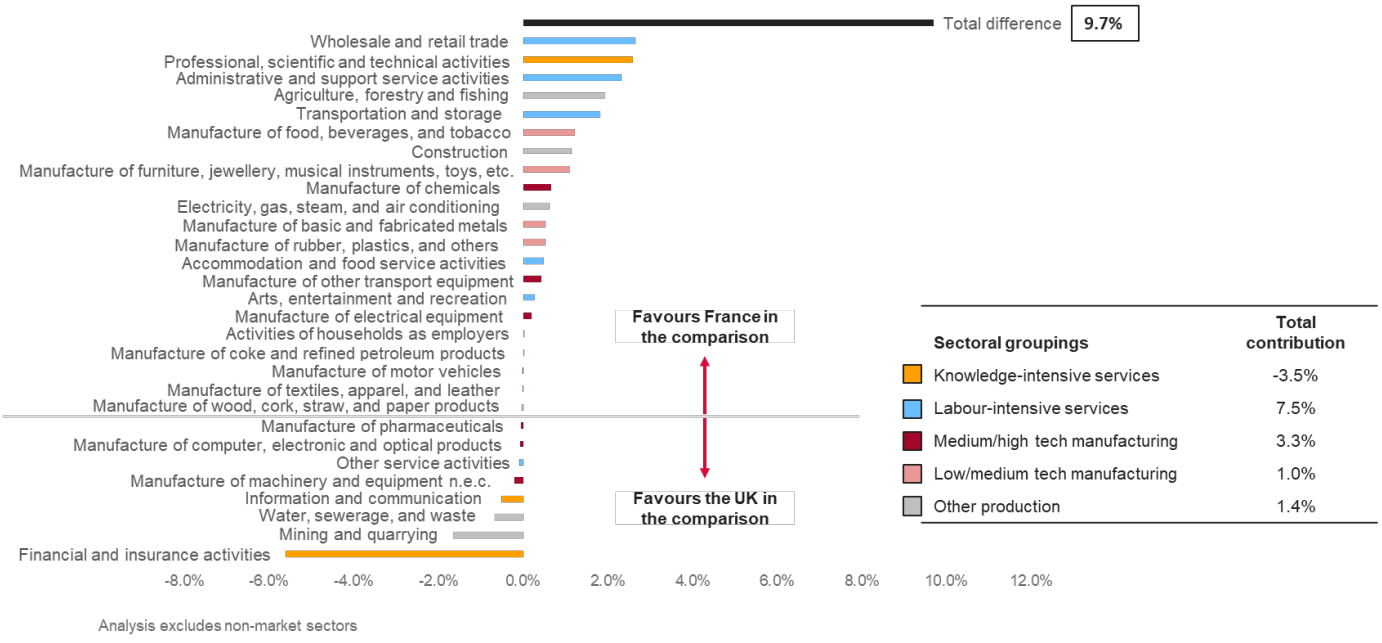
According to OECD Annual National Accounts data, during the 2010–19 period France's aggregate productivity was, on average, **9.7%** higher than that of the UK. During this period France's productivity outpaced that of the UK by margins ranging from 5.0% to 16.7%, with the only exception occurring in 2015 when the UK surpassed France by 3.3%.

We conducted the analysis at two levels of aggregation. First, we quantified the contributions of 29 sectors to the aggregate productivity difference between the two countries using a common productivity decomposition method. This allowed us to analyse the extent to which each sector's contribution to the aggregate difference is based on productivity level differences and how much it is based on their relative sizes in the two countries. Second, we grouped these sectors into five broader categories: *knowledge-intensive services*, *labour-intensive services*, *medium/high-tech manufacturing*, *low/medium-tech manufacturing* and *other production sectors*.

Which sectors are driving the productivity difference between France and the UK?

- As Figure ES1 shows, **of the 29 sectors analysed, 21 favoured France, while only 8 favoured the UK.** More importantly, France tends to have higher productivity in large sectors. The top five sectors contributing to France's higher aggregate productivity account for 52.2% of the total employment in France and 50.9% in the UK. In contrast, the top five sectors favouring the UK represent only 10.3% of employment in France and 12.2% in the UK.

FIGURE ES1. CONTRIBUTIONS OF SECTORS TO THE FRANCE–UK AGGREGATE PRODUCTIVITY DIFFERENCE, 2010–2019 AVERAGE



Source: Own elaboration. Data from OECD Annual National Accounts.
Note: Market sectors only. Average values from 2010 to 2019 are used to mitigate the impact of year-specific fluctuations.

- Three large labour-intensive sectors – **wholesale and retail trade**, **administrative and support service activities** and **transportation and storage** – are responsible for a large share of the productivity difference (6.8 percentage points of the 9.7% difference).
- Of these three, **wholesale and retail trade** was the largest contributor to France's higher aggregate productivity**.** Productivity in this sector was 24% higher in France than the UK during 2010–19. In this period value added in this sector was, on average, approximately $250 billion in both countries. However, this was achieved by employing, on average, 1 million fewer people in France than the UK. The sector's large share of total employment – 19.7% in France and 20.8% in the UK – explains its substantial contribution to the productivity gap between the two countries.
- After wholesale and retail trade, the sector with the largest contribution in favour of France was **professional, scientific and technical activities**. Productivity in this sector was 30% higher in France than the UK. The average value added was $188 billion in France, slightly higher than the UK's $181 billion during 2010–19. Notably, this higher level of value added was obtained in France with fewer workers (1.9 million) than in the UK (2.4 million).
- **Agriculture, forestry and fishing** was the sector that made the fourth largest contribution to France (fifth overall). This resulted from a combination of 30% higher productivity and a higher employment share – 4.0% in France versus 1.8% in the UK. France's annual average value added in this sector was $42.1 billion, more than double the UK's $17.4 billion. To achieve this, France employed an average of 757,000 people, whereas the UK employed 406,000.
- Interestingly, the sector that made the largest absolute contribution to the France–UK aggregate productivity difference – **financial and insurance activities** – favoured the UK. Productivity in this sector was 57% higher in the UK and employed a larger share of the UK's workforce (4.7%) than in France (4.1%). During 2010–19, the UK's annual average value added in this sector was $217 billion, more than double France's $102 billion. The UK accomplished this with an average of 1.1 million employees, compared to France's 780,000.
- Despite its small size, **mining and quarrying** made the second largest contribution to the UK, mainly because of productivity that was 207% higher in the UK than France.

Sectoral groupings

The analysis of sectoral groupings revealed that:

- **Labour-intensive services** primarily drove the productivity difference in favour of France, contributing 7.5 percentage points of the 9.7% aggregate difference. Key sectors contributing to this include *wholesale and retail trade*, *administrative and support services* and *transportation and storage*.
- **Manufacturing sectors** also favoured France, contributing 4.3 percentage points, driven by higher French productivity in *medium/high-tech manufacturing* and larger employment shares in *low/medium-tech manufacturing*.
- **Other production** sectors favoured France by 1.4 percentage points, with *agriculture, forestry and fishing* and *construction* being significant contributors.
- **Knowledge-intensive services** is the only grouping that favoured the UK, contributing -3.5 percentage points to the overall difference. This was mainly because of the UK's strong performance in *financial and insurance activities*.

The importance of sectoral analysis

Sectoral analyses are useful "focusing devices" for policy-makers, revealing the relative performances of different parts of the economy. This paper underscores the complexity of the productivity gap between France and the UK, highlighting the importance of both productivity levels and employment distribution in the aggregate difference. More research is required into the causes of the sectoral productivity differences between the two countries.

