TPI Sector Productivity Scorecards Drivers and Indicators

Methodology and Data sources

By Olga Menukhin, William Sarsfield and Nathan Mckeogh

The TPI's UK Sector Productivity Scorecard provides a comparative assessment of labour productivity performance by UK industries (e.g. manufacturing, services sectors, etc). It helps the TPI's audience assess the relative productivity drivers and drawbacks of growth (or lack of it), helps to identify challenges that need to be addressed and sources of growth in industries to engage with the business community. Visualising UK productivity data on the level of economic sectors can support different perspectives and analysis of labour productivity in the UK.

The scorecard evaluates four productivity driver categories each representing a cluster of economic indicators pertinent to productivity performance of sectors as shown in Figure 1:

- Productivity Output
- Direct Labour Inputs: Employment, Skills & Wellbeing
- Direct Capital Inputs: Capital & Investment
- Indirect Drivers: Innovation, Technology, Market Exposure, other structural dynamics (could be added in the future)

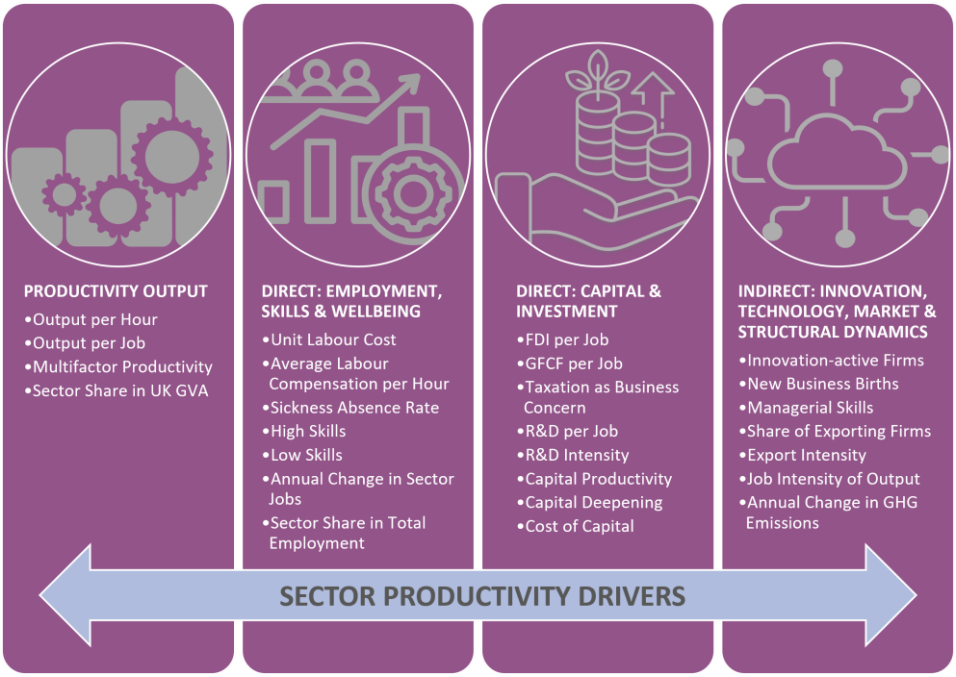

Figure 1. Sector Productivity Drivers

The scorecard's structure is based on the production function perspective whereby a production function establishes a quantifiable relationship between physical inputs such as labour and capital, and physical output, i.e. output Y as a function of Direct Inputs: Labor L and Capital K, and total factor productivity (TFP) which captures the impact of other factors like technology, innovation, other organisational efficiency-related and TFP-enhancing forces. Being indirect drivers, the latter are key to explaining productivity differences. Tracking productivity and sector data using the production function logic enables clearer policy targeting, e.g. skills policy vs export policy vs technology or innovation diffusion. It also allows comparison of sector profiles, for instance high labour input and low innovation indicate a productivity lag.

