The State of Competition in Ireland: Services Sector Analysis

December 2025

CCPC

Coimisiún um Iomaíocht agus Cosaint Tomhaltóirí | Competition and Consumer Protection Commission

Table Of Contents

Table of Figures

Tables

Glossary

Active Businesses
Businesses which generate turnover in a given year.

Annual Services Inquiry (ASI)
The main microdata source from the Central Statistics Office (CSO) for analysing the Services Sector.

Business Births
Newly established businesses in a given year.

Business Register
A dataset of all active businesses, compiled annually by the CSO.

Cobb-Douglas Production Function
A specific mathematical form used to estimate total factor productivity (TFP), quantifying the efficiency with which businesses combine labour and capital to generate output.

Concentration
The extent to which a small number of businesses account for a large share of revenue in an industry.

Concentration Ratio (CR4, CR10)
The percentage of total market output or turnover produced by the four (CR4) or ten (CR10) largest businesses in an industry.

Cost Share Approach
A method for estimating markups, focusing on the share of input costs in total revenue.

Digitally Intensive
Industries classified as "high" digitally intensive, fall within the top quartile of the OECD's digital taxonomy which includes Investment in ICT equipment; Purchases of ICT intermediates; Robot use; ICT specialists; and, Online sales.

Entrenchment
The number of businesses that remain in the top ranks (e.g., top four) for consecutive years, indicating stability among market leaders.

Entry Rate / Exit Rate
The proportion of businesses entering (entry rate) or leaving (exit rate) an industry in a given year.

Herfindahl-Hirschman Index (HHI)
A measure of concentration calculated by summing the squares of each business' market share. Values range from 0 (perfect competition) to 10,000 (monopoly).

Job Reallocation Rate
The sum of job creation and job destruction rates, reflecting the movement of labour across businesses in the economy.

Labour Productivity
Output per worker, measured as gross value added per employee.

Markups
The ratio of a business' price to its marginal cost, used as an indicator of market power.

NACE Codes
A classification system for economic activities, used to categorise industries at various levels of detail (e.g., 2-digit, 4-digit).

Production Function Approach
A method for estimating markups based on the relationship between input costs and output.

Rank Persistence
The likelihood that the largest businesses in an industry maintain their top positions over time.

Sectoral Level
Analysis conducted within specific industries or sub-industries.

Services Sector
The non-financial services sector, as defined in the report, excluding financial and insurance activities.

Survival Rate
The proportion of new businesses (births) that remain active after a certain number of years.

Total Factor Productivity (TFP)
A measure of efficiency that captures output not explained by labour or capital inputs, often linked to innovation or technology.

Turnover
The total sales or revenue generated by a business.

Young Businesses
Businesses that have been active for less than five years.

Acknowledgements

This report uses microdata from the Central Statistics Office (CSO). We are grateful to the CSO staff for facilitating access to the data and for their assistance with queries.

We thank Professor Tommaso Valletti for reviewing the report and providing feedback on methods and results.

Executive Summary

This report presents the first comprehensive, evidence-based assessment of the evolution of competition within Ireland's non-financial services sector over a 15-year period (2008-2022), setting a new benchmark for competition policy analysis and research.

While Ireland's services sector demonstrates resilience and adaptability in a number of ways, the balance of evidence suggests that competitive intensity has weakened in several important areas. Strong competition is critical for the health of the Irish economy and the welfare of consumers, and some of these results point to rising risks to competition in key parts of the Irish economy. It is vital that every effort is made to maintain open markets and to ensure that market power does not become entrenched to the detriment of innovation, consumer choice, and economic dynamism.

The analysis in this report is timely, aligning with heightened scrutiny of competition and competitiveness at both EU and national levels, and aims to inform policy, academic debate and future activity of the Competition and Consumer Protection Commission (CCPC).

Concentration and average markups have risen

The CCPC's report found that concentration has risen in Ireland's services sector, particularly since 2016, with the average market share of the top 4 businesses reaching 37% in 2022 (up 12 percentage points since 2008). This pattern is not unique, mirroring similar trends observed across other advanced economies. The rise in market share is most pronounced in more digitally intensive sectors such as Information & Communication (for example, ICT services) and Professional, Scientific & Technical services (such as accounting and legal services), where a small number of businesses now account for a larger share of turnover. Over the same period average markups have also edged upwards by 3%, suggesting that firms in these areas are gaining modest pricing power alongside their growing market presence. However, notable differences across sectors were observed, with markups rising most significantly in the Professional, Scientific and Technical industry while markups decreased in a number of other areas including the Arts, Entertainment & Recreation and Transport & Storage industries.

Business dynamism is cooling but productivity gains evident

Despite signs of cooling business dynamism – fewer exits, rising long-term survival rates, and increasing incumbent entrenchment – the sector is still delivering productivity gains. Total efficiency is rising, and after an early dip, labour productivity has bounced back since 2016. In short, even with less rapid turnover of businesses and more established players holding their ground, businesses are finding ways to work smarter and produce more. In particular, younger businesses have a rising share in turnover and productivity improvements, allowing them to make a growing contribution to the Irish economy.

Barriers to competition

This report (in addition to the accompanying reports on Barriers to Entry and Expansion) also highlights country-specific factors that may influence concentration and wider business dynamism. Key barriers include financial capacity, regulatory burdens, knowledge gaps, and legal costs. Addressing barriers to entry and expansion can bring significant market benefits. Notably, more than two decades have passed since the CCPC published its proposals on legal reform, yet issues continue to persist in the sector. This highlights the need for government to prioritise market reform, and we welcome Government commitments under the Action Plan for Competitiveness and Productivity in this area.

CCPC priorities

In making decisions on where to prioritise its resources, the CCPC targets areas where harm to competition and consumers is greatest and where its interventions can have the most significant impact. This report provides an important evidence base to inform those prioritisation decisions.

These findings point to a services sector where competitive pressures are uneven and, in some industries, clearly diminishing. The rise in concentration and market power, coupled with reduced churn at the top of many industries, raises concerns about risks to the long-term health of competition. Taking concentration, mark-ups, digital intensity and business dynamism measures together, such risks are particularly evident in certain sectors, such as

Information & Communication; Professional, Scientific & Technical; and Wholesale & Retail (for example, domestic electrical appliances and machine tools).

The findings highlights that the role of the CCPC in enforcing competition law and advocating for pro-competitive reforms is more important than ever. The findings also reinforce the CCPC's pro-competition advocacy priorities in key high-cost, high-barrier sectors such as legal services and finance, and we will continue to drive for reforms in these areas to make markets more competitive for Irish businesses and consumers.

The CCPC is active in a number of the higher risk markets identified in our report, such as betting, ICT systems and domestic electrical appliances. Guided by the findings of this report, the CCPC will conduct further in-depth market studies to identify more granular problems and targeted interventions within the services sector. In addition, the State of Competition analysis will be broadened to include additional key sectors – specifically manufacturing and construction – enabling a more complete and integrated understanding of competition trends across the entire economy.

1. Introduction

The State of Competition Launch Paper ("Launch Paper")[1] established the rationale and framework for the assessment of competitive conditions across the Irish economy.[2] Building on the Barriers to Entry and Barriers to Expansion reports[3] - which captured direct business perspectives on the real-world obstacles facing businesses- this paper looks more broadly at Ireland's non-financial services sector (the "Services Sector").[4] Manufacturing and construction are not included in this first report due to delays regarding the release of necessary data from the Central Statistics Office (CSO).

The Launch Paper highlighted the heightened focus on competitiveness at both EU and national levels, as reflected in initiatives like the European Commission's Competitiveness Compass[5] and Ireland's Action Plan on Competitiveness and Productivity[6]. This heightened scrutiny is mirrored internationally, where concerns about declining competition in advanced economies have intensified over the past decade.

Given this context, there is a clear and pressing need for the CCPC to provide robust, evidence-based analysis of competition dynamics across the Irish economy. This project is not only timely – it is essential (i) to establish an analytical framework for measuring the state of competition in the Irish economy; (ii) to inform and shape academic and public debate on competition in markets; and (iii) to directly inform future work within the CCPC. In line with other studies from the UK, Canada and New Zealand[7], this report is intended to provide a benchmark assessment of key indicators used for the analysis of competition trends. The scope does not allow for a definitive assessment of the wider structural and economic drivers behind the trends, such interpretations would require more detailed sectoral level analysis.

[1] Available on CCPC website as part of package of State of Competition outputs

[2] The definition of the Irish economy for this programme of work is dictated by data availability and, in this context, refers specifically to the services, manufacturing, and construction sectors.

[3] Available on CCPC website as part of package of State of Competition

[4] Financial and Insurance Activities are not included within the scope of the research as this NACE Section (K) does not form part of the CSO's ASI dataset. This is in line with other similar international studies (e.g. UK. Canada, New Zealand).Each of the sectors listed in Figure 3 are included in the ASI.

[5] For more detail see: https://commission.europa.eu/topics/eu-competitiveness/competitiveness-compass_en

[6] For more detail see: https://enterprise.gov.ie/en/publications/action-plan-on-competitiveness-and-productivity.html

[7] The national competition authorities of these countries are the only ones to date to have attempted to establish a benchmark analysis of economy wide trends in competition.

1.1 Project indicators

As set out in the Launch Paper, and after consideration of the feedback received on the both the project scope and the metrics for analysis outlined in the 2024 *Invitation to Input*[8], the CCPC has assessed the evolution of competition in the Irish Services Sector under the following measures:

Figure 1: Competition Indicators

Industry structure	To examine sectoral structure and concentration, metrics such as the Herfindahl-Hirschman Index (HHI) and the concentration ratio (CR4 and CR10) are included. This will provide insights into the structure of industries in Ireland and how turnover within those industries is divided between the largest participants. The CCPC has also explored distributional changes in concentration levels.
Markups	Markups serve as a useful proxy of market power. Markups measure the difference between the price businesses charge for their good or service and the marginal cost incurred in producing that good or service.
Dynamic measures	Dynamic indicators of competition include: (i) rates of entry and exit - the proportion of businesses entering and exiting sectors; (ii) survival rates - the ability of new businesses to remain in business over time; (iii) rank persistence and entrenchment - measures of churn of the largest businesses in an industry; (iv) job reallocation - the rate at which labour is moving across the economy.
Contribution of younger businesses	The proportion of employees and revenue in a sector held by new and less-established businesses.
Productivity	As part of the analysis, potential dynamics between competition and productivity in the Irish economy is considered. Both labour productivity and total factor productivity are analysed.

To best capture how competition has evolved in Ireland, the above measures should be considered collectively. While individual metrics offer some limited indication of competitive conditions, their combined use facilitates a more comprehensive understanding of competition trends and market power within the Irish economy.

The intention of the project is to provide a broader perspective on competition in the Irish economy over time than the CCPC would typically do in more narrowly defined assessments

[8] For more detail see: https://www.ccpc.ie/business/research/consultations/state-of-competition-in-ireland/

as part of merger or antitrust investigations. Therefore, this project does not set out to examine indicators of competition at individual product market level.

1.2 Data

Results are based on analysis of strictly controlled research microdata files provided by the CSO. The CSO does not take any responsibility for the views expressed or the outputs generated from this research. The analysis presented in this report utilises business-level microdata. The microdata files used for this report include:

- Annual Services Inquiry (ASI)
- Business Register (BR)

The data analysis outputs produced by the project team have been assessed by CSO data custodians to ensure adherence to statistical disclosure controls and safeguard the confidentiality of businesses contained within the analysis. Details on the data cleaning steps can be found in the appendix in addition to descriptive statistics.

