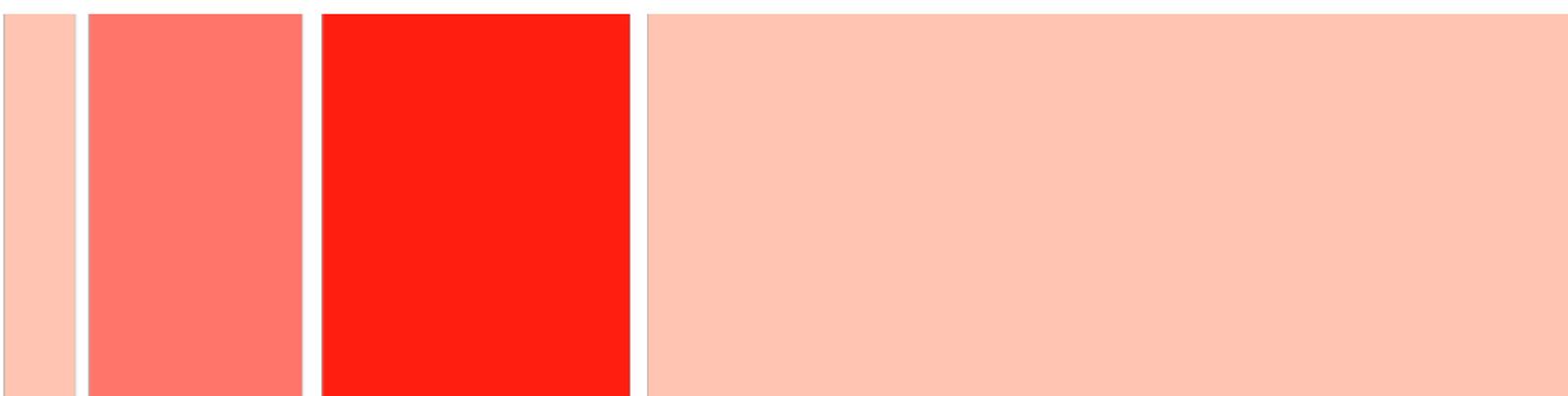




SOCIAL RESEARCH NUMBER: 47/2026

PUBLICATION DATE: 25/03/2026

Wales' tradeable services sector: a mixed-methods study



Mae'r ddogfen yma hefyd ar gael yn Gymraeg.

This document is also available in Welsh.

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Wales' tradeable services sector: a mixed-methods study

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Full Research Report: Oliver, D; Miller, N; Rigley, H; Byrne, M; Hopkins, G; Mucientes, M; Pemberton, Y. (2026). Wales' tradeable services sector: a mixed-methods study. Cardiff: Welsh Government, GSR report number 47/2026.

This report can be found on the Statistics and research pages of the Welsh Government website: <https://www.gov.wales/statistics-and-research>

Views expressed in this report are those of the researcher and not necessarily those of the Welsh Government

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Glossary

ASE

Actual Services Exports

BEIS

Department for Business, Energy and Industrial Strategy

CCR

Cardiff Capital Region

CPA

Classification of Products by Activity – an EU categorisation of products linked to NACE, with each product tied to a single NACE activity.

EBITDA

Earnings before interest, taxes, depreciation, and amortisation

ECIPE

European Centre for International Political Economy

ESG

Environmental, Social, and Governance

EU

European Union

FTA

Free Trade Agreements

GATS

General Agreement on Trade in Services

GDP

Gross Domestic Product

GVA

Gross Value Added

IDBR

Inter-Departmental Business Register

ITIS

International Trade in Services

NACE

Nomenclature statistique des Activités économiques dans la Communauté Européenne – EU industry classification broadly similar to SIC 2007.

Nesta

National Endowment for Science, Technology and the Arts

NQF

National Qualifications Framework

OECD

Organisation for Economic Cooperation and Development

ONS

Office for National Statistics

SIC 2007

Standard Industrial Classification – a means of classifying industrial and commercial activities.

SME

Small and medium-sized enterprise

TiVA

Trade in Value Added

TISMOS

Trade In Services by Mode Of Supply

WTO

World Trade Organization

1. Introduction

The Welsh services sector is a cornerstone of Wales' economy, accounting for a significant share of employment, gross value added (GVA), and inward investment. Yet, comprehensive data and analysis on the sector, particularly on its tradeable dimension, remain limited. Recognising the need to deepen its evidence base, in January 2025, the Welsh Government commissioned Miller Research to undertake a comprehensive study of the services sector in Wales.

The study aimed to investigate the current size, state, economic contributions, challenges, and future growth prospects of the sector, including consideration of export potential and opportunities. The findings will inform Welsh Government policy by providing an evidence base for strategies to support the sustainable growth of the services sector and enhance its contribution to the wider Welsh economy.

1.1. Scope of the study

The services sector encompasses activities that do not result in the production of physical products and are typically delivered in sub-sectors such as finance, education, healthcare, hospitality, retail, entertainment, and professional services (including legal services, business consultancy, and information technology). For the purposes of the study, the services sector is defined as economic activities that result in a change in the conditions of consuming units or facilitates the exchange of products or financial assets ([European Commission \(2023\) International trade in services](#)). A particular focus was placed on tradeable services, which are defined as those services which have potential to be sold and consumed outside the region in which they are produced (i.e. those which are not tied to a specific location for delivery).

1.2. Situating the study

This research provides a comprehensive view of the services sector and its sub-sectors in Wales, with a focus on:

- economic contribution: assessing the size, structure, and economic contribution of the services sector, including employment levels, business composition, and workforce characteristics (e.g., pay, skills, hours worked).
- sub-sector focus: identifying key industries within the sector, including those with the greatest economic importance and highest growth potential.
- growth prospects: examining future trends, opportunities, and areas where the sector could expand, particularly in comparison with global markets.
- barriers and challenges: understanding the barriers facing service sector businesses in Wales and proposing potential policy responses.
- Welsh Government interventions: examining the role of existing Welsh Government interventions and academic expertise in enabling sectoral development.
- export potential: assessing Wales' tradeable service industries and identifying opportunities to expand into international markets.

A key component of the study was to map Wales' services ecosystem, including universities and research institutions supporting industry development. The research examines the role of Mode 5 services, where service inputs (such as research, design, or software) are embedded within exported goods. Mode 5 services can significantly boost the value of Welsh exports yet often remain hidden within standard trade data. By focusing on Mode 5 services, the research highlights an opportunity to deepen its competitive advantages and strengthen its manufacturing-service ecosystem.

1.3. Methodological approach

To ensure a robust and actionable evidence base, the study adopted a mixed-methods approach, combining:

- a review of existing research and literature on global services trade and policy interventions.
- secondary data analysis to quantify economic contributions and sectoral composition. The secondary data used was the latest available at the time of writing.
- stakeholder engagement with businesses, policymakers, and industry representatives.
- an approach to analysing the sector which triangulates a number of datasets to try and achieve a "best fit" picture of the service sector in Wales.

This research helps to understand the role of tradeable services, addressing data limitations, leveraging available data, and conducting primary research with stakeholders. This is aimed at enabling policymakers to better support Wales' tradeable services sector through understanding priorities, opportunities, and challenges.

2. Approach and methodology

2.1. Introduction and rationale

This study aimed to establish an evidence base on Wales' tradeable services sector – services that may be sold or consumed outside the region in which they are produced. The objective was to better understand how these services contribute to employment, GVA, and exports, as well as to explore challenges and opportunities for future growth. A particular emphasis was placed on:

- profiling the sector's structure, composition, and workforce characteristics.
- identifying key service sub-sectors and their economic contributions.
- uncovering the key challenges facing service-sector businesses and proposing potential policy responses.
- exploring global comparisons to highlight future trends and new opportunities.
- understanding the phenomenon of Mode 5 services (services that are embedded within or bundled with manufactured goods) and assessing how they may enhance Wales' competitiveness.

Given the complexity and limited availability of data on service-sector exports at the subnational level, the study combined desk-based research, comprehensive data analysis (including official and proprietary databases), and primary research (including 55 survey responses and 18 interviews) to develop actionable insights for policy and planning.

2.2. Research scope and definitions

The study focused on identifying and understanding the potentially tradeable portion of Wales' services sector. While certain services (e.g. training) may not be tradeable in a traditional setting, the rise of digital delivery methods has blurred these lines. For instance, face-to-face seminars become tradeable once moved online and offered remotely to international clients. Recognising these nuances was vital for accurately defining the scope of the research.

To identify which services could be classified as 'tradeable', the study references the United Nations Conference on Trade and Development (UNCTAD) definitions, which classify services by how they affect consuming units (e.g. repair, healthcare, education), facilitate product exchange (e.g. transport and logistics), or facilitate financial exchange (e.g. banking and insurance) (United Nations Conference on Trade and Development (UNCTAD) (1999) UNCTAD/ITE/IIT/11 (Vol. II): Scope and Definition. UNCTAD Series on Issues in International Investment Agreements. New York and Geneva: United Nations). These categories align broadly with the Extended Balance of Payments Services (EBOPS) 2010 framework, which groups services into twelve overarching types, from financial services and telecommunications to personal and recreational activities ([United Nations \(2010\) Manual on Statistics of International Trade in Services 2010: Extended Balance of Payments Services Classification](#)). Standard Industrial Classification (SIC) 2007 codes help identify individual industries or sub-industries that demonstrate tradeable service characteristics.

The sample used for this study is comprised of SIC codes as they form the official framework used by the Office for National Statistics (ONS) and other government bodies, ensuring consistency and comparability when analysing business registrations, turnover, and employment data. This approach helps pinpoint specific sub-industries while aligning with national statistical standards.

A particular emphasis lies in Mode 5 services, wherein service inputs, such as design, engineering, or research and development (R&D), are embedded within exported goods. This often means their value is 'hidden' under manufacturing activities and not directly captured in standard trade statistics. By examining data from Companies House, Beauhurst, and the Trade in Value Added (TiVA) database, the study aimed to explore these embedded contributions and gauge their significance to Welsh exports. The research used Input-Output tables to explore how services, whether directly tradeable (e.g. consulting) or indirectly embedded (e.g. Mode 5), support the broader manufacturing sector.

Ultimately, the study explores the breadth of Wales' services, attempting to gauge export readiness and potential policy interventions or support mechanisms that can enhance the sector's competitiveness, both domestically and on the global stage.

2.3. Methodological approach

This study adopted a structured, multi-phase approach to investigate the size, composition, and future growth prospects of Wales' services sector, with a specific focus on tradeable services.

2.3.1. Desk-based review and sector mapping

This phase involved a thorough review of academic, policy, and grey literature to contextualise both global and UK-level trends in tradeable services. Using UK SIC codes, the study identified a short-list of potentially tradeable services' business activities and applied these to data from Companies House and commercial database Beauhurst, to compile a database of Welsh service-sector businesses. During this process, the research mapped supporting 'ecosystem' elements, such as universities, research institutes, and government initiatives, that underpin service sector innovation.

A short-list of potentially tradeable service business types by SIC code was agreed in collaboration with Welsh Government. Initial analysis and assessment of these businesses identified a series of sub-sectors for further study. These were selected with reference to a series of subjective criteria including:

- economic contribution: the sub-sector's share of employment, turnover, or GVA in Wales.
- export potential: the sub-sector's ability to deliver services remotely or across borders (e.g. digital or professional services).
- alignment with Welsh Government priorities: relevance to current Welsh Government strategies such as the Economic Mission or Export Action Plan for Wales.

- innovation and R&D Capacity: availability of partnerships with universities or research centres offering specialised knowledge and expertise.
- economic and social impact: ability to create high-quality, skilled positions or contribute to upskilling/reskilling.

The resulting sub-sectors and their relevant SIC codes were identified for further study through a workshop with colleagues from across the Welsh Government. These broad, 2-digit SIC Divisions can cover a broad range of services, some of which may be tradeable or non-tradeable.

Table 1: Identified sub-sectors.

Sub-Sector	SIC Code
Financial and Insurance	Divisions 64, 65, 66 (K)
IT and Development	Divisions 62, 63 (J)
Creative and Digital Media	Divisions 58, 59, 60 (J)
Legal and Accounting	Divisions 69 (M)
Management Consultancy / Head Office	Divisions 70 (M)
Architectural and engineering activities, technical testing, analysis	Divisions 71 (M)
Scientific Research and Development	Divisions 72 (M)
Advertising & Market Research	Divisions 73 (M)
Other professional, scientific, technical	Divisions 74 (M)

Source: Miller Research

It is worth noting that there are some significant services sector activities which straddle a range of sectors, are undertaken by manufacturing coded businesses, or are not adequately defined through SIC codes. Examples here might include cybersecurity, life sciences, robotics or blockchain activities. These were identified through desk-based research, interviews, and workshop discussion and were researched separately, working through industry fora, universities and anchor company data for Wales.

2.3.2. Primary data collection

To complement secondary analysis, a range of primary research techniques were employed:

- scoping interviews: 8 semi-structured interviews with industry bodies, sector representatives, and policymakers provided an overview of the service sector and service sector support in Wales. Welsh Government selected respondents for the scoping and semi-structured interviews and provided contact details to Miller Research.
- stakeholder interviews: a further 10 semi-structured interviews with industry bodies, businesses support agencies, businesses, and ecosystem providers added qualitative depth, uncovering real-world challenges related to funding, skills, and support.
- online survey: a detailed questionnaire was distributed to service-sector businesses to capture data on export activities, workforce dynamics, and perceived barriers, and 55 responses were received. The survey was distributed to a targeted list of 4,658 Welsh service businesses via SurveyMonkey and promoted through Welsh Government channels and partner networks. This equates to a response rate of 1.2%..

2.3.3. Analysis and synthesis

All data streams, both quantitative (survey findings, official statistics, analysis of service sector database) and qualitative (interviews, workshop) were analysed and consolidated into an analytical framework. Key activities included:

- GIS mapping: using geographic information systems, business data was visualised by size and SIC code to reveal spatial patterns, identify regional clusters, and highlight potential gaps in service provision. This mapping facilitated an understanding of where particular sub-sectors thrive and helped pinpoint areas requiring targeted policy or investment.
- qualitative data analysis: all interviews and open text survey responses underwent thematic analysis supported by data visualisation tools. Multiple researchers collaborated in coding the data, cross-checking interpretations, and refining themes through iterative discussion aiming to identify nuanced barriers, enablers, and stakeholder viewpoints that may not have emerged from quantitative measures alone.
- horizon scanning: to project how Wales' services sector may evolve, the team examined emerging trends at both national and global levels. Factors such as digitisation, climate-oriented innovation, and shifting trade policies were assessed to anticipate their likely impact on service providers. Through reviewing external research, monitoring technological breakthroughs, and incorporating expert stakeholder views, the study highlights areas where Wales can stay competitive, adopt new technologies, and adapt to future market conditions.
- quantitative data analysis: the study employed multiple data sources, including official statistics (e.g. Companies House, ONS) and proprietary datasets (e.g. Beauhurst), to estimate size, composition, and performance of Wales' service sector.

After consolidating, cleaning, and cross-referencing records, descriptive statistics were used to reveal patterns in workforce size, turnover, and export activity.

- Mode 5 review: the study assessed the extent and significance of Mode 5 services in Wales, focusing on services embedded within or bundled alongside manufactured products. Supply and Use, Input-Output tables and additional survey data were used to estimate Mode 5 contributions to exports. This was calculated by understanding the level and nature of service sector purchases by the manufacturing sector, and the proportion of these which are embedded in manufactured goods. The review highlights where policy support or further data collection might optimise the value of these under-recognised services.

2.4. Limitations and caveats

Although the study sought to provide a robust and comprehensive overview of Wales' services sector, several limitations affect the depth and precision of the findings. We have outlined these below.

2.4.1. Coverage and quality of data

Partial financial data: after combining Beauhurst and Companies House records, the final dataset consisted of 73,544 entries. However, turnover data was available for only 4.3% of these companies. This low coverage of key financial fields limited the robustness of certain economic indicators.

Headquartered vs operating in Wales: both datasets primarily capture businesses headquartered in Wales. Businesses that operate or have branch offices in Wales but are headquartered elsewhere may not appear in the datasets, potentially hindering an understanding of the true footprint of services activities in Wales.

2.4.2. Assumptions about SIC codes and tradeable activities

Sector classification: determining which businesses fall within the broad remit of 'tradeable services' required mapping from SIC codes. This approach rested on the assumption that specific SIC codes correspond reliably to possibly tradeable activities. In reality, enterprises may use SIC codes that do not perfectly reflect their actual business activities, and some firms may operate in multiple service areas under a single classification.

Unknown proportion of tradability: while an industry or company may be classified as a 'tradeable' service by SIC code, the actual share of its services sold beyond the immediate local area - particularly beyond Wales - can vary significantly. As a result, the precise proportion of each company's activities, and each sub-sector's activities, that is actually tradeable in an interregional or international sense remains difficult to quantify.

2.4.3. Mode 5 and embedded services

Hidden nature of embedded services: the study attempted to estimate Mode 5 contributions (i.e. services embedded in exported goods) using Input-Output Tables and Supply and Use Tables. However, quantifying the exact service value within a manufactured export is complex, since businesses rarely report embedded services separately. The resulting figures should therefore be read as indicative rather than exact.

2.4.4. Temporal and sectoral boundaries

Data timelines: much of the data (e.g. IDBR or official Input-Output Tables) is subject to publication lags. Although the latest available figures at the time of writing have been used, they may not fully capture recent market changes, especially in rapidly evolving sub-sectors (e.g. digital services) and rapidly evolving geopolitical situations. Relatedly, while the latest available figures at the time of writing have been used, the time lag between drafting and publication means they may not be the latest available figures as of the publication date.

Sector aggregation: in certain instances, such as financial services or insurance, data may be combined into high-level aggregates, obscuring nuances of individual sub-sectors.

2.4.5. Exclusion of certain business types

Non-Profit and public sector: some non-profit or public sector organisations delivering services may not be fully captured in this analysis if they do not register as businesses with turnover data.

Under-Reported small enterprises: micro-businesses (particularly sole traders) can be missed if they have minimal reporting obligations or operate without limited company status.

2.4.6. Stakeholder engagement considerations

As with any mixed-methods policy study, certain limitations should be considered when interpreting the findings. Firstly, in terms of qualitative engagement, the research aimed to conduct 25 semi-structured interviews with businesses, industry bodies, sector representatives, policymakers, business support agencies, and ecosystem providers across the agreed upon service sub-sectors. A total of 18 interviews were completed (including 8 scoping interviews and 10 sector-specific consultations). While the evidence collected is thematically rich, engagement was constrained in some sub-sectors. Several businesses indicated they were unavailable during the fieldwork window due to operational demands, particularly those responding to the evolving US tariff regime. In other cases, stakeholders did not respond despite follow-up attempts. These limitations do not negate the indicative value of the insights presented, but they do warrant caution when interpreting comparative insights across regions or sectors.

A complementary online survey was conducted to broaden engagement and capture additional views. The survey was promoted through Welsh Government channels and partner networks and received 55 responses. While this level of engagement is consistent with typical business-to-business survey response rates, it does limit the generalisability of the results. Accordingly, survey findings have been used primarily in a contextual and illustrative capacity, supporting qualitative insights and triangulating patterns identified through interviews and secondary analysis.

2.5. Implications for interpretation

Taken together, these limitations mean that while the findings offer useful insights into Wales' service sector, particularly around potential tradeable activities and indicative Mode 5 contributions, some figures should be regarded as illustrative rather than definitive.

Wherever practical, we have used the most recent and relevant data sources, presenting ranges of data where different sources present a range of figures. Embedded services remain difficult to quantify with accuracy, and the figures are best read as a plausible baseline range informed by available methodologies rather than as fixed totals.

To address these issues, we undertook several steps to improve robustness. Wherever possible, we triangulated between multiple data sources, selecting the most relevant and up-to-date information. In cases of uncertainty (e.g. employment) we have provided a range of estimates rather than a point value to reflect plausible upper and lower bounds. In our qualitative fieldwork, findings from stakeholder interviews were reviewed against literature reviews and policy documents.

Nonetheless, due to sample sizes and data limitations, the report does not claim sector-wide generalisability. Instead, it offers a strategic overview grounded in evidence, with findings used to identify opportunities for further investigation and policy development. The study should be seen as a foundation for understanding sectoral dynamics, informing policy decisions, and highlighting areas where further data collection and research can refine understanding.

2.6. Global trade environment

Between January and April 2025, the global trade environment became highly volatile following the United States' imposition of sweeping tariffs, with average rates rising from 2.5% to 27%. These measures, and the retaliatory actions they provoked, created substantial uncertainty, dampened business confidence, and disrupted global markets. Of particular concern to Wales was the announcement of a US tariff on non-American films, which could pose a threat to Cardiff's growing film and media industry. With productions increasingly reliant on co-financing, US partnerships, and international distribution, industry stakeholders and policymakers have warned that these tariffs risk undermining investment in Welsh screen infrastructure, reducing export potential and eroding the competitiveness of Cardiff as a location for high-value creative services ([Equity \(2025\) More US Production Can Help Whole Film Industry, Says Equity in Response to Tariffs](#); [Hansard \(2025\) United States Film Tariff, House of Commons debate, 7 May 2025](#); [Nation Cymru \(2025\) Trump's](#)

[Tariffs on Non-US Movies Would Deal Knock-Out Blow to UK Film Industry; The Guardian \(2025\) UK Film Industry Horror at Possible Trump Tariffs, 9 May 2025](#)).