Table 1. Direct/Indirect Scorecard logic

Type	Elements included	Economic role
Direct Inputs	Labour, Capital, Hours, Skills	Tangible, measurable inputs
Indirect Drivers	Innovation, Technology, Market exposure, and Structural dynamics	Enhance TFP, affect input quality or efficiency

The use of the Direct/Indirect logic to construct the TPI UK Sector Productivity scorecard makes it:

- Focused on productivity driver categories that reflect real-world economic levers
- Balanced between inputs, performance, and strategic context
- Modular for easier updates and expansion

This structure allows for analysing both productivity levels and drivers in a coherent way, with a view toward improving performance through policy, innovation, or workforce investment.

Productivity and Sector performance indicators included in each of the categories were collected from the UK Office for National Statistics (ONS). The inclusion of economic indicators was determined by consistent availability of statistics datasets by economic sector. Latest national statistical data are used for all indicators across the UK economy sectors. This means that year end varies per indicators. We use the UK Standard Industrial Classification (SIC) Hierarchy by the Office for National Statistics (ONS) to define UK economic sectors, see Table 2. The scorecards are generated for 18 sectors.

Table 2. Standard Industrial Classification (SIC 2007) sector codes and descriptions

	Sector	Section code	Division code
	Whole economy	A to T	01 to 98
1	Agriculture, forestry and fishing	A	01 to 03
2	Mining and quarrying	B	05 to 09
3	Manufacturing	C	10 to 33
4	Electricity, gas, steam and air conditioning supply	D	35
5	Water supply; sewerage, waste management and remediation activities	E	36 to 39
6	Construction	F	41 to 43
7	Wholesale and retail trade; repair of motor vehicles and motorcycles	G	45 to 47
8	Transportation and storage	H	49 to 53
9	Accommodation and food service activities	I	54 to 56
10	Information and communication	J	58 to 63
11	Financial and insurance activities	K	64 to 66
12	Real estate activities	L	68
13	Professional, scientific and technical activities	M	69 to 75
14	Administrative and support service activities	N	77 to 82
15	Public administration and defence; compulsory social security	O	84
16	Education	P	85
17	Human health and social work activities	Q	86 to 88
18	Arts, entertainment and recreation	R	90 to 93
19	Other service activities*	S	94 to 96
20	Activities of households as employers*	T	97 to 98

*Scorecards have not been generated for sectors S and T.

Sector Performance Visualisations

The sector performance visualisation integrates percentile-based colour encoding with rank-based bar positioning to provide a consistent comparative across multiple indicators and sectors.

- **Colours show relative performance (percentiles).** Each colour reflects how well a sector performs in the latest available year compared to other UK sectors. The top-ranked value is assigned 100%, the

lowest-ranked 0%, and the UK median ranked 50%. This provides a consistent colour scale, helping audience quickly identify stronger and weaker performers across all indicators:
    - **Green** (better performance) indicates performance above the 60th percentile
    - **Orange** (approximately equal) represents results within the 40th and 60th percentile
    - **Red** (weaker performance) indicates performance below the 40th percentile.
- **Bar lengths show rank positions.** The position and length of each bar represent actual rankings. Ranks 10th - 19th are placed on the left, and ranks 9th - 1st on the right meaning higher ranks extend further to the right. This ensures that visual length matches performance level.
- **Differences between sectors**. Some sectors do not include every indicator, so their maximum (last-place) rank may differ. This keeps the chart consistent across indicators, though it can make a few bars appear slightly off-centre - this reflects differences in data coverage, not errors.

Reversed (Inverted) Scale Indicators

For a small number of indicators, such as 'Low Skills', 'Annual Sickness Rate', 'Taxation as a Business Concern', 'Nominal Unit Labour Costs', 'Cost of Capital' and 'Job Intensity of Output', the relationship with productivity is inverse. In these cases, lower values indicate stronger productivity performance. The colour coding is therefore reversed to preserve interpretive consistency. For example, a sector with a 'Low Skills' value below the 40th percentile appears in green, signalling a smaller proportion of low-skilled workers and a more productive labour composition, while a value above the 60th percentile appears in red. Indicators displayed on a reversed scale are marked with an asterisk (*). This convention allows for consistent comparison across the scorecard, ensuring that "improvement" is always represented by a movement in the same visual direction.