1. Introduction

Productivity is an important issue for France and the UK, as both countries have seen sluggish productivity growth in recent decades.[1] However, on closer examination, France's productivity has been at a consistently higher level than the UK since the global financial crisis of 2008–9 (see Figure 1). This policy brief helps to explain the productivity gap between the two countries by identifying which sectors contribute most to this difference.

International comparisons of economic performance are useful exercises to benchmark how well a country is performing and to obtain insights into how well it *could* perform. When choosing comparator countries, a common approach is to aim for the highest-performing countries to obtain lessons, for example, how successful policies and conditions could be emulated, albeit in different contexts. This type of comparison, however, often faces challenges, as differences in fundamental conditions, such as size, geographical position, economic structure, institutions and political settings, may make the lessons impractical or unfeasible in a different country.[2] [3]

Another approach is to compare economically similar countries and seek lessons that can be learned from each other. This is arguably the case for France and the UK. These countries have a similar size and economic structure and they are geographically close. They have also seen similar economic transformations in recent decades – both have deindustrialised and seen a rise in the importance of services in their economies.[4] There is also evidence that France and the UK have been affected more than other European countries by the offshoring of national companies to other countries.[5] These similarities mean that they can learn a lot from each other, as their challenges are similar and their successes are potentially replicable.

The analysis in this paper uses the OECD Annual National Accounts disaggregated data to calculate sectoral productivities (value added per worker) in France and the UK. We selected the 2010–19 period for the analysis, as in this period the gap between the two countries widened (see Figure 1). To avoid any potential year-specific biases, we used the 2010–19 average productivity levels for the analysis.

We conducted the analysis at two levels of aggregation. First, we compared productivity across 29 sectors using the ISIC Rev 4 classification. Second, we grouped these sectors into five broader sectoral groupings: knowledge-intensive services, labour-intensive services, medium/high-tech manufacturing, low/medium-tech manufacturing and other production sectors.[6] To avoid the known distortions in productivity calculations of non-market sectors (education, human health and social services, public administration and defence, and real estate activities), we focused the analysis on market sectors.

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[1] Cambridge Industrial Innovation Policy, 2021.
[2] Hantrais (1999). Contextualization in cross-national comparative research.
[3] LSE (n.d.). In comparative research, how do I choose which countries to compare?
[4] Cambridge Industrial Innovation Policy, 2021.
[5] France Stratégie, 2020.
[6] See Appendix II and III for a description of the sectoral composition of sectoral groupings.

2. Why – and how – should we compare the productivity of France and the UK?

France and the UK have similar economic structures

Table 1 (below) shows the employment shares of sectoral groupings of activities. We can see that France and the UK have similar economic structures, with most sectoral groupings having less than 2 percentage points difference. The largest difference occurs in knowledge-intensive services, in which the UK has a slightly larger employment share than France (3.8 percentage points difference). This means there are many lessons to be learned between the two economies in terms of sectoral performance.

TABLE 1. EMPLOYMENT SHARES BY SECTORAL GROUPING, 2010–2019 AVERAGE

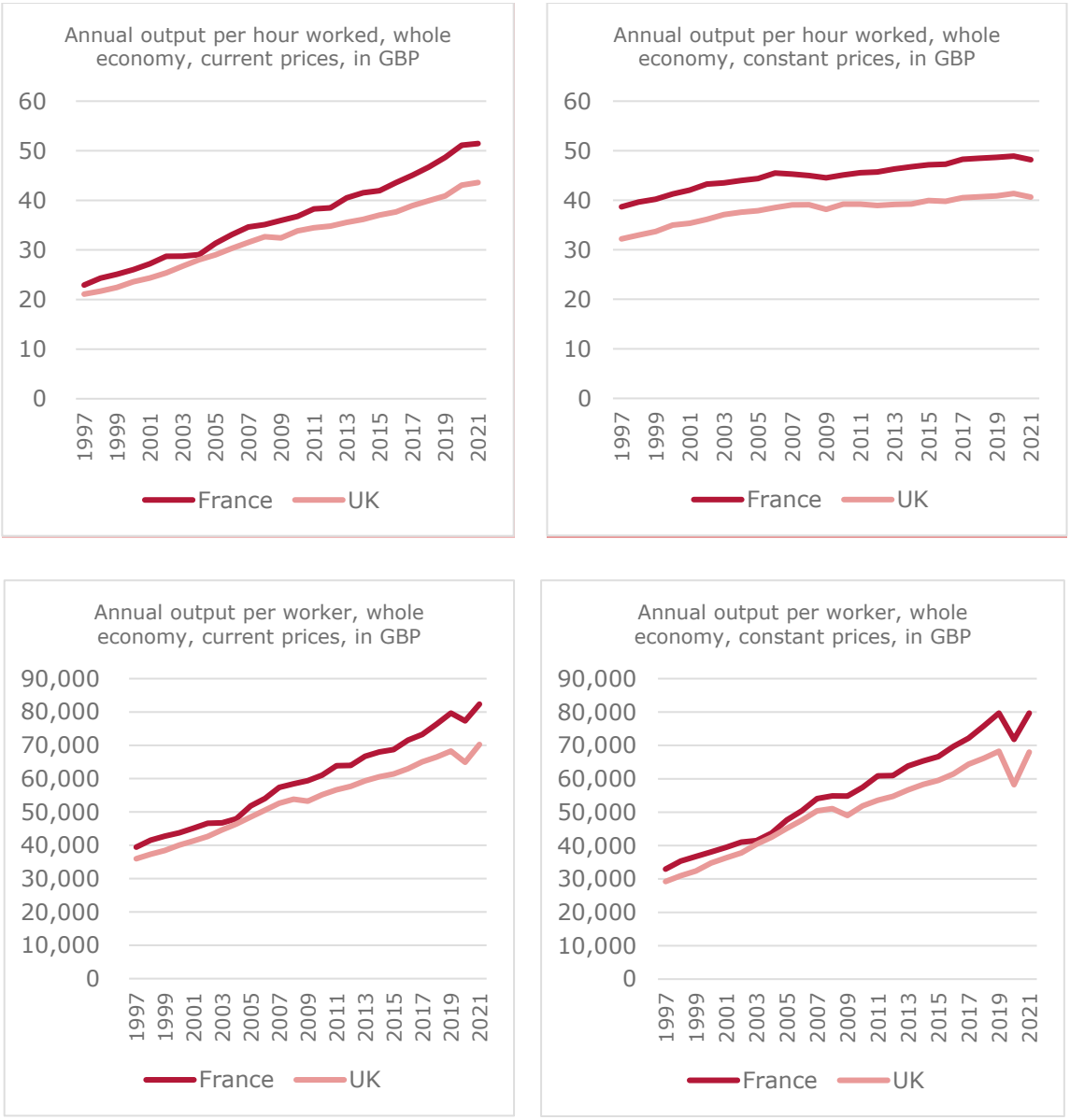
Sector	Examples of industries covered	France	United Kingdom	Difference (percentage points)
Knowledge-intensive services	Financial intermediation, engineering services, information and communication, etc.	20.0%	23.8%	-3.8
Labour-intensive services	Retail, hospitality, transport, personal services, etc.	60.0%	58.7%	1.3
Low/medium-tech manufacturing	Food, textiles, wood, etc.	7.2%	5.4%	1.7
Medium/high-tech manufacturing	Pharmaceuticals, aerospace, automotive, etc.	2.5%	2.6%	-0.2
Other production	Construction, agriculture, electricity, etc.	10.4%	9.5%	0.9
Total economy		**100.0%**	**100.0%**	

Source: Own elaboration. Data from OECD Annual National Accounts.