For Wales, the global trade environment poses challenges to the competitiveness of its services sector. The US is Wales' second-largest export market for goods and a major partner for services trade (worth an estimated £3.2 billion in 2022). Any disruption in US-UK trade could indirectly influence Welsh service providers, through reduced US client activity or knock-on effects from Welsh manufacturers facing new barriers. Business leaders in Wales voiced concern that tariffs had the potential for significant impact to businesses, prompting the Welsh Government to establish and convene a Tariff Intelligence & Response Group. Business confidence was impacted, and firms began to reassess growth forecasts, risk exposure, in some cases postponing investments or hiring decisions ([Welsh Government \(2025\) UK-US Economic Prosperity Deal; Chandak, A. and Shrivastava, S. \(2025\) Global trade war hits UK business sentiment, growth outlook: Reuters poll](#)).

While the tariffs largely targeted goods, Wales' tradeable services sector experienced indirect impacts via inflation, currency fluctuations, and shifts in global demand. The situation underscored the strategic importance of Mode 5 services, which are indirectly affected by goods tariffs.

3. Service sector background

This section outlines an overview of international services trade, including an examination of statistics and desk-based research relating to the UK and Wales.

3.1. Global and European context

The services sector is a major driver of economic activity globally, contributing substantially to employment, GDP, and trade. In the EU, services account for approximately 73% of GDP, positioning the EU as a leading player in global services trade. EU service industries are diverse, with business, transport, telecommunications, and computer and information services representing significant proportions of EU service exports ([European Services Forum \(2025\) Regions in Europe – 2025 Edition](#); [European Services Forum \(2024\) EU international Trade Focus on Trade in Services – Trend per Services Sectors - From 2012 to 2023 - October 2024](#)).

3.1.1. The rise of servicification

Internationally, the relationship between services and manufacturing has become increasingly intertwined through 'servicification', whereby companies integrate services as inputs in their production processes, embed services within products, or offer standalone service offerings ([Kommerskollegium \(2016\) The Servicification of EU Manufacturing Building Competitiveness in the Internal Market](#)). This shift has been driven by factors such as the 2008 financial crisis, a growing emphasis on productivity, global value-chain integration, and advances in digitalisation ([Copenhagen Economics \(2018\) Making EU Trade in Services Work for All](#)).

EU manufacturing exports have a higher share of value added from services than those from the US and Japan, making services a crucial driver of export competitiveness. Service inputs are essential across all EU member states, and manufacturing jobs are becoming increasingly service oriented. This convergence means that manufacturers are increasing bundling high-value service offerings with their products, creating new opportunities for higher-skilled jobs, enhanced export competitiveness, and the need for revised business models and policies that recognise and support the growing service content of what were once purely manufacturing activities.

3.2. UK services sector: overview and key sub-sectors

The UK is the world's second largest services exporter and services dominate economic output, accounting for approximately 80% of GVA and 83% of employment in July to September 2025 ([House of Commons Library \(2025\) Service industries: Economic indicators](#)). However, regional disparities persist, with London and the Southeast capturing a disproportionate share of employment and value. The UK's services sector spans a range of industries, with financial services amongst the most significant, [employing 2.3 million people](#) in 2020 (7% of the UK workforce) and making the UK one of the world's largest

financial centres (Stansbury, A. et al. (2023) Tackling the UK's regional economic inequality: binding constraints and avenues for policy intervention; [The CityUK \(2020\) Key Facts about UK-based financial and related professional services](#); UK Trade Policy Observatory (202) [Links between Services and Manufacturing Trade in the UK: Mode 5 and Beyond](#)).

While London is the world's second-largest financial hub, two-thirds of UK financial services employment is based outside the capital, creating opportunities and enhancing competition for other parts of the UK such as Wales (OCO Global (2022) Welsh Financial Services Offer: Capabilities, assets and competitiveness). Alongside financial services, business and professional services, including legal, accounting, and consultancy, are key export sectors ([Government Office for Science \(2018\) Services Transformed: Growth Opportunities for the UK Service Economy, A report by the UK Government Chief Scientific Adviser](#)). Creative and digital industries, including media, IT, and software services, are among the fastest growing, while transport, logistics, and tourism contribute significantly to the economy, particularly in several regions and the devolved nations ([Deloitte \(2013\) Tourism: Jobs and Economy. The economic contribution of the tourism economy in the UK](#); [Fazio, G., Jones, J., Maioli, S. and Simandjuntak, D. \(2024\) UK Trade in a Global Creative Economy: Creative PEC State of the Nations](#)). Service-based inputs such as engineering, R&D, and after-sales support are also critical to the UK's high-value manufacturing industries, including motor vehicles, aerospace, and pharmaceuticals (OCO Global (2023) UK financial services sector employment and competitiveness).

Recent UK-wide research highlights a large productivity gap between frontier service businesses and those lagging behind, addressing this gap through targeted support, such as improving management practices, digital adoption, and upskilling has the potential to yield significant economic gains ([Government Office for Science \(2018\) Services Transformed: Growth Opportunities for the UK Service Economy](#)).

The UK services sector thrives on a diverse range of industry, from financial services to creative and digital fields, although substantial regional disparities remain. The following section examines how recent developments, specifically the EU-exit and Covid-19, have reshaped this landscape.

3.2.1. Recent shifts: the EU-exit and Covid-19

The UK services sector has faced two significant disruptors in recent years:

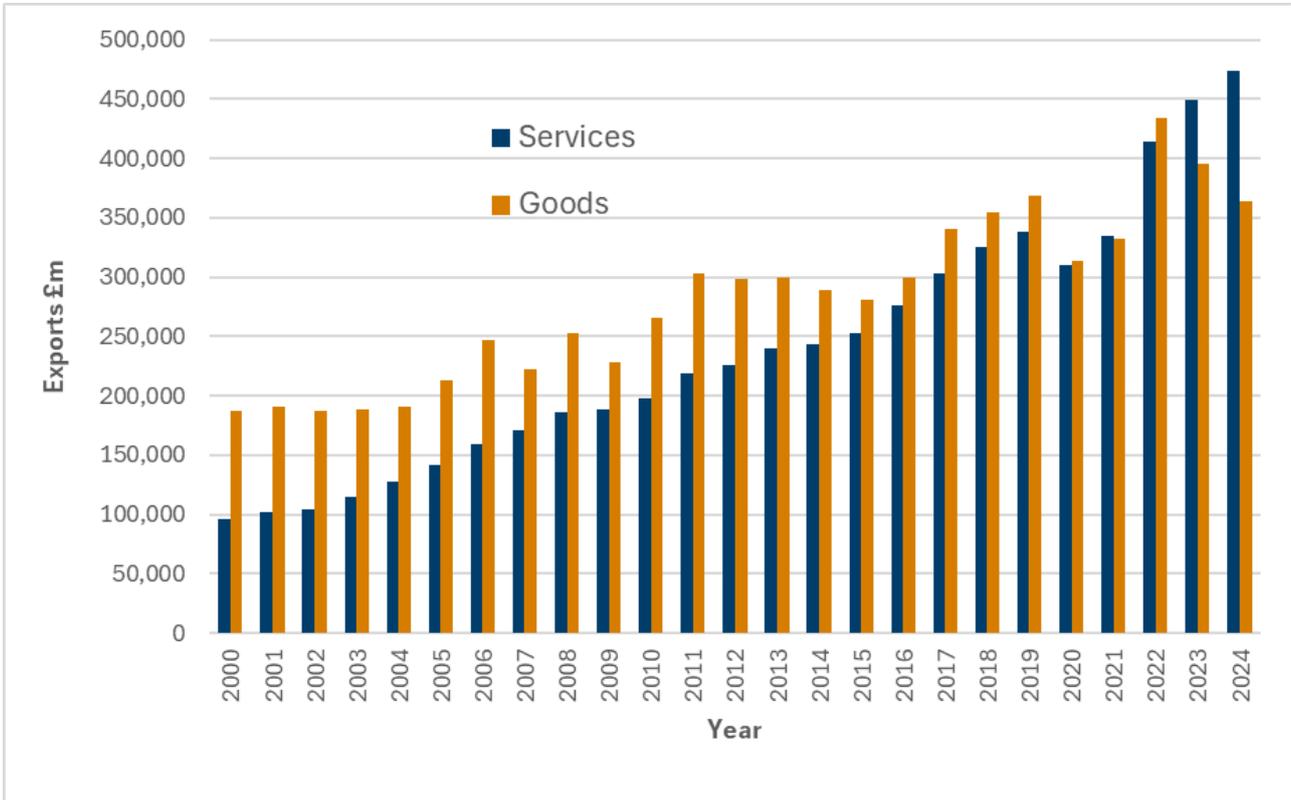
- The EU-exit: the UK's departure from the EU Single Market has increased competition in financial services, as EU financial centres sought to attract investment away from London. This has resulted in a decline in the UK's share of financial services-related Foreign Direct Investment (FDI) (Reuters (2024) Brexit and UK financial services competition).
- Covid-19: in 2020, 82.1% of UK service exports were delivered remotely, up from 65.2% in 2019, demonstrating a rapid pivot to digital business models. At the same time, remote service imports grew from 54.9% to 71.8% ([Office for National Statistics \(2022\) UK trade in services by modes of supply](#)).

This highlights the need for adaptive policy interventions that support digital transformation, attract investment, and help services businesses adapt in a post EU-exit and post-pandemic landscape.

3.3. High-level export context

Against the backdrop of evolving trade conditions, tariffs, and digital transformation, it is important to understand the broader export landscape in which these services operate. Exports are vital to the UK accounting for an estimated 32% of GDP ([Webb, D. \(2024\) Economic update: Services exports outpace goods](#)). This is especially true for Wales, where goods and service exports were estimated at 37.1% of GDP; higher than in England, Scotland or Northern Ireland ([Wood, A \(2024\) Exports crucial to boosting Welsh economy. Business Live](#)).

Figure 1: UK Exports of Goods and Services; 2000-2024.



Description of Figure 1: Chart showing UK exports of goods and services over the 2000-2024 period. Services exports have grown at a faster rate than goods exports, with their total value surpassing the total value of goods exports in 2021, 2023 and 2024. Source: ONS, International Trade in goods and services

As shown in Figure 1, service exports have become increasingly important, growing at a faster rate than goods exports over the last 25 years and surpassing them in total value since 2023. Unlike UK trade in goods, service exports benefit from a net trade surplus in

excess of £150bn; contributing the equivalent of 5.7% of GDP to the UK balance of payments.

However, there was significant regional disparity in the role of service sector exports. According to ONS, in 2023 Welsh exports of services accounted for 33% of exports by value compared with 84% for London (an outlier), 59% for the South East, and 53% for Yorkshire and the Humber ([Office for National Statistics \(2025\) International trade in UK nations, regions and cities: 2023](#)). As demonstrated in Figure 2, ONS data suggests that Wales has a larger proportion of businesses with services exported as part of manufacturing activities than other UK regions, at 17% of all exports ([Office for National Statistics \(2023\) International exports of services from subnational areas of the UK: 2023](#)).

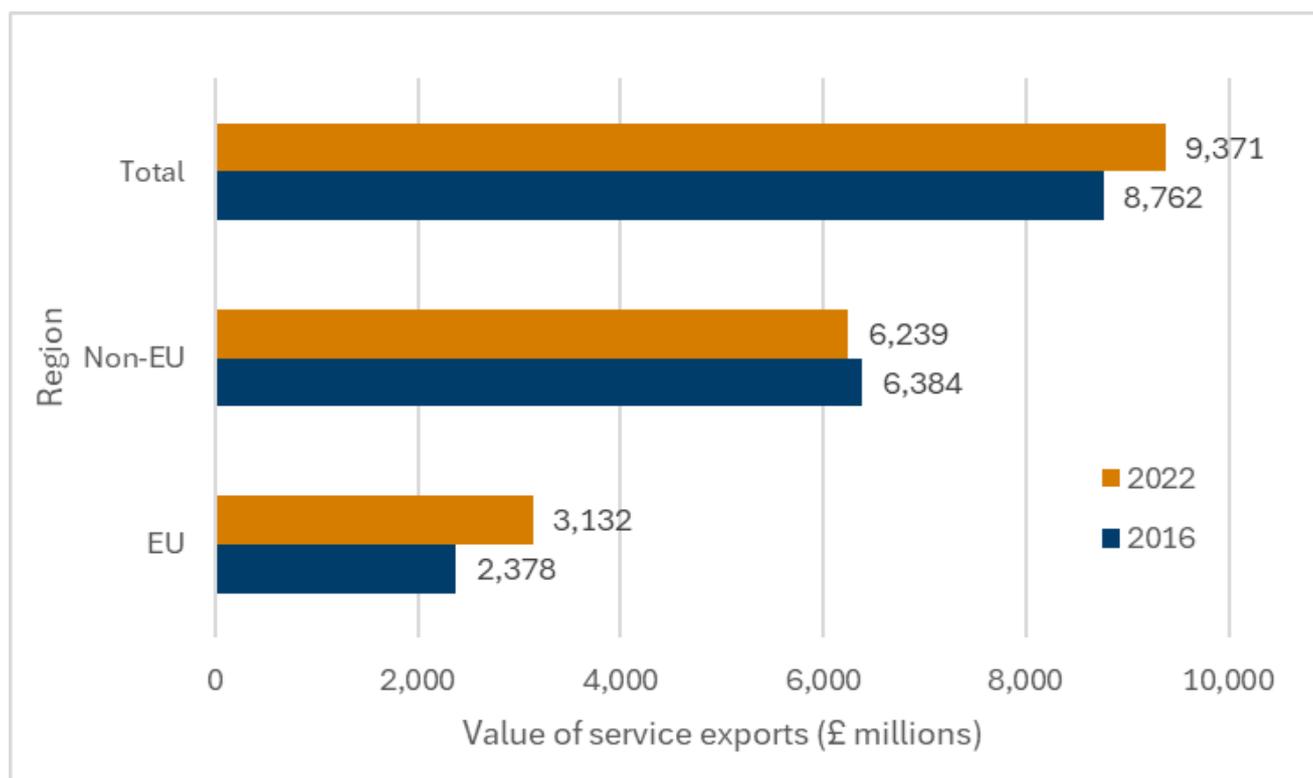
This aligns with the fact that Wales generates 15.4% of its national output from manufacturing against the UK average of 9.4%. In addition, Wales' largest manufacturing subsector by output (2024) was Transport Equipment, and 2009 EU27 data demonstrates that this sector had the highest Mode 5 services as a share of total exports at 40% ([MAKE UK \(2023\) Regional Manufacturing Outlook 2023](#)). In Wales, manufacturing services exports are higher than financial services.

Similarly, Wales has a higher proportion of manufacturing against all sector service exports (17%) than the UK as a whole (6%) ([Office for National Statistics \(2025\) Subnational trade in services](#)).

Statistics from ONS for 2023 showed that at a joint authority level (City Region or Combined Authority in England), Cardiff Capital Region (CCR) had the highest proportion of its service exports arising from manufacturing of anywhere in the UK. The data suggests that 21% of service exports from the region were in manufacturing, compared to 6% across the UK overall ([Office for National Statistics \(2025\) Subnational trade in services](#)).

A recent report from the Resolution Foundation found that in 2021, service exports from London totalled £152.2bn, a rise of 47% in five years and almost fifteen times the value of service exports from Manchester, the city with the second largest value of service exports ([Fry, E. and Barlow, W. X. \(2023\) Local roots of trade routes: The UK's regional services trade over time](#)). Cardiff's service exports were said to have fallen over the same period, although ONS data suggests that Wales as a whole grew its service sector exports between 2016 and 2022 by 7% ([Office for National Statistics \(2025\) UK trade in services by industry, country and service type, exports](#)). Exports to the EU grew over that period whilst those to the rest of the world declined.

Figure 2: Service exports from Wales, 2016 and 2022.



Description of Figure 2: Chart showing service exports from Wales in 2016 and 2022, broken down by exports to EU and non-EU countries. Overall service exports and service exports to EU countries have increased, while service exports to non-EU countries have slightly decreased.

Source: ONS (2024) Timeseries of total value of trade in services in the UK by ITL1 area

Figure 2 shows service exports from Wales in 2016 and 2022, demonstrating an increase in EU exports of 31.7%, and a decrease in non-EU exports of 2.2%. This represents an overall increase of 6.9% ([Subnational trade time series](#)).¹

Data coverage for sectors is limited but appears to show that although there was substantial growth in professional, scientific and technical activities, and service offerings in manufacturing, exports in financial and insurance activities fell during the period.

In terms of destination countries, the US (including Puerto Rico) dominated, accounting for 24% of service sector exports, followed by France (7%) and Germany (6%).

The UK Government aims to capitalise on its competitive advantage in services through the new UK Industrial Strategy, in which five of the eight priority sectors are services-based ([Department for Business and Trade \(2024\) Invest 2035: the UK's modern industrial strategy](#)). These include the creative industries, digital and technologies, financial services, professional and business services, and life sciences. Services are also a key pillar of UK Trade Policy, with the government seeking to reduce and remove barriers to cross-border

¹ It should be noted that these statistics are labelled as official statistics in development, and so results should be treated with caution.

trade in services through Free Trade Agreements (FTAs) and hence enhance global market access for UK service providers.

While the UK Government's Industrial Strategy identifies multiple services-based priority sectors, Welsh policymakers have introduced regional-specific measures to ensure alignment with local conditions and aspirations. A place-based approach, emphasising local culture, talent attraction, and high-quality digital infrastructure, has been identified as key to regional service-sector growth ([Government Office for Science \(2018\) Services Transformed: Growth Opportunities for the UK Service Economy](#)). Welsh cities and regions can build 'innovation ecosystems' in creative or technology sectors, enabling them to retain skilled workers, foster entrepreneurship, and attract further investment. Welsh policy measures are detailed below.

3.4. Welsh policy environment

Within Wales, the Welsh Government is supporting its service economy and working to grow exports in a way that aligns with its broader economic priorities for sustainable and inclusive growth.

The [Well-being of Future Generations \(Wales\) Act 2015](#) underpins this approach, with the goals of A Prosperous Wales and A More Equal Wales driving efforts to develop a skilled workforce, support fair work, and promote financial and digital inclusion.

Welsh Ministers have a statutory responsibility to promote Wales as a business location, enhance international competitiveness, provide financial support to businesses, and develop sites, premises, and facilities. Under Section 60 of the [Government of Wales Act 2006](#), they also have broad powers to take actions that promote Wales' economic, social, or environmental well-being.

The [Export Action Plan for Wales](#) provides targeted support to help Welsh businesses expand into international markets, which has supported Welsh small and medium-sized enterprises (SMEs) in securing over £320 million in export deals since its launch in December 2020. The [Economic Mission: Priorities for a Stronger Economy](#) (2023) reinforces inward investment as a key priority, aiming to attract high-value, high-skilled jobs to rural and deprived communities in particular. In September 2024, the First Minister of Wales [reaffirmed](#) a focus on green jobs and growth, emphasising the role of services in helping businesses improve efficiency and unlock their net-zero potential.

The Welsh Government's [Approach to Trade Policy](#) (2024) aligns trade objectives with the [Well-being of Future Generations Act](#), advocating for sustainable, fair, and inclusive trade policies in UK Government negotiations. The [UK's FTA programme](#) aims to provide opportunities to enhance trading conditions for Welsh service exporters, improving market access and investment opportunities.

4. Welsh service sector overview

This chapter provides an overview of Wales' service sector based on prior research. It outlines the sector's contribution to employment and economic activity, examines the role of universities and identifies challenges identified in past research. This context sets the stage for a more detailed analysis of Wales' services sector, tradeable services, and sub-sectors of interest in Chapter 5.

4.1. Scale and composition of Wales' services sector

As of 2024, the services sector accounted for 80.4% of employment in Wales ([Office for National Statistics \(2024\) Business Register and Employment Survey](#)).

Within services, financial and insurance activities contributed £5.13bn in GVA in 2023, approximately 6.3% of Wales' total GVA ([Stats Wales: Regional Gross Value Added by industry, 2023](#)). In December 2024, there were 41,000 jobs in the sub-sector in Wales ([ONS: Workforce Jobs by Region and Industry](#)). Estimates for the number of businesses vary substantially based on definitions used, with data from ONS suggesting there were 1,190 active enterprises operating within the finance and insurance industry in Wales in 2023 ([Stats Wales](#)).

The Welsh technology sector is another key driver of economic growth, contributing approximately £8.5bn annually and employing 45,000 people ([UKTN \(2024\) Tech Report: Wales](#)). Over the past five years, the number of tech enterprises in Wales has increased by 20%, supported by £157m in venture capital investment secured in 2023 ([UKTN \(2024\) Tech Report: Wales](#)).

In terms of export, financial and related professional services generated £3.6bn in exports in 2022, accounting for 1.9% of total UK industry exports in the sector. Financial services alone comprised 38% of all Welsh services exports, with 73% of these destined for non-EU markets. However, the financial services sector faced marginal decline between 2017 and 2021, with exports decreasing by an average annual rate of 0.1% ([TheCityUK \(2023\) Exporting from across Britain: Financial and related professional services 2023](#)).