Measuring Growth

Short- and long-term growth rates in the sectoral scorecards are calculated as simple percentage changes between the latest available year and the base year for each indicator. This approach captures the actual observed change in each variable over time, including temporary shocks such as the COVID-19 pandemic. Unlike compound or smoothed measures (e.g. CAGR), simple percentage change reflects the true variation in sectoral performance (without smoothing out temporary shocks such as COVID2019) and therefore provides a more transparent diagnostic of productivity dynamics.

Using simple percentage change also ensures consistency across sectors, since the underlying dataset provides the same period coverage for each industry. The selected base year (typically 2019) follows ONS guidance to use pre-pandemic benchmarks for productivity comparisons. Growth rates are interpreted as follows:

- change over time > 0.5 % - sectors show growth and are considered to have better performance,
- change over time within ±0.5 % - sectors are considered to have no significant change, and
- change over time < -0.5 % - sectors show a decrease in performance.

The same colour-coding scheme (green, orange and red) is used to indicate productivity growth over time. This method allows for a clear and policy-relevant view of each sector's recent and longer-term productivity developments, highlighting where structural challenges - such as underinvestment, skills, or innovation - may be constraining growth.

If the long-term trend is not presented, this means that the ONS data in unavailable (a grey dot).

Datasets

This methodology document outlines the productivity output metrics and the economic indicators included within each driver category. All indicators used in the scorecard are sourced and reported consistently by the ONS. Where data are unavailable at the SIC level, for reasons such as confidentiality or statistical disclosure, the indicator is shown in grey.

Productivity Output

This category comprises five indicators that assess and contrast the relative performance of labour productivity across different industries in the UK with respect to the entire UK economy, while a sector share in the UK GVA provides macroeconomic context by indicating the relative economic size and weight of a sector which can be useful for benchmarking and policy targeting.

Indicator	Description	Source/ Release
Labour Productivity (Output per Hour)	**Output per Hour (OpH) worked by industry, £/h** Gross Value Added (GVA) per hour values are current price (CP) data showing how productivity in each industry (SIC 2007 section level) compares to other industries, and the whole economy. Time period 1997-2024. *Dataset: Output per hour worked, UK*	ONS / 15 May 2025
Labour Productivity (Output per Job)	**Output per Job (OpJ) by industry, £** ONS calculates output per job for each industry by dividing gross value added (GVA) by jobs for that industry. GVA per job in current prices (CP) in GBP is used in this scorecard. Time period 1997-2024. *Dataset: Output per job, UK*	ONS / 15 May 2025
MFP	**Multi-factor productivity, index, 2022=100** Annual indices to the 2022 values. Industries O, P and Q are combined; R, S, T and U are combined for reporting by the ONS. Time period 1970-2024. *Dataset: Multi-factor productivity, annual, UK*	ONS / 23 May 2025
Sector Share in UK GVA	**Contribution to annual GVA by section-level industry, %** Shows how much growth in whole economy is contributed by each individual industry. Contribution is calculated as a percentage share of the sector GVA in the total economy (Annual GVA by section-level industry, Current price (CP), £ millions / Annual GVA for the whole economy, Current price (CP), £ millions. Time period 1997-2024. This indicator is not included in the driver categories. It provides context for the sector performance. *Dataset: Output per hour worked, UK*	ONS / 15 May 2025

Direct Inputs: Employment, Skills & Wellbeing

This category of direct inputs includes a range of indicators that describe the UK's labour market dynamics. These indicators reflect labour quantity, cost and quality.