France has seen higher productivity levels than the UK in the last 15 years

Despite their similar economic structures, France tends to have higher productivity indicators than the UK. Figure 1 (below) shows the evolution of productivity levels in France and the UK from 1997 to 2021 using different measurements. The graphs show that France's productivity is consistently higher than the UK's for both output per worker and output per hour worked, and in both current and constant prices. Across measurements, the productivity difference between the two countries becomes more pronounced after the 2008–9 global financial crisis.

FIGURE 1. DIFFERENT PRODUCTIVITY MEASUREMENTS, FRANCE AND THE UK, 1997–2021



Source: Own elaboration. Data from ONS (2023) *International comparisons of UK productivity.*

The France–UK aggregate productivity difference is explained mainly by productivity differences in market sectors

Calculating productivity in non-market sectors – namely education, human health services and public administration activities – is known to have its challenges. In a large share of their activities, value-added calculations are not obtained directly from market revenue and rely on input techniques. To avoid potential distortions, we excluded these sectors from the analysis. We also considered real estate activities as a non-market sector (and thus excluded it from the analysis), as rents from unproductive assets are included in this industry's output (imputed rents from owner-occupied dwellings are included in the value added of the sector). This boosts measured labour

productivity and can distort the sector's contribution to aggregate productivity. For these reasons, it is not unusual to exclude these sectors from productivity analyses.[7]

It is important to note, however, that when we excluded non-market sectors, the productivity differences between France and the UK remained significant. Removing non-market sectors from the analysis only changes the productivity gap between France and the UK by, on average, 5.9% in the 1998–2021 period. This shows that the productivity difference between the two countries can predominantly be explained by *market sectors*, which are the focus of this policy brief.

To avoid year-specific biases, we used the 2010–2019 average for the sectoral analysis

As shown in Figure 1 (above), the productivity gap between France and the UK widened after the global financial crisis (2008–9). For this reason, this policy brief focuses on the post-2010 period. Additionally, we excluded 2020 and 2021 from the analysis to avoid the temporary economic distortions caused by the COVID-19 pandemic. The aggregate productivity levels in France and the UK in the selected 2010–19 period are presented in Table 2 (below).

TABLE 2. PRODUCTIVITY LEVELS IN FRANCE AND THE UK, 2010–2019

THOUSAND USD PER WORKER, CURRENT PRICES, MARKET SECTORS

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2010–19 average
France	84.0	89.7	83.2	87.0	88.0	75.3	75.6	78.0	83.0	80.4	82.4
UK	73.2	76.9	76.4	78.5	83.7	77.9	70.0	69.6	73.5	72.2	75.1
Absolute difference (France *minus* UK)	10.8	12.8	6.8	8.5	4.2	-2.6	5.6	8.4	9.5	8.2	7.3
% difference (France /UK)	14.7%	16.7%	8.9%	10.8%	5.0%	-3.3%	8.1%	12.1%	12.9%	11.4%	**9.7%**

Source: Own elaboration. Data from OECD Annual National Accounts.[8]

To avoid any year-specific biases and focus the analysis on the structural issues behind the productivity gap, we used the 2010–19 average difference for our analysis. In the 2010–19 period, the productivity of France's market sectors was, on average, 9.7% higher than that of the UK. The sectoral analysis of this policy brief seeks to explain this difference.

[7] Riley et al. (2018). Below the Aggregate: A Sectoral Account of the UK Productivity Puzzle.
[8] Data differs from ONS data from Figure 1 because of the different data sources and currency.

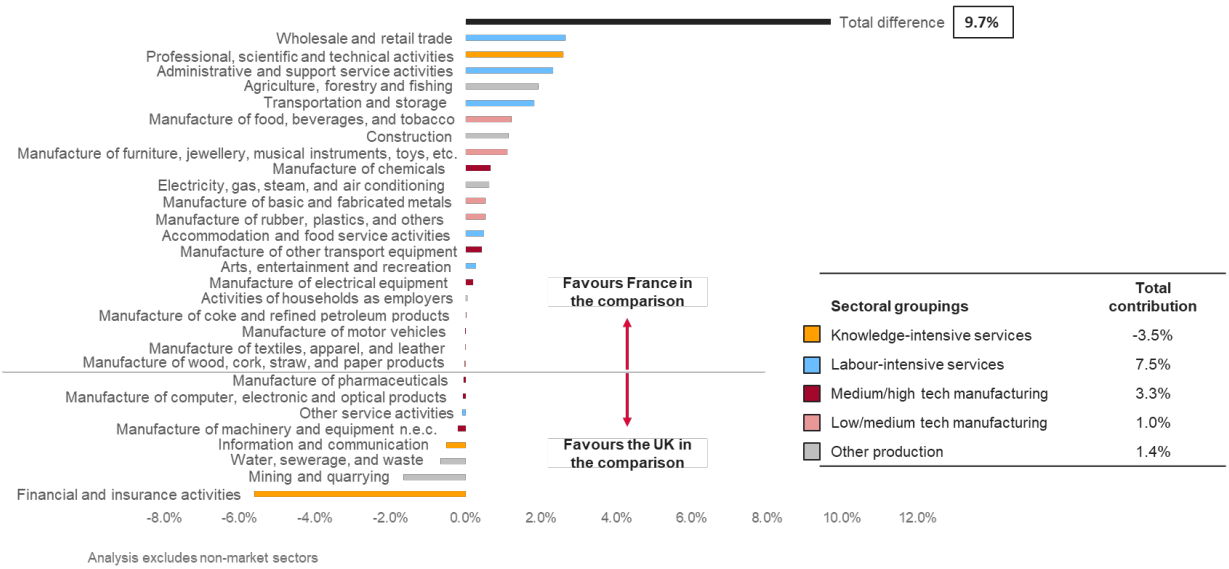
3. Which sectors drive the productivity difference between France and the UK?

To understand the exact contribution of sectors to the France–UK aggregate productivity difference between the two countries, we used a decomposition formula that compares the extent to which the difference is explained by the weighted differences in sector productivity levels, or by the different sector sizes (measured by employment shares in the economy) in the two countries. These are called **intra-industry difference effects** and **structural difference effects**, respectively. For example, the UK may have a higher productivity level than France in a specific sector, but that can be counterbalanced by that sector being smaller in the UK. The formula disentangles these two effects and provides the final contribution of each sector to the aggregate productivity difference. See Appendix II for a detailed description of the formula used.

3.1 Contributions of sectors

Figure 2 (below) shows the contributions of sectors to the France–UK aggregate productivity difference. It can be observed that, of the 29 sectors analysed, 21 favoured France, while only 8 favoured the UK. Overall, France has higher productivity in sectors that constitute significant portions of both economies. For example, the top five sectors contributing to France's higher aggregate productivity account for 52.2% of the total employment in France and 50.9% in the UK. In contrast, the top five sectors favouring the UK represent only 10.3% of employment in France and 12.2% in the UK.

FIGURE 2. CONTRIBUTIONS OF SECTORS TO THE FRANCE–UK AGGREGATE PRODUCTIVITY DIFFERENCE, 2010–2019 AVERAGE



Source: Own elaboration. Data from OECD Annual National Accounts.