Wales remains competitive in terms of business costs, with the lowest labour, property and utility costs of any UK region across multiple sectors (OCO (2022) Welsh Financial Services Offer: Capabilities, assets and competitiveness). It also benefits from strong anchor investors, an innovative business environment, and industry-led skills training initiatives, making it an attractive location for foreign investment. Areas in South Wales, particularly Cardiff and Swansea, are among the most competitive regional financial centres, with Cardiff hosting one of the UK's largest insurance employment clusters outside London. The city is recognised as a leading UK location for cost-effective and high-quality contact centres (OCO (2022) Welsh Financial Services Offer: Capabilities, assets and competitiveness).

4.2. Role of universities and skills

Welsh universities play a pivotal role in sustaining a robust service sector. Despite lower overall student numbers compared to other UK regions, around 130,000 in Wales compared to 260,000 in North West England and 170,000 in South West England, this shortfall is partly offset by strong links to cities including Birmingham, Bristol, Liverpool, and Manchester, whose graduates often enter the Welsh workforce (OCO (2022) Welsh Financial Services Offer: Capabilities, assets and competitiveness).

While Wales falls below the UK average for post-secondary NQF Level 4 and above qualifications, it performs comparably with regions in the North and Midlands and outperforms these regions in terms of the number of working age adults who hold these higher-level qualifications. Welsh universities offer bespoke training programmes tailored to employer and investor needs, with a reputation for specialised research and industry collaboration (OCO (2022) Welsh Financial Services Offer: Capabilities, assets and competitiveness).

Several universities in Wales have established themselves as centres of excellence in financial services, cybersecurity, and advanced computing. For instance, Cardiff University and the University of South Wales both offer specialised education in finance, business, and cybersecurity, with cutting-edge facilities such as a Trading Room and the Centre for Financial and Professional Services. Collaborations with industry leaders, such as Admiral's South Wales Financial Centre of Excellence and the National Cyber Security Academy, ensure workforce readiness. Additionally, initiatives such as Supercomputing Wales and the Computational Foundry at Swansea University support the digital economy, while Cardiff Metropolitan University advances blockchain research. These initiatives support Wales' role in technological and economic development, reinforcing the value of its universities in shaping the future of the service sector (OCO (2022) Welsh Financial Services Offer: Capabilities, assets and competitiveness).

4.3. Challenges and opportunities

Wales' service sector faces multiple challenges that can hinder its growth and long-term competitiveness:

- Talent retention: many skilled graduates migrate elsewhere due to limited local job opportunities and suboptimal transport links (OCO (2022) Welsh Financial Services Offer: Capabilities, assets and competitiveness).
- Digital connectivity: in Mid and North Wales particularly, poor broadband infrastructure restricts the potential for remote work and digital enterprise ([UKTN \(2024\) Tech Report: Wales](#)).
- Productivity disparities: the most efficient 25% of businesses in each sub-sector outperform the least efficient by a factor of between 2 and 5 ([Henley, A. \(2021\) Wales' Productivity Challenge: Exploring the issues](#)).
- Automation and digital transformation: while these offer pathways to higher-value job creation, they can also lead to workforce displacement and redundancies in certain industries ([Government Office for Science \(2018\) Services Transformed: Growth Opportunities for the UK Service Economy](#)).

Despite these challenges, the service sector remains a key part of Wales' economy, significantly contributing to employment, economic activity, and exports ([Cernat, L. \(2024\) What Mode of Supply Will Matter the Most for the Future of Services Trade?](#)). However, data limitations continue to obscure the full scope of tradeable services and their contribution.

Existing evidence highlights the role of services in Wales' economy but also reveals gaps in understanding the sector's full potential. This gap complicates efforts to design targeted policies or measure emerging trends with precision.

5. Welsh service sector analysis

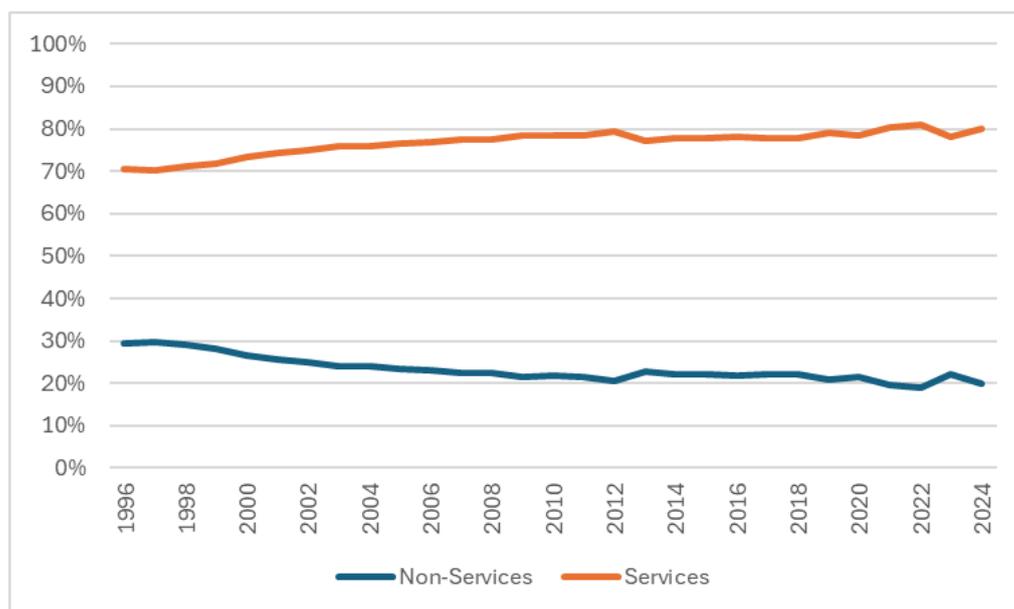
This chapter presents a profile of the service sector in Wales, analysing its scale, economic contribution, and strategic positioning within the broader UK context. Drawing on a bespoke dataset of approximately 73,544 businesses, along with official data sources and stakeholder insights, it assesses the structure, performance, and spatial distribution of services across Wales. The analysis focuses on nine priority sub-sectors identified in consultation with the Welsh Government, with specific attention given to tradeable services - those with the potential to generate income from outside Wales. This chapter builds on chapter 4 to provide a more granular picture of employment trends, GVA contribution, productivity, trade capacity, regional distribution, and future growth opportunities. Together, these elements provide a foundation for identifying strengths, systemic barriers, and areas for policy intervention to support a resilient and regionally balanced service economy.

Sections 5.1 to 5.4 primarily draw from secondary data to map out the size, scale and geographical distribution of the Welsh services sector, including key tradeable sub-sectors, while sections 5.5 to 5.11 discuss the strengths, weaknesses, challenges and opportunities facing the sector, integrating the findings from the primary research (qualitative and quantitative) conducted as part of this project

5.1. The Welsh service economy: scale, composition and trends

Services dominate the Welsh economy in terms of both employment and output.

Figure 3: Share of workforce jobs by industry, Wales, December 1996 to December 2024



Description of Figure 3: Chart showing the share of workforce jobs in, respectively, the services and non-services sectors in Wales between December 1996 to December 2024. Over the entire period the services sector has accounted for the majority of workforce jobs, with its share trending gradually upwards over time.
Source: Miller Research analysis of Workforce Jobs, 2025

As Figure 3 shows, in December 2024, services accounted for approximately 80.1% of total jobs in Wales - up from 70.5% in December 1996 - reflecting the long-term shift from industry to services. This change has been accompanied by a steady decline in non-service jobs, which fell from 29.7% to 19.0% over the same period.

The service sector's role as a driver of economic growth is evident in its contribution to output. Services generated 73% of total Gross Value Added (GVA) in Wales in 2023 and contributed 74% of GDP growth between 2011 and 2023 (not accounting for inflationary effects). The most significant GVA contributions in 2023 came from sectors such as human health and social work, real estate activities, public administration, and wholesale and retail trade - all foundational pillars of Wales' service economy.

Together, these indicators confirm the service sector's role as the primary driver of Wales' employment and economic output. Workforce jobs in the service sector in Wales rose by 37.9% between March 1996 and December 2024, with particular expansion in real estate activities (150.0% increase), information & communication (84.2%) and professional scientific & technical activities (78.3%). However, both overall and service sector jobs growth was slower than the UK average over the period. In the UK as a whole, the sector grew by 47.3%, whilst the equivalent figure for Wales was 37.9%. Sectors which grow at a faster rate in Wales than in the UK were finance and insurance (41.4% vs 10.2%), transport and storage (56.8% vs 50.4%) and public administration, defence and compulsory social security (36.3% vs 4.3%). This structural duality has implications for workforce

development, regional policy, and support for service sector innovation and trade. ([Office for National Statistics \(2025\) Subnational Trade in Services](#))

5.1.1. Productivity trends across sectors

Labour productivity in Welsh manufacturing grew by 146% between 1998 and 2023 ([Office for National Statistics \(2025\) Regional](#) gross value added (balanced) by industry: all ITL regions). This occurred despite a decline in manufacturing employment, indicating that output increased through productivity rather than workforce expansion.

5.1.2. Productivity trends across service sub-sectors

Within the service sector itself, labour productivity varies widely.

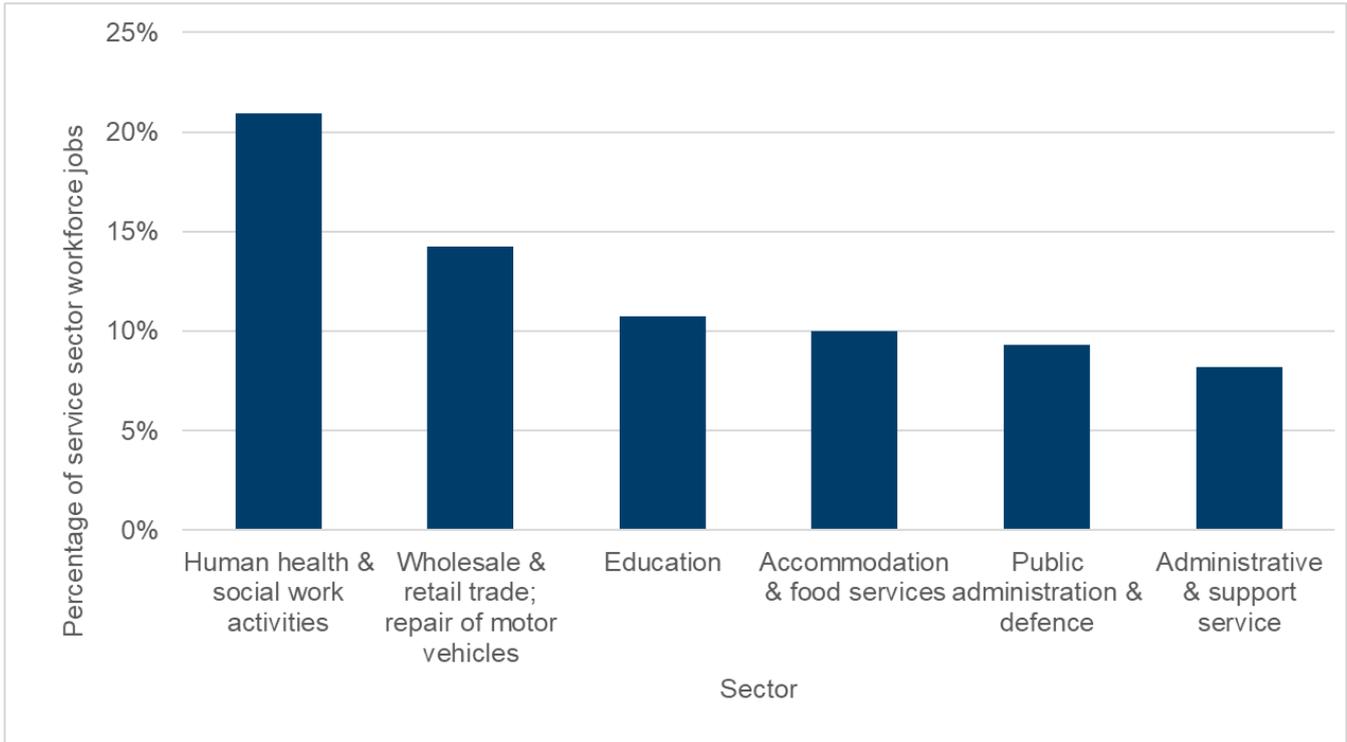
Between 1998 and 2023, the greatest gains were observed in financial and insurance services and information and communication. These sub-sectors combine capital intensity with export potential, making them strategic assets for growth. For instance, value-added per worker in Welsh financial and insurance services now stands at 92% of the UK average (up from 81% in 2010), signalling a significant productivity gain ([Office for National Statistics \(2025\) Regional](#) gross value added (balanced) by industry: all ITL regions).

Other high-employment sub-sectors, including wholesale and retail trade, administrative support, and professional, scientific and technical activities - showed more limited productivity growth. These sectors have nonetheless absorbed a significant share of Wales' workforce, reflecting their structural importance despite lower value-added per employee.

5.1.3. Employment contribution of Welsh services sector

Employment is a key indicator of economic growth and labour market health. Employment data can be used to analyse sector by sector productivity and understand whether changes in employment levels result from structural changes in the sector.

Figure 4: Share of workforce jobs of services sector total, Wales, December 2024



Description of Figure 4: Chart showing the share of total workforce jobs in the services sector in Wales, as of December 2024, accounted for by a range of sub-sectors. In descending order, these were human health; wholesale and retail trade; education; accommodation and food services; public administration and defence; and administrative and support services.

Source: Miller Research analysis of Workforce Jobs by region and industry, 2025

According to the ONS Workforce Jobs by Region and Industry dataset, which provides quarterly estimates of jobs by sector, the largest Welsh service sectors in December 2024, as demonstrated in Figure 4, are human health (20.9% of total service sector jobs), wholesale and retail trade (14.3%) and education (10.8%). Service sectors with the fewest jobs as a share of the total (excluding other service activities and people employed by households) include real estate activities (1.7%), information and communication (3.0%), financial and insurance activities (3.5%), and arts, entertainment and recreation (3.5%). This distribution likely reflects the labour-intensive nature and broad demand for services such as health, retail, and education, which are fundamental to local economies and public service provision.

There are several sources for employment data in Wales. The analysis explored a range of these databases with triangulation of multiple sources supporting a more reliable picture of service sector employment. Detail and limitations of different data sources are discussed in Annex 1.

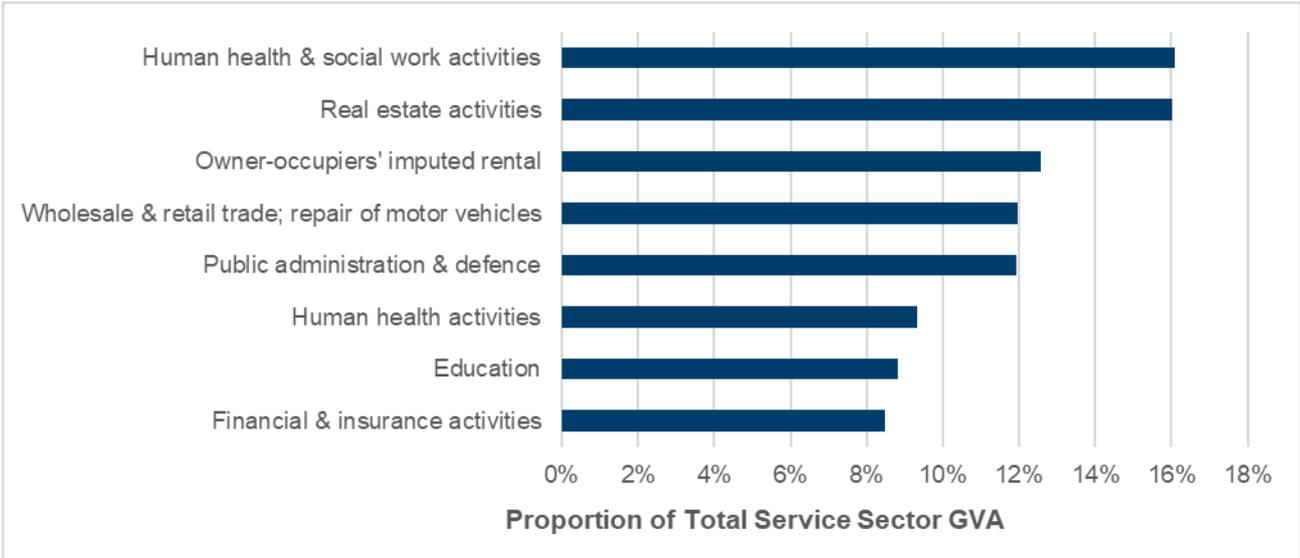
5.1.4. Economic output contribution of Welsh services sector

The contribution of the Welsh service sector to overall Gross Value Added (GVA) provides a critical indicator of its economic importance. GVA offers insight into the relative performance of individual sectors.

In 2023, the Welsh service sector generated an estimated £59.2 billion, accounting for approximately 73% of total GVA; below the 2025 UK estimate of 81% but in line with the 2021 EU average of 73.3% (all latest available data) ([Welsh Government \(2025\) Socio-economic overview in Wales: Welsh Government consultation on UK Local Growth Funding in Wales, Annex A](#); [House of Commons Library \(2025\) Service industries: Economic Indicators](#); [Eurostat \(2021\) Services represented 73.3% of EU's total GVA](#)).

This reflects a substantial increase in output, with the absolute contribution of services to Welsh GVA reported to have grown by 44% since 1998. This trend underscores the sector's long-term expansion and its increasingly dominant role in the Welsh economy.

Figure 5: Share of GVA contribution towards services sector total, Wales, 2023



Description of Figure 5: Chart showing the share of total services sector GVA in Wales, as of 2023, accounted for by a range of sub-sectors. In descending order, these were human health; real estate activities; rental; wholesale and retail trade; public administration; human health; education; and finance and insurance.

Source: ONS (2025), ITL1 & UK chained volume measures in 2023 money value

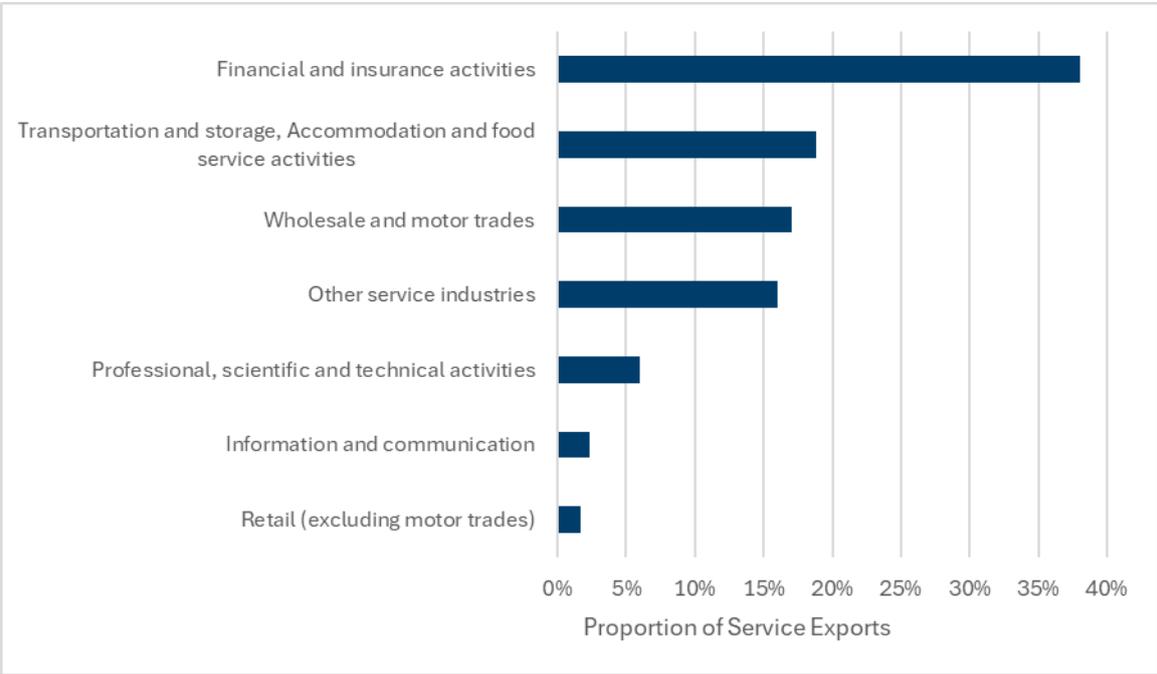
As demonstrated in Figure 5, among service sub-sectors, human health and real estate activities each accounted for approximately 16% of total service sector GVA in 2023, making them the largest contributors to value-added within the Welsh service economy. Other significant sectors include wholesale and retail trade and public administration and defence (each contributing around 12%), education (9%), and financial and insurance activities (9%).

5.1.5. Trade contribution of Welsh services sector

Service sector exports have grown in relative importance within the Welsh economy in recent years. As of 2022, service sector exports accounted for 29.7% of total Welsh exports, worth a total of £9.4 billion ([Office for National Statistics \(2022\) Subnational Trade Analysis](#)).

Among the leading contributors, financial and insurance activities recorded the highest export value, estimated at £3.6 billion in 2022. Other key exporting sub-sectors include transportation and storage (£1.8 billion), wholesale and retail trade (£718 million in 2019), and professional, scientific and technical activities (£565 million in 2022).