Indicator	Description	Source / Release
Unit Labour Cost	**Unit labour cost (ULC), ratio** Nominal unit labour costs (ULCs) for an industry are the ratio of total employment costs (not including the costs covered by subsidies) to real gross value added (GVA) for that industry. Time period 1997-2024. *Dataset: Labour cost and labour income, UK*	ONS / 15 May 2025
Average Labour Compensation	**Average labour compensation per hour worked (ALCH), £/h** ALCH for an industry is the total employment costs (not including the costs covered by subsidies) divided by the total number of hours worked in that industry. Time period 1997-2024. *Dataset: Labour cost and labour income, UK*	ONS / 15 May 2025
Sector Jobs in Total Employment	**Share of jobs by industry in total employment in the UK economy, %** Jobs data show how total employment in the economy was distributed across industries. The TPI Productivity Lab estimates Sector Jobs as a percentage of the number of jobs in each industry divided by the total number of jobs in the UK economy. Time period 1997-2024. This indicator is not included in the driver categories. It provides context for the sector performance. *Dataset: TPI Productivity Lab estimates using Output per job, UK*	ONS / 15 May 2025
Annual Change in Sector Jobs	**Annual change in jobs by sector, %** Annual change in jobs within each sector is calculated based on productivity jobs values. Indicates job creation dynamics as the change is useful for tracking labour expansion or contraction in a sector. Time period 1998-2024. The short-term change (1 year) is measured in percentage points, i.e. a change is an arithmetic difference between two percentages. *Dataset: TPI Productivity Lab estimates using Output per job, UK*	ONS / 15 May 2025
High Skills	**Proportion of population with high skills, %** Represents the proportion of the working-age population (aged 16-64) with high competency skills by industry. High Skills proportion estimates median skill proficiency trends across industries and years. The ONS skills data uses anchor values adapted from the O*NET framework, where each skill is benchmarked against real-world tasks and occupational requirements. Anchor levels 4–7 that map to - advanced analytical or technical processing, strategic, abstract or creative reasoning, and leadership, innovation, or domain expertise - are included in high skills proportion estimates. *Dataset: TPI Productivity Lab estimates using Skills supply estimates: 2012 to 2023*	ONS / 9 Aug 2024
Low Skills	**Proportion of population with no or low skills, %** The low skills indicator represents the proportion of the working-age population (aged 16-64) with low competency skills by industry. Low	ONS / 9 Aug 2024

Indicator	Description	Source / Release
	Skills proportion estimates median skill proficiency trends across industries and years. The ONS skills data uses anchor values adapted from the O*NET framework, where each skill is benchmarked against real-world tasks and occupational requirements. Level 1–3 that map to routine, observable, simple skill applications, tasks involving basic recall, reaction, or physical coordination, and entry-level or support roles *Dataset: TPI Productivity Lab estimates using Skills supply estimates: 2012 to 2023*	
Sickness Absence Rate	**Sickness absence rate, % of hours lost out of total worked** Annual sickness absence rates of workers by industry in the UK labour market (as reported). It represents proportion of total working time lost (hours) due to sickness or injury. Shows how much potential productive labour is being lost, can be comparable across sectors and time. Data is available for 2019-2024. *Dataset: Sickness absence rate*	ONS / 4 Jun 2025

Direct Inputs: Capital & Investment

These measure capital investment and knowledge inputs. For instance, FDI brings not just capital but also new technologies and management practices, boosting productivity, while GFCF per job is a proxy for capital investment intensity, and an essential input in multifactor productivity. The indicators included in this driver category are critical inputs and context variables that affect sector productivity through capital investment and competitiveness.

Indicator	Description	Source / Release
FDI per Job	**Foreign Direct Investment (FDI) by industry per job, £** Captures external capital infusion per employee. Estimated as FDI by industry activity divided by industry jobs to give inward FDI position per job in an economic sector. The value is then converted to real value over time using GDP deflator. Foreign Direct Investment is international investment position in the UK held by foreign companies (inward) by industrial activity. Some of the data in the ONS FDI dataset have been suppressed to prevent disclosure. Industry jobs, taken from the ONS 'Output per Job' publication. Time period 2015-2021. *Datasets*: *Foreign direct investment, experimental UK subnational estimates: 2021, Output per job, UK, GDP deflators at market prices, and money GDP June 2025 (Quarterly National Accounts)*	TPI Lab estimates / ONS / FDI: 24 Apr 2023 Jobs: 15 May 2025 Deflator: HM Treasury /30 June 2025
GFCF per Job	**Gross fixed capital formation (GFCF) per job, £** Measures physical capital investment intensity. Estimated as GFCF by industry (£ million) divided by industry jobs from ONS 'Productivity Jobs' The value is then converted to real value over time using GDP deflator. *Datasets: Annual gross fixed capital formation by industry and asset, Output per job, UK, GDP deflators at market prices, and money GDP June 2025 (Quarterly National Accounts)*	TPI Lab estimates ONS / GFCF: 1 Nov 2024 Jobs: 15 May 2025 Deflator: HM Treasury /30 June 2025