The components of each sector's contribution to the aggregate productivity difference vary. A contribution can be due to differences in productivity levels, sector sizes (and thus their different weights in aggregate productivity) or employment shares in France and the UK. Below we describe what is driving the contributions of the sectors, with the highest contributions for each country.

Top five sectors contributing to France:

- **Wholesale and retail trade**. This sector favours France because of its 24% higher productivity level in France than the UK. In the 2010–19 period, both countries had a similar annual average value added in this sector – approximately $250 billion. However, France achieved this by employing an average of 3.7 million people, while the UK employed an average of 4.7 million people. The sector's large size (19.7% of the total employment in France and 20.8% in the UK) also helps to explain its large contribution to the productivity difference between the two countries.
- **Professional scientific and technical activities.** This sector favours France because of its 30% higher productivity level in France than the UK. France had an annual average value added in this sector of $188 billion, while the UK had a lower $181 billion. However, France achieved this by employing an average of 1.9 million people, while the UK employed an average of 2.4 million people.
- **Administrative and support service activities.** This sector favours France because of its 35% higher productivity level in France than the UK. The French annual average value added in this sector was $130 billion, while that of the UK was lower – at $118 billion. However, France achieved this by employing an average of 2.1 million people, while the UK employed an average of 2.5 million people.
- **Agriculture, forestry and fishing.** This sector favours France because of the combined effect of 30% higher productivity and a significantly higher employment share in France than the UK (4.0% of total employment in France against 1.8% in the UK). France's annual average value added in this sector was $42.1 billion, against $17.4 billion in the UK. Meanwhile, France employed an average of 757,000 people, versus an average of 406,000 in the UK. Both productivity levels and employment shares contributed in favour of France in this sector.
- **Transportation and storage.** This sector favours France because of the combined effect of 16% higher productivity and higher employment share in France than the UK (7.3% of total employment in France against 6.4% in the UK). The French annual average value added in this sector was $109 billion, while the UK had a lower $100 billion. France achieved this by employing an average of 1.4 million people, while the UK employed an average of 1.5 million people.

Top five sectors contributing to the UK:

- **Financial and insurance activities.** This sector favours the UK because of the combined effect of 57% higher productivity and a higher employment share in the UK than France (4.7% of total employment in the UK against 4.1% in France). In the 2010–19 period, the annual average value added of this sector in the UK was $217 billion, while in France it was less than 50% of that – at $102 billion. The UK achieved this by employing, on average, 1.1 million people, while France employed, on average, 780,000 people. Both productivity levels and employment shares contributed in favour of the UK in this sector.
- **Mining and quarrying**. This sector favours the UK because of its 207% higher productivity in the UK than France. The annual average value added of this sector in the UK was $30.9 billion, while in France it was less than 10% of that – at $2.5 billion. The employment shares of this sector are very low but also favour the UK, which employed 68,000 people (0.3% of total employment), while France employed 17,000 in this sector (0.1%).
- **Water, sewerage and waste**. This sector favours the UK because of the 71% higher productivity in the UK than France. The annual average value added of this sector in the UK was $32.5 billion, while in France it was much lower – at $17.8 billion. The UK achieved this by

employing, on average, 169,000 people, while France employed an average of 158,000 people. With a similar number of people employed, the UK obtained significantly higher value added.

- **Information and communication**. Despite France's productivity in this sector being 21% higher than the UK, the sector favours the UK because of its higher employment share (5.7% of total employment, employing 1.3 million people) than France (4.4% of total employment, employing 832,000 people).
- **Manufacture of machinery and equipment**. This sector favours the UK because of its 13% higher productivity in the UK than France. The annual average value added of the sector in the UK was $21.1 billion, while in France it was lower – at $14.8 billion. The UK achieved this by employing, on average, 190,000 people, while France employed an average of 151,000.

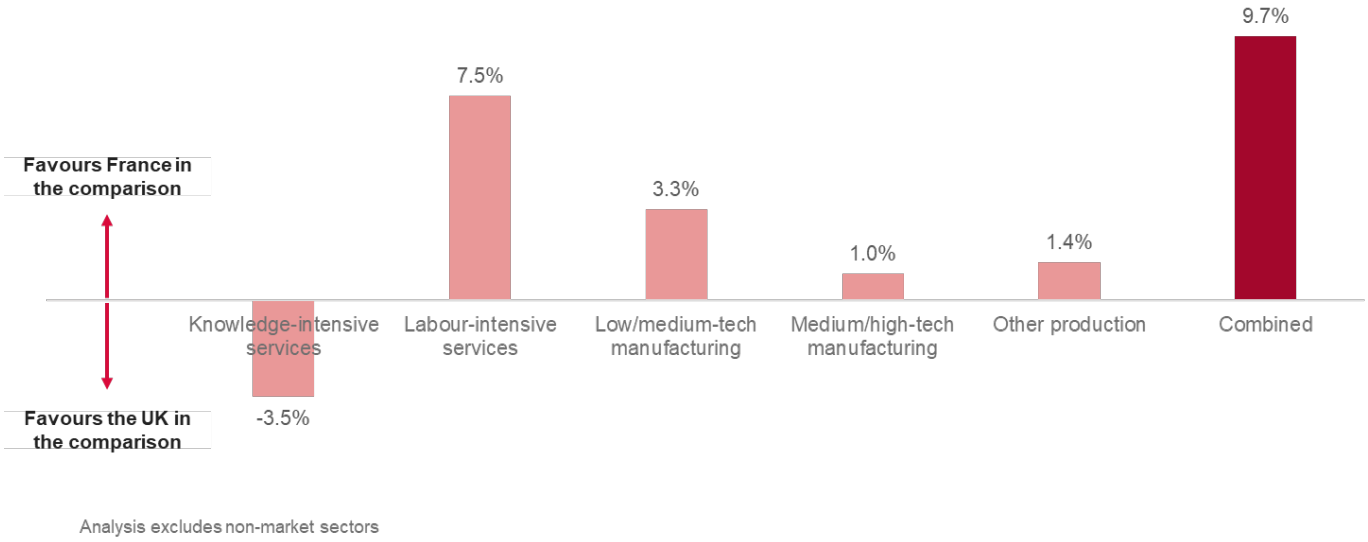
3.2 Contributions of sectoral groupings

When analysing the contributions of sectoral groupings to the France–UK productivity difference, labour-intensive services, low/medium-tech manufacturing and medium/high-tech manufacturing all favour France. The only sectoral grouping that favours the UK is knowledge-intensive services (Figure 3, below). Labour-intensive services are the sectoral grouping driving France's higher aggregate productivity, contributing 7.5 percentage points of the 9.7% aggregate productivity difference between France and the UK.