The CSO's Large Cases Unit are excluded from microdata files made available to researchers. This data consists of the 75 largest businesses in Ireland.[9] These businesses could be large multinationals based in Ireland but trading across borders or large businesses operating in Ireland only. The CSO engage with these businesses directly rather than requiring them to submit a survey return, so they do not appear in the ASI data. The exclusion of these businesses from the microdata files is necessary to ensure the confidentiality of businesses is protected. These large businesses would be outliers in the data, creating the risk that de-anonymisation would be possible if they were included. These large businesses make up a high proportion of overall turnover in individual industries. This means that it is possible that some indicators of competition have been underestimated, including concentration and markups. Particular caution must be exercised when examining the level of these indicators at one point in time. The exclusion of these large businesses may impact some industries more than others. For example, in *Professional, Scientific & Technical Activities* and *Information & Communication*, where we know there are very large players active in these industries. As a

[9] For more detail see: Economic_Statistics_Review_(ESRG)_Report_Dec_2016.pdf.

result of any underestimation, some cross-industry variation in competition indicators may be masked.

The data available is for the period 2008-2022. Over this timeframe, several economically significant events occur which likely have an impact on competition trends. This includes the aftermath of the Global Financial Crisis in 2008, Brexit, and Covid-19 as well as international trends like globalisation and digitalisation. However, given the data that we have and the methodology we employ, it is important to note that we cannot infer any causality between any event and competition trends. We can measure and report on trends in competition in the Irish services sector over the period of analysis, and we do make reference to international trends and events which may be affecting competition indicators, but we cannot attribute changes in competition to any one of these factors.

Some volatility can be seen following the financial crash in 2008, but the time period covered by the data does not include the preceding years. It is also likely that some economic consequences of recent events such as Brexit and the Covid pandemic have not yet been realised and so are not visible in the data. Furthermore, the most recent impacts of digitalisation including advances in technology like the widespread adoption of generative artificial intelligence take place after this time period.

1.3 Ireland's Services Sector

The CCPC's first State of Competition in Ireland analysis focuses on the non-financial services sector. This sector represented 47% of total gross value added (GVA) and 46.5% of total turnover in the Irish business economy in 2022 (CSO 2024). **Error! Reference source not found.** below sets out the industries within the services sector that will be included in the CCPC's analysis, alongside non-exhaustive examples of the type of business activity that fall under each industry

Figure 2: Industries included the CCPC Services Report

The Services industries and relevant NACE Letter analysed by the CCPC include the following:	***Wholesale & retail; repair of motor vehicles and motorcycles (G)**: including the sale of goods to businesses; the sale of goods for personal or household consumption; and motor sales and repairs*
	***Transportation & storage (H)**: including passenger or freight transport, cargo handling, storage as well as postal and courier activities.*
	***Accommodation & food (I)**: including short-stay accomodation for tourists; temporary long-term accomodation for students and seasonal workers; and restaurants.*
	Information & communication (J): including publishing; broadcasting; telecomms; and information technology activities.
	***Professional, scientific & technical activities (M)**: including legal, accounting and consultancy services; engineering and architecture; and scientific research and development*
	***Administrative & support service activities (N)**: including rental and leasing; human resources; call centres; travel agencies; and security activities.*
	***Arts, entertainment & recreation (R)**: including sports and recreation activites; and gambling and betting.*
	***Other service activities (S):** including the repair of computers and household goods; funeral services; and personal services.*

In line with other international studies, industries dominated by public sector bodies and that are believed not to follow the standard cost-minimising behaviour (as required for the calculation of certain measures) are excluded from the analysis. This includes NACE Letter L, *Real Estate*, and NACE two-digit sectors 90, *Creative, arts and entertainment activities*, 91 *Libraries, archives, museums and other cultural activities* and 94, *Activities of membership organisations.*[10]

The CCPC plans to use the findings from this analysis to identify potential topics or sectors that warrant further attention and assessment as part of a future market study. Beyond this,

[10] NACE four-digit sector, 7735 *Renting and leasing of air transport equipment*, was excluded also due to data reliability considerations and distortionary effects.

the CCPC also intends to carry out similar analysis of other broad sectors of the Irish economy, such as the Construction industry and domestic Manufacturing. [11]

1.4 NACE Classification of Data

The ASI and BR microdata from the CSO classifies the primary activity of every business according to the NACE Rev. 2 statistical classification system. Each business is assigned a four-digit code which reflects the majority of their gross value added. This 4-digit code is the fourth level of aggregation, which is the lowest level of aggregation of the data available. There are four levels to the NACE system in total. The highest level of aggregation is the sector letter. *Table 1* shows all of the sector letters included in this report and the corresponding categories at the next highest level of aggregation – the two digit level.

It is important to acknowledge that the NACE categorisation, even at the lowest level of aggregation, does not correspond with more narrowly defined product or geographic markets as would be set in a CCPC merger determination or enforcement investigation. In line with similar prior studies, we rely on more aggregated data. CSO data at the lowest level includes 222 different 4-digit NACE codes. There is a wide variation in the number of businesses captured within each 4-digit NACE code. For example, some 4-digit codes capture tens of thousands of individual businesses within a single year, while other 4-digit codes may have fewer than five businesses within the same year.

Table 1: Breakdown of NACE Rev. 2 Categories

Letter	Industry Name	Two-Digit Industry Name
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	Wholesale and retail trade and repair of motor vehicles and motorcycles
		Wholesale trade, except of motor vehicles and motorcycles
		Retail trade, except of motor vehicles and motorcycles
H	Transportation and storage	Land transport and transport via pipelines

[11] The ASI covers NACE Letters G-N excluding K (Financial and Insurance activities). Industries such as Agriculture, Construction, Manufacturing, Electricity, Water, Waste, Education and Health are not included in the ASI and are beyond the scope of this report.

		Water transport
		Air transport
		Warehousing and support activities for transportation
		Postal and courier activities
I	Accommodation and food service activities	Accommodation
		Food and beverage service activities
J	Information and communication	Publishing activities
		Motion picture, video and television programme production, sound recording and music publishing activities
		Programming and broadcasting activities
		Telecommunications
		Computer programming, consultancy and related activities
		Information service activities
M	Professional, scientific and technical activities	Legal and accounting activities
		Activities of head offices; management consultancy activities
		Architectural and engineering activities; technical testing and analysis
		Scientific research and development
		Advertising and market research
		Other professional, scientific and technical activities
		Veterinary activities
N	Administrative and support service activities	Rental and leasing activities
		Employment activities
		Travel agency, tour operator reservation service and related activities

		Security and investigation activities
		Services to buildings and landscape activities
		Office administrative, office support and other business support activities
R	Arts, entertainment and recreation	Gambling and betting activities
		Sports activities and amusement and recreation activities
S	Other service activities	Repair of computers and personal and household goods
		Other personal service activities

The results of our analysis included in this report will mainly examine competition dynamics at the letter industry level (as set out above). Some of the analysis, including key indicators such as concentration and markups, has been completed at a lower level of aggregation and then aggregated up to a higher level. Where relevant, we highlight findings at the 2-digit NACE code level to provide further insight into the competitive dynamics observed.

1.5 Report Structure

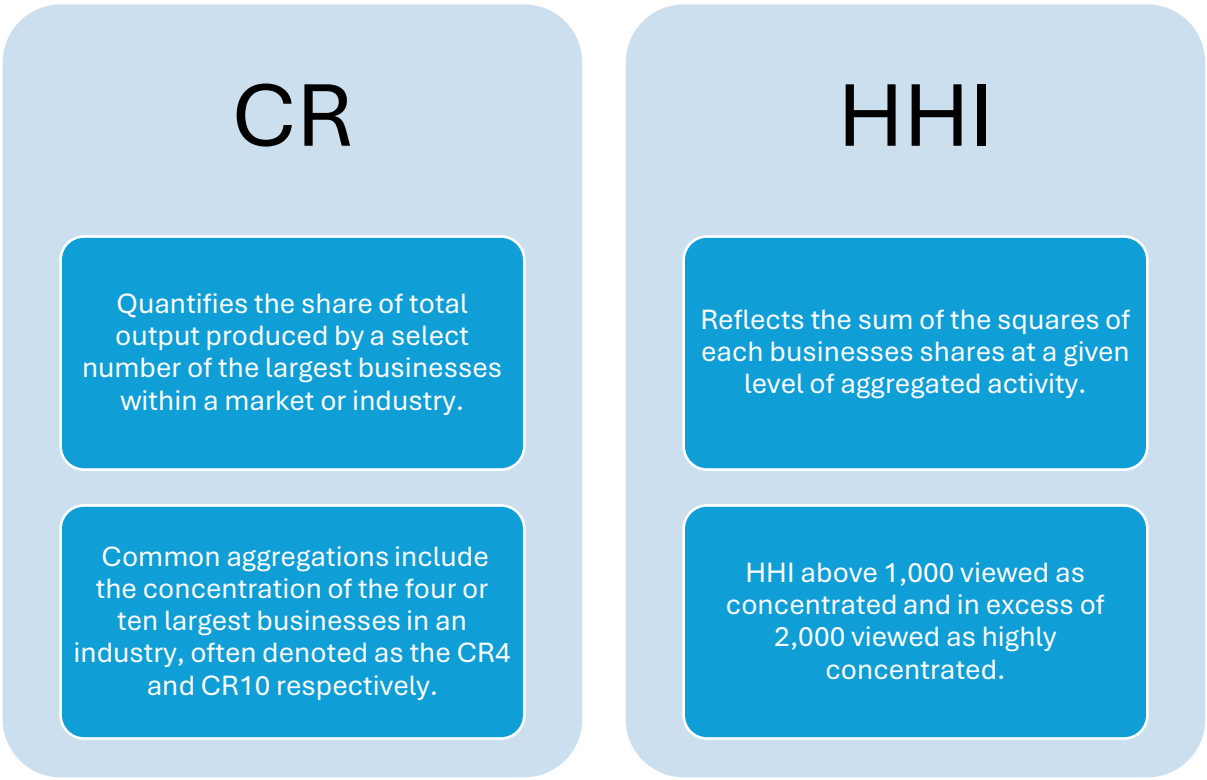
To provide a comprehensive account of how competition has evolved in the Irish Services Sector, this report delivers a multi-dimensional analysis across four core chapters. Chapter 2 examines industry concentration in the Irish Services Sector, identifying key shifts in the competitive landscape over time. Chapter 3 advances the analysis by examining business-level markups, offering important insights into the extent of market power. Chapter 4 then explores business dynamism, including entry, exit and survival rates, while chapter 5 examines the role of younger businesses (including an assessment of productivity). Chapter 6 summarises results from the CCPC's Barriers to Entry and Expansion work. The findings from these chapters are then combined in chapter 7, where trends are interpreted at an aggregate and industry level.

2. Concentration

As there is no single preferred way to measure market power, we rely on a combination of metrics, which together shine a light on how competitive dynamics have evolved over time and across industries. Taken in the context of the other measures set out in this report, industry concentration serves as a useful, albeit somewhat imperfect, measure of market power in Ireland.

Business-level concentration measures the extent to which a handful of – often large – businesses account for the total output, and or employment, within an industry. Economists typically measure concentration using Concentration Ratios (CR) or the Herfindahl Hirschman Index (HHI) methods:

Figure 3: Concentration Measures



Both measures are relatively straightforward to compute, while each have their respective advantages and disadvantages. For example, the HHI method captures information on all businesses within an industry, not just the 4 (or 10) largest, and as such takes into account asymmetries among market shares that may be lost in C4. High concentration levels typically

suggest that a small number of businesses account for a large share of the market. This can limit competition and innovation, while also having adverse effects on consumer prices and income distribution. However, the European Commission (2024) cautions that high concentration does not always indicate a lack of competition.

In some cases, high concentration levels may be the outcome of strong competition, where the most productive and efficient businesses gain greater market share through effective performance rather than anti-competitive practices. This perspective recognises that incumbent industry leaders may secure top positions by outperforming their rivals, thereby contributing to higher productivity across the industry. Similar cautions have been voiced by Davis and Orhangazi (2020) in their study on competition and monopoly in the US economy. Similarly, low concentration levels do not always mean strong competition. While they may reflect a highly competitive market, they equally could indicate low rivalry if substantial barriers to entry prevent businesses from successfully challenging incumbents (European Commission 2024). As a result, it is important to consider the underlying factors that drive concentration, rather than relying solely on concentration metrics themselves.