Figure 6: Share of exports of services sector total, Wales, 2022



Description of Figure 6: Chart showing the share of Wales' total services sector exports, as of 2022, accounted for by a range of sub-sectors. In descending order, these were finance and insurance; transport, storage, accommodation and food service activities; wholesale and motor trades; other service industries; professional, scientific and technical activities; information and communication; and retail.

Source: ONS value of trade in services, 2022

The distribution of service exports by sub-sector is illustrated in Figure 6. Financial and insurance activities accounted for the largest share of total service exports, contributing 38%, followed by transportation and storage (19%), wholesale and motor trades (17%), manufacturing (16%), and other services (16%).

5.1.6. Welsh international competitiveness

The service sector remains a strategically important part of the Welsh economy and contributes meaningfully to the UK's wider services landscape, particularly in areas such as professional services, fintech, and higher education ([Government Office for Science \(2018\) Services Transformed: Growth Opportunities for the UK Service Economy, A report by the UK Government Chief Scientific Adviser](#)). These strengths, coupled with targeted Welsh Government initiatives to boost export capacity and international investment, can provide a foundation for growth in high-value service activities.

However, international competitiveness is constrained by lower than UK average productivity, limited scale in some sub-sectors and infrastructure challenges (M. Jones (2025) Wales' Productivity Challenge: A Focus on the Future). Strengthening digital connectivity, skills development, and international collaboration will be critical to strengthening international competitiveness.

Although output has grown, Wales' share of UK service GVA declined from 3.21% in 2011 to 3.00% in 2023, reflecting slower relative growth compared to other regions. This decline is not explained by population growth; Wales' population has grown broadly in line with other UK nations ([ONS \(2025\) Population estimates for the UK, England, Wales, Scotland and Northern Ireland: mid-2024](#)). Instead, it reflects a slower rate of economic growth in services relative to other regions, pointing to a missed opportunity to capture a larger share of the UK's expanding services economy. This underscores the need to scale export-focused, high-productivity service activities and address structural constraints to enhance Wales' position within the UK's service economy.

5.2. The tradeable service segment: scale, composition and trends

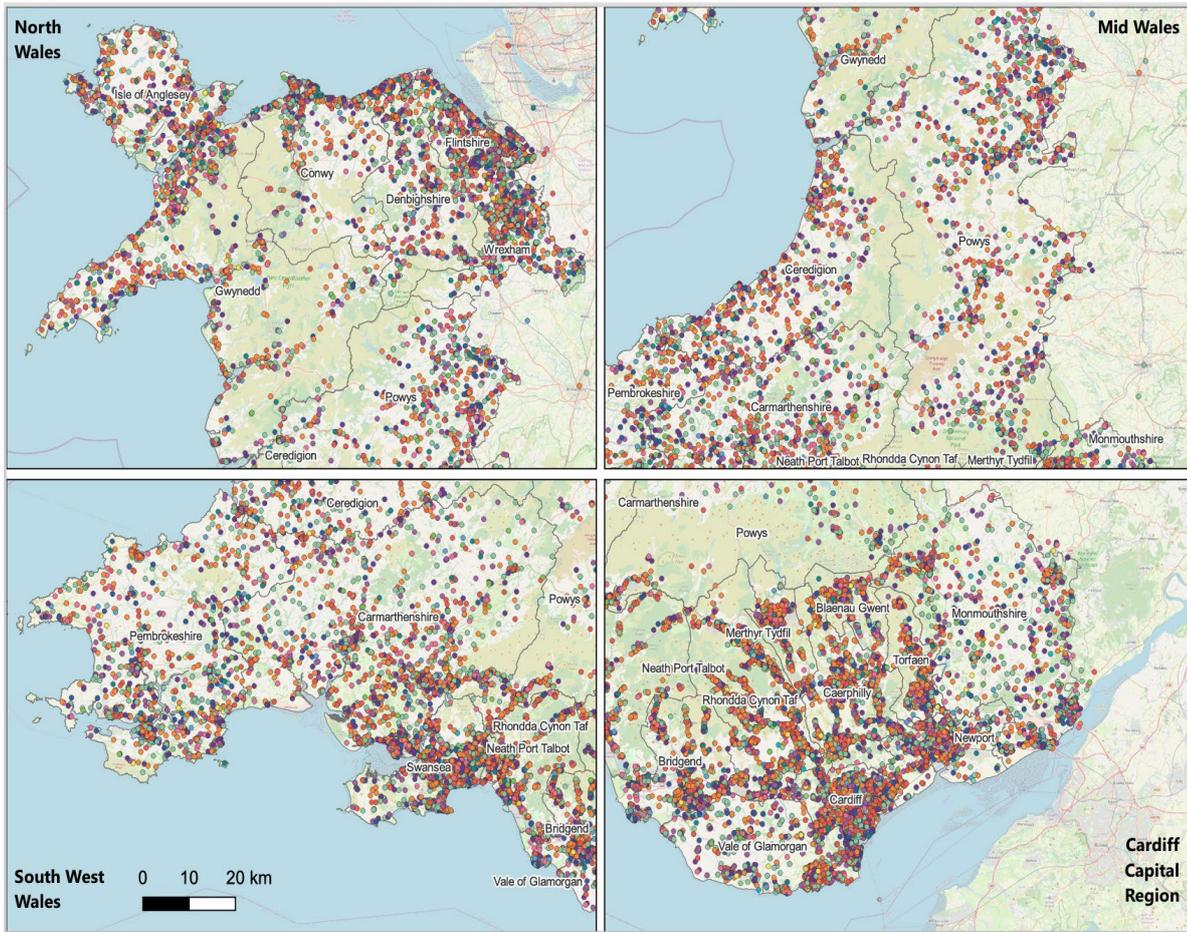
This section assesses the presence and economic contribution of tradeable service activities, defined as services that can be sold and consumed outside the region in which they are produced. In partnership with Welsh Government officials, we mapped 176 four-digit SIC codes judged to have clear external-market potential. A full list of SIC codes agreed with the Welsh Government as having potential to be tradeable is included in Annex 2.

The research compiled a proprietary database of Welsh tradeable service sector businesses aligned to the shortlisted SIC codes. The database includes 73,544 individual business entries, sourced from Companies House and third-party data provider, Beauhurst.

5.3. Spatial distribution and mapping of Wales tradeable service segment

The study mapped businesses within the series of potentially tradeable service SIC codes (Annex 2). The resulting map provides a spatial snapshot of where Wales' potentially tradeable service capacity is located, rather than an exhaustive count of all enterprises.

Figure 7: Geographic distribution of tradeable services sector businesses in Wales, 2025



Legend

Location data

- A - Agriculture, forestry and fishing
- B - Mining and quarrying
- C - Manufacturing
- D - Electricity, gas, steam and air conditioning supply
- E - Water supply, sewerage, waste management and remediation activities
- F - Construction
- G - Wholesale and retail trade / repair of motor vehicles and motorcycles
- H - Transportation and storage
- J - Information and communication
- K - Financial and insurance activities
- M - Professional, scientific and technical activities
- N - Administrative and support service activities
- P - Education
- R - Arts, entertainment and recreation

□ Local Authority boundaries

Description of Figure 7: Chart showing the geographic distribution of tradeable services sector businesses in Wales, as of 2025, with dense clusters in South East, South West and North Wales.

Source: Miller Research

The mapping, displayed in Figure 7, confirms a pronounced south-eastern corridor of service activity stretching from Cardiff and Newport westwards towards Swansea. Cardiff accounts for approximately one-fifths of all mapped service businesses, with a particularly dense cluster in central Cardiff and secondary concentrations along the M4 corridor and in Newport's city centre business district. Swansea and its surrounding area form the second-largest aggregation, anchored by the city's tech and creative hubs and the university-led innovation zone.

In North Wales, the map shows distinct hotspots in Rhyl, Holywell, and Wrexham. Wrexham benefits from proximity to the Cheshire knowledge spine, while Rhyl and Holywell capture spill-over demand from Chester and the wider Mersey-Dee economic area. Significant nodes appear on Anglesey, reflecting Bangor Universities specialisms in material science and engineering and the regions nascent clean-energy, and marine-engineering activity.

Mid-Wales displays markedly lower density, mirroring its more rural settlement profile. Nevertheless, digital-enabled businesses in sectors such as creative media, niche consultancy and professional translation are evident around Aberystwyth, Machynlleth, and Newtown.

5.3.1. Key Welsh tradeable sub-sectors distribution

The research identified nine priority sub-sectors for further investigation and study. These sectors were based on their potential exportability, alignment with Welsh Government strategic plans (Digital Strategy, Innovation Strategy, Creative Wales, Net Zero), innovation, and evidence of recent jobs or GVA growth above the overall service-sector trends. The finalised list of sectors was agreed through a workshop with colleagues from across Welsh Government.

The relative distribution of each priority sub-sector mirrors the overall pattern of geographic distribution, with some sector-specific regional trends:

- Financial & Insurance, IT & Development, and Legal & Accounting businesses are predominantly located in Cardiff, Newport, and Swansea.
- Creative and Digital-media businesses are concentrated in Cardiff Bay, central Swansea and coastal Denbighshire, with a satellite presence in Pembrokeshire.
- Architectural, Engineering and Technical-Testing businesses align with construction and energy corridors, producing notable groupings in Cardiff-Newport, Swansea Bay, Wrexham, and Milford Haven.
- Scientific R&D entities are anchored to the Catapult and University sites in Cardiff-Newport, Swansea, Aberystwyth, and Bangor.
- Other professional services (IP, translation, environmental consulting) show a broader rural dispersal, particularly in Mid Wales and along the North Wales coast.

5.4. Key Welsh tradeable sub-sectors

The table below outlines the key Welsh sub-sectors identified for further study, including their corresponding SIC code classifications and the principal activities associated with each. This typology was developed through horizon scanning, expert interviews, and survey insights.

Table 2: Key identified tradeable service sub-sectors and core activities in Wales

Sub-Sector	SIC Code	Key Identified Activities
Financial and Insurance	Divisions, 64, 65, 66 (K)	Banking, Fintech, Asset Management, Insurance, Sustainable Finance.
IT and Development	Divisions 61, 62, 63 (J)	Software, Cloud, AI, Cybersecurity, Data Services.
Creative and Digital Media	Divisions 58, 59, 60 (J)	Film/TV, Gaming, Animation, Digital Marketing, Immersive Tech.
Legal and Accounting	Divisions 69 (M)	Corporate Law, Compliance, Audit, Tax, Environmental, Social and Governance (ESG) Advisory, Legal-Tech.
Management Consultancy / Head Office	Divisions 70 (M)	Strategy, Digital Transformation, Sustainability, Change Management.
Architectural and engineering activities, technical testing, analysis	Divisions 71 (M)	Design, BIM, Sustainability Consulting, Certification.
Scientific Research and Development	Divisions 72 (M)	Contract Research, Bio-Tech, Semiconductors, Climate R&D.
Advertising & Market Research	Divisions 73 (M)	Creative Campaigns, Performance Marketing, Consumer Insights.
Other professional, scientific, technical	Divisions 74 (M)	IP Services, Translation, Environmental Consulting, Veterinary, Standards.

Source: Miller Research

Together these sub-sectors account for 30.0% of tradeable service employment in Wales and 13.1% of total Welsh GVA in 2023 ([Office for National Statistics \(2024\) Gross Value Added GVA](#)). This contribution is aligned with that found in Northern Ireland (13.1%), but behind that of contributions in Scotland (18.4%) and England (24.1%). This comparison highlights a gap in the relative scale of these specific sub-sectors in Wales compared to other UK nations, particularly in terms of its contribution to economic output.

Collectively, these sub-sectors represent a significant share of employment, regional gross value added, and business activity in Wales. Some sub-sectors, such as finance and IT, are long-established contributors to the economy, whilst others such as the creative and legal domains, are experiencing rapid growth and demonstrating high potential for international trade and innovation-driven growth (Office for National Statistics (2022) TL1 & UK chained volume measures in 2022 money value, pounds million). The prioritisation of these sectors aligns with key Welsh Government strategies, including the [Digital Strategy for Wales](#), the [Innovation Strategy for Wales](#), [Net Zero commitments](#), and [initiatives led by Creative Wales](#).

Table 3 below presents an overview of the official number of businesses for each of these sub-sectors as per IDBR data compared to the number of firms identified in our proprietary dataset. While the IDBR relies on HMRC-registered PAYE and VAT data (i.e. only firms above the £90k VAT threshold or with PAYE records) our proprietary dataset, drawn from Companies House and Beauhurst, captures a broader array of active Welsh companies (including VAT-exempt sole traders and small microbusinesses). As a result, the official IDBR count underestimates particularly small and recently formed firms.

Table 3: Key identified tradeable service sub-sectors business numbers, Wales, 2024-2025

Sub-Sector	SIC Code	IDBR Business Numbers	Proprietary Dataset Business Numbers
Financial and Insurance	Divisions, 64, 65, 66 (K)	1,675	4,517
IT and Development	Divisions 61, 62, 63 (J)	2,960	5,803
Creative and Digital Media	Divisions 58, 59, 60 (J)	1,230	2,711
Legal and Accounting	Divisions 69 (M)	2,135	2,090 ²
Management Consultancy / Head Office	Divisions 70 (M)	3,415	5,832
Architectural and engineering activities, technical testing, analysis	Divisions 71 (M)	2,595	2,671
Scientific Research and Development	Divisions 72 (M)	195	420
Advertising & Market Research	Divisions 73 (M)	420	863
Other professional, scientific, technical	Divisions 74 (M)	2,195	3,603

Source: Miller Research, Based on IDBR, Companies House and Beauhurst data

Employment figures in Wales' tradeable services businesses are uncertain due to differences in data collection methods, reporting thresholds and timing. No single source captures every worker, especially in microbusinesses or sole-trader operations, so any estimated should be treated as a range rather than a precise headcount.

Table 4 details employment figures for tradeable service sub-sectors of interest, sourced from BRES. It should be noted that while BRES reports actual headcounts for PAYE-Registered employees at the four-digit SIC level, it omits any business whose sole workers are VAT-only or below the PAYE threshold causing under-representation of micro-firms and freelancers.

² A potential reason for the smaller number of Legal and Accounting firms in the proprietary dataset, compared to the IDBR figures, is that the IDBR count includes companies not headquartered in Wales. It is unclear why this pattern only affects the Legal and Accounting sector.

Table 4: Employment Estimates for Selected Tradeable Service Sub-Sectors, Wales, 2023

Sub-Sector	SIC Code (only tradeable 4-digit SIC codes within divisions)	BRES Employees (2023)
Financial and Insurance	Divisions, 64, 65, 66 (K)	32,000
IT and Development	Divisions 61, 62, 63 (J)	24,000
Creative and Digital Media	Divisions 58, 59, 60 (J)	6,000
Legal and Accounting	Divisions 69 (M)	20,000
Management Consultancy / Head Office	Divisions 70 (M)	16,000
Architectural and engineering activities, technical testing, analysis	Divisions 71 (M)	13,000
Scientific Research and Development	Divisions 72 (M)	3,500
Advertising & Market Research	Divisions 73 (M)	1,750
Other professional, scientific, technical	Divisions 74 (M)	7,000

Source: BRES

Table 5 below presents an overview of the estimated GVA contributions of the key tradeable service sub-sectors in Wales. Financial and Insurance services accounted for an estimated £5.1 billion or 6.3% of total GVA in 2023. This is followed by IT and Development (£1.93 billion), Legal and Accounting (£1.38 billion), and Architectural and Engineering services (£636 million), each representing significant contributions from knowledge-intensive sectors. Other sub-sectors, including Creative and Digital Media, Management Consultancy, and Scientific Research and Development, are smaller in absolute terms, but strategically important in terms of innovation, exports, or future growth potential. While the figures vary, they collectively show a service economy that is diverse and multi-layered with some areas already scaling and others still emerging but holding long-term value.

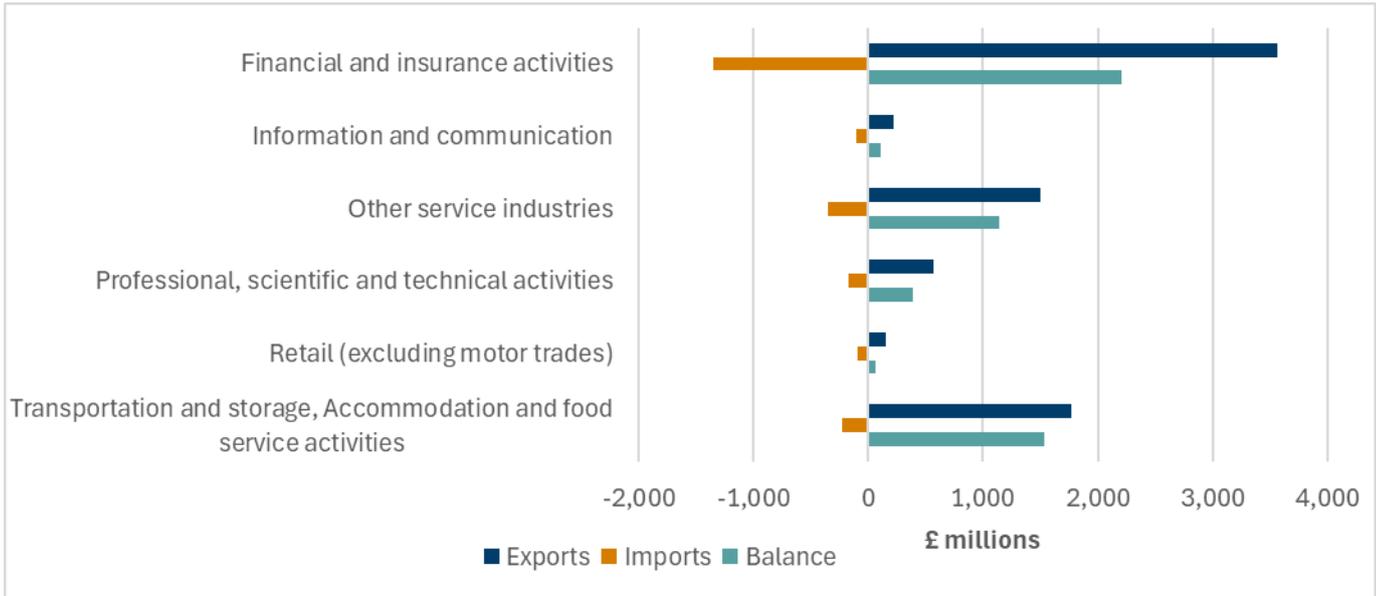
Table 5: Estimated Gross Value Added (GVA) of key tradeable service sub-sectors in Wales, 2023

Sub-Sector	SIC Code	GVA (£ million)	% of total Welsh GVA
Financial and Insurance	Divisions, 64, 65, 66 (K)	5,129	6.3
IT and Development	Divisions 61, 62, 63 (J)	1,930	2.4
Creative and Digital Media	Divisions 58, 59, 60 (J)	446	0.5
Legal and Accounting	Divisions 69 (M)	1,379	1.7
Management Consultancy / Head Office	Divisions 70 (M)	488	0.6
Architectural and engineering activities, technical testing, analysis	Divisions 71 (M)	636	0.8
Scientific Research and Development	Divisions 72 (M)	227	0.3
Advertising & Market Research	Divisions 73 (M)	98	0.1
Other professional, scientific, technical	Divisions 74 (M)	318	0.4

Source: ONS Regional Gross Value Added Data, 2023

Data from ONS provides insights into imports and exports of services by broad sector for Wales ([Office for National Statistics \(2025\) International trade in UK nations, regions and cities: 2022](#)).