Figure 4 (below) shows the breakdown of the contributions of each sectoral grouping in intra-industry and structural difference effects. Observations for each sectoral grouping can be made as follows:

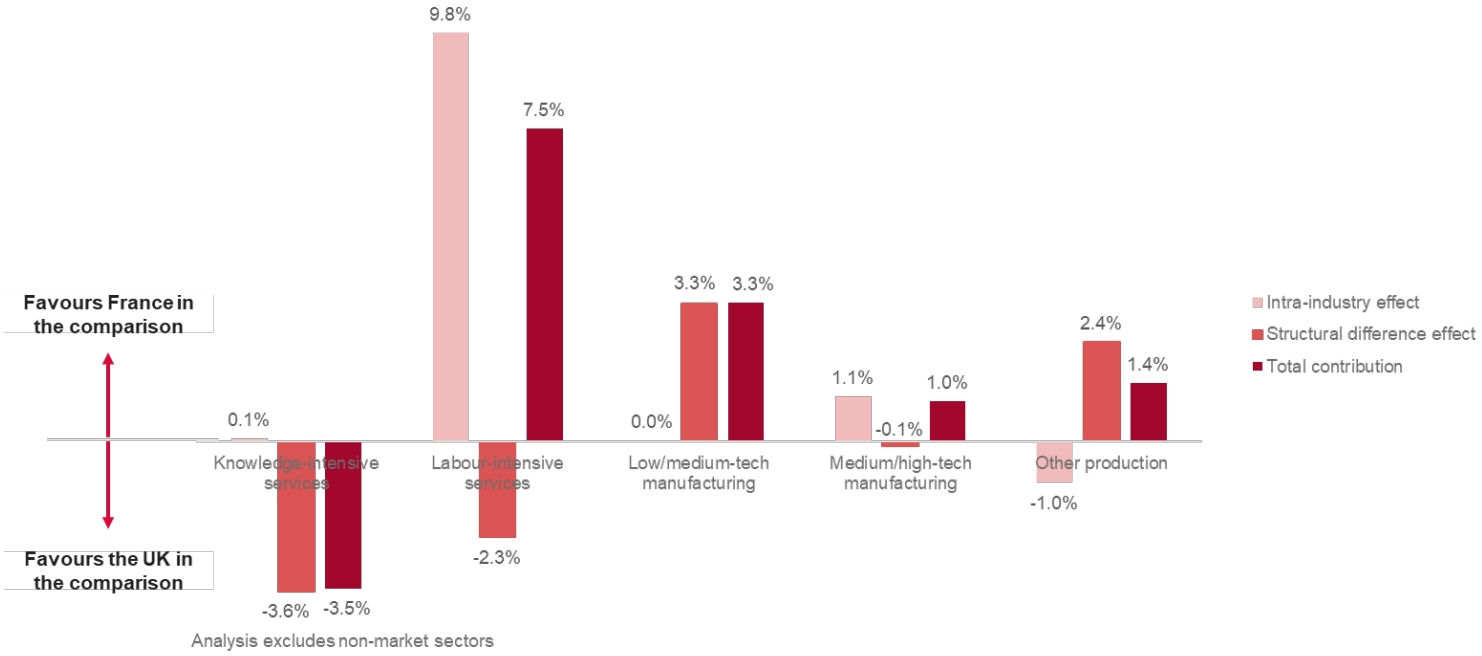
- **Labour-intensive services:** The large contribution of labour-intensive services is due to a strong intra-industry difference effect, which reflects this sectoral grouping's higher productivity in France (27% higher) and the large size of this sectoral grouping in both countries. This effect is strong enough to compensate for the higher employment shares of this sectoral grouping in the UK.
- **Knowledge-intensive services:** The intra-industry effect is almost negligible in this sectoral grouping, reflecting its almost identical productivity levels in France and the UK. However, the contribution of this sectoral grouping favours the UK because of its significantly larger employment share in the UK (21.1%) than in France (18.8%).
- **Low/medium-tech manufacturing:** Similarly, while both countries are levelled in this sectoral grouping in terms of productivity levels, the contribution favours France because of the higher employment share in France (10.4%) than the UK (7.5%).
- **Medium/high-tech manufacturing:** This sectoral grouping has levelled employment shares in the two countries, so its contribution to France is mainly explained by the higher productivity level in France (16.1% higher) than the UK.
- **Other production:** Despite the productivity level of this sectoral grouping being 6.8% higher in the UK, its contribution favours France because of the higher French employment shares in this sectoral grouping (15.1% in France versus 13.0% in the UK).

FIGURE 3. CONTRIBUTIONS OF SECTORAL GROUPINGS TO THE FRANCE–UK AGGREGATE PRODUCTIVITY DIFFERENCE, 2010–2019 AVERAGE



Source: Own elaboration. Data from OECD Annual National Accounts.

FIGURE 4. BREAKDOWN OF THE CONTRIBUTIONS OF SECTORAL GROUPINGS INTO INTRA-INDUSTRY AND STRUCTURAL DIFFERENCE EFFECTS, 2010–2019 AVERAGE



Source: Own elaboration. Data from OECD Annual National Accounts.

4. How different are the sectoral productivity levels in France and the UK?

Focusing solely on the productivity levels of sectors in France and the UK, we can obtain insights into the relative sectoral strengths of each country. This section compares the productivity levels of France and the UK across sectors and sectoral groupings.

4.1 Productivity-level differences across sectors

When analysing the productivity-level differences across sectors (Figure 5, below), the first observation is that the highest productivity difference between France and the UK is in the manufacture of other transport equipment, which includes, among other things, aerospace equipment manufacturing. In this sector France's productivity is more than double (119% higher) that of the UK. This is an interesting finding given that both countries have world-leading aerospace industries. Different participation levels across higher and lower supply chain segments of this industry may help to explain these results.[9]

The second important observation is that France has significantly higher productivity in several labour-intensive services, such as accommodation and food services (59% higher), administrative and support services (35% higher), arts and entertainment (31% higher), wholesale and retail trade (24% higher) and transportation and storage services (16% higher).

The third observation is that in some knowledge-intensive services, France has higher productivity levels than the UK. This is the case in professional, scientific and technical activities (30% higher) and information and communication activities (21% higher). In financial and insurance activities, in turn, the UK's productivity is 57% higher than that of France.