Indicator	Description	Source / Release
Taxation as Business Concern	**Taxation as a business concern, % of businesses** Represents a percentage of active businesses that indicated taxation as a concern to doing business in the ONS business insights survey when asked to list main concerns for their business. The survey covers the UK businesses and is conducted monthly. Period covered 2022-2024 (responses for September). 'Other service activities' (T) and 'Mining and quarrying' (B) were removed for disclosure purposes, but ONS includes their totals in 'All Industries'. *Dataset: Business insights and impact on the UK economy*	ONS / BICS / 23 Oct 2025
R&D per Job	**Real R&D per job by industry, £** Captures capital allocated to innovation activities as levels of R&D expenditure are linked to productivity levels. ONS data on BERD provides a breakdown of R&D performed in UK businesses by industry. Real R&D per job is estimated as R&D expenditure relative to industry jobs. The value is then converted to real value over time using GDP deflator. *Datasets: Business enterprise research and development, UK, Output per job, UK, GDP deflators at market prices, and money GDP June 2025 (Quarterly National Accounts)*	TPI Lab estimates ONS / R&D: 11 Dec 2024 Jobs: 15 May 2025 Deflator: HM Treasury /30 June 2025
R&D Intensity	**R&D intensity by industry, %** Measures R&D investment relative to output. The TPI Productivity Lab estimates R&D intensity as R&D expenditure (£ million) in an industry as % of industry GVA (annual GVA, £million, by section-level industry aggregations). *Datasets: Business enterprise research and development, UK, Output per hour worked, UK*	ONS / R&D: 11 Dec 2024 GVA: 15 May 2025
Capital Productivity	**Capital productivity by industry, index, 2022=100** Measures output generated per unit of capital services and shows efficiency of capital use in a sector. Across sectors, capital productivity provides insights into how effectively different UK sectors use capital, distinguishing between capital-intensive growth and efficiency-driven performance. Can indicate whether sectors underperform due to capital inefficiency vs. labour or structural issues. Short- and long-term annual percentage change in capital productivity can help track capital-use trends. *Dataset: Multi-factor productivity, annual, UK*	ONS / 23 May 2025
Capital Deepening	**Capital deepening by industry, index, 2022=100** Shows capital intensity per hour worked. Indicates higher labour productivity achieved through better availability of capital per worker to invest in technology or machinery to be used by workers. Short- and long-term annual percentage change in capital deepening can help track capital intensity trends. *Dataset: Multi-factor productivity, annual, UK*	ONS / 23 May 2025
Cost of Capital	**Cost of capital by industry, £ million** Reflects the annualised cost of using capital assets (e.g. machinery, buildings, equipment, software). Complements GFCF, FDI, and R&D by adding a price dimension to capital inputs. A useful measure when assessing investment productivity and capital efficiency. *Dataset: Volume Index Capital Services (VICS), annual, UK*	ONS / 23 May 2025

Indirect Drivers: Innovation Technology, Market & Structural Dynamics

This driver category shows the role of innovation technology, market exposure and structural dynamics as a group of indirect drivers influencing industry productivity. These are TFP-enhancing strengths. Although not direct production inputs, they are key to explaining productivity differences across economic sectors. Innovation activity, entrepreneurship and the level of business dynamism in an industry are considered crucial elements affecting the economic sector performance. Market exposure, trade openness and the significance of business export activity affects learning, scale economies, and competition, and improve productivity indirectly. Separating these varied indicators from core inputs in the scorecard is consistent with the production function perspective, sharpens the productivity growth signals from each source of productivity gain, and is useful for refining and extending the scorecard in the future, for example by including new additional indicators such as digitalisation level, automation or digital technology adoption.