Figure 8: Imports, exports and trade balance of key services, Wales, 2022

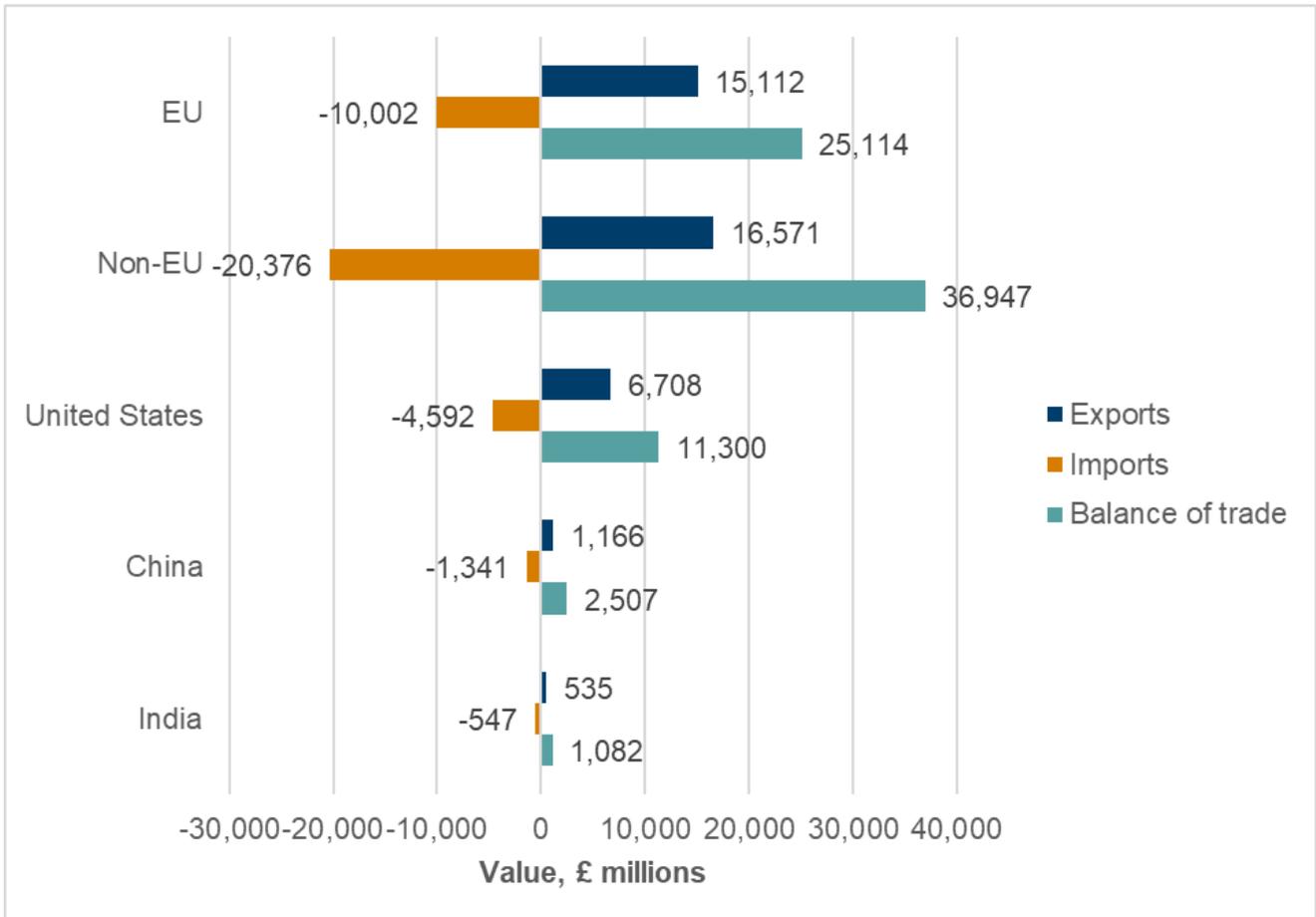


Description of Figure 8: Chart showing Wales’ imports, exports and balance of trade in 2022 for the sectors finance and insurance; information and communication; other service industries; professional, scientific and technical activities; retail; and transport, storage, accommodation and food service. There is a positive balance of trade in each of these sectors, with the largest in the finance and insurance sector.

Source: ONS International trade in UK nations, regions and cities: 2022 (Except data for transport and other services imports from 2021)

Figure 8 outlines these insights. The latest figures show that all key tradeable service sectors deliver a trade surplus, with financial and insurance services providing both the largest export trade (£3,565m) and trade surplus (£2,209m).

Figure 9: Wales imports, exports and trade balance for financial and insurance services sector by destination, 2022



Description of Figure 9: Chart showing Wales’ imports, exports and balance of trade in 2022 for the financial and insurance services sector, broken down by destination. Wales had a positive balance of services for this sector with each of EU countries, non-EU countries, United States, China and India.

Source: ONS International goods and services trade in UK nations, regions and cities: 2022

In terms of destinations for Welsh service exports, ONS provides some information at sectoral level. Figure 9 shows the sources and destination of imports and exports in financial and insurance services, as an example. The 5 largest trade partners are shown in Figure 9.

The recently published, [revised Input-Output tables for Wales](#) provide more granular detail on service sector trade flows. Importantly, the tables provide some insight into Welsh service sector exports to other parts of the UK as well as to the rest of the World. Table 6 below lays these out along with rest of world exports as a proportion of total sector output, providing a measure of export strength in each sector. Computer programming, consultancy and related activities and financial and insurance activities have the highest RoW exports as a percentage of outputs.

Table 6: Service sector exports, Wales, 2019

Sub-Sector	Division	SIC Code	Exports Rest of UK £m	Exports Rest of World £m	RoW Exports as % of Output
Publishing	J	58	11.3	3.6	3.5%
Film and TV	J	59, 60	148.4	118.2	11.1%
Telecommunications	J	61	257.2	41.4	3.0%
Computer programming, consultancy & related	J	62, 63	236.9	161.2	18.9%
Financial and Insurance	K	64, 65, 66	2794.0	941.6	18.7%
Legal and accounting, management consultancy / Head Office	M	69,70	950.3	72.2	3.9%
Architectural and engineering activities, technical testing, analysis	M	71	221.1	52.7	7.7%
Scientific Research and Development	M	72	115.4	99.0	12.0%
Advertising & Market Research	M	73	26.9	3.1	2.3%
Other professional, scientific, technical	M	74	130.9	37.9	8.2%

Source: Input-Output Tables for Wales, 2025

The report will now turn to a discussion of the strengths, weaknesses, challenges and opportunities facing the Welsh services sector, integrating the findings from the primary research (qualitative and quantitative) conducted as part of this project.

5.5. Identified strengths and competitive advantages

A competitive advantage of the Welsh services sector lies in the fact that many Welsh service providers operate in digitally driven industries such as fintech, IT, cybersecurity, and digital marketing ([UKTN \(2024\) Tech Report: Wales](#)). These sectors are inherently well-suited to cross-border provision through virtual means, enabling Welsh businesses to engage with international markets without geographical limitations. The widespread use of cloud platforms, software-as-a-service models, and other advanced digital tools has further enhanced the sector's ability to operate flexibly and efficiently on a global scale. This is

supported by quantitative findings from stakeholder engagement, with 56.0% (n=28/50) of survey respondents identifying digital and IT skills as critical to their business operations.

The availability of a well-educated and skilled workforce is another key strength. Specialised research capabilities based within Welsh universities including the Centre for Cyber Security Research (Cardiff University), the Computational Foundry (Swansea University), and the National Cyber Security Academy (University of South Wales), all provide notable contributions to the high performance computing and cybersecurity, examples of disciplines crucial to service economy growth.

Wales provides a competitive operating environment, characterised by lower business costs relative to other parts of the UK, such as London or Edinburgh. These cost advantages enhance the sustainability and competitiveness of Welsh businesses, particularly SMEs and start-ups, which are often integral to service innovation. The relatively affordable commercial landscape, combined with access to high-quality talent, could make Wales an attractive base for service-based businesses, especially those adopting hybrid or flexible models. Costs for labour, property and utilities are between 6-8% lower than the neighbouring regions of the South West, West Midlands and North West. Cost data also supports a strategy of attracting expansion from companies based in London, as Welsh costs are reported by the OCO as being half of that in London across multiple sectors (OCO Global (2022) Welsh Financial Services Offer: Capabilities, assets and competitiveness).

Wales benefits from integration within the wider UK legal and regulatory framework, enhancing its international credibility. Welsh service providers can leverage the trust and recognition associated with UK professional standards - particularly in fields such as legal services, financial compliance, and environmental consultancy - where adherence to robust regulatory norms is essential for cross-border transactions. Stakeholder feedback underscored the value of this reputation in building trust with international partners.

Supportive public policy and institutional structures further reinforce the strengths of the service sector. Strategic initiatives, such as the Digital Strategy for Wales and Innovation Strategy for Wales, alongside targeted interventions from organisations such as Creative Wales, provide essential infrastructure, coordination, and growth direction. Collaborative programmes linking academia with industry, and sustained investment in research and digital infrastructure, have created an enabling ecosystem for service innovation and global engagement. However, unlocking these opportunities will require not only sustained investment but also more effective alignment between policy aspirations and the operational realities of service-based businesses.

5.6. Weaknesses and barriers to growth

A common issue across the Welsh service sector is the limited scale and fragmentation of the business base, with large enterprise employment accounting for 37.7% of employment in Wales compared to 39.7% for the UK as a whole. In addition, small, medium, and micro businesses in Wales are responsible for a greater share of employment in Wales relative to UK averages ([Welsh Government \(2023\) Size analysis of businesses](#)). Qualitative stakeholder engagement highlighted that this could restrict business' ability to pursue larger contracts, expand internationally, or build the delivery capacity needed to service global

clients. In addition, the qualitative engagement indicated that such businesses tend to focus on transactional service provision, limiting their ability to move up the value chain into more exportable advisory or specialised services. This restricts both visibility and leverage in global markets, hindering Wales' ability to establish a critical mass comparable to service hubs such as London or Edinburgh.

Although Wales produces a high-quality graduate pipeline, there are concerns around the retention of talent - particularly in legal, accountancy, architecture, and design sectors. Some stakeholders reported persistent “brain drain” effects, with talent flowing to other parts of the UK, despite some regional improvements. Of the businesses we spoke to, many face challenges attracting and retaining senior-level professionals, especially those with international commercial experience. Survey data shows that 48.0% (n=24/50) of respondents identified managerial or leadership skills as critical, and 44.0% (n=22/50) cited access to skilled labour as a barrier to growth. Limited availability and accessibility of management training has been argued as a challenge to Welsh productivity (CMI (2021) [Delivering Success for Wales](#)). Some stakeholders also highlighted difficulties in sourcing candidates with both technical and client-facing skills and noted that competition with London-based salaries remains a structural disadvantage. In addition, concerns were raised about visa restrictions, evolving employment regulations post EU-exit, and a mismatch between higher education provision and the skills required in R&D and consultancy.

Some stakeholders point to a lack of export readiness and trade knowledge as a further barrier to growth in the Welsh services sector. Whilst some IT, cyber and creative interview stakeholders reported that they tend to approach export as a natural extension of digital operations, qualitative stakeholder engagement further highlighted limited awareness of available support, and ongoing difficulties in accessing specialist trade advice when they were looking to increase their knowledge. Post EU-exit changes have also created specific issues: one stakeholder highlighted that the loss of services passporting rights has hindered firms offering legal, financial, or audit services within the EU, whilst another noted the lack of mutual recognition for professional qualifications presents barriers in regulated sectors. Some stakeholders further highlighted that for smaller businesses, the cost and complexity of exporting services, driven by rapid technological advancements and changing international regulations, can make it harder for them to keep up and less likely to sustain or pursue exporting.

Concerns around trade knowledge and the effectiveness of public support were a recurring theme in both interview and survey findings. Some qualitative interviews highlighted a lack of tailored, business-led support, with concern that Welsh Government interventions often prioritise large or low-risk projects, leaving SMEs feeling overlooked. These concerns were echoed in the survey data, with 74.0% (n=37/50) of respondents reporting that they had not accessed Welsh Government business support in the past three years, with some commenting that this is partly due to frustration at the administrative complexity and slowness of grant schemes.

Geography should also be taken into account when considering the barriers to growth in the Welsh service sector. Limited transport connectivity between different Welsh regions limits the viability of scaling businesses or opening offices elsewhere in Wales. In the qualitative interviews, a few stakeholders highlighted that transport bottlenecks, especially along the M4 corridor, affect the ability to recruit staff and meet clients, while rural areas face compounded issues of digital access and talent availability. In addition, procurement

practices were perceived by some stakeholders as favouring larger, often non-Welsh firms, thereby limiting opportunities for smaller local providers to secure major contracts or lead on public service delivery.

Lastly, a few stakeholders noted that there is limited understanding among smaller firms and traditional service providers of how to scale digital services for export. These stakeholders noted a general need for capacity-building support to bridge this digital scalability gap.

5.7. Challenges and risks

Cost pressures have become increasingly acute, particularly in the wake of the COVID-19 pandemic and the UK's withdrawal from the European Union. Rising national insurance contributions, increases in minimum wage thresholds, and surging energy costs have created financial strain for many service sector SMEs, particularly those operating with tight margins. Although 50.0% (n=22/44) of survey respondents indicated that export sales had remained stable over the past three years, 22.7% (n=10/44) reported a decline, and 22.7% (n=10/44) reported an increase, highlighting varied exposure to economic volatility. In the creative media sector, one stakeholder noted that inward investment into high-end productions, while welcome, has had inflationary effects, driving up rates for crews, locations, and suppliers, thereby creating affordability challenges for smaller domestic producers.

Geopolitical instability and a rise in protectionist trade policies represent broader external risks for Welsh service providers. Stakeholders referenced the destabilising effects of foreign policy decisions, such as recent US tariff announcements and the alteration of tax incentives for international media production, as factors that erode market predictability and deter strategic investment. These global uncertainties, when layered atop existing structural challenges, may reduce confidence and discourage smaller firms from pursuing international expansion.

Changes to UK immigration policy have posed further operational risks, particularly with regard to international mobility and workforce recruitment. Several firms reported in qualitative interviews difficulties deploying staff overseas or attracting skilled workers from abroad, challenges that are especially pronounced in internationally oriented sectors such as consultancy, legal services, and media production (OCO (2022) Welsh Financial Services; [Institute of Export and National Trade \(2023\) Global horizons Realising the services export potential of UK nations and regions](#)). Stakeholders expressed concern over the complexity of visa processes and the reduction in access to EU labour, which had previously supported key service operations.

Operational costs, specifically labour, energy, and infrastructure were identified by stakeholders as ongoing challenges for smaller businesses. Although Wales continues to offer a relatively favourable business environment overall, these rising costs may erode competitiveness for firms without the scale to absorb them, particularly those in traditional services or early stages of growth.

Lastly, some businesses highlighted concerns around the erosion of service passporting rights following the UK's departure from the EU. This has created uncertainty for these businesses in sectors requiring regulatory recognition across borders, such as financial and legal services. While stakeholders emphasised that Welsh firms benefit from the UK's regulatory credibility, they also noted that these post EU-exit constraints may inhibit international client acquisition and compliance alignment.

5.8. Opportunities and potential growth areas

Wales has developed recognised specialisms in several high-growth, knowledge-intensive areas. In financial technologies, initiatives such as Fintech Wales have supported the growth of a dynamic cluster of firms which are now at the forefront of digital financial services, including embedded finance and AI-driven solutions ([UKTN \(2024\) Tech Report: Wales](#)).

Creative and digital media continue to offer strong growth potential, with Wales establishing a notable reputation for high-end television drama production ([UKTN \(2024\) Tech Report: Wales](#)). In qualitative interviews, stakeholders highlighted additional areas of innovation, particularly in gaming, software development, and immersive content. Cardiff is increasingly positioned as a global creative hub, underpinned by academic partnerships and public investment ([UKTN \(2024\) Tech Report: Wales](#)). As some stakeholders noted, the strategic role of Creative Wales, coupled with the development of dedicated media infrastructure, strengthens the sector's long-term outlook.

Cybersecurity is another area of competitive advantage, underpinned by academic expertise from institutions such as the University of South Wales. Welsh firms offer services in risk management, compliance, and digital security, areas of growing importance across international markets ([UKTN \(2024\) Tech Report: Wales](#)).

In research and development, Wales demonstrates capability in life sciences, renewable energy, and advanced materials, supported by institutions such as Cardiff and Swansea Universities and the Compound Semiconductor Applications Catapult. The architectural and engineering sector in Wales is recognised for its expertise in sustainable design and climate-resilient infrastructure. Welsh firms are increasingly delivering services in low-carbon construction, digital engineering, and environmental planning, skills that are in demand across both developed and emerging markets ([UKTN \(2024\) Tech Report: Wales](#)).

5.9. Support for businesses and exporting in Wales

A range of support mechanisms are available to businesses of all sizes in Wales seeking to grow their export activities, access new markets, and enhance their competitiveness. These include financial assistance, advisory services, training programmes, and networking opportunities, delivered through a mix of Welsh Government initiatives, UK-wide schemes and private sector-led support.

However, stakeholders repeatedly noted that existing provisions tend to cater to businesses across all sectors rather than offering targeted assistance tailored specifically to service sector firms. In particular, much of the available financial support, including grants and loans, is geared towards capital-intensive industries, with some stakeholders noting that manufacturing firms are perceived as more frequent beneficiaries than service-oriented enterprises.

5.10. Policy alignment

While the Welsh service sector demonstrates substantial strengths, realising its full potential requires stronger alignment between high-level policy goals and the operational realities facing firms. Welsh Government strategies, such as those for Net Zero and Digital Transformation, are broadly aligned with the sector's direction of travel. However, qualitative stakeholder engagement highlighted persistent gaps in translating these ambitions into actionable, firm-level outcomes.

Some businesses are actively embracing sustainability, through measures like solar-powered equipment or automated ESG reporting tools, but many SMEs face significant barriers. These include high implementation costs, limited access to tailored support, and shortages of relevant skills. Some stakeholders also noted that existing public schemes often favour larger enterprises and are sometimes administered by advisers perceived to lack direct business experience, undermining their commercial relevance and uptake.

In the context of trade, many stakeholders further noted that Welsh Government export policies tend to remain disproportionately focused on goods-based sectors. Service-specific challenges, such as those relating to intellectual property, cross-border regulation, and data localisation, receive less emphasis. In particular, support for Mode 5 services, which are increasingly important to Wales' trade profile, was seen as limited or absent from mainstream export assistance frameworks.

5.11. Implications for policy and next steps for Wales' service economy

This analysis confirms that the Welsh service sector is an engine of national economic output and employment and a potential driver of Wales' international competitiveness. The sector benefits from a skilled workforce, a relatively affordable commercial landscape, a supportive policy framework, and increasing international visibility in high-value, knowledge-intensive domains. However, qualitative engagement suggested persistent structural limitations, including small firm size, uneven regional capacity, uneven digital infrastructure, limited export readiness, and skills mismatches, continue to constrain the sector's ability to scale, innovate, and compete globally.

One potential implication for policy is that, in future, it could move beyond broad sectoral support and instead target specific enablers of tradeable services growth. This includes:

- developing service-specific export and investment support, including tailored guidance for Mode 5 trade,
- addressing regional inequalities in digital connectivity,
- enhancing leadership, commercial, and digital skills pipelines,
- supporting innovation in micro and small firms through de-risking mechanisms and access to applied R&D, and
- improving data visibility and granularity to enable better tracking of service sector performance and emerging trends.

5.12. Looking ahead

The next chapter explores one of the most important yet under-acknowledged dimensions of service sector trade: Mode 5 services-where services are embedded within goods exports. Building on the structural analysis provided here, Chapter 6 examines how Mode 5 activities can help unlock additional value, expand Wales' trade footprint, and strengthen the global competitiveness of Welsh firms across both service and manufacturing domains.

6. Mode 5

6.1. Definition and significance of Mode 5

Mode 5 services refer to the services content embedded in exported goods, an ‘additional’ mode of international service delivery beyond the four traditional GATS modes ([Welsh Government \(2022\) Mode 5 services: exploratory research with businesses and trade bodies](#)). In essence, when a manufactured product is exported, any value added by services, such as design, engineering, R&D, software, branding or after-sales support, constitutes a Mode 5 service. These are sometimes called ‘services in a box’, since they are delivered inside the physical product rather than as a standalone service export ([Cernat, L. \(2024\) The ‘hidden giant’: How official statistics underestimate the true scale of global services trade](#)). For example, a machinery export may include embedded software or a car may be sold with digital updates and maintenance support ([Welsh Government \(2022\) Mode 5 services: exploratory research with businesses and trade bodies](#)). This is distinct from traditional service exports (such as tourism or banking sold directly) as Mode 5 services are traded under goods trade rules (WTO GATT) as part of a product’s value, rather than under the direct services trade rules of GATS ([Borchert, I. and Tameri, N. \(2018\) The Engagement of UK Regions in Mode 5 Services Exports](#)). In summary, Mode 5 captures the intangible, knowledge-intensive inputs that are bundled with or embodied in goods exports, a growing phenomenon not fully accounted for in traditional trade categorisation ([Welsh Government \(2022\) Mode 5 services: exploratory research with businesses and trade bodies](#)).

In discussing this, it is helpful to distinguish between two related but distinct trends: *servicification* and *servitisation*. *Servicification* refers to the increasing use of services as inputs into manufacturing—such as design, R&D, or software—that are embedded in the final exported product. This is the focus of Mode 5 analysis and the core subject of this chapter. In contrast, *servitisation* describes a business model transformation in which manufacturers offer bundled products and services, such as maintenance contracts, leasing, or training, often sold alongside or after the sale of a physical good. While *servitisation* is important for competitiveness and export relationships, the present analysis does not seek to quantify this aspect directly. Instead, it focuses solely on the embedded services element that contributes to the measured value of goods exports via Mode 5. Where bundled services are discussed later (e.g. in Section 6.5), they are highlighted for their strategic relevance but are analytically distinct from Mode 5 estimations.

6.2. Significance for trade competitiveness and industrial strategy

Mode 5 services have become increasingly significant as drivers of export competitiveness and modern industrial strategy. In advanced economies, manufacturing firms rely heavily on knowledge-based services, from advanced engineering and design to marketing and logistics, to differentiate products and compete globally. This trend has been described as the ‘servicification of manufacturing’, meaning that services inputs make up a rising share of manufacturing value added ([Borchert, I. and Tameri, N. \(2018\) The Engagement of UK Regions in Mode 5 Services Exports](#)). For the UK, around one-quarter of manufacturing

export value consists of domestic services value-added ([Borchert, I. and Tameri, N. \(2018\) The Engagement of UK Regions in Mode 5 Services Exports](#)). In 2017, the UK's exported manufactured goods embodied over £70 billion worth of domestic services (comparable in scale to the UK's total direct exports of financial and insurance services) ([Borchert, I. and Tameri, N. \(2018\) The Engagement of UK Regions in Mode 5 Services Exports](#)). This hidden services value is spread across all UK regions: London and the Southeast contribute the largest share, but other regions, including Wales, each supply billions of pounds in services embodied in their goods exports ([Borchert, I. and Tameri, N. \(2018\) The Engagement of UK Regions in Mode 5 Services Exports](#)).