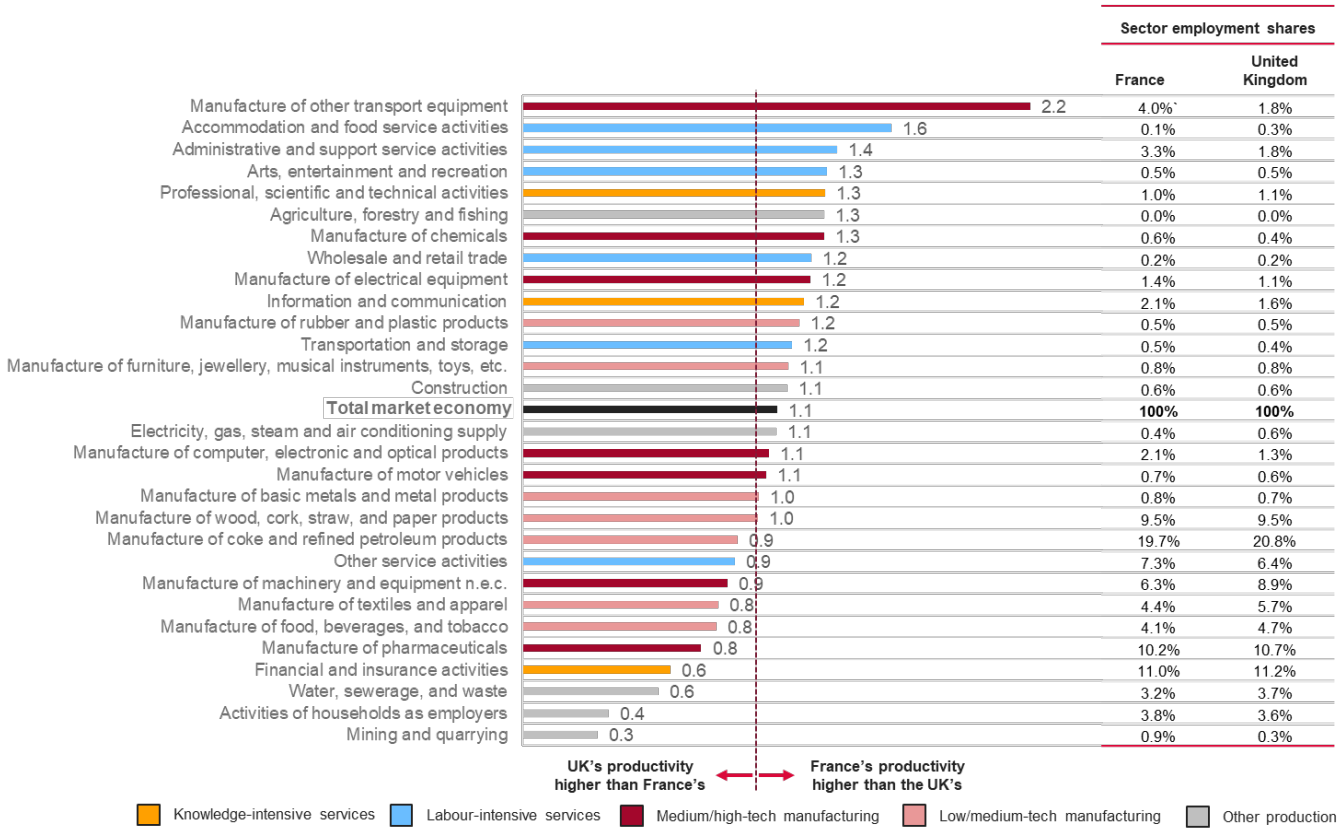
Fourth, it can be observed that, in terms of manufacturing sectors, France and the UK are reasonably balanced. France surpasses the UK in around half of the sectors, while the UK surpasses France in the other half. The largest productivity differences in manufacturing sectors are in other transport equipment and chemicals, favouring France, and pharmaceuticals, favouring the UK.

Finally, the UK's productivity superiority in mining and quarrying is noteworthy, having a productivity level three times (or 207%) higher than that of France.

[9] For a review of the UK aerospace sector, see Cambridge Industrial Innovation Policy, 2023.

FIGURE 5. PRODUCTIVITY-LEVEL RATIO (FRANCE/UK), BY SECTOR, 2010–2019 AVERAGE

THOUSAND USD PER WORKER, CURRENT PRICES, MARKET SECTORS



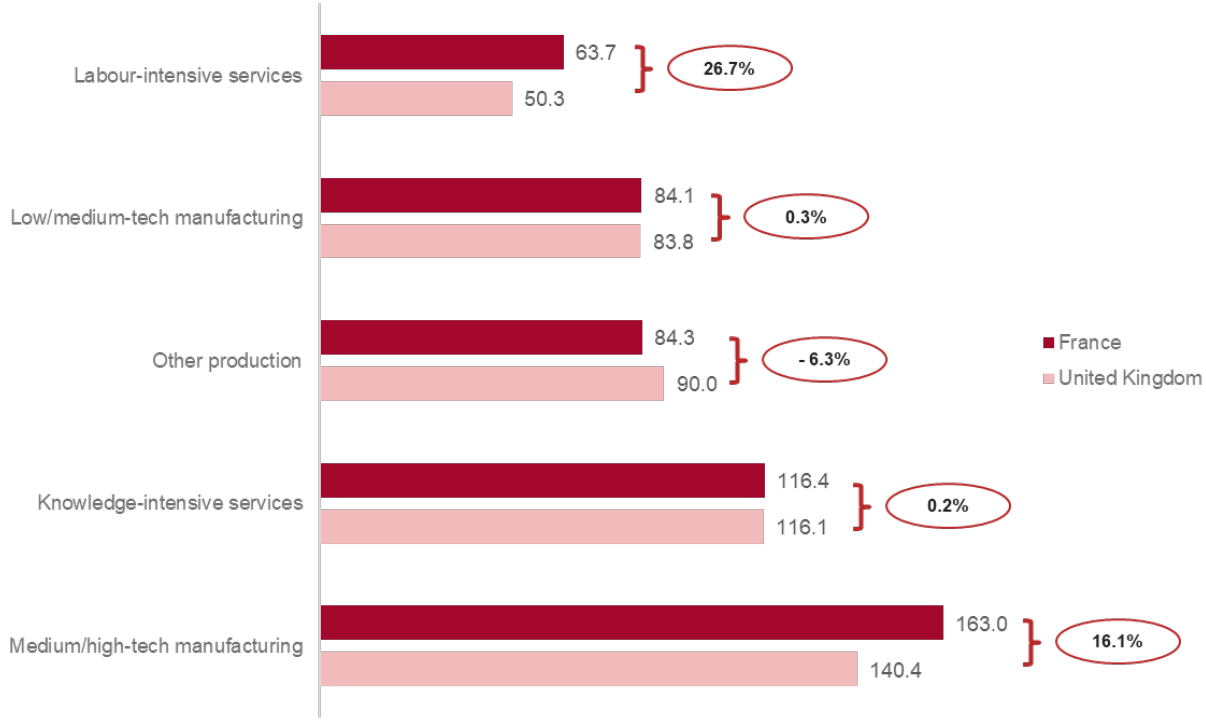
Source: Own elaboration. Data from OECD Annual National Accounts.

4.2 Productivity-level differences across sectoral groupings

Analysing the productivity-level differences across sectoral groupings, the highest percentual difference between France and the UK is in labour-intensive services (26.7% difference), followed by medium/high-tech manufacturing (16.1%). The two countries are at the same level in knowledge-intensive services (0.2%) and low/medium-tech manufacturing (0.3%). The only sectoral grouping in which the UK has higher productivity is other production, which includes mining, utilities, agriculture and construction (Figure 6, below).

FIGURE 6. PRODUCTIVITY LEVELS IN FRANCE AND THE UK, BY SECTORAL GROUPING, 2010–2019 AVERAGE

THOUSAND USD PER WORKER, CURRENT PRICES, MARKET SECTORS



Source: Own elaboration. Data from OECD Annual National Accounts.

5. Conclusions

Our analysis of the sectoral contributions to the aggregate productivity difference between France and the UK indicates that **labour-intensive services** – including wholesale and retail trade, administrative and support services, transportation and storage, and accommodation and food services – are the main drivers of the difference in the 2010–19 period. These services contribute 7.5 percentage points of the 9.7% productivity difference between France and the UK, driven by the higher productivity levels of these services in France than the UK, and the large share of these sectors in the countries' economies.

It is also evident that **financial and insurance activities** are the most important sectoral contributors in favour of the UK. This sector's contribution is the main reason why knowledge-intensive services favoured the UK in the comparison. Not only are these activities 57% more productive in the UK than France, but they also have a higher employment share in the UK (4.7% in the UK vs 4.1% in France). **Professional, scientific and technical activities**, in turn, contribute strongly in favour of France. This is driven by France's higher productivity level in this sector (30% higher than the UK) and the large share of employment that this sector represents (between 10% and 11% in both countries).