2.1 International Trends in Concentration[12]

Wider research demonstrates a pattern of rising market concentration in advanced economies in recent decades. Bajgar *et al.* (2023) conducted a study across 19 EU countries[13] and North America[14], finding that industry concentration increased on average in both regions. However, the increase was more significant in North America, where the average share of the 10% largest companies in industry sales rose by almost 8 percentage points between 2000 and 2014, compared to a 4 percentage point increase in the EU. This increase was observed in both manufacturing and non-financial market services, though it is acknowledged that in some industries, businesses compete across Europe rather than within each country. Further corroboration comes from a report by the European Commission (2024)

[12] Caution is required when making comparisons as studies vary in terms of type of data used and timeframe for analysis. In addition, some studies account for the impact of factors such as international trade and common ownerships while others do not.

[13] European measurements are based on OECD firm-level (EU) data spanning Belgium, Denmark, Estonia, Finland, Fance, Germany, Greece, Hungary, Ireland, Italy, Latvia, the Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, and the UK. Note that data periods vary, for example, Ireland's data is from 2006-2014.

[14] North America measurements are based on North America and Canada, and use the Orbis-Worldscope-Zephyr database, which also contains data on EU.

which observed a rise in industry concentration across their respective jurisdictions. The UK also experienced a marginal increase in economy-wide concentration between 1997 and 2022 (CMA 2024). Notably, despite these well-established international trends, there remains a significant gap in the literature regarding the evolution of concentration across industries of the Irish economy.

Several drivers may underpin these changes in concentration, including structural change[15] (Nuvolari and Russo 2021), financial constraints (Ratti *et al.* 2008), the spread of knowledge (Luttmer 2007) and technological change (Dosi *et al*. 2013). Bajgar *et al*. (2023) emphasise that if industry concentration rose only in the US, country-specific factors would be responsible. The concurrent upward trend across different countries strongly supports the argument that globalisation and technological change are significant contributors, as previously proposed by Van Reenan (2018). These factors not only influence competition but, as Autor *et al.* (2020) note, disproportionately benefit the most productive businesses, which may in turn serve to reinforce the market share of industry leaders.

2.2 CCPC Analysis

2.2.1 Aggregate Concentration Trends

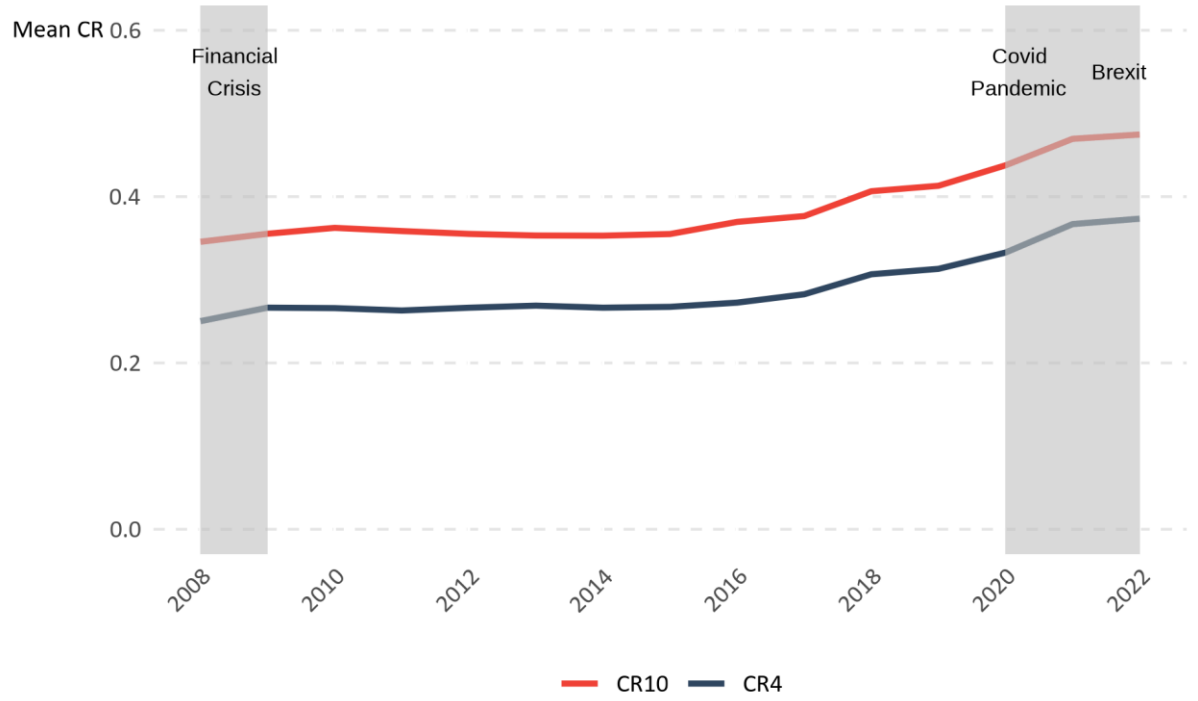
Overall, the average CR4 and CR10 increased in Ireland over our sample period, both following similar patterns (Figure 4). Both ratios were broadly stable between 2008 and 2015, before rising from 2016 onwards. We estimate that the CR4 rose by approximately 12 percentage points throughout our 15-year sample period, reaching 37% in 2022. Similarly, the CR10 rose by 13 percentage points, reaching 47% in 2022.

The findings presented in this section are based on analysis using sectoral weights;[16] however, we have also conducted the analysis without weights and found that the trends remain broadly unchanged. Sectoral weights are used to ensure that the aggregate concentration

[15] Defined by Nuvolari and Russo as the transformation of the sectoral composition of the economic system. Structural change is a long-term process of reallocation of economic activity across the three main sectors of the economy namely, agriculture, manufacturing and services.
[16] Weighted by turnover.

trends reflect the economic importance of each industry, rather than giving equal influence to industries of vastly different sizes.

Figure 4: Aggregate Concentration Ratios



Source: CCPC analysis using CSO Annual Services Inquiry microdata

Placing our findings in the context of other international studies is complicated by the fact that we focus only on the Services Sector of the Irish economy and timeframes differ across studies. Notwithstanding this limitation, we observe that concentration levels (C5 and C10) in the overall UK economy peaked in 2010 before stabilising in the following years. For example, the CR5 fluctuated between 47% and 50%, and CR10 fluctuated between 56% and 60% in the period after 2010. However, the rising trend in concentration in Ireland, particularly from 2016 onwards, are notably more pronounced when put in context of the UK.

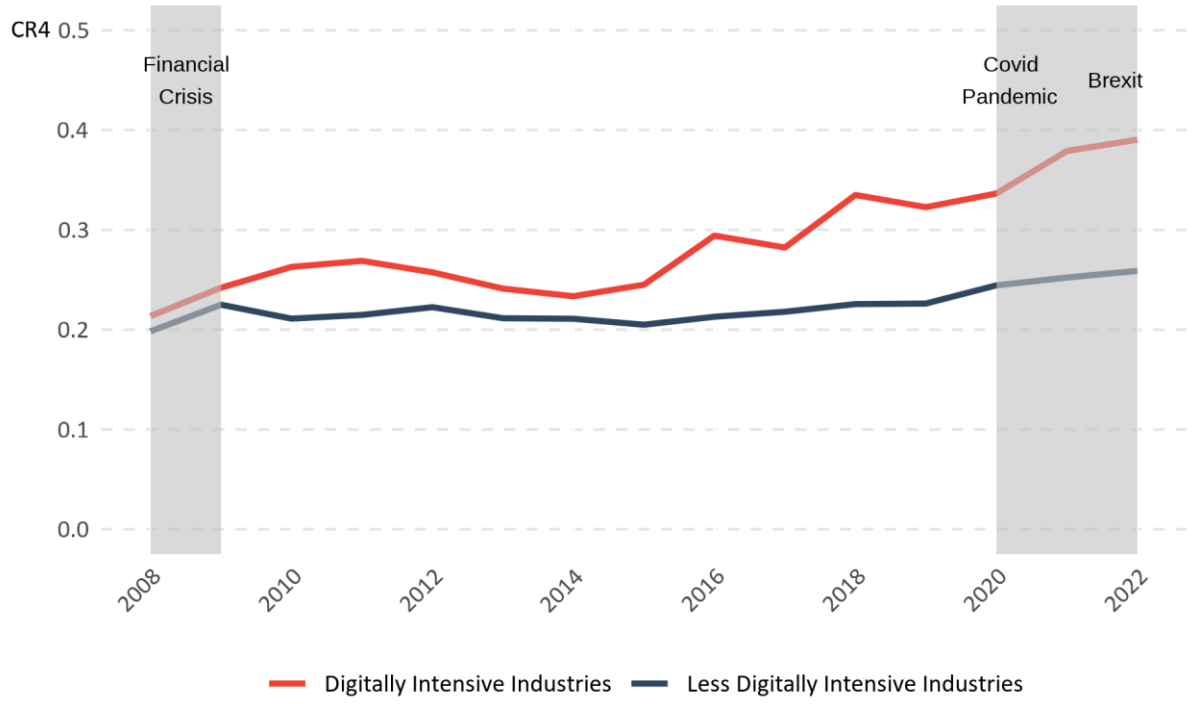
At the European level, the average CR4[17] rose steadily from 26% in 2000 to 31% in 2019 (Calligaris *et al.* 2024). While many countries experienced an increase in concentration levels over time, there is evidence of diversity with some countries (e.g. the UK[18], Norway, Finland) appearing more concentrated than others (e.g. Italy, Germany). For example, the average CR4

[17] Covers mining, manufacturing, non-financial market services (excluding real estate) and utilities sectors.
[18] The UK results presented in the European Commission (EC) report and those highlighted in the CMA's report do not align, with the concentration ratios highlighted by EC being higher than those reported by CMA. This underscores the sensitivity of these analyses to both the data used as well as the underlying assumptions.

in Italy in 2019 was approximately 25%, whereas Belgium saw average CR4 rise above 60% by 2019 (European Commission 2024).

Given the international trends observed in concentration, and the underlying arguments put forward in the literature relating to globalisation and technological change, comparing digitally intensive industries to their less digitally intensive counterparts can provide valuable insights.[19] As can be seen in Figure 5, concentration in digitally intensive industries is higher throughout the period of analysis, with the gap between digitally intensive and less digitally intensive widening significantly after 2016. Concentration in less digitally intensive industries was relatively stable over the period of analysis.

Figure 5: Concentration Ratio of Digitally Intensive Industries



Source: CCPC analysis using CSO Annual Services Inquiry microdata

These results are generally in line with the literature, as digitally intensive industries often experience competitive dynamics driven by rapid technological change, scalability, and innovation. These industries tend to see greater variability in concentration and markups,

[19] We have classified sectors as "digitally intensive" based on classifications for sectoral taxonomy of digital intensity produced by the OECD (2018), available at: *A taxonomy of digital intensive sectors (EN)*. In applying the OECD digital taxonomy to define our digital-intensive sectors, we include only sectors defined as "high" digitally intensive, meaning such a industry falls within the top quartile of the distribution of values of the OECD taxonomy. Businesses in these sectors are highly correlated with defined dimensions of digital transformation.

reflecting the outsized impact of leading businesses and the transformative nature of digital business models. In contrast, less digitally intensive industries may exhibit more stable patterns of concentration, shaped by traditional barriers to entry and slower rates of change. Some of the key barriers noted in the literature as being influential on concentration trends were also identified as challenges for Irish businesses in the CCPC's assessment of barriers to entry and expansion in Ireland. Financial capacity, regulatory burdens and legal fees in particular were major challenges for entry, while financial capacity and knowledge sharing barriers affected expansion (see Chapter 6 for more detail).