Recognition of the value of Mode 5 exports can enhance trade competitiveness. Research indicates that firms and regions which integrate more services into their products tend to export more successfully ([Borchert, I. and Tameri, N. \(2018\) The Engagement of UK Regions in Mode 5 Services Exports](#)). High-value services such as innovation, design, and digital capabilities enhance the quality and uniqueness of goods, allowing exporters to command premium prices and enter global niches.

Across the EU, Mode 5 services have been linked to a significant share of export-supported jobs ([Rueda-Cantuche, J. M., Cernat, L. and Sousa, N. \(2017\) Trade and Jobs in Europe: The Role of Mode 5 Services Exports](#)). Modern industrial strategies are increasingly emphasising the fostering of these service inputs alongside traditional manufacturing. A policy focus on Mode 5 aligns with the reality that the boundary between manufacturing and services is blurring in modern economies. Export-led growth today often means leveraging service expertise (for example, software, product customisation, after-sales support) as much as manufacturing prowess ([Rueda-Cantuche, J. M., Cernat, L. and Sousa, N. \(2017\) Trade and Jobs in Europe: The Role of Mode 5 Services Exports](#)). With this in mind, some economists argue that services, including those embedded in goods, are becoming the most dynamic engine of global trade growth in the 21st century ([Cernat, L. \(2024\) The 'hidden giant': How official statistics underestimate the true scale of global services trade](#)). For Wales, with its high-value manufacturing sectors, Mode 5 represents an opportunity to amplify export competitiveness by harnessing the nation's strengths in engineering, digital technology, and creative services as part of its manufacturing offer.

6.3. Measurement and classification challenges

Despite growing importance, Mode 5 services pose significant measurement and classification challenges. Traditional trade statistics and regulations have lagged in capturing services embedded in goods. Official export data usually classify an exported car or machine entirely as a 'good', even though a substantial portion of its value may come from services (such as design and software). This leads to an underestimation of services trade and a misperception of the economy; policymakers might see a goods trade surplus/deficit without acknowledging the hidden services inside. The WTO-OECD TiVA database is one tool that reveals these hidden flows, showing for example, that around 22-25% of UK manufacturing export value consistently derives from services inputs ([Borchert, I. and Tameri, N. \(2018\) The Engagement of UK Regions in Mode 5 Services Exports](#)). However, official statistics and customs records do not separately identify this content.

Classification issues also arise in trade rules and taxation. Because Mode 5 services are not defined as a separate category under WTO rules (falling under goods in customs terms),

companies and customs authorities face ambiguity in how to treat them. A key concern is double taxation or inconsistent valuation of embedded services. When goods with high service content cross a border, import tariffs (and related duties) apply to the full product value, effectively taxing the embodied service inputs as if they were part of the physical good. For instance, some industrial equipment contains expensive embedded software and R&D, ad valorem tariffs on the equipment will implicitly tax that software/R&D value. Those services components, had they been exported separately (e.g. software delivered online), might not face good tariffs. As such, some argue that current customs practices can inadvertently penalise businesses for adding innovative service content, acting as an indirect barrier to the use and development of services inputs in manufacturing ([OECD \(2023\) Interactions between goods and services in international trade: Implications for customs valuation and rules of origin](#)). This is an aspect of the 'double taxation' challenge: the same value creating activity (a service) can be taxed once as a service (e.g. through domestic taxation) and then again as part of a product's tangible value at the border.

Beyond tariffs, customs valuation and classification rules struggle with goods-services bundles. Trade regulations were not originally written with Mode 5 in mind, so there is variation and discretion in how countries enforce them. For example, if a product is sold bundled with a service contract (e.g. a machine sold with an accompanying 3-year maintenance/service agreement), customs authorities must decide whether the value of that service contract is included in the dutiable value of the goods. WTO customs valuation guidelines provide some principles, but in practice they leave significant room for interpretation ([OECD \(2023\) Interactions between goods and services in international trade: Implications for customs valuation and rules of origin](#)). This can lead to uncertainty and inconsistent treatment across markets, where companies might find their embedded service value is assessed differently by different customs authorities, complicating pricing, and compliance. Determining the origin of services within goods is another challenge; rules of origin for goods ignore services content, yet in some cases a high-value service input (such as design work done domestically) arguably should count towards a product being 'Made in Wales/UK'. Currently origin rules, however, do not clearly account for this, and adding such provisions to trade agreements could be overly complex ([OECD \(2023\) Interactions between goods and services in international trade: Implications for customs valuation and rules of origin](#)).

Global trade rules continue to classify Mode 5 services primarily as 'goods', resulting in the absence of a universal standard for identifying or measuring these bundled intangibles. Initiatives such as the WTO-OECD TiVA database help illustrate the proportion of goods exports which stems from service industries. However, most official statistics and customs procedures still do not separately identify this content. In turn, policymakers lack full visibility into the true nature of their exports, and businesses can face unpredictable tariffs or regulatory treatment. Improving measurement can help, as the OECD notes that many goods-services trade configurations are "not well captured by trade statistics", making it difficult to gauge their scale and to design fit-for-purpose rules ([OECD \(2023\) Interactions between goods and services in international trade: Implications for customs valuation and rules of origin](#)). A review of this literature suggests that there is a gap in data in Wales, where this study identified low awareness among businesses of the Mode 5 concept and limited tracking of services embedded in exports ([Welsh Government \(2022\) Mode 5 services: exploratory research with businesses and trade bodies](#)). Recognising the contingent nature of Mode 5 services – whose value materialises only when integrated into and exported alongside a physical product – is critical for refining economic measurements and ensuring fair, coherent trade rules for knowledge-intensive industries. Without better

metrics and clarity, countries risk undervaluing key assets and inadvertently imposing barriers on the inputs that drive competitiveness.

6.4. Why recognising embedded services matters for policy

Acknowledging and understanding Mode 5 services can ensure that the true sources of value in exports are recognised. When policymakers acknowledge that a significant portion of Wales' 'manufactured' exports are underpinned by service inputs, such as software development, engineering design, and other services, they are better positioned to design policies that support and strengthen these enabling sectors. This may influence industrial policy to support those upstream service activities, such as through investments in STEM education or digital infrastructure, as a means of bolstering manufacturing success. It also suggests that trade promotion efforts may benefit from highlighting not just the final product but the embedded expertise that Wales contributes, effectively marketing the knowledge content of goods.

Recognition of Mode 5 can help align trade policy with the realities of modern business models. Many manufacturing firms now operate on a product-service basis (selling integrated solutions that include maintenance, training, and digital updates, rather than just tangible goods) (Baines, Tim & Lightfoot, Howard & Benedettini, Ornella & Kay, J.M.. (2009). *The servitization of manufacturing: A review of literature and reflection on future challenges*. *Journal of Manufacturing Technology Management*. 20. 547-567). If trade agreements and export support programmes focus solely on tangible goods, firms may not receive the support or market access they need for the service component of their offering. By accounting for embedded services, policymakers can negotiate trade deals that address related service regulations, prevent double taxation challenges, and ensure companies can export value overseas. For example, if a Welsh equipment manufacturer exports to an EU client and provides technicians (Mode 4 services) or digital updates (Mode 1 services) as part of a contract, both goods and services provisions in the trade agreement need to work in tandem. A Mode 5 perspective encourages such coordinated policy, avoiding silos between goods and services trade negotiations ([Welsh Government \(2021\) Written Evidence](#)).

In the context of the UK's post EU-exit trading environment, such alignment is timely. Early evidence suggests that lack of provisions for goods-services bundles has resulted in delays and extra costs (e.g. training materials shipped from Wales to the EU being held up at the border as 'goods' even though linked to a service delivery) ([Welsh Government \(2021\) Written Evidence](#)). Integrating Mode 5 considerations can help governments eliminate hidden barriers and design regulation that facilitates more seamless trade in the combined goods-plus-services that characterise modern goods.

In addition, proper recognition of embedded services can help improve domestic tax and regulatory policy. For example, if policymakers are aware that a large share of value in exported goods comes from R&D or software services, they may consider support for those activities. It also informs options for measurement of economic performance, for instance, Wales' service sector contribution to exports may be underestimated using conventional

statistics. Acknowledging Mode 5 services as a key part of the trade landscape could support more informed decision-making and more effective support for export-led growth.

6.5. Servicification of manufacturing: opportunities for domestic service providers

Servicification of manufacturing creates new opportunities for service industries. As manufacturers embed more services in their goods, they rely on a broad network of service providers, from IT and software developers to research labs, design studios, consulting engineers, logistics firms, legal and marketing agencies. This means that even companies who do not themselves export any goods can become indirect exporters through the supply of services that end up embodied in exported products. For example, a Welsh tech firm that develops embedded software for a local electronics manufacturer is effectively exporting that software when the final device is shipped abroad, even if the tech firm's own sales are all domestic. This dynamic can open new markets for service businesses and can spur job creation in high-skill service fields linked to manufacturing. Across the UK regions, evidence shows that greater use of specialist services closely aligns with stronger manufacturing export performance, benefitting both parties where service firms obtain additional business and manufacturing firms build competitiveness ([Borchert, I. and Tameri, N. \(2018\) The Engagement of UK Regions in Mode 5 Services Exports](#)).

Servicification of manufacturing offers a chance for Wales to diversify and expand its industrial base. Wales has a strong foundation of engineering talent, universities, and creative industries ([Welsh Government \(2021\) A manufacturing future for Wales](#)). Supporting these in collaboration with manufacturers can help establish high-value offerings and boost demand for local service expertise (Reddy, P. K., Sasidharan, S., & Thangavelu, S. (2022). Does Servicification of Manufacturing Increase the GVC Activities of Firms? Case of India. WORLD ECONOMY. Advance online publication). It can also help SMEs to partner with service providers to add features and support that make their products more attractive to overseas customers (Hansen, U. E., Nygaard, I., Morris, M., & Robbins, G. (2022). Servicification of Manufacturing in Global Value Chains: Upgrading of Local Suppliers of Embedded Services in the South African Market for Wind Turbines. Journal of Development Studies, 58(4), 787-808). Industry clusters that encourage manufacturing and services providers to collaborate, such as technology hubs, can help raise the value added through domestic production, improve resilience (as firms with multiple revenue streams from goods and services can better accommodate market shifts), and create higher-skilled jobs.

One small-scale research project suggests that servicification can strengthen relationships in international markets, with manufacturers regarding after-sales services (e.g. maintenance, user training, spare parts management, remote diagnostics) as key to building customer satisfaction and loyalty ([Welsh Government \(2022\) Mode 5 Services: exploratory research with businesses and trade bodies](#)). The same research highlights that for some Welsh businesses, providing ongoing support post-sale is essential to building trust and securing repeat customers. This suggests that Mode 5 is not just about hidden economic value, but also about strategic value; it can enable long-term client relationships and reputational advantages. For service providers involved, it can mean steady streams of work tied to the installed base of products. As more industries move towards selling 'outcomes' or 'solutions' rather than one-off products, Welsh service firms (in sectors such

as digital and creative, technology, training, consulting, and maintenance) stand to gain new opportunities through integration with manufacturing supply chains.

6.6. Approach to estimating Mode 5 in Wales

Our analysis builds on the methodology outlined in the UK Trade Policy Observatory Briefing Paper from Ingo Borchert and Nicolo Tamberi at the University of Sussex ([Borchert, I. and Tamberi, N. \(2018\) The Engagement of UK Regions in Mode 5 Services Exports](#)). This briefing paper highlights the increasing role of services inputs in UK manufacturing exports, also known as servicification. It reinforces how domestic and foreign services are embedded in manufactured goods and how this contributes to export success across UK regions. Their approach involves estimating services embodied in manufacturing exports using national trade data from HMRC, which enables them to track the flow of both services across borders. In line with their findings, this analysis also acknowledges that services exports are more evenly distributed across regions when considered in their embodied form rather than as standalone exports. This analysis covers the period up to 2020, which was the latest year for which OECD-WTO TiVA data were available. While more recent trade data exist, TiVA data provides the most consistent basis for estimating embedded services, and future analysis could extend this as updated Input-Output tables are released.

The TiVA database provides international-level Input-Output tables that trace value added across countries and sectors. TiVA data is used to quantify the share of services embedded in UK manufacturing exports, distinguishing between domestic and foreign inputs. Building on this, the Welsh contribution is isolated by applying Wales' annual share of GVA within each relevant manufacturing sub-sector to the corresponding national TiVA-based estimates.

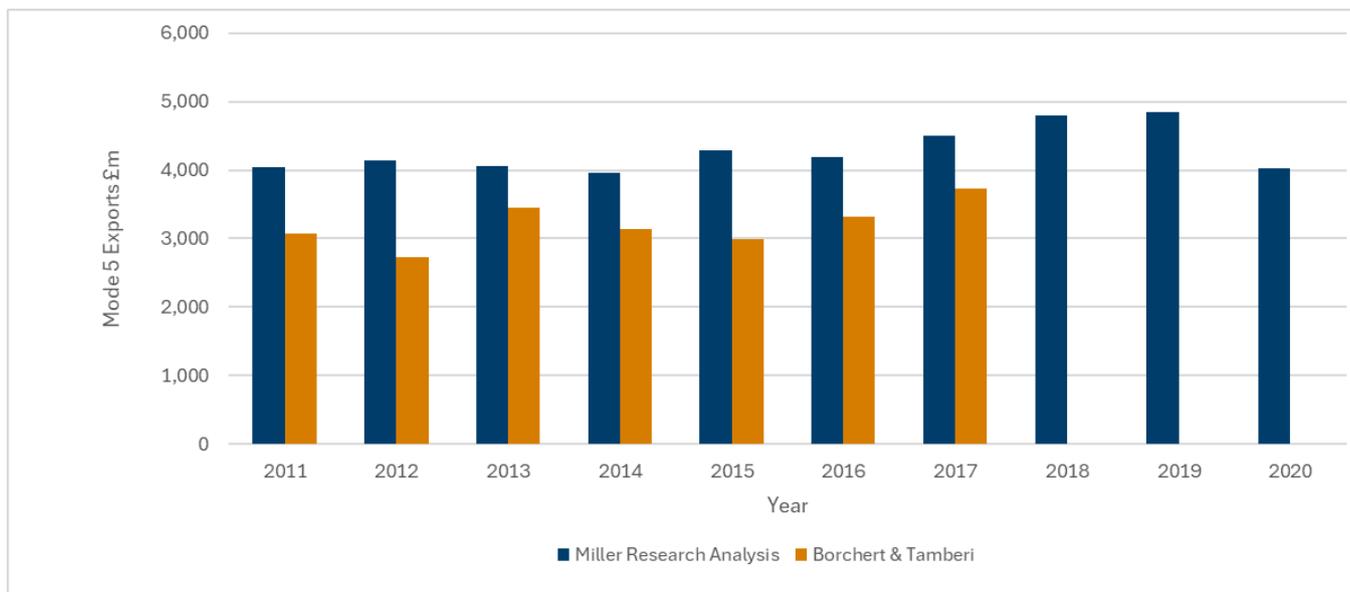
Our method of calculation of Mode 5 services contributions departs from the Sussex paper in this way, as it estimates the regional contribution of Wales to UK manufacturing exports. Instead of relying on HMRC trade data to track regional exports directly, this analysis utilises a GVA-based method. It calculates the Welsh share of total UK GVA within each manufacturing sub-sector on an annual basis and applies these proportions to estimate Wales' contribution to embodied services exports. This approach was adopted with the aim of capturing more industry-specific nuances, recognising that structural differences in regional manufacturing profiles may not be fully reflected in aggregate trade data. While the Sussex method provides a comprehensive national view grounded in trade statistics, the GVA-based approach offers a disaggregated perspective per sector that may be more representative of regional industrial composition and change over time.

However, this approach has limitations. GVA-based apportionment assumes that the proportion of value added in each Welsh sub-sector aligns proportionally with the services content embedded in exported goods. This may not capture variations in firm-level integration of services, regional export intensity, or differing service-mix by product. For example, some Welsh sectors may specialise in high-volume but low-service products, leading to possible overestimation. Conversely, niche exporters with high embedded services but small GVA footprints may be underrepresented. As such, results should be interpreted as indicative estimates of embedded services activity, rather than precise export values.

6.7. Estimation of total Welsh Mode 5 services

This section outlines our findings and analysis from our estimation of total Welsh Mode 5 services.

Figure 10: Miller Research analysis and Borchert & Tamberi estimates of Mode 5 exports (indicative), Wales, £ million, 2011-2020

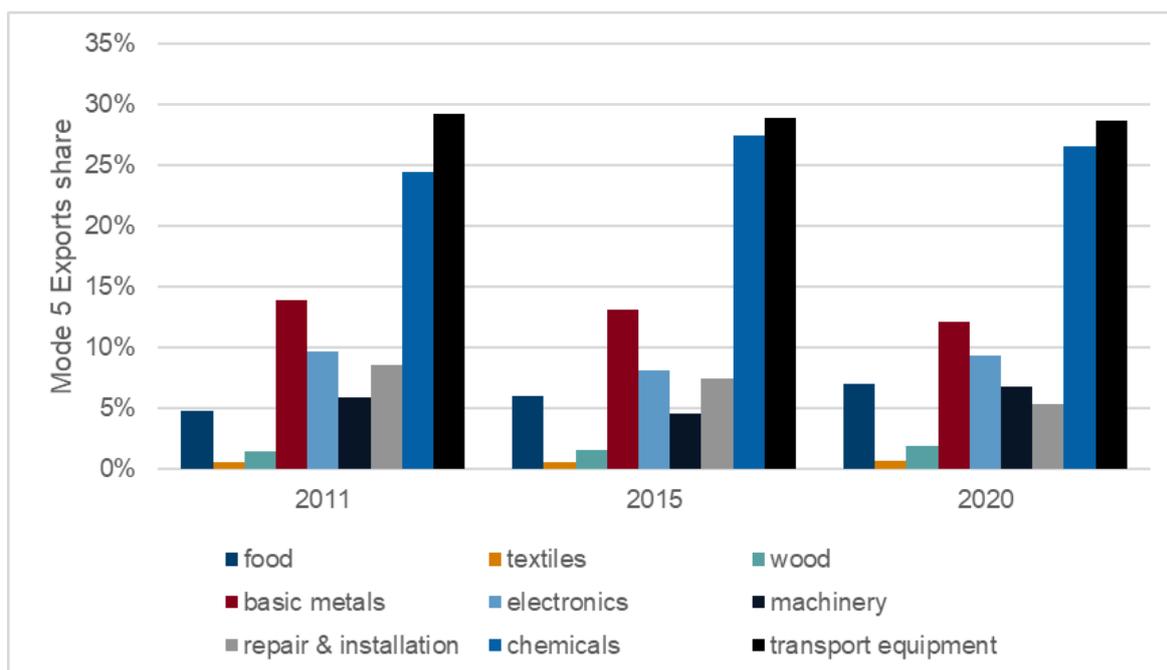


Description of Figure 10: Chart showing estimates by both Miller Research and Borchert & Tamberi for Mode 5 exports from Wales, over the period 2011-2017 for Borchert & Tamberi and 2011-2020 for Miller Research. Both sets of figures suggest a relatively stable contribution over the relevant periods.

Source: Miller Research analysis of Regional gross value added (balanced) by industry and OECD-WTO TiVA database, and Borchert and Tamberi (2018)

Figure 10, presenting the estimation of total Welsh Mode 5 services, reveals a relatively stable contribution over the period 2011 to 2020, with total values ranging between approximately £4 billion and £4.8 billion annually. These figures were derived by applying [Wales' annual share of UK manufacturing GVA](#) to the [OECD-WTO TiVA estimates](#) for UK manufacturing exports by destination region. The highest value occurred in 2019 at just over £4.8 billion, while the lowest was in 2011 at just over £4 billion, reflecting fluctuations in both overall export volumes and the Welsh share of manufacturing output. Notably, despite global economic disruptions in 2020, including the Covid-19 pandemic and the onset of new trading conditions with the EU, Welsh Mode 5 exports remained resilient at around £4 billion. This indicates a consistent role for embedded services in Wales' manufacturing sector, underlining its integration into international value chains.

Figure 11: Mode 5 exports by industry (as share of total Mode 5 exports) (indicative), Wales, 2011/2015/2020



Description of Figure 11: Chart showing Wales' Mode 5 exports broken down by industry, as a share of total Mode 5 exports, for 2011, 2015 and 2020. Mode 5 exports linked to the manufacture of transport equipment, followed by those linked to the manufacture of chemicals, were the biggest contributors to total Mode 5 exports for 2011, 2015 and 2020. Source: Miller Research analysis of Regional gross value added (balanced) by industry and OECD-WTO TiVA database

Figure 11, derived by applying [Wales' annual share of UK manufacturing GVA](#) to the [OECD-WTO TiVA estimates](#), reveals a pronounced concentration of Wales' Mode 5 export share within a few key manufacturing sectors over the period analysed. Notably, the manufacture of motor vehicles, trailers, and other transport equipment consistently represented the highest share of total Mode 5 exports, ranging between 29% and 35%. This dominant position reflects the strength of Wales' automotive and transport sector in contributing to embedded services exports.