In addition, France performs better than the UK in the **manufacturing sectors**. In low/medium-tech manufacturing, this is driven mainly by the higher French employment shares in these sectors. In medium/high-tech manufacturing, this is explained by the higher French productivity in these sectors. For example, **other transport equipment manufacturing** (including aerospace) and **chemicals manufacturing** have the highest productivity-level differences compared to the UK (119% and 30% more productive in France, respectively). However, **food and beverages manufacturing** is the strongest manufacturing contributor to the productivity difference between the two countries because of its larger employment share in France (3.3%) than the UK (1.8%).

Our analysis also revealed that **agriculture, forestry and fishing** are important contributors to the France–UK difference, favouring France both in productivity levels (30%) and employment shares (4.0% in France versus 1.8% in the UK). **Mining and quarrying**, in turn, favour the UK, reflecting the much larger productivity levels of this sector in the UK (207% higher than France). This difference in productivity levels is compensated by the small employment shares of this sector in both countries (0.3% in the UK and 0.1% in France), making its contribution to the aggregate difference modest.

Directions for future research: investigating the causes of sectoral productivity differences

Analysing the sectoral contributions to productivity differences is an important exercise, as it can focus the attention of policy-makers on the most important sectors when it comes to explaining this difference. However, this is only a first step, and more research is needed to understand the underlying causes of the observed differences. For example, the importance of labour-intensive services calls for a deeper investigation of the drivers of productivity in these activities. Areas that could be explored include investigating infrastructural and labour market conditions, as well as identifying sector-specific value added and employment patterns.

Appendix I. Value tables for France and the UK

TABLE A1. VALUE ADDED, EMPLOYMENT AND PRODUCTIVITY VALUES FOR FRANCE AND THE UK, 2010–2019 AVERAGE, BY SECTORAL GROUPING, MARKET SECTORS ONLY

	Value added (USD)		Employment (thousands)		Share in value added		Share in employment		Value added (USD) per thousand workers	
	France	UK	France	UK	France	UK	France	UK	France	UK
Knowledge-intensive services	413,237	553,144	3,551	4,762	26.5%	32.6%	18.8%	21.1%	116.4	116.1
Labour-intensive services	628,653	623,171	9,865	12,389	40.3%	36.7%	52.1%	54.9%	63.7	50.3
Low/medium-tech manufacturing	165,745	141,255	1,970	1,685	10.6%	8.3%	10.4%	7.5%	84.1	83.8
Medium/high-tech manufacturing	109,967	114,702	674.8	816.92	7.1%	6.8%	3.6%	3.6%	163.0	140.4
Other production	240,804	263,765	2,857	2,931	15.5%	15.6%	15.1%	13.0%	84.3	90.0
Total market sectors	**1,558,407**	**1,696,036**	**18,918**	**22,584**	**100%**	**100%**	**100%**	**100%**	**82.4**	**75.1**

TABLE A2. VALUE ADDED, EMPLOYMENT AND PRODUCTIVITY VALUES FOR FRANCE AND THE UK, 2010–2019 AVERAGE, BY SECTOR, MARKET SECTORS ONLY

	Value added (USD)		Employment (thousands)		Share in value added		Share in employment		Value added (USD) per worker	
	France	UK	France	UK	France	UK	France	UK	France	UK
Agriculture, forestry and fishing	42,127	17,386	757	406	2.7%	1.0%	4.0%	1.8%	55.6	42.8
Mining and quarrying	2,535	30,917	17	68	0.2%	1.8%	0.1%	0.3%	147.4	452.6
Manufacture of food products; beverages and tobacco products	52,016	41,231	623	413	3.3%	2.4%	3.3%	1.8%	83.5	99.8
Manufacture of textiles, wearing apparel, leather and related products	6,538	8,156	103	109	0.4%	0.5%	0.5%	0.5%	63.4	75.1
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; manufacture of paper and paper products; printing and reproduction of recorded media	13,897	17,126	195	244	0.9%	1.0%	1.0%	1.1%	71.2	70.3
Manufacture of coke and refined petroleum products	2,845	3,300	9	10	0.2%	0.2%	0.0%	0.0%	302.6	326.7
Manufacture of chemicals and chemical products	22,233	15,185	113	100	1.4%	0.9%	0.6%	0.4%	197.5	152.1
Manufacture of basic pharmaceutical products and pharmaceutical preparations	14,960	18,657	47	45	1.0%	1.1%	0.2%	0.2%	319.0	414.2
Manufacture of rubber and plastic products and other non-metallic mineral products	23,273	18,975	257	250	1.5%	1.1%	1.4%	1.1%	90.4	75.9
Manufacture of basic metals and fabricated metal products, except machinery and equipment	31,701	28,842	393	363	2.0%	1.7%	2.1%	1.6%	80.8	79.5
Manufacture of computer, electronic and optical products	14,278	18,245	87	118	0.9%	1.1%	0.5%	0.5%	163.7	154.0
Manufacture of electrical equipment	8,615	6,789	85	83	0.6%	0.4%	0.5%	0.4%	101.1	81.6
Manufacture of machinery and equipment n.e.c.	14,828	21,166	151	190	1.0%	1.2%	0.8%	0.8%	98.5	111.5
Manufacture of motor vehicles, trailers and semi-trailers	16,479	19,922	115	146	1.1%	1.2%	0.6%	0.6%	143.7	136.7
Manufacture of other transport equipment	18,573	14,738	78	135	1.2%	0.9%	0.4%	0.6%	239.0	109.3
Manufacture of furniture; jewellery, musical instruments, toys, etc.; repair and installation of machinery and equipment	35,476	23,625	390	297	2.3%	1.4%	2.1%	1.3%	91.1	79.7
Electricity, gas, steam and air conditioning supply	40,385	37,622	133	135	2.6%	2.2%	0.7%	0.6%	304.8	279.2
Water supply; sewerage, waste management and remediation activities	17,804	32,558	158	169	1.1%	1.9%	0.8%	0.7%	112.8	193.0
Construction	137,953	145,282	1,793	2,153	8.9%	8.6%	9.5%	9.5%	76.9	67.5
Wholesale and retail trade; repair of motor vehicles and motorcycles	250,858	254,545	3,721	4,690	16.1%	15.0%	19.7%	20.8%	67.4	54.3
Transportation and storage	109,466	99,728	1,378	1,455	7.0%	5.9%	7.3%	6.4%	79.4	68.5
Accommodation and food service activities	65,194	69,542	1,183	2,001	4.2%	4.1%	6.3%	8.9%	55.1	34.7
Information and communication	122,649	154,997	832	1,276	7.9%	9.1%	4.4%	5.7%	147.4	121.5
Financial and insurance activities	102,317	217,242	783	1,061	6.6%	12.8%	4.1%	4.7%	130.6	204.7
Professional, scientific and technical activities	188,271	180,904	1,935	2,425	12.1%	10.7%	10.2%	10.7%	97.3	74.6
Administrative and support service activities	131,587	117,755	2,086	2,529	8.4%	6.9%	11.0%	11.2%	63.1	46.6
Arts, entertainment and recreation	33,838	35,798	597	826	2.2%	2.1%	3.2%	3.7%	56.7	43.3
Other service activities	33,680	41,757	725	821	2.2%	2.5%	3.8%	3.6%	46.5	50.8
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	4,031	4,046	176	66	0.3%	0.2%	0.9%	0.3%	22.9	61.3
Total market sectors	**1,558,407**	**1,696,036**	**18,918**	**22,584**	**100%**	**100%**	**100%**	**100%**	**82.4**	**75.1**

Source: Own elaboration. Data from OECD Annual National Accounts.