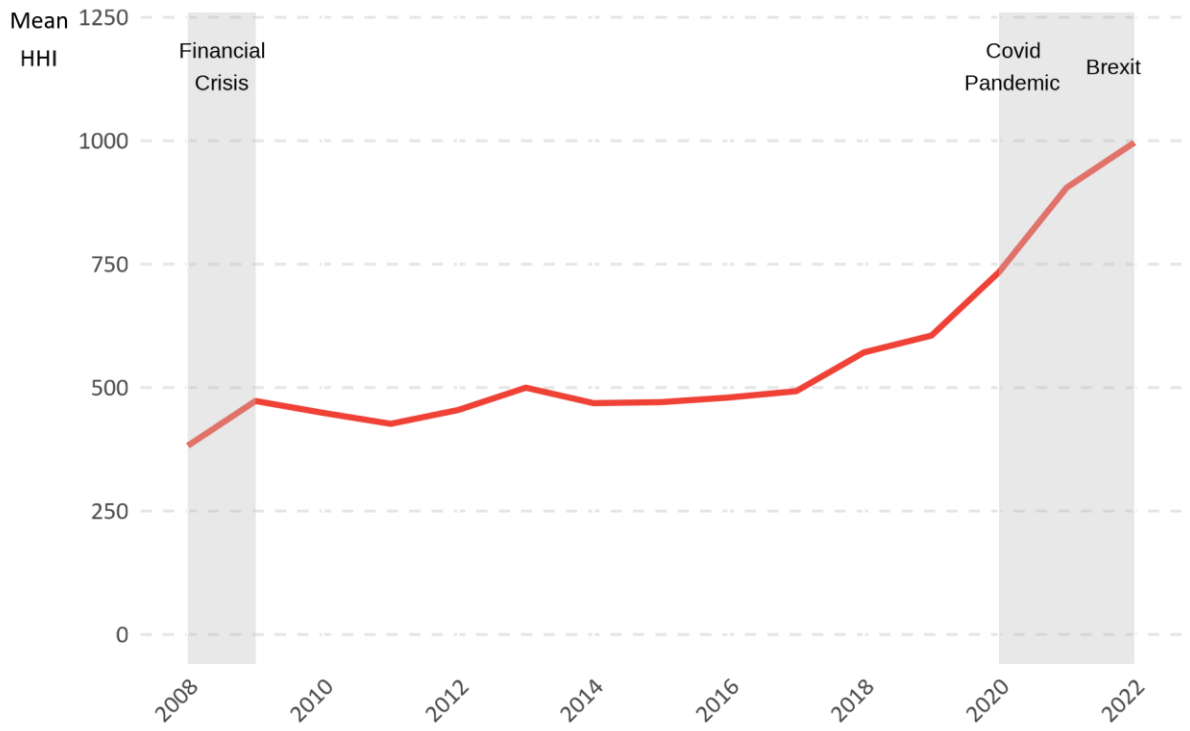
Next, we turn to the Herfindahl-Hirschman Index (HHI), another benchmark used when estimating concentration. Higher index values indicate greater concentration, potentially greater market power and lower competition. In line with CCPC merger guidelines[20], markets with a HHI more than 1,000 are viewed as concentrated, while markets in excess of 2,000[21] are considered to be highly concentrated.

Figure 6 illustrates the development of the aggregate HHI between 2008 and 2022 for the Irish Services Sector. Reflective of the CR4 and CR10 shown earlier, the trend is increasing over our sample period, with a notable tick upwards from 2017 onwards. The estimated HHI rose from approximately 600 to just below 1000 between 2019 and 2022 reflecting a rise of close to 65% in just three years. The largest year-on-year increase occurred between 2020 to 2021, when aggregate HHI rose from just below 735 to 905. This indicates that larger businesses have grown their market share over time, especially in more recent years, suggesting that competitive intensity may have reduced.

[20] See, https://www.ccpc.ie/business/wp-content/uploads/sites/3/2017/04/CCPC-Merger-Guidelines.pdf

[21] HHI bands can vary across regions and type of analysis. For example, US merger guidelines considers markets in excess of 1,800 to be highly concentrated. The CMA notes in its State of Competition reports that it is also generally accepted in the literature that market with a HHI of less than 1,500 is generally considered competitive, a HHI between 1,500 and 2,500 shows moderate levels of competition and concentration, and a HHI above 2,500 is highly concentrated.

Figure 6: Aggregate Herfindahl-Hirschman Index



Source: CCPC analysis using CSO Annual Services Inquiry microdata

2.2.2 Sectoral Analysis

Turning to sectoral dynamics, Figures 7 and 8 show how both concentration measures have evolved over the past 15 years across NACE sectors. We observe significant diversity across industries. Both *Information & Communication Services* and *Professional, Scientific & Technical activities* experienced significant increases in both CR4 and CR10 measures between 2008 and 2022, while more modest increases were observed in the *Wholesale & Retail Trade* and *Administration & Support Services industries*. Analysis of both publicly available CSO data as well as the ASI establishes *Information & Communication* as the industry most open to international trade. It is likely this openness contributes to the observed rise in concentration as a relatively small number of larger businesses and digital platforms capture large export shares, stemming from productivity selection, scale economies and stronger integration into global markets

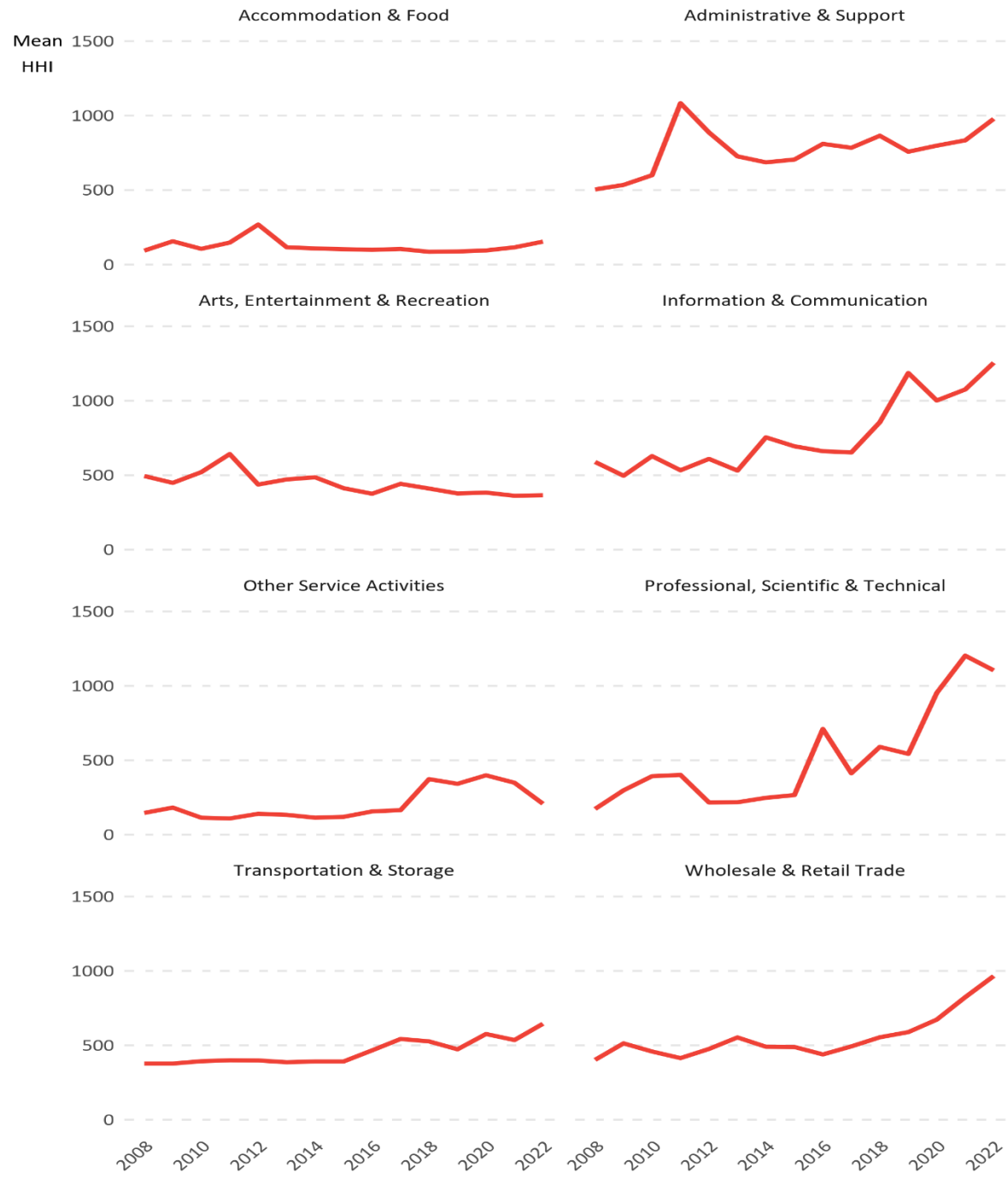
The most significant increase in concentration was in *Professional, Scientific & Technical activities*, where CR4 rose from 18% to 44% and the CR10 rose 27% to 55%. In contrast, *Arts, Entertainment & Recreation* saw a drop of more than 8 percentage points(pp) in CR4 and 7 pp in CR10. Variation in concentration across industries is also evident in the UK, with Arts and Entertainment experiencing the strongest increase in the period 1997 to 2022 (CMA 2024).

Figure 7: Concentration Ratios by Industry

Source: CCPC analysis using CSO Annual Services Inquiry microdata

Unsurprisingly, the trends observed in both Figures 7 and 8 are consistent, whereby increases (decreases) in the CR4/10 within a specific industry were also generally reflected in corresponding increases (decreases) in the HHI.

Figure 8: Herfindahl-Hirschman Index by Industry

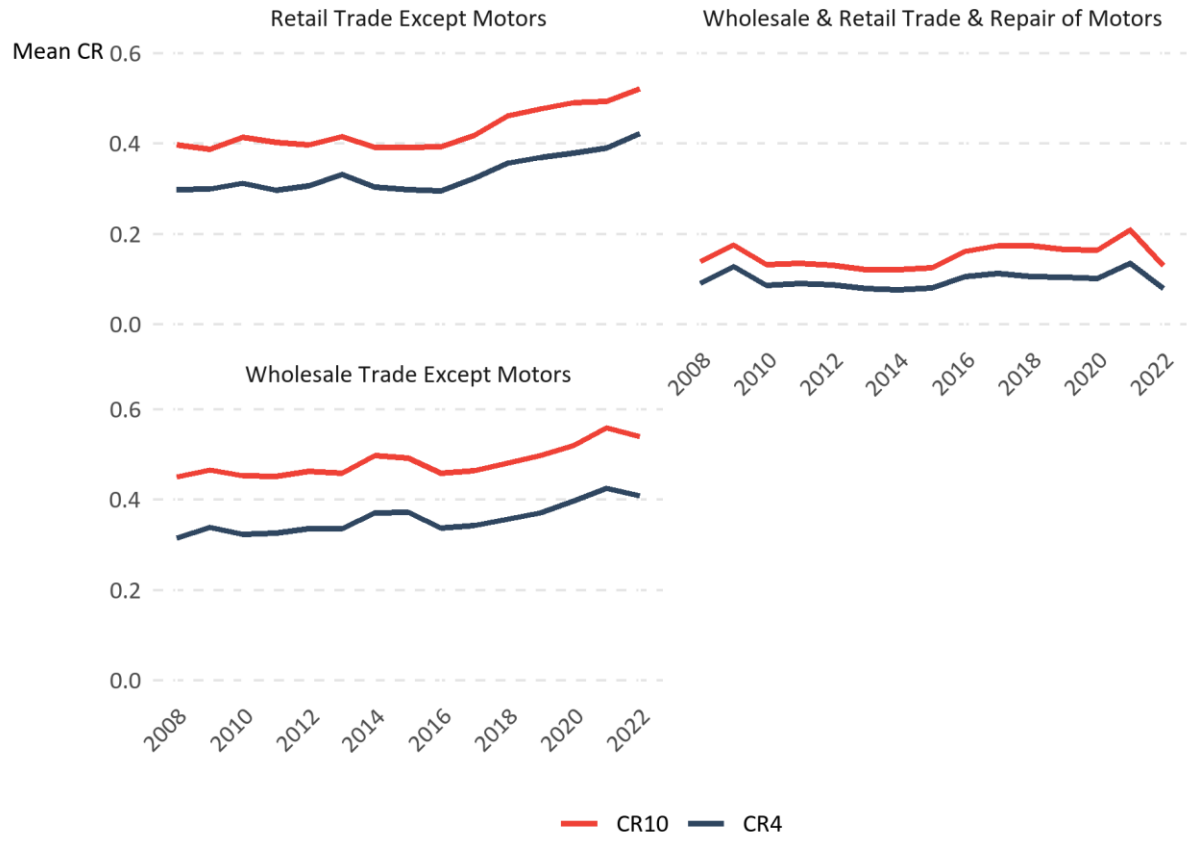


Source: CCPC analysis using CSO Annual Services Inquiry microdata

The *Wholesale & retail trade; repair of motor vehicles and motorcycles industry* accounts for over 50% of all sales revenue in the Irish Services Sector. Given the scale of this industry, further analysis of the different components is warranted. Figure 9 illustrates that CR trends

within the *Wholesale trade except motor* and the *Retail trade except motors industries* were broadly similar over our sample period, with a slightly larger uptick in *Retail trade* between 2017 and 2022. *Wholesale & retail trade; repair of motors only* meanwhile saw very little change in concentration, while the overall level was significantly lower than non-motor related *Wholesale & retail trade*.