Similarly, the chemical and non-metallic mineral products sector maintained a substantial share, fluctuating between 24% and 28% throughout the decade. In contrast, other sectors such as textiles, wood and paper products, and furniture and miscellaneous manufacturing consistently contributed a modest 1-2% each, underscoring their relatively limited role in the Welsh Mode 5 value chain. These disparities highlight the highly concentrated nature of Wales' Mode 5 export profile, dependent on capital-intensive and globally integrated industries.

Over time, the composition of Wales' Mode 5 export share has shown relative stability in sectoral dominance, with minor shifts reflective of broader economic or policy influences. From 2011 to 2020, the motor vehicle and chemical sectors jointly accounted for more than half of all Mode 5 exports from Wales, illustrating a persistent reliance on sectors that

combine complex goods with high value-added services. While some sectors like machinery and equipment and computer and electronic products occasionally approached or exceeded the 10% mark, their shares were more volatile, likely influenced by external trade dynamics, such as global supply chain disruptions.

Overall, the data suggests that diversification in Mode 5 exports remains limited, potentially posing a risk to economic resilience if leading sectors face international competitive pressures or regulatory shifts. This pattern reinforces the strategic importance of supporting innovation and service integration across a broader range of manufacturing industries in Wales.

The Input-Output tables for Wales can provide some insights into the relative contributions of key tradeable services to mode 5 exports. Table 7 shows the proportion of overall output traded to other businesses in Wales (intermediate sales) and the main manufacturing sectors supported. This gives an indication of both the volume and content of embedded services in the outputs of the main manufacturing sectors, whether sold domestically or for export.

Table 7: Estimates for intermediate trade as a proportion of service sector outputs and main manufacturing sectors supplied, Wales, 2019

Sub-Sector	Intermediate Sales proportion of output	Main Manufacturing Sectors Supplied
Publishing	26%	Manufacture of motor vehicles and other transport equipment (1.2%) Manufacture of food products, beverages and tobacco products (1.0%)
Film and TV	24%	Manufacture of motor vehicles and other transport equipment (0.3%) Manufacture of food products, beverages and tobacco products (0.3%)
Telecommunications	37%	Manufacture of furniture and other manufacturing; repair and installation of machinery and equipment (1.1%) Manufacture of motor vehicles and other transport equipment (1.1%)

Sub-Sector	Intermediate Sales proportion of output	Main Manufacturing Sectors Supplied
Computer programming, consultancy & related	43%	Manufacture of motor vehicles and other transport equipment (4.4%) Manufacture of electrical equipment (4.0%)
Financial and Insurance	18%	Manufacture of furniture and other manufacturing; repair and installation of machinery and equipment (0.9%) Manufacture of food products, beverages and tobacco products (0.9%)
Legal and accounting, management consultancy / Head Office	42%	Manufacture of motor vehicles and other transport equipment (1.9%) Manufacture of basic metals (1.6%)
Architectural and engineering activities, technical testing, analysis	37%	Manufacture of electrical equipment (19%) Manufacture of chemical, coke and refined petroleum products (2.7%)
Scientific Research and Development	16%	Manufacture of basic pharmaceutical products and pharmaceutical preparations (4.6%) Manufacture of motor vehicles and other transport equipment (2.7%)
Advertising & Market Research	74%	Manufacture of food products, beverages and tobacco products (1.5%) Manufacture of furniture and other manufacturing (0.9%)
Other professional, scientific, technical	29%	Manufacture of motor vehicles and other transport equipment (1.7%) Manufacture of food products, beverages and tobacco products (1.5%)

Source: Input-Output Tables for Wales, 2025

Several tradable services sell a large share of their output to other Welsh businesses, most notably Advertising & Market Research (74%), and knowledge intensive services such as Computer programming (43%), Legal & accounting/management consultancy (42%), Telecoms (37%), and Architecture & engineering (37%). These could indicate substantial scope for Mode 5 value add. Motor vehicles & transport equipment is a cross-cutting anchor: it appears as a major client for multiple services (publishing, film/TV, telecoms, IT,

legal/consultancy, R&D, and other professional services), suggesting that upgrades in these service inputs could have disproportionate spillovers into one of Wales' more export-oriented manufacturing bases. Architecture & engineering is unusually concentrated in electrical equipment (19%), while R&D has its strongest linkage with pharmaceuticals (4.6%), pointing to sector specific service–manufacturing ecosystems that could be nurtured. Food & drink manufacturing is a recurring client across several services (e.g., publishing, film/TV, finance/insurance, advertising, other professional services), highlighting the breadth of embedded service content in a key Welsh manufacturing sector.

6.8. Implications on Welsh services policy

Mode 5 services are beginning to influence the composition of trade and the sources of export competitiveness ([Cernat, L. \(2024\) What Mode of Supply Will Matter the Most for the Future of Services Trade?](#)). For Wales, they create opportunities to add value to existing manufacturing strengths and to stimulate demand for domestic service providers.

However, the data suggests that diversification in Mode 5 exports remains limited, potentially posing a risk to economic resilience if leading sectors face international competitive pressures or regulatory shifts. This reinforces the strategic importance of supporting innovation and service integration across a broader range of manufacturing industries in Wales.

In addition, under current customs rules, embedded services are treated as part of the tangible good, exposing firms to potential double taxation and regulatory uncertainty ([OECD \(2023\) Interactions between goods and services in international trade: Implications for customs valuation and rules of origin](#)). In future trade negotiations, the UK Government with support from the Welsh Government, should advocate for provisions that: prevent customs duties from being applied to purely digital after-sales updates; streamline border procedures for goods-plus-service packages; and ensure that intangible inputs are appropriately recognised when applying rules of origin. Addressing these issues may help support Wales' competitiveness in digitally enabled, value-added exports.

Furthermore, evidence-based policy requires better data on embedded services. Reviewing the Trade Survey for Wales, collaborating with the Office for National Statistics on regional TiVA estimates, and refining input-outputs tables will provide better visibility into Mode 5 contributions. Statistical enhancements should draw, wherever possible, on existing data collection mechanisms to minimise additional reporting burdens on business.

Mode 5 services have the potential to enhance the value and resilience of Welsh exports, but their contribution materialises only when embedded services are matched to market demand and supported by competitive products. An enabling policy framework - focusing on supporting innovation and service integration across a broader range of manufacturing industries in Wales, pragmatic trade provisions, and improved measurement - may help to enable Welsh firms to capitalise on Mode 5 opportunities.

7. Conclusions and recommendations

7.1. Overall conclusions

Wales' tradeable service sector occupies a critical space in the national economy, contributing over 70% of total GVA and accounting for a growing share of employment. As global markets evolve and production becomes increasingly servitised, Wales' ability to build on its strengths in knowledge-intensive service industries will be an important factor in shaping its long-term economic trajectory.

Our research suggests that Wales is home to a number of strategically important service sub-sectors (including digital, creative, financial, and professional services) that demonstrate strong domestic contributions to GVA and employment. These sectors benefit from a digitally enabled workforce, lower operating costs than some other UK regions, and emerging support structures.

Despite the potential of Wales' high-value service sub-sectors, structural barriers continue to hinder growth and internationalisation. Talent retention challenges, infrastructure challenges beyond the Cardiff Capital Region, and some reported limited understanding of service export mechanisms may be collectively constraining scale and impact. Furthermore, many stakeholders felt that existing trade and industrial policies tend to prioritise goods-based sectors, sidelining the embedded and intangible value generated by services. In addition, diversification in Wales' Mode 5 exports remains limited, potentially posing a risk to economic resilience if leading sectors face international competitive pressures or regulatory shifts.

The evidence suggests an opportunity to place greater emphasis on the service economy within economic policy. Wales is home to a range of high value services sub sectors, including digital and IT services, creative industries, professional and legal services, fintech, and cybersecurity. These sectors are supported by a digitally enabled workforce, proximity to academic and research institutions, and competitive business costs. In several areas, such as Mode 5 trade, digital exports, and creative production, Wales has both emerging specialisms and export potential. However, while these strengths are evident, realising their full potential will benefit from improved data visibility, targeted support mechanisms, and a policy environment that is responsive to the needs of modern service businesses.

In short, this study invites policymakers to take a fresh look at how and where economic value is generated in Wales. It suggests moving beyond traditional sector boundaries to adopt a more integrated view that recognises the interconnections between services, manufacturing, and digitalisation. If Wales is to future-proof its economy, it must fully embrace the service-driven foundations of 21st century competitiveness and reflect this in its long-term economic strategy.

7.2. Policy recommendations

This report underscores the economic significance and latent potential of Wales' tradeable services sector. While the sector has demonstrated strengths, including specialisation in high-value domains such as fintech, digital media, and cybersecurity, persistent structural challenges and evolving global conditions necessitate a recalibration of policy focus. The following policy implications should be considered in shaping more responsive, future-oriented policy capable of nurturing and supporting Wales' service economy.

7.2.1. Data and Research

7.2.1.1. PR1: Strengthening data and visibility

Policymakers may benefit from clearer visibility into how services contribute to the Welsh economy, particularly where these are not directly captured by traditional export metrics. Wales may benefit from exploring ways to improve visibility of embedded and cross-border service flows within existing data sources. This could include reviewing the Trade Survey for Wales to assess whether incremental refinements - such as expanding the goods/services classification list - might provide more granular insights without increasing respondent burden.

7.2.2. Policy Development

7.2.2.1. PR2: Addressing structural barriers to growth

Persistent challenges, such as uneven digital infrastructure and limited managerial capacity, suggest opportunities for targeted and sustained policy support. While the Welsh Government's Export Action Plan includes measures to expand advisory services and support programmes for new and high-potential exporters, targeted attention may help to ensure ongoing support is streamlined, agile, and attuned to the practical realities of service sector businesses. Enhancing the reach and responsiveness of existing schemes, such as through export clusters, tailored training, and simplified access pathways, could help reduce some of the barriers to further international growth.

7.2.2.1. PR3: Embedding Mode 5 in trade and industrial policy

Greater recognition of Mode 5 services could support both trade and industrial policy. This includes negotiating trade agreements that account for services embedded in goods, preventing double taxation, and aligning rules of origin to reflect intangible contributions. Domestically, industrial strategy may benefit from treating service businesses as potential enablers of manufacturing competitiveness, funding joint R&D initiatives, and integrating digital, design, and consultancy services into sectoral roadmaps.

7.2.3. Business support / development

7.2.3.1. PR4: Rethinking the model of export support

Many stakeholders felt that current trade support is predominately focused on goods-dominated models. A greater policy emphasis could be placed on services-led trade, including Mode 5 exports. This presents an opportunity to expand existing support through the development of service-aware trade support, incorporating advisory services, regulatory guidance, and aftercare tailored to service firms. This includes improving access to export finance, digital trade facilitation, and upskilling in areas such as IP management and standards compliance.

7.2.3.2. PR5: Improving policy-commercial alignment

Stakeholder feedback suggests there is scope to improve alignment between the design of public support and the practical realities of running a service-sector business in Wales, particularly for SMEs. Many respondents emphasised that while the strategic intent of Welsh Government schemes is often clear, delivery mechanisms can feel bureaucratic or poorly attuned to commercial timelines. For example, some grant and advisory programmes were perceived by some as administratively complex, with lengthy application processes, unclear eligibility criteria, or limited follow-up support. Future support may be more effective if it is co-designed with industry, led by professionals with commercial expertise, and shaped around business workflows. It may benefit from emphasis being placed on ease of access, clarity of purpose, and timeliness - ensuring that support enables rather than delays business responsiveness.

The recommendations outlined above provide a strategic foundation, but further practical steps and evidence-building efforts are required to ensure sustained progress.

7.3. Potential next steps and further research

To build on the findings of this study and progress towards a more supportive ecosystem for Wales' tradeable services sector, several practical and cost-effective next steps are recommended.

7.3.1. Data and research

7.3.1.1. R1: Enhance service sector data collection

Enhancing the data infrastructure that underpins our understanding of the service economy and addressing gaps is essential. At present, Wales lacks comprehensive visibility into the full scale and contribution of its services, particularly for those inputs embedded within exported goods. To address this, the Welsh Government could consider, as part of ongoing methodological reviews, whether enhancements to the Trade Survey for Wales could

improve understanding of tradeable services. For example, cognitive testing could inform whether businesses can provide more detail on service exports within the current framework. Any changes should balance the need for richer data with the priority of maintaining survey length and response rates.

7.3.1.2. R2: Undertake sector-specific deep dives

Several high-potential sub-sectors identified in this report, including cybersecurity, fintech, and design-led services, could benefit from more detailed analysis to understand their specific growth enablers and constraints. Commissioning short, focused sector deep dives could help refine support mechanisms, inform targeted export promotion, and identify market entry barriers or IP concerns particular to each domain. Deep dives could focus on understanding global demand, major buyers, and competitors, with value-chain analysis identifying how Welsh service firms insert themselves into broader industrial networks.

7.3.1.3. R3: Pursue further research into Mode 5

Despite its significance, Mode 5 remains largely unrecognised in terms of export performance. Further research and analysis are recommended to:

- Map key manufacturing-service linkages in Wales.
- Estimate the value of embedded services across priority sectors.
- Identify international best practices for recognising and promoting Mode 5 trade.

To close this information gap, Welsh Government could undertake a comprehensive mapping and estimation exercise. A network-analysis graphic showing the top one hundred manufacturing purchasers and top one hundred service suppliers (ranked by transaction value) will highlight geographic clusters and critical nodes. Wales should examine international best practices for recognising and promoting Mode 5 trade. A global policy scan covering Germany's partial duty relief for embedded software, Canada's 'Value-Added Service' customs classification, Japan's tariff reduction on ICT-heavy machinery, Singapore's digital after-sales exemptions in FTAs, and South Korea's 'Servicification Roadmap' may provide useful insights. These findings can support Wales to advocate for supportive provisions in UK trade negotiations and future FTAs.

7.3.2. Policy development

7.3.2.1. R4: Strengthen integration of services in industrial policy

Welsh Government's existing strategies around innovation, digital infrastructure, and net zero can be extended to more explicitly include service-sector capabilities. For example, future revisions of sector roadmaps could incorporate consultancy, software, and creative services as enablers of low-carbon industrial transitions. A cross-departmental working group could be established to ensure services are systematically embedded in place-based industrial planning.

7.3.3. Business support/development

7.3.3.1. R5: Leverage existing export support structures

Rather than creating entirely new institutions or schemes, enhancements to service export support can be delivered through existing mechanisms such as the Export Action Plan. These might include tailored training for Business Wales and WG trade advisers on service-specific export pathways, simplified application routes for service firms, or updates to marketing materials to better reflect Wales' digital and creative strengths.

7.3.3.2. R6: Pilot service-export readiness tools

A low-cost yet high-impact step would be to develop and pilot a 'Service Export Readiness Toolkit' to help SMEs self-assess their preparedness for internationalisation. This interactive resource could guide SMEs through five key dimensions, identified as challenges in the research: market intelligence, regulatory readiness, intellectual property strategy, operational capability, and financial preparedness. On completion, each firm can receive a personalised 'gap report' outlining prioritised next steps. The toolkit could be integrated into Business Wales support programmes or made available via export cluster networks.

7.4. Closing summary

This report suggests that a more deliberate, evidence-based policy framework can aid in addressing the constraints facing Wales' tradeable services sector, by upgrading data collection (R1), conducting focused sector deep dives (R2), deepening our understanding of Mode 5 (R3), strengthening the integration of services in industrial policy (R4), strengthening existing support structures (R5), and piloting an export readiness toolkit (R6), Wales can build the infrastructure required for sustained, sustainable, outward-looking growth.

Recommendations on data collection and analysis could play a key role in an era of global volatility. The rapid and unpredictable shifts in world politics, in particular the resurgence of protectionist trade policies under U.S. leadership, render having a clear, up-to-date picture of how services drive both standalone exports and embedded value indispensable. Early 2025 saw President Trump's administration impose sweeping tariffs on a range of imported goods, generating widespread uncertainty. Although those tariffs targeted primarily manufactured products, they had a second-order impact on services through higher supply-chain costs, dampened global demand, and currency fluctuations. For Wales, where the United States remains a major export destination, both for goods and for services, such policy reversals underscore the importance of agility and access to timely information for Welsh firms. The broader consequences from these trade tensions, from higher borrowing costs to delayed investment decisions, have depressed business confidence in the United Kingdom. As Wales looks to strengthen its service sector, it must remain alert to the possibility of retaliatory measures or abrupt regulatory shifts.

Geopolitical tensions have reignited scrutiny of supply-chain resilience. For key sectors such as cybersecurity, fintech, and life sciences, which are heavily reliant on cross-border collaboration and the free flow of data and talent, the withdrawal of the United Kingdom from European regulatory frameworks adds complexity. Supporting Welsh firms to comply with both EU and U.S. data-privacy regimes, while guarding against future onshoring of critical digital infrastructure will be a key challenge.

Allegiances in global trade are shifting, with free trade agreements being renegotiated with an eye towards national strategic industries. In this environment, Wales' engagement should aim to advocate, through UK-level trade negotiations, for provisions that protect embedded services from double taxation or excessive customs duties and deepen relationships with key trading partners while establishing new ones.

8. Annex

8.1. Annex 1: Data review, approach and limitations

8.1.1. Data review

There is a wide range of business classifications for considering trade in goods and services, based for example on the requirements of the host nation, consideration of the level of processing, or of the nature of main business activity. Some of these, as well as relevant databases, are reviewed below in the context of establishing a sample of businesses for the research.

8.1.1.1. UNCTAD

The definition of scope for the project proposed in the original research specification follows the [UNCTAD \(United Nations Conference on Trade and Development\) definition](#), which splits services into three categories of production activity:

- Those that change the conditions of consuming units. These can be described as service activities which alter the state or utility of a good or a person (the consuming unit) without transferring ownership of a physical product. Examples include:
 - Repair and Maintenance Services: Repairing a car alters its condition, making it functional again.
 - Healthcare Services: Provision of medical treatment changes the health status of a patient.
 - Education Services: Teaching provides knowledge, changing the skill set of the learner.

- Those that facilitate the exchange of products. These refer to services that support the sale, distribution, or transfer of goods between parties. Examples include:
 - Retail and Wholesale Trade: A supermarket facilitates the exchange of food products between suppliers and consumers.
 - Transport and Logistics: Shipping services move goods from producers to consumers.
 - Marketing and Advertising: Promoting products to create demand and support sales.

- Those that facilitate the exchange of financial assets. These activities relate to financial and intermediary services that support the transfer of money, or financial instruments between two or more parties. Examples include:

- Banking Services: A bank facilitates the exchange of money by processing payments or managing deposits.
- Stock Brokerage: A brokerage firm enables the buying and selling of shares on behalf of clients.
- Insurance Services: Providing coverage for risk, facilitating the financial stability of the insured party.

8.1.1.2. Extended Balance of Payments Services Classification (EBOPS)

The United Nations Trade and Development (UNCTAD) and the World Trade Organisation (WTO) use a set of categories defined in the Implementation of the Balance and International Investment Position Manual, of which the current incarnation is known as BPM6 ([International Monetary Fund \(2009\) Balance of Payments and International Investment Position Manual](#)). This is compiled by the International Monetary Fund as a reference point for compiling international balance of payment statistics and uses a classification known as EBOPS 2010, which is divided into 12 categories as follows:

- Manufacturing services on physical inputs owned by others (such as processing, assembly, labelling and packaging by businesses that do not have ownership of the goods).
- Maintenance and repair services n.i.e.
- Transport
- Travel
- Construction
- Insurance and pension services
- Financial services
- Charges for the use of intellectual property n.i.e.
- Telecommunications, computer and information services
- Other business services
- Personal, cultural and recreational services
- Government goods and services n.i.e.

8.1.1.3. SIC 2007

For the most part EBOPS can be translated to UK SIC2007, which is the classification used by UK Government and ONS for collection and dissemination of a wide range of statistical data on the economy and trade. The table in Annex 1 presents a list of SIC coded activities which might be considered tradeable services, and it is suggested that these will encompass the majority of the above EBOPS list, with the exception of Government goods and services.

The list excludes manufacturing of goods, as well as non-tradeable services, in so far as these can be defined. The process of selection requires some degree of judgement, for example in retail trade – where we have excluded physical retail premises, but included online retail, as this has the greater potential for export trade.

8.1.1.4. Trade in Value Added (TiVA)

The WTO and Organisation for Economic Cooperation and Development (OECD) developed the [TiVA database](#) to go beyond measures of international trade by value to quantify the *value added* by countries in the production of goods and services. This approach has the advantage of avoiding double counting in trade data, as it focuses on *net trade* between countries. The measures in the database include the service content of gross exports by exporting industry, by type of service and type of value added – i.e. a useful measure of global Mode 5 trade.

8.1.1.5. Inter-Country Input-Output tables (ICIO)

TiVA is in turn based on the ICIO, which is a set of tables listing inter-sector trade within country and between countries, including a measure of intermediate consumption (that is the goods and services consumed in the production process and, by implication, embedded in the final product). These tables, although useful, have limitations in that the lowest level of disaggregation is UK level, implying a need for some additional modelling to find data applicable to Wales.

8.1.1.6. UK Input-Output tables

ONS publishes an annual set of Input-Output analytical tables for the UK, consistent with the UK National Accounts [Blue Book](#) and UK Balance of Payments [Pink Book](#). These estimate the value of products and services used to produce further products and satisfy final use. The most recent tables relate to 2022 and include data for exports of services as part of final use.