Indicator	Description	Source / Release
Innovation-active Firms	**Innovation-active businesses, %** Businesses engaging in innovation activity as % of total businesses by industry. The rate at which new businesses are emerging reflects the extent of entrepreneurial activity in an economic sector. Entrepreneurship, firm dynamism, and firm establishment are identified as significant catalysts for economic wellbeing. The UK Innovation Survey (UKIS) 2023 by ONS/DBT dataset on business demography in the UK provides data for businesses engaging in innovation activity in 2020-2022. The ONS/UKIS consists of a nationally representative sample of businesses with 10 or more employees in sections B-N of the SIC 2007. The data by SIC divisions for manufacturing, transportation, ICT and professional activities sectors is aggregated according to SIC 2007 section level, and the percentage value for the aggregated sections is re-calculated based on the reported weighted sample size of each SIC division included in the respective SIC section. We used the weighted sample size since the UKIS results were based on weighted data for representativeness of the population of firms. *Datasets: Statistical Annex of UK Innovation Survey Report 2023, 2021, 2019, 2017, 2015*	ONS / Department for Business & Trade (DBT) / 9 May 2024
New Business Births	**New businesses by economic sector, %** The rate of new enterprises being created is an indicator of the level of entrepreneurial activity by industry. The TPI Lab estimates of new business births (count) as % of all active enterprises (count). Time period covered 2017-2022. *Dataset: Business demography, UK*	ONS / 18 Nov 2024
Managerial Skills	**Proportion of population with managerial skills** Represents the proportion of the working-age population (aged 16-64) with managerial skills by industry. Managerial Skills proportion estimates median skill proficiency trends across industries and years. This measure reflects organisational efficiency and ability to implement productivity-enhancing processes. The ONS skills data uses anchor values adapted from the O*NET framework, where each skill is benchmarked against real-world tasks and occupational requirements. Anchor levels 4–7 used for managerial skills map to the following skill groups: - Cross-Functional Skills: Resource Management, Social Skills, Systems Skills - Generalised Work Activities: Interacting with others, Mental Processes	ONS / 9 Aug 2024

Indicator	Description	Source / Release
	- Knowledge: Business and Management, Communications, Education & Training. *Dataset: Skills supply estimates: 2012 to 2023*	
Exporters	**Exporters of Goods and Services by industry, %** Percentage of businesses which are exporters. The TPI Lab estimates of industry exporters as % of all active enterprises. This measure is linked to Export Intensity indicating which UK industry is more export orientated and have access to international markets and competition. Time period covered 2011-2023. *Dataset: Exporters and importers by industry breakdown (Annual Business Survey)*	ONS ABS / 1 Jul 2024
Export Intensity	**Exports intensity, %** The export intensity of an industry plays a crucial role in driving productivity as companies engaged in global competition typically enhance their efficiency and reduce costs, thereby boosting their productivity levels. Consequently, a higher export performance among firms leads to increased productivity within the industry. This metric is determined by summing the nominal values of trade in goods and services, then dividing the result by the nominal industry GVA value. Because this measurement relies on distinct estimations of goods and services exports, issues related to confidentiality may emerge at the industry level, resulting in gaps within the dataset. Some data cells have been suppressed by the ONS to protect confidentiality. The TPI Lab estimates of annual export of goods and services (£ millions) as % of industry GVA (current price, £ millions). *Datasets: UK trade in goods by industry, UK trade in services by industry, Output per hour worked, UK*	HM Treasury ONS / Trade: 15 May 2023 GVA: 14 May 2024
Job Intensity	**Job intensity of output - jobs per £1m GVA** Jobs per output is a measure inverse of output per hour and estimated as Number of Jobs / GVA (constant prices, £m GBP). Shows how labour-intensive a sector is and could be useful for identifying automation potential or productivity slack in a sector. *Datasets: Output per job, UK, GDP output approach – low-level aggregates*	ONS / Jobs: 15 May 2025 GVA: 30 Sep 2025
Annual Change in GHG Emissions	**Annual change in GHG (Greenhous Gas) emissions, %** Shows the percentage of annual change in total GHG emissions by industry. The emissions are measured as mass of air emissions per annum in thousand tonnes of carbon dioxide equivalent, data available for 1990 to 2023. While not directly influencing productivity, environmental and sustainability factors may stimulate long-term productivity by improving operational effectiveness and spurring innovation. Annual % change in GHG emissions reflects whether sectors are improving their environmental efficiency which could be a relevant productivity consideration. The short-term change (1 year) is measured in percentage points, i.e. a change is an arithmetic difference between two percentages. *Dataset: Atmospheric emissions: greenhouse gases by industry and gas*	ONS / 5 Jun 2025