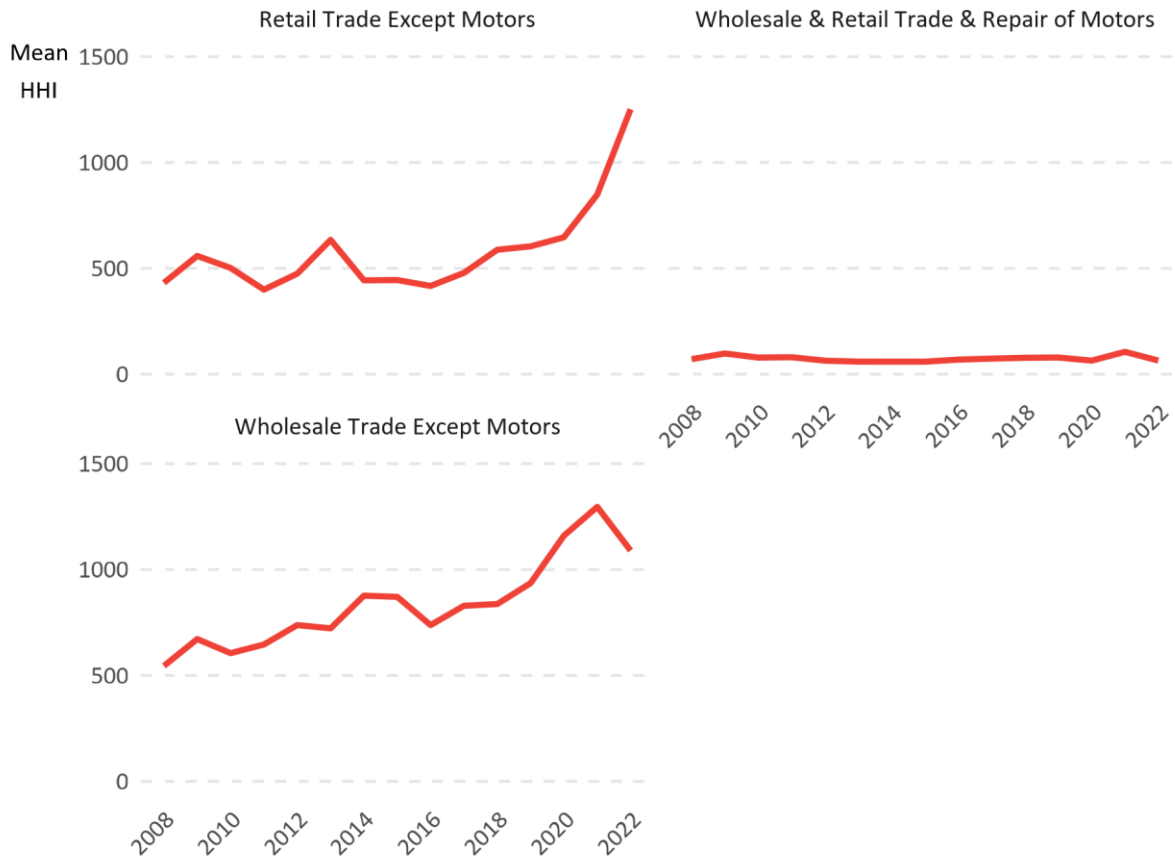
Figure 9: Concentration Ratios in Wholesale and Retail Trade; Repair of Motor vehicles and Motorcycles



Source: CCPC analysis using CSO Annual Services Inquiry microdata

Similarly, a steady rise in concentration, as measured by HHI, was observed within the *Wholesale trade except motor* and the *Retail trade except motors industries* across our sample period. From 2016 onward, there are notable rises in HHI for both *Wholesale trade except motor* and the *Retail trade except motors*, shifting from 738 in 2016 to 1089 by 2022 and 416 in 2016 to 1251 by 2022, respectively.

Figure 10: Herfindahl-Hirschman Index in Wholesale and Retail Trade; Repair of Motor vehicles and Motorcycles



Source: CCPC analysis using CSO Annual Services Inquiry microdata

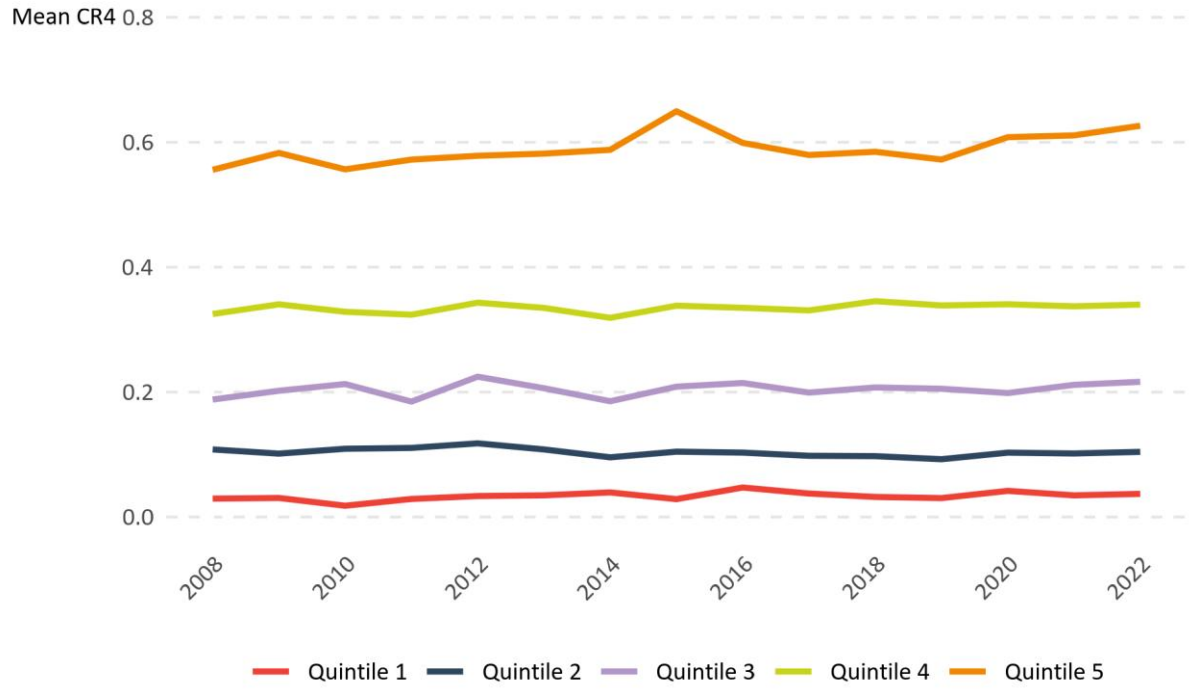
2.2.3 Distributional Analysis

Examining the distributional aspect of concentration is important because it helps us understand whether the overall increase in concentration comes from industries that had already high levels of concentration or from industries that started with low levels of concentration. To do this, we group our data into 5 equal CR4 quintiles, where quintile 1 captures businesses in the lowest end of the CR4 distribution and quintile 5 those in the highest. For context, the average CR4 was 3% in quintile 1 and 59% in quintile 5. Figure 10 thus shows how the average CR4 has evolved within highly concentrated markets as well as less concentrated markets.

We observe that the upward trend in the CR4, as illustrated in Figure 4 earlier, was driven mainly by highly concentrated industries. For example, Figure 11 shows that the average CR4

for businesses in quintile 5 rose from 56% in 2008 to 63% in 2022, a rise of 7 percentage points. Pronounced increases were also observed in quintile 4 (5 percentage points) and quintile 3 (2 percentage points), while the average CR4 declined in quintile 2.

Figure 11: Average CR4 by Quintile



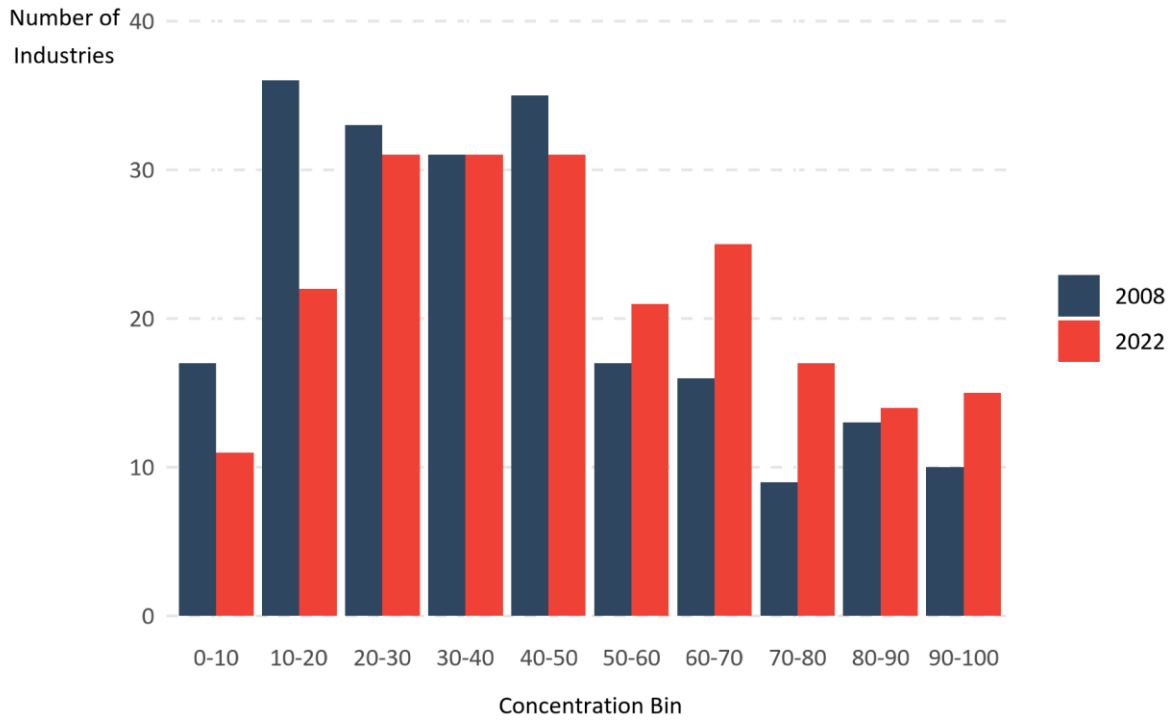
Source: CCPC analysis using CSO Annual Services Inquiry microdata

To further understand the distributional nature of concentration, we follow the approach of Koltay *et al.* (2023) and Calligaris *et al.* (2024) by creating a concentration distribution ranging from 0 – 100%. This provides insights into how market power is spread across industries. Ten equal bins are created, ranging from a CR4 of 0-10 up to 90-100. We then calculate the number of industries in each bin in 2008 and 2022.

Figure 12 shows that the proportion of industries with a CR4 level below 30% was significantly higher in 2008 (77%) than in 2022 (59%). In contrast, a larger share of industries had a higher level in concentration in 2022, evidenced by a rightward shift in the number of industries with a CR4 level above 50%. Calligaris *et al.* (2024) provides a similar analysis of European countries for the period 2000-2019 based on economy-wide datasets. A greater number of industries

in 2019 fell into the 30-40, 40-50, 60-70 and 70-80 CR4 level bins, while fewer industries in 2019 were in the 80-90 and 90-100 CR4 bins than in 2000.

Figure 12: CR4 Distribution: Proportion of 4-Digit NACE Industries Across Concentration Bins



Source: CCPC analysis using CSO Annual Services Inquiry microdata

2.3 Conclusion

The analysis of concentration in Ireland's Services Sector reveals a clear trend towards greater consolidation over the past fifteen years, with both CR4/CR10 ratios and the HHI rising notably since 2016. This pattern is especially pronounced in digitally intensive industries such as *Information & Communication* and *Professional, Scientific & Technical* activities, where a small number of businesses now account for a larger share of turnover.

International research demonstrates that rising concentration is not unique to Ireland, but reflects broader global trends driven by globalisation and rapid technological change. These forces have enabled leading businesses—particularly in digitally intensive industries—to scale quickly, leverage innovation, and reinforce their market share. In an Irish context, the gap between digitally intensive and less digitally intensive industries has widened significantly

since 2016, with digitally intensive industries exhibiting higher and more volatile concentration levels.

However, the potential influence of country-specific factors cannot be ruled out. In Ireland, barriers such as financial capacity, regulatory burdens, and legal fees have been identified as major challenges for entry, while financial capacity and knowledge-sharing barriers affect expansion. These obstacles can amplify the effects of global trends, making it more difficult for new entrants to challenge incumbents and potentially leading to entrenched market power.

3. Markups

Markups serve as a useful proxy of competitive intensity between businesses. While estimating market power is challenging, markups are often the preferred measure of market power as they directly capture a business' ability to influence prices.

Markups estimate the difference between price and marginal cost. A value above one implies that the price a business can charge for the good or service they produce is above the costs they incur in producing it. Therefore, the larger the estimated markup (i.e. the higher a business raises prices above marginal costs), the higher the market power that business commands.

3.1 International Context

Several studies highlight that markups have risen in recent years. For example, the US has sustained a notable rise in markups, above that of other regions such as the UK and Europe. In the US, average markups have risen from 1.21 (21%) in 1980 to 1.61 (61%) in 2016 (De Loecker *et al.* 2020). On the other hand, the UK experienced a more modest rise of around 10% since 1997 (CMA 2024). At an EU level, markups have increased by slightly more than 7% between 2000 and 2019, although heterogeneity in trends over time were evident across several EU countries (European Commission 2024). The Canadian Competition Bureau (2023) found between 2002 and 2018, the average markup across all industries has risen, with the largest increase coming in the most highly concentrated industries. These studies are based on data for the entire economy so are not directly comparable with the results presented later in this chapter for the Irish Services Sector.

The rise of superstar[22] businesses and digitalisation give rise to a wider debate on what is driving the rise in markups as well as their implications for competition. Evidence has shown

[22] Superstar and dominant businesses both have high market share. Dominant businesses control much of the market, often due to scale, barriers to entry, or consumer perception, but may not always be innovative. Superstar companies stand out for their innovation, strong brands, and positive reputation. Dominant businesses can reduce competition and innovation, while superstar businesses tend to drive innovation and market differentiation. For more information, see: https://www.researchgate.net/publication/387402313_Understanding_superstar_firms'_phenomenon

that highly productive, digitally intensive businesses account for a disproportionate share of the increase in markups (Autor *et al.* 2020; Calvino *et al.* 2018). This may explain why both markups and productivity have increased more quickly in the US compared to Europe, as more digitally intensive and intangible asset rich businesses and industries tend to be based in the US rather than in Europe. However, unlike the US, García-Perea et al. (2021) show the rise in markups in Spain is accelerated by small and unproductive businesses who faced higher costs and overhead expenses. Other suggested factors include changes in broader institutional and social factors e.g. weakening bargaining power of labour (Nikiforos *et al.* 2024), entry costs e.g. regulatory and licencing (Liu and Luo 2024) and weak antitrust enforcement (De Loecker *et al.* 2020).

When taken together, trends in markups are complex and may be due to a number and/or combination of factors that depend on both specific-country level contexts and businesses' exposure to international trade.

3.2 Measuring Markups

3.2.1 Data overview

To measure markups, we use data from the *ASI* and *BR*.

The ASI covers a sample of services businesses (excluding financial services). Non-respondent businesses in the ASI had their returns estimated using administrative data provided by Revenue to the CSO, providing information on the relevant population of businesses. This is the most comprehensive data source available for this type of analysis.

In terms of estimating business-level markups, the key variables available in the dataset were: turnover, gross value added (GVA), total purchases, cost of sales, number persons employed (employees), the business' wage bill (wages), acquisition of assets (investment), disposal of assets. Variables with a monetary value were deflated using economy wide GVA deflators.

Business-level capital stocks – one of the input variables used in the markup estimation procedure —were calculated using the perpetual inventory method (PIM). In doing so, we align our approach to that of Lawless and Rehill (2024). First, we estimate a business' opening

capital stock as the average business investment (proxied by acquisition of assets) in all available years divided by the depreciation rate.[23] For all subsequent years, we follow the approach of the US Bureau of Labour Statistics (Giandrea *et al.* 2021):

$$K_{i,t} = Inv_t + K_{i,t-1}(1-\delta)$$

Where $K_{i,t}$ is the capital stock for asset i in period t, Inv_t is investment in period t and δ is the rate of depreciation for asset i.

Businesses with incomplete data were dropped from our analytical sample for the markup estimation procedure. Consequently, businesses with missing or negative values for turnover, employees, wages, capital stock, or total purchases were omitted. Logged values for turnover, total purchases, cost of sales, employees, and capital stock were estimated.

3.2.2 Methods

Markups are challenging to compute. Indeed, debate surrounding the most appropriate method(s) remains highly contested among researchers. This is mainly because marginal costs are not directly observable, resulting in numerous approaches being developed in an effort to overcome this problem.

The cost minimisation approach is particularly popular, a methodology originally proposed by Hall (1988) and further developed by De Loecker and Warzynski (2012). As noted by OECD (2021, pp 21) "*This* [De Loecker and Warzynski (2012)] *approach is based on the assumption that if firms minimise their costs, then markups can be estimated using information on the costs of an input as a share of firm's revenue, (the input costs revenue share), and the extent to which the firm's output varies based on changes in the quantity of that input used (i.e. the output elasticity)*".

The input costs revenue share is relatively straightforward to compute using the variables provided in our dataset. However, the estimation of a production function is necessary to retrieve the relevant output elasticities.

[23] A depreciation rate of 12% is applied as disaggregation of asset classes were unavailable.

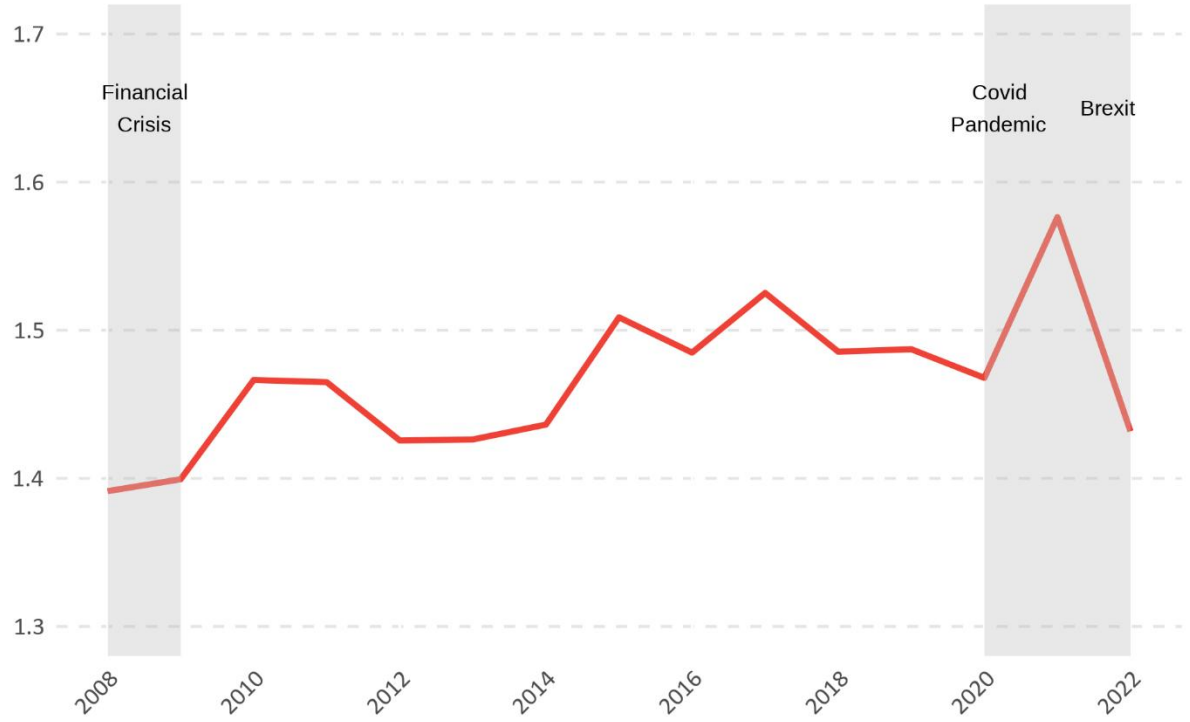
After estimating the input costs share of materials and labour, outliers were removed to prevent potential biases. Specifically, the top and bottom 1% of the estimated revenue shares for both labour and materials were omitted.

In terms of calculating output elasticities, we follow closely the approach of CMA (2024) in estimating a translog production function using an OLS model specification. Total purchases, used as a proxy for intermediate consumption/materials, was selected as the flexible input variable in the estimation of our production function. Purchases have commonly been used as the preferred flexible input variable for this process, especially in European countries where labour market rigidities are considered pertinent (Calligaris *et al.* 2024).

Finally, after obtaining the relevant output elasticities and calculating business-level markups, outliers were trimmed by removing the top and bottom 2% of estimated markups.

3.3 CCPC Analysis

Figure 13: Aggregate Markups



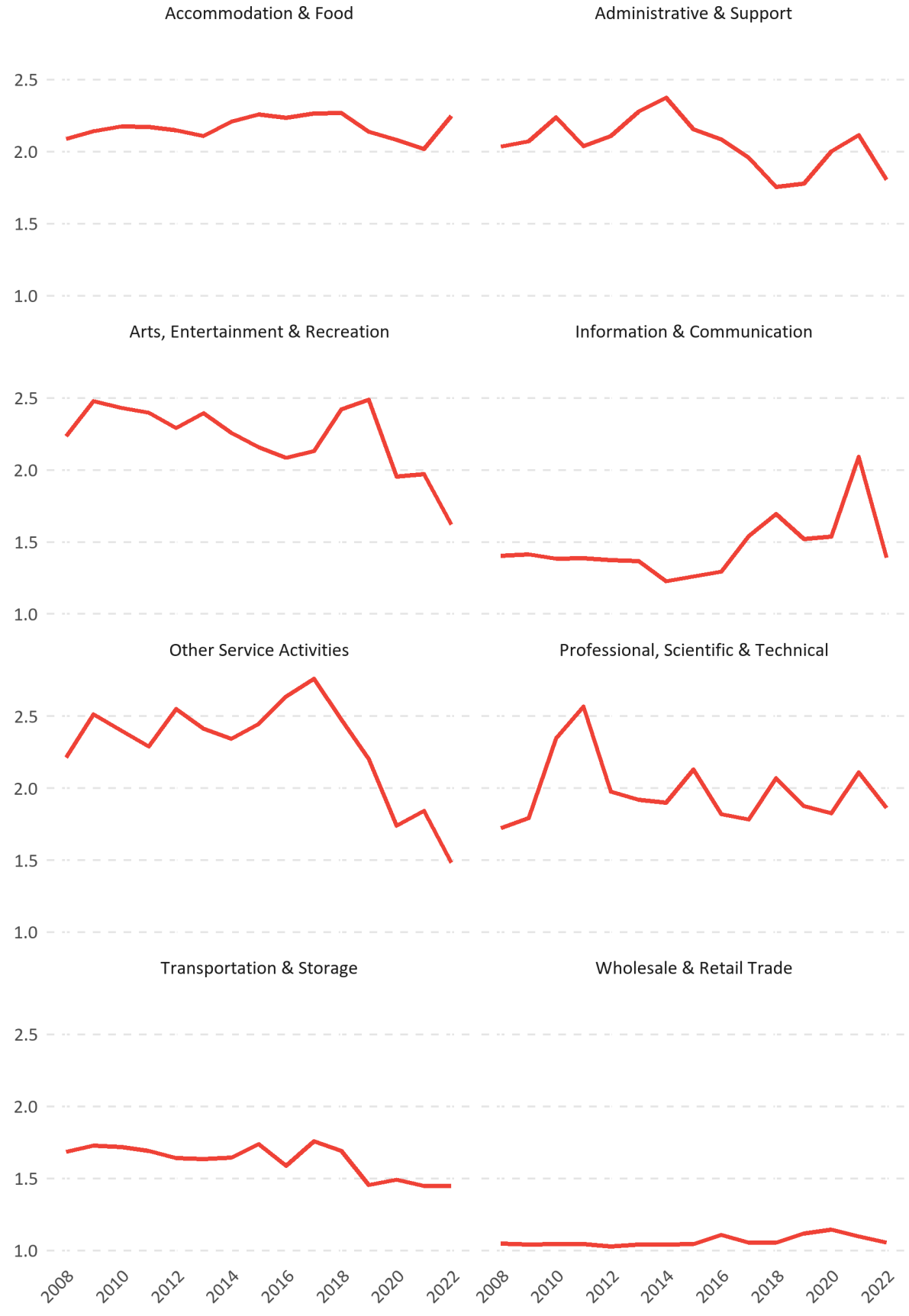
Source: CCPC analysis using CSO Annual Services Inquiry microdata

Overall, aggregate markups have increased modestly over our sample period (Figure 13). Specifically, markups rose from just under 1.4 in 2008 to over 1.5 in 2017. Markups increased

further to over 1.55 in 2021 before falling back to below 1.45 in 2022, a cumulative rise over the period of 2.9%. Overall, this upward trend mirrors similar increases observed in the UK (with the Services sector being identified as the main driver behind this increase (CMA 2024)), the EU (Calligaris *et al*. 2024; European Commission 2024) and Canada (Competition Bureau Canada 2023).

At the industry level, we observe sizeable differences in the overall level of markups, as well as the trends over time (Figure 14). Outside of competitive dynamics, some variation is to be expected due to differences across industries in factors such as cost structure, risk, product differentiation etc. Markups fell across many industries, while the most notable increase over the sample period was observed in *Information & Communication* services between 2008 and 2021, the most digitally intensive and open-to-trade industry. *Accommodation & Food services* and *Wholesale & Retail Trade* experienced little change in their average markup over time, with average markups of 2.2 in *Accommodation & Food services* and 1 in *Wholesale & Retail Trade*.

Figure 14: Markups by Industry



Source: CCPC analysis using CSO Annual Services Inquiry microdata

Table 2: Change in industry markups (2008–2022)

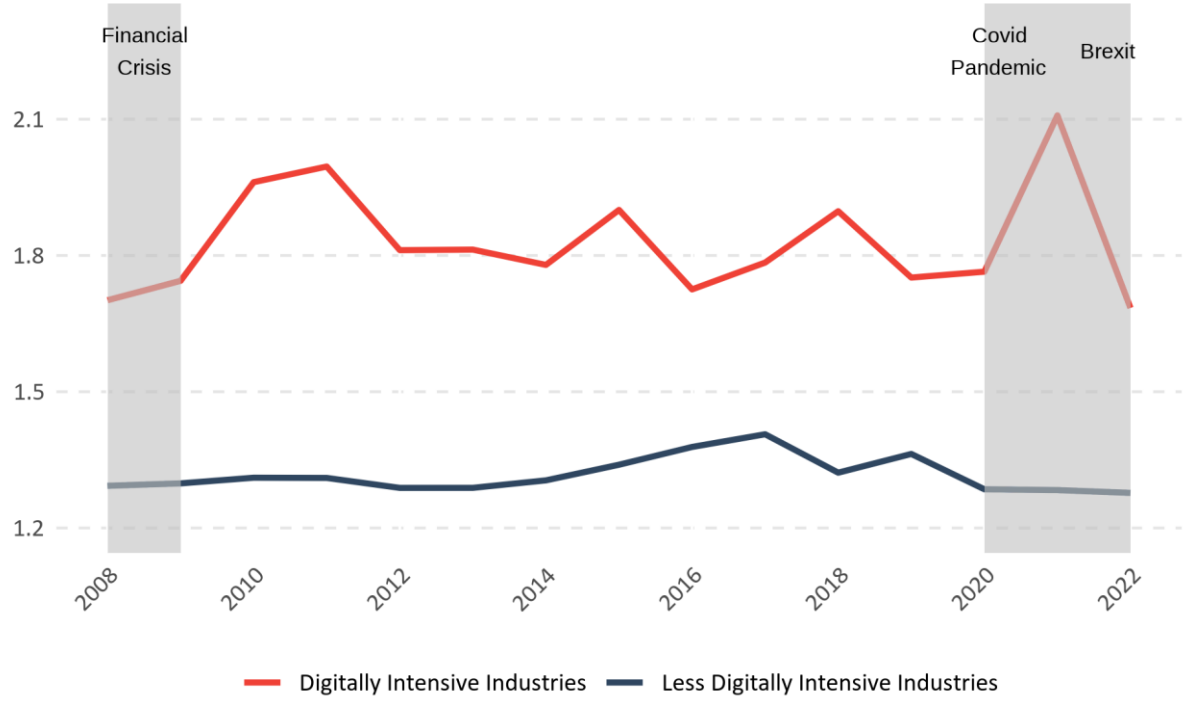
Sector	Average Annual Change (%)	2008-2022 Change (%)
Accommodation & Food	0.6	7.7
Administrative & Support	-0.5	-11.2
Arts, Entertainment & Recreation	-1.8	-27.4
Information & Communication	1.1	-1.0
Other services	-2.2	-32.9
Professional, Scientific & Technical	1.5	8.2
Transport & Storage	-0.9	-14.1
Wholesale & Retail	0.1	0.6

Source: CCPC analysis using CSO Annual Services Inquiry microdata

As outlined in Table 2 above, three industries see a net increase in markups in 2022 versus 2008, *Accommodation & Food, Professional, Scientific & Technical* and *Wholesale & Retail,* but almost negligibly so in the case of the latter. In *Accommodation & Food*, markups on average rose by 0.6% annually between 2008 and 2022 while the estimated markup level was 7.7% higher in 2022 compared to 2008. *Information & Communication* sees the strong increase in markups until 2021 halted by a sharp drop off in 2022. Several industries report a substantial net decrease in markups, most notably *Other Services* and *Arts, Entertainment & Recreation.* The average annual change highlights *Professional, Scientific & Technical* and *Information & Communication* as the industries with largest figures. The findings for *Information & Communication* demonstrates the volatility in the industry: with an average annual increase of 1.1% over sample period despite the level of markups in 2022 being lower than 2008.

Below figure 15 illustrates that markups are consistently higher in digitally intensive industries compared to less digitally intensive industries. While the overall trend in both groups remains relatively flat, markups in digitally intensive industries exhibit greater year-to-year variability. Throughout the period, digitally intensive industries have maintained higher average markups – just above 2.2 – compared to less digitally intensive industries, where the average remains just below 1.59.

Figure 15: Markups of Digitally Intensive Industries



Source: CCPC analysis using CSO Annual Services Inquiry microdata

These results are generally in line with the existing literature regarding digitally intensive industries and markups. As noted in previous studies, digitally intensive industries experience higher levels of markups in addition to higher year-to-year variability. Calligaris *et al.* (2018) found that the gap between markups of digitally intensive vs less digitally intensive has widened. In contrast, we observe that the estimated gap in markups across digital and less digitally intensive industries remained broadly stable over our sample period.

3.4 Conclusion

Aggregate markups in the Services Sector increased modestly between 2008 and 2022, with markups reaching their highest level in 2021. Placing our aggregate findings in an international context, the rise in markups in Ireland is broadly consistent (although less pronounced) with trends observed in the EU, the UK, Canda, and to a lesser extent, the USA.

However, as Figure 14 and Table 2 demonstrate, the aggregate findings mask significant heterogeneity in the evolution of markups. For example, rising markups were most evident in the *Accommodation & Food* and *Professional, Scientific & Technical* industries, while markups declined in the *Arts, Entertainment & Recreation* and *Other Services* industries. The

substantial increases in markups in *Information & Communication* up until 2021 were countered by a large drop off in 2022, though the average annual change in markups remained relatively high. In *Wholesale & Retail*, markups are close to flat across the period, with the average annual increase only 0.1%.

These patterns point to the uneven evolution in the competitive intensity and market power across the Services Sector. Industries with rising markups may be experiencing reduced competition or increased pricing power, whereas those with declining markups may face intensified competition or cost pressures. Our analysis also finds that markups were significantly higher amongst digitally intensive businesses, and that the gap between digital and less digitally intensive businesses remained broadly unchanged over our analytical period.

4. Business Dynamism

This chapter examines the vital role of business dynamism – the ongoing entry, growth, and exit of businesses – in shaping competition within Ireland's Services Sector. Competitive intensity is not captured by concentration measures and profitability indicators alone; it is exhibited through the constant movement and renewal of market participants. Business dynamism is driven by new businesses with new technologies and ideas entering the market and challenging established players. A competitive environment is characterised by a steady influx of entrants striving to outperform incumbents, while less successful businesses exit the market. This churn is essential; it ensures that only the most efficient and innovative businesses thrive, and that consumers benefit from better choices and lower prices. Therefore, to fully understand the competitive landscape, it is important to assess not just who holds market power, but how easily new businesses can enter, survive and challenge incumbents.

To assess business dynamism in Ireland's Services Sector, we focus first on entry and exit rates, which can reveal how easily new or dormant businesses are able to (re-) enter the market. Next, we examine survival rates, which track the proportion of newly established businesses that remain active up to five years after their founding. This gives us a sense of whether new businesses can win enough business to remain active for several years after entering the market. In addition, to understand whether new or expanding businesses are able to successfully challenge the largest existing businesses in the market, we calculate rank persistence (i.e. the degree to which a business maintains its relative position) and entrenchment (i.e. the degree to which incumbent businesses become 'locked into' their top positions).[24] Finally, by examining the job reallocation rate, we can provide clear evidence of how effectively labour is being redistributed across the economy – not just to new businesses, but also to businesses that are growing.

[24] Both rank persistence and entrenchment are measures of the likelihood of the top businesses continuing to hold their leading positions over time.

4.1 International Trends

Recent international evidence points to a decline in business dynamism, raising significant concerns about weakening levels of competition on a global scale. Using data from 19 EU countries (1997-2021), Biondi *et al.* (2025) find a broad-based drop in aggregate job reallocation rates (averaging -21%) – a trend that was comparable to that found in the US over the same period. While the exact causes may differ according to individual country contexts, this is broadly attributed to a reduced responsiveness of businesses to productivity shocks with businesses hiring or downsizing less when their productivity changes and to rising market power and technological changes that enable leading businesses to increase their output with less labour.

Other studies (de Ridder, 2024) trace a decline in productivity growth and business dynamism in the US between 2005 and 2018, while a similar slowdown also occurred in Europe, falling sharply after the 2008 global financial crisis and remaining sluggish thereafter (Alder *et al.* 2017).

In relation to US, Bennet (2020) finds that rank persistence among top-performing American companies has steadily increased since the 1980s. While this may point towards established leaders now being more likely to remain at the top of their industries year on year, Bennet does acknowledge opposing perspectives, noting how product lifecycles are becoming more rapid and that conditions are becoming more difficult for businesses to maintain their advantage.[25] Nonetheless, as evidenced by increases in concentration and markups in digitally intensive industries, increased rank persistence may be a consequence of the increased economic importance of "tipping"[26] markets with strong network effects. In such markets, a dominant business emerges and remains in place for a significant period of time. Overall, declining business dynamism in both Europe and the US raises significant concerns in relation to long-term competition and innovation as fewer new businesses are successfully

[25] For product lifetimes, see Bayus, B. L. (1998) 'An analysis of product lifetimes in a technologically dynamic industry', *Management Science,* 44(6), pp. 763-765, available here: https://www.jstor.org/stable/2634645. For difficult firm conditions, see D'Aveni, R. A., Dagnino, G. B., & Smith, K. G. (2010) 'The age of temporary advantage', *Strategic Management Journal,* 31(13), pp. 1371-1385, available at: https://doi-org.dcu.idm.oclc.org/10.1002%2Fsmj.897.

[26] The process by which a competitive market reaches a critical point of user adoption and shifts from a market with many suppliers to a market with one or few suppliers.

challenging incumbent businesses, while incumbent businesses are continuing to enjoy more market power.

4.2 Entry and Exit Rates

In a dynamic economy, we would expect to see new businesses entering the market to compete with more established businesses, as well as some incumbents exiting due to competitive pressures. A certain level of churn is to be expected, dependent on characteristics of an industry. These patterns are captured by entry and exit rates, which are fundamental indicators of how business dynamism has evolved in a industry over time.

Several international studies have, however, found that entry and exit rates have been declining in recent years, suggesting a potential weakening of business dynamism. For example, the OECD (2020) examined data for 18 countries over 20 years focusing mainly on entry rates and job reallocation and found some degree of a decline in business dynamism in each of the countries analysed.

We calculate entry and exit rates using comprehensive annual data on all active businesses, and classify them in the following way:

> Entry Rate: An entrant is defined as an active business which was not active the previous year. This approach captures both newly established businesses and those re-entering the market after a period of inactivity or industry change.
>
> Exit Rate: An exit is a business which is active in that year but not the subsequent year. This includes businesses that cease operations, become dormant, or move to a different industry.

Importantly, our methodology recognises the fluid nature of business activity. A single business may be classified as an entrant one year, an exit the next, and potentially an entrant again in subsequent years. It is also possible for a business to be both an exit and an entrant in the same year if it's active in that year but not the previous or following years. A business which moves from one service industry to another is treated as an entrant to the new industry and an exit from the original industry. To calculate entry (exit) rates, we quantify the number

of entrants (exits) in a given year and divide that by the total number of active businesses in that year. We do this for each service industry and year.

Figure 16: Aggregate Entry and Exit Rates

Source: CCPC analysis using CSO Annual Services Inquiry microdata

Figure 16 show a marginal increase in entry rates over the period and a marginal decrease in exit rates. This divergence means that, overall, more businesses are entering than leaving the Services Sector. This net-entry results in a modest increase in the number of active businesses between 2009 and 2021, moving from 165,345 to 186,086 businesses. Turning our attention to specific industries, this increase in the number of active businesses occurs in all industries except *Arts, Entertainment & Recreation*; *Transportation & Storage*; and *Wholesale & Retail Trade*.

Figure 17 shows the entry and exit rates by industry. While there is considerable year-to-year fluctuation, most industries experienced an initial slight decline in both entry and exit rates, followed by a recovery to near-2015 levels. By the end of the period, every industry shows entry rates exceeding exit rates, indicating a net increase in the number of active businesses at the end of the sample. Relative to other industries, both entry and exit rates are lower *in Transportation & Storage* and *Wholesale & Retail Trade*.

The linear trends show that, across the majority of services industries, entry rates are either stable or increasing slightly, signalling a generally positive environment for new business formation. The exceptions are *Arts, Entertainment & Recreation* and *Wholesale & Retail Trade* where the entry rate is trending downwards. Meanwhile, exit rates are declining in almost all industries, with the exception of *Other Service* Activities where it is stable and *Transportation & Storage* where it is increasing.

Figure 17: Entry and Exit Rates by Industry

Source: CCPC analysis using CSO Annual Services Inquiry microdata

Table 3 below sets out the net entry of businesses for each industry over the period of analysis.

Table 3: Total Net entry by Industry

Transportation & Storage	-2603
Wholesale & Retail Trade	2516
Accommodation & Food	2325
Other Service Activities	6263
Professional, Scientific & Technical	13181
Information & Communication	6131
Arts, Entertainment & Recreation	715
Administrative & Support	3079

Source: CCPC analysis using CSO Annual Services Inquiry microdata

While our analysis focuses exclusively on Ireland's Services Sector and covers a slightly different timeframe, it is nonetheless worthwhile to consider our results in the context of other international research. The CMA (2024) found that, across the UK economy, both entry and exit rates have been declining. The rate of decline in the entry rate was lower than the exit rate and as such the number of active businesses increased from 2004 to 2021. In Canada (2023), entry and exit rates declined from 2001 to 2020. The exit rate moved above the entry rate before the financial crash and remained so for the duration of the period. The impact of the financial crisis is clear across the findings in the UK, Canada, and Ireland, as entry rates fall in its aftermath in all three cases.

Our findings on entry rates in the Services Sector differ from the findings of the other studies on the whole-economy entry rate. We find that entry rates are either stable or trending marginally upwards in most services industries in Ireland, with an increase in active businesses across our years of data. However, our finding that the exit rate is declining across the period is consistent with the findings of other studies. Although we find that this decline is minor. It

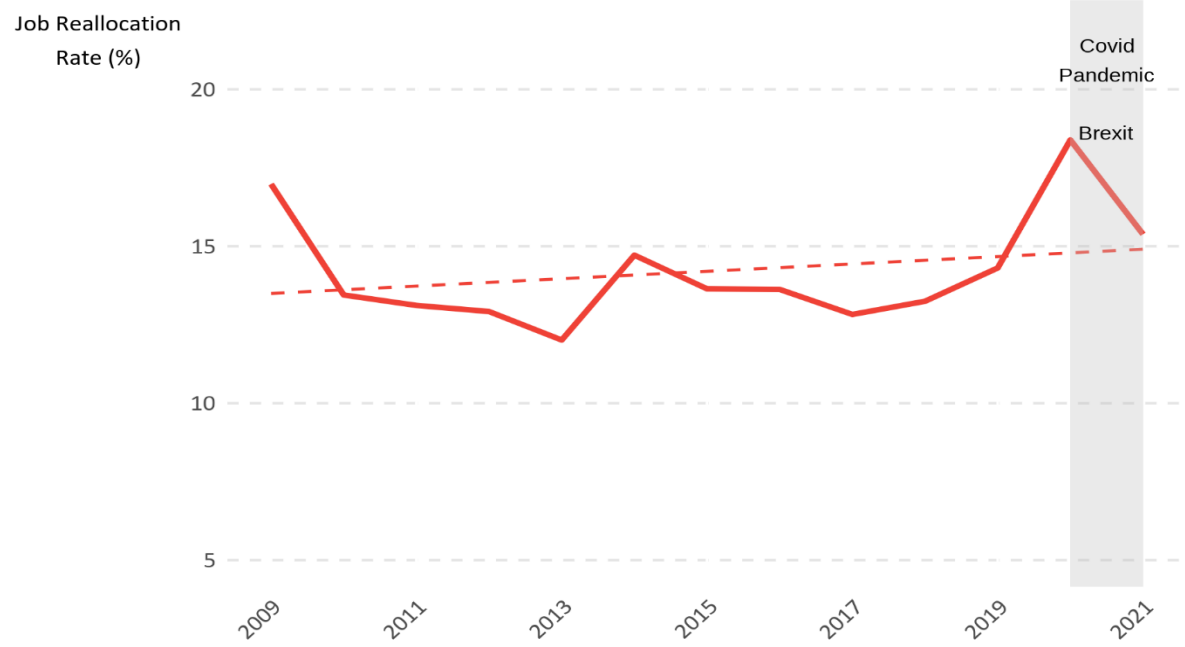
should be noted that differences in time periods, definitions, and industries included make direct comparison of trends more difficult.

The CMA (2024) also reported entry and exit rates by industry and found that both rates fell in the majority of industries. However, there were notable exceptions: in *Wholesale & Retail*, and *Transportation & Storage*, both entry and exit rates increased. In Ireland, our analysis shows a distinctly different pattern with entry and exits rates in most industries diverging slightly, with the exception of *Transportation & Storage* and *Wholesale & Retail.* While *Transportation and Storage* mirrors the UK with rising entry and exit rates, *Wholesale & Retail* stands apart – here, both entry and exit rates are trending downwards.

4.3 Job Reallocation

The rate of job reallocation is a key indicator of business dynamism, capturing flows in job creation and destruction across businesses. In keeping with previous analysis on job reallocation in Ireland (Lawless, 2013), we follow the approach of Davis and Haltiwanger (1992, 1999) in the calculation of job flow measures. In doing so, we calculate job reallocation as the sum of job creation and job destruction.[27]

Figure 18: Aggregate Job Reallocation Rate



Source: CCPC analysis using CSO Annual Services Inquiry microdata

[27] For more detail see Appendix

Over the decade or so that our data concerns, figure 18 above illustrates, the job reallocation rate in Ireland is lower in 2022 than in 2008. However, the trend line indicates that the rate of reallocation has moved upwards. As seen with both share of employment and turnover of young businesses from 2009 to 2013 or so, there is a sharper decline in the job reallocation rate before gently increasing in the following years. Increases in the job reallocation rate can be explained by increases in the job creation rate, the job destruction rate, or both. Given the steady rise in job creation and the 2020 spike in job destruction in Appendix 1, it is not surprising that rate of job reallocation would have risen in this period.

In an international context, the CMA (2024) found, the job reallocation rate in the UK declined significantly from 2004 to 2021. For 19 European countries job reallocation has declined, with notable drops in the reallocation rate in the post financial crash period (Biondi *et al.* 2025). Some of this difference is potentially data driven, as our data period includes job turnover likely caused by Covid-19 which may not be fully captured in the study of European countries. Similarly, the differential between Ireland and the UK is potentially a consequence of alternative government support schemes for businesses and workers, with the pandemic unemployment payment and furlough schemes causing distortions in job loss figures. A cautious approach should be taken in comparing Ireland with these other studies as international figures relate to economy-wide analysis not just the Services Sector.

4.4 Survival Rates

Entry and exit rates are useful for measuring the churn of businesses in the economy but they need to be considered alongside survival rates. It is possible for an industry to have high entry and exit rates but not necessarily be dynamic if it is the case that entrants are unable to enter successfully and less efficient businesses are increasingly surviving. To understand whether new businesses are able to challenge incumbent businesses and attract enough business to survive, we calculate the survival rate of new businesses.