8.1.1.7. 2019 Supply & use and Input-Output tables for Wales

Welsh Government has recently published updated supply and use and [Input-Output tables for Wales](#), operating across 55 sectors (aggregated from 64), updating an earlier (2007) set of tables produced by Cardiff Business School. Supply and use tables enable an understanding of the flow of goods and services at product level between industries and end consumers (including intermediate consumption by businesses, exports and inter-UK trade). Input-Output tables, however, comprise a matrix which shows transactions between industries at industry level, to understand how inter-sector trade contributes to overall economic output.

8.1.2. Understanding Mode 5 service exports

Trade agreements and global trade in services are generally governed by the General Agreement of Trade in Services (GATS), overseen by the World Trade Organisation (WTO). However, there was historically limited information or statistics available to describe this trade until, in 2019 the Trade In Services By Mode Of Supply (TISMOS) database was compiled for the first time. TISMOS covers four modes of direct service exports;

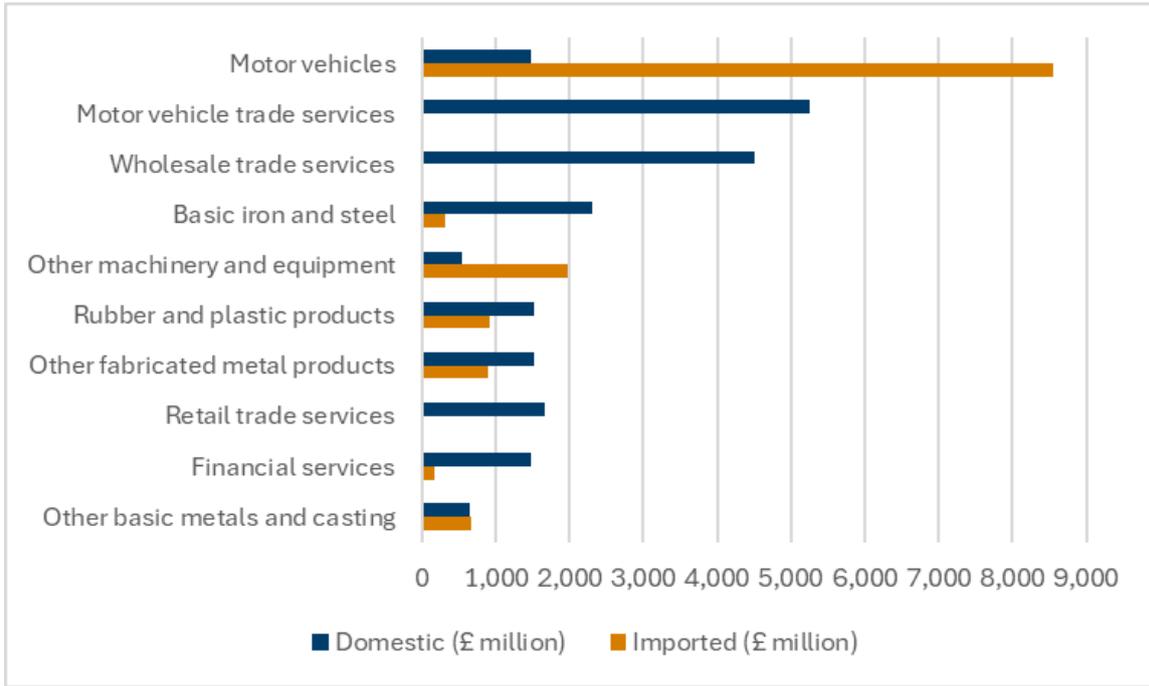
- Mode 1: Cross-border supply – This mode describes trade from one territory to another. It typically covers digital services trade such as consultancy or training via the internet, or it can include international transport (shipping, air transport)
- Mode 2: Consumption abroad – This mode of supply covers services supplied in one territory to consumers from another. It primarily captures international tourism activities, but could include higher education, for example
- Mode 3: Commercial Presence – Under this mode, companies establish a physical presence abroad, such as an office or subsidiary, to deliver services to customers from that territory
- Mode 4: Temporary Movement of Natural Persons – This mode refers to service suppliers sending staff to another territory to deliver a service in person – for example construction, consultancy or medical expertise

Time series data from TISMOS clearly shows that there was a change in the way that services were provided following the Covid-19 pandemic. The level of services delivered face to face by physical travel (Mode 4) fell globally by 60% between 2019 and 2022. At the same time, services delivered digitally, for example using Microsoft Teams or Zoom, (Mode 1) increased by almost 40% over the same period ([Cernat, L. \(2024\) The Big Shift in Global Trade in Services: A Tale of Five Modes of Supply](#)).

In addition to these four modes covered by TISMOS, there is growing interest in the under-recognised field of indirect service exports, known as Mode 5. These are services embedded within manufacturing, which are not directly quantified in traditional datasets as they are included in the value of goods.

A [2018 research paper](#) from the European Centre for International Political Economy (ECIPE) highlights that Mode 5 services may be subject to tariffs because of their embedded nature: The value of activities such as R&D, design, engineering and software can all be treated as part of the overall value of goods when exported. [Research from the OECD](#) estimates that the liberalisation of Mode 5 services from tariffs could release global GDP gains of €300bn by 2025 and increase world trade by €500bn.

Figure 12: Products and services used in the making of motor vehicles, UK, 2023



Description of Figure 12: Chart showing the amount of a range of products and services used in the manufacture of motor vehicles in the UK that were sourced domestically, and the amount that were imported, in 2023. Motor vehicle trade services, wholesale trade services, and retail trade services were wholly domestically sourced.

Source: Input-Output supply and use tables from the Office for National Statistics

Figure 12 provides an illustration of this, using the example of the UK motor vehicle manufacturing sector at UK level. In terms of domestically-supplied inputs, motor vehicle trade services and wholesale trade services are the largest areas of spend by the industry – substantially ahead of basic iron and steel, or machinery and equipment.

The ECIPE report acknowledged the importance of Mode 5 trade, and cited TISMOS and TiVA databases as useful for calculating Mode 5 (by combining the value of goods from TISMOS and the embedded added value from TiVA).

Globally, Mode 5 represents 29% of total service exports by value and this is expected to grow. A lack of understanding of Mode 5 services is potentially undervaluing Wales’ services exports, with implications for how this key export output is impacted by customs duties. The following section suggests an approach to mapping the sector and understanding Mode 5 exports of tradeable services from Wales.

8.1.3. Sources of employment data

To accurately assess employment figures across service sectors in Wales, the analysis drew on several databases that track employment. Available datasets each offer unique strengths and limitations and so triangulating multiple sources is useful in devising a reliable and comprehensive picture of the service sector’s contribution to the labour market.

8.1.3.1. Workforce Jobs by Region and Industry (ONS)

The primary source of employment data used in this study is the [ONS Workforce Jobs by Region and Industry dataset](#), which provides quarterly estimates on the number of jobs by broad sector. The time series begins from March 1996 and is updated quarterly, with the latest data used in this report being December 2024, enabling analysis of long-term employment trends across regions and industries. Its quarterly frequency supports timely tracking of labour market fluctuations, including seasonal variations and cyclical patterns.

8.1.3.2. BRES (ONS)

The [Business Register and Employment Survey](#) (BRES) serves as a secondary source, collecting data through employer surveys on the number of jobs held by employees. The data is disaggregated by full-time and part-time status and reported at the detailed four-digit SIC 'Class' level, enabling granular analysis of employment patterns. This level of detail is particularly valuable for assessing the distribution of tradeable service activities within broader sub-sectors.

It should be noted that BRES data includes businesses registered for Pay As You Earn (PAYE) but excludes those registered only for Value Added Tax (VAT). As a result, there is potential for underrepresentation of smaller firms or sole traders, which may affect the accuracy of sector-level employment estimates. The latest available data relates to 2023, with updates provided on an annual basis.

8.2. Annex 2 – List of SIC codes considered to be in scope as tradeable services.

Table 8: List of SIC codes

Description	Class	Level headings
Support activities for crop production	0161	Class
Support activities for animal production	0162	Class
Support services to forestry	0240	Class
Support activities for petroleum and natural gas extraction	0910	Class
Support activities for other mining and quarrying	0990	Class
Repair of fabricated metal products, machinery and equipment		Group
Repair of fabricated metal products	3311	Class
Repair of machinery	3312	Class
Repair of electronic and optical equipment	3313	Class
Repair of electrical equipment	3314	Class
Repair and maintenance of ships and boats	3315	Class
Repair and maintenance of aircraft and spacecraft	3316	Class
Repair and maintenance of other transport equipment	3317	Class
Repair of other equipment	3319	Class
Installation of industrial machinery and equipment		Group
Installation of industrial machinery and equipment	3320	Class
Trade of electricity	3514	Class
Dismantling of wrecks	3831	Class
Remediation activities and other waste management services	3900	Class
Development of building projects	4110	Class
Construction of residential and non-residential buildings		Group
Construction of residential and non-residential buildings	4120	Class
Construction of roads and railways		Group
Construction of roads and motorways	4211	Class
Construction of railways and underground railways	4212	Class
Construction of bridges and tunnels	4213	Class
Construction of utility projects		Group
Construction of utility projects for fluids	4221	Class
Construction of utility projects for electricity and telecommunications	4222	Class
Construction of other civil engineering projects		Group
Construction of water projects	4291	Class
Construction of other civil engineering projects nec	4299	Class
Demolition and site preparation		Group
Demolition	4311	Class
Site preparation	4312	Class
Test drilling and boring	4313	Class
Electrical, plumbing and other construction installation activities		Group
Electrical installation	4321	Class
Plumbing, heat and air-conditioning installation	4322	Class
Other construction installation	4329	Class
Building completion and finishing		Group
Plastering	4331	Class
Joinery installation	4332	Class
Floor and wall covering	4333	Class
Painting and glazing	4334	Class
Other building completion and finishing	4339	Class
Other specialised construction activities		Group
Roofing activities	4391	Class
Other specialised construction activities nec	4399	Class
Maintenance and repair of motor vehicles		Group
Maintenance and repair of motor vehicles	4520	Class
Sale of motor vehicle parts and accessories		Group
Wholesale trade of motor vehicle parts and accessories	4531	Class
Retail trade of motor vehicle parts and accessories	4532	Class
Sale, maintenance and repair of motorcycles and related parts and accessories		Group
Sale, maintenance and repair of motorcycles and related parts and accessories	4540	Class
Wholesale on a fee or contract basis		Group
Agents involved in the sale of agricultural raw materials, live animals, textile raw materials and semi-finished goods	4611	Class
Agents involved in the sale of fuels, ores, metals and industrial chemicals	4612	Class
Agents involved in the sale of timber and building materials	4613	Class
Agents involved in the sale of machinery, industrial equipment, ships and aircraft	4614	Class
Agents involved in the sale of furniture, household goods, hardware and ironmongery	4615	Class
Agents involved in the sale of textiles, clothing, fur, footwear and leather goods	4616	Class
Agents involved in the sale of food, beverages and tobacco	4617	Class
Agents specialised in the sale of other particular products	4618	Class
Agents involved in the sale of a variety of goods	4619	Class
Wholesale of agricultural raw materials and live animals		Group
Wholesale of grain, unmanufactured tobacco, seeds and animal feeds	4621	Class
Wholesale of flowers and plants	4622	Class
Wholesale of live animals	4623	Class

Description	Class	Level headings
Wholesale of hides, skins and leather	4624	Class
Wholesale of food, beverages and tobacco		Group
Wholesale of fruit and vegetables	4631	Class
Wholesale of meat and meat products	4632	Class
Wholesale of dairy products, eggs and edible oils and fats	4633	Class
Wholesale of beverages	4634	Class
Wholesale of tobacco products	4635	Class
Wholesale of sugar and chocolate and sugar confectionery	4636	Class
Wholesale of coffee, tea, cocoa and spices	4637	Class
Wholesale of other food, including fish, crustaceans and molluscs	4638	Class
Non-specialised wholesale of food, beverages and tobacco	4639	Class
Wholesale of household goods		Group
Wholesale of textiles	4641	Class
Wholesale of clothing and footwear	4642	Class
Wholesale of electrical household appliances	4643	Class
Wholesale of china and glassware and cleaning materials	4644	Class
Wholesale of perfume and cosmetics	4645	Class
Wholesale of pharmaceutical goods	4646	Class
Wholesale of furniture, carpets and lighting equipment	4647	Class
Wholesale of watches and jewellery	4648	Class
Wholesale of other household goods	4649	Class
Wholesale of information and communication equipment		Group
Wholesale of computers, computer peripheral equipment and software	4651	Class
Wholesale of electronic and telecommunications equipment and parts	4652	Class
Wholesale of other machinery, equipment and supplies		Group
Wholesale of agricultural machinery, equipment and supplies	4661	Class
Wholesale of machine tools	4662	Class
Wholesale of mining, construction and civil engineering machinery	4663	Class
Wholesale of machinery for the textile industry and of sewing and knitting machines	4664	Class
Wholesale of office furniture	4665	Class
Wholesale of other office machinery and equipment	4666	Class
Wholesale of other machinery and equipment	4669	Class
Other specialised wholesale		Group
Wholesale of solid, liquid and gaseous fuels and related products	4671	Class
Wholesale of metals and metal ores	4672	Class
Wholesale of wood, construction materials and sanitary equipment	4673	Class
Wholesale of hardware, plumbing and heating equipment and supplies	4674	Class
Wholesale of chemical products	4675	Class
Wholesale of other intermediate products	4676	Class
Wholesale of waste and scrap	4677	Class
Non-specialised wholesale trade		Group
Non-specialised wholesale trade	4690	Class
Retail trade not in stores, stalls or markets		Group
Retail sale via mail order houses or via Internet	4791	Class
Other retail sale not in stores, stalls or markets	4799	Class
Freight transport by road and removal services		Group
Freight transport by road	4941	Class
Removal services	4942	Class
Transport via pipeline		Group
Transport via pipeline	4950	Class
Sea and coastal passenger water transport		Group
Sea and coastal passenger water transport	5010	Class
Sea and coastal freight water transport		Group
Sea and coastal freight water transport	5020	Class
Freight air transport and space transport		Group
Freight air transport	5121	Class
Space transport	5122	Class
Software publishing		Group
Publishing of computer games	5821	Class
Other software publishing	5829	Class
Motion picture, video and television programme activities		Group
Motion picture, video and television programme production activities	5911	Class
Motion picture, video and television programme post-production activities	5912	Class
Motion picture, video and television programme distribution activities	5913	Class
Motion picture projection activities	5914	Class
Sound recording and music publishing activities		Group
Sound recording and music publishing activities	5920	Class
Radio broadcasting		Group
Radio broadcasting	6010	Class
Television programming and broadcasting activities		Group
Television programming and broadcasting activities	6020	Class
Wired telecommunications activities		Group
Wired telecommunications activities	6110	Class
Wireless telecommunications activities		Group
Wireless telecommunications activities	6120	Class
Satellite telecommunications activities		Group
Satellite telecommunications activities	6130	Class

Description	Class	Level headings
Other telecommunications activities		Group
Other telecommunications activities	6190	Class
Computer programming, consultancy and related activities		Group
Computer programming activities	6201	Class
Computer consultancy activities	6202	Class
Computer facilities management activities	6203	Class
Other information technology and computer service activities	6209	Class
Data processing, hosting and related activities; web portals		Group
Data processing, hosting and related activities	6311	Class
Web portals	6312	Class
Other information service activities		Group
News agency activities	6391	Class
Other information service activities nec	6399	Class
Monetary intermediation		Group
Central banking	6411	Class
Other monetary intermediation	6419	Class
Activities of holding companies		Group
Activities of holding companies	6420	Class
Trusts, funds and similar financial entities		Group
Trusts, funds and similar financial entities	6430	Class
Other financial service activities, except insurance and pension funding		Group
Financial leasing	6491	Class
Other credit granting	6492	Class
Other financial service activities, except insurance and pension funding, nec	6499	Class
Insurance		Group
Life insurance	6511	Class
Non-life insurance	6512	Class
Reinsurance		Group
Reinsurance	6520	Class
Pension funding		Group
Pension funding	6530	Class
Activities auxiliary to financial services, except insurance and pension funding		Group
Administration of financial markets	6611	Class
Security and commodity contracts brokerage	6612	Class
Other activities auxiliary to financial services, except insurance and pension funding	6619	Class
Activities auxiliary to insurance and pension funding		Group
Risk and damage evaluation	6621	Class
Activities of insurance agents and brokers	6622	Class
Other activities auxiliary to insurance and pension funding	6629	Class
Fund management activities		Group
Fund management activities	6630	Class
Buying and selling of own real estate		Group
Buying and selling of own real estate	6810	Class
Renting and operating of own or leased real estate		Group
Renting and operating of own or leased real estate	6820	Class
Real estate activities on a fee or contract basis		Group
Real estate agencies	6831	Class
Management of real estate on a fee or contract basis	6832	Class
Legal activities		Group
Legal activities	6910	Class
Accounting, bookkeeping and auditing activities; tax consultancy		Group
Accounting, bookkeeping and auditing activities; tax consultancy	6920	Class
Activities of head offices		Group
Activities of head offices	7010	Class
Management consultancy activities		Group
Public relations and communication activities	7021	Class
Business and other management consultancy activities	7022	Class
Architectural and engineering activities and related technical consultancy		Group
Architectural activities	7111	Class
Engineering activities and related technical consultancy	7112	Class
Technical testing and analysis		Group
Technical testing and analysis	7120	Class
Research and experimental development on natural sciences and engineering		Group
Research and experimental development on biotechnology	7211	Class
Other research and experimental development on natural sciences and engineering	7219	Class
Research and experimental development on social sciences and humanities		Group
Research and experimental development on social sciences and humanities	7220	Class
Advertising		Group
Advertising agencies	7311	Class
Media representation	7312	Class
Market research and public opinion polling		Group
Market research and public opinion polling	7320	Class
Specialised design activities		Group
Specialised design activities	7410	Class
Photographic activities		Group
Photographic activities	7420	Class
Translation and interpretation activities		Group

Description	Class	Level headings
Translation and interpretation activities	7430	Class
Other professional, scientific and technical activities nec		Group
Other professional, scientific and technical activities nec	7490	Class
Renting and leasing of motor vehicles		Group
Renting and leasing of cars and light motor vehicles	7711	Class
Renting and leasing of trucks	7712	Class
Renting and leasing of personal and household goods		Group
Renting and leasing of recreational and sports goods	7721	Class
Renting of video tapes and disks	7722	Class
Renting and leasing of other personal and household goods	7729	Class
Renting and leasing of other machinery, equipment and tangible goods		Group
Renting and leasing of agricultural machinery and equipment	7731	Class
Renting and leasing of construction and civil engineering machinery and equipment	7732	Class
Renting and leasing of office machinery and equipment (including computers)	7733	Class
Renting and leasing of water transport equipment	7734	Class
Renting and leasing of air transport equipment	7735	Class
Renting and leasing of other machinery, equipment and tangible goods nec	7739	Class
Leasing of intellectual property and similar products, except copyrighted works		Group
Leasing of intellectual property and similar products, except copyrighted works	7740	Class
Activities of employment placement agencies		Group
Activities of employment placement agencies	7810	Class
Temporary employment agency activities		Group
Temporary employment agency activities	7820	Class
Other human resources provision		Group
Other human resources provision	7830	Class
Travel agency and tour operator activities		Group
Travel agency activities	7911	Class
Tour operator activities	7912	Class
Other reservation service and related activities		Group
Other reservation service and related activities	7990	Class
Private security activities		Group
Private security activities	8010	Class
Security systems service activities		Group
Security systems service activities	8020	Class
Investigation activities		Group
Investigation activities	8030	Class
Combined facilities support activities		Group
Combined facilities support activities	8110	Class
Landscape service activities		Group
Landscape service activities	8130	Class
Office administrative and support activities		Group
Combined office administrative service activities	8211	Class
Photocopying, document preparation and other specialised office support activities	8219	Class
Activities of call centres		Group
Activities of call centres	8220	Class
Organisation of conventions and trade shows		Group
Organisation of conventions and trade shows	8230	Class
Business support service activities nec		Group
Activities of collection agencies and credit bureaus	8291	Class
Packaging activities	8292	Class
Other business support service activities nec	8299	Class
Higher education		Group
Post-secondary non-tertiary education	8541	Class
Tertiary education	8542	Class
Educational support activities		Group
Educational support activities	8560	Class
Creative, arts and entertainment activities		Group
Performing arts	9001	Class
Support activities to performing arts	9002	Class
Artistic creation	9003	Class
Operation of arts facilities	9004	Class
Libraries, archives, museums and other cultural activities		Group
Library and archive activities	9101	Class
Museum activities	9102	Class
Operation of historical sites and buildings and similar visitor attractions	9103	Class
Botanical and zoological gardens and nature reserve activities	9104	Class
Gambling and betting activities		Group
Gambling and betting activities	9200	Class
Sports activities		Group
Operation of sports facilities	9311	Class
Fitness facilities	9313	Class
Other sports activities	9319	Class
Activities of business, employers and professional membership organisations		Group
Activities of business and employers' membership organisations	9411	Class
Activities of professional membership organisations	9412	Class
Activities of trade unions		Group
Activities of trade unions	9420	Class

Description	Class	Level headings
Activities of other membership organisations		Group
Activities of religious organisations	9491	Class
Activities of political organisations	9492	Class
Activities of other membership organisations nec	9499	Class

Source: Miller Research