Appendix II. Methodology

For the analyses conducted in this policy brief, we used value added and employment data from the OECD Annual National Accounts database and calculated productivity as **value added per worker.** We used value added per worker instead of value added per hour, as this was the indicator that allowed the highest level of sectoral disaggregation. Additionally, as we are interested in the value added and employment shares of different sectors, we used current prices. Using constant prices creates distortions in sectoral shares; it is therefore more appropriate for time-series analysis, which is not done in this policy brief.

The OECD Annual National Accounts data used was disaggregated by sector using ISIC Rev 4. In addition, we reaggregated the data in sectoral groupings: labour-intensive services, knowledge-intensive services, low/medium-tech manufacturing, medium/high-tech manufacturing. This is a useful sectoral grouping frequently used in sectoral analyses.[10] See Appendix III for the full description of the sectoral classifications used.

We excluded non-market sectors from the analysis – namely education, human health services and public administration activities – because calculating productivity in these sectors is known to have its challenges, which can distort the analysis. We also considered real estate activities as a non-market sector (and thus excluded it from the analysis), as rents from unproductive assets are included in this industry's output (imputed rents from owner-occupied dwellings are included in the value added of the sector). This boosts measured labour productivity above that seen in other sectors and can distort the sector's contribution to aggregate productivity. For these reasons, it is not unusual to exclude these sectors from productivity analyses.[11]

We chose 2010–19 as the period of analysis, because it was after 2009 that the productivity difference between the UK and France became more accentuated (see Figure 1). Also, to avoid potential biases of any particular year, we used 2010–19 average values for the comparison.

Productivity decomposition formula

Finally, to calculate the contribution of each sector, we used a modified version of Tang and Wang's (2004)[12] productivity decomposition formula. This decomposition accounts for both "intra-industry" effects, that is weighted differences in productivity levels within industries, and "structural" effects, namely weighted differences in the employment shares in each industry.

Specifically, the formula used for productivity decomposition is as follows:

$$D_f = \underbrace{\sum_i D_{if} \frac{Y_{iu}}{Y_u}}_{intra-industry\ effect\ (1)} + \underbrace{\sum_i (1 + D_{if}) \frac{Z_{iu}}{Z_u} \left(l_{if} - l_{iu}\right)}_{structural\ effect\ (2)} \qquad (1)$$

[10] For the classification of manufacturing sectors, see UNIDO (2023). For the classification of service activities, we used a modified version of UNSTATS (n.d.). See Appendix III for the full classification used.
[11] Riley et al. (2018). Below the Aggregate: A Sectoral Account of the UK Productivity Puzzle.
[12] Tang and Wang (2004). Sources of aggregate labour productivity growth in Canada and the United States.

whereby D_f is the aggregate relative productivity difference between France and the UK (the difference that we seek to explain); D_{if} is the relative productivity difference between France and the UK in sector i; $\frac{Y_{iu}}{Y_u}$ is the value-added share of sector i in the UK; $\frac{Z_{iu}}{Z_u}$ is the relative productivity level of sector i in the UK; and $\left(l_{if} - l_{iu}\right)$ is the difference in employment shares of activity i in France and the UK.

This is a modified version of Tang and Wang's (2004)[13] formula, which was originally used to analyse the sectoral contributions to productivity growth in Canada and the US. The formula was modified because, instead of measuring the sectoral contributions to productivity differences between two points in time (a growth rate) for one country, we used it to measure the sectoral contributions to productivity differences between two countries for one point in time. We made a further modification: instead of a single year, we used the 2010–19 average as our period of reference to avoid the possible biases of any single year.

This formula captures both intra-industry effects and structural effects. Intra-industry effects are the differences in productivity levels between France and the UK within each sector weighted by the value-added shares of the sector in the UK. Structural effects are the differences in employment shares between France and the UK in each sector, weighted by the relative productivity level of the sector in the UK. The use of UK value-added shares and productivity levels as the weights is a limitation of the formula. Such a limitation also exists in the traditional use of the formula in calculating contributions to growth (as it uses the value-added shares and productivity levels of the initial year as weights, which can be significantly different from the values for later years). Therefore, it is not a result of the adaptation made here. In our case this limitation is mitigated by the fact that France and the UK have similar sectoral value-added shares.

[13] Tang and Wang (2004). Sources of aggregate labour productivity growth in Canada and the United States.

Appendix III. Sectoral groupings

TABLE A3. SECTORAL GROUPINGS

Sector	ISIC Rev 4 Code	Groups	Market or non-market
Agriculture, forestry and fishing	A	Other production	Market
Mining and quarrying	B	Other production	Market
Manufacture of food products; beverages and tobacco products	C10T12	Low/medium-tech manufacturing	Market
Manufacture of textiles, wearing apparel, leather and related products	C13T15	Low/medium-tech manufacturing	Market
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; manufacture of paper and paper products; printing and reproduction of recorded media	C16T18	Low/medium-tech manufacturing	Market
Manufacture of coke and refined petroleum products	C19	Low/medium-tech manufacturing	Market
Manufacture of chemicals and chemical products	C20	Medium/high-tech manufacturing	Market
Manufacture of basic pharmaceutical products and pharmaceutical preparations	C21	Medium/high-tech manufacturing	Market
Manufacture of rubber and plastic products and other non-metallic mineral products	C22_23	Low/medium-tech manufacturing	Market
Manufacture of basic metals and fabricated metal products, except machinery and equipment	C24_25	Low/medium-tech manufacturing	Market
Manufacture of computer, electronic and optical products	C26	Medium/high-tech manufacturing	Market
Manufacture of electrical equipment	C27	Medium/high-tech manufacturing	Market
Manufacture of machinery and equipment n.e.c.	C28	Medium/high-tech manufacturing	Market
Manufacture of motor vehicles, trailers and semi-trailers	C29	Medium/high-tech manufacturing	Market
Manufacture of other transport equipment	C30	Medium/high-tech manufacturing	Market
Manufacture of furniture; jewellery, musical instruments, toys, etc.; repair and installation of machinery and equipment	C31T33	Low/medium-tech manufacturing	Market
Electricity, gas, steam and air conditioning supply	D	Other production	Market
Water supply; sewerage, waste management and remediation activities	E	Other production	Market
Construction	F	Other production	Market
Wholesale and retail trade; repair of motor vehicles and motorcycles	G	Labour-intensive services	Market
Transportation and storage	H	Labour-intensive services	Market
Accommodation and food service activities	I	Labour-intensive services	Market
Information and communication	J	Knowledge-intensive services	Market
Financial and insurance activities	K	Knowledge-intensive services	Market
Real estate activities	L	Labour-intensive services	Non-market
Professional, scientific and technical activities	M	Knowledge-intensive services	Market
Administrative and support service activities	N	Labour-intensive services	Market
Public administration and defence; compulsory social security	O	Labour-intensive services	Non-market
Education	P	Knowledge-intensive services	Non-market
Human health and social work activities	Q	Labour-intensive services	Non-market
Arts, entertainment and recreation	R	Labour-intensive services	Market
Other service activities	S	Labour-intensive services	Market
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	T	Labour-intensive services	Market

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Cambridge Industrial Innovation Policy (CIIP) is a global, not-for-profit policy group based at the Institute for Manufacturing (IfM), University of Cambridge. CIIP works with governments and global organisations to promote industrial competitiveness and technological innovation. We offer new evidence, insights and tools based on the latest academic thinking and international best practices.

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17 Charles Babbage Road, Cambridge, CB3 0FS, United Kingdom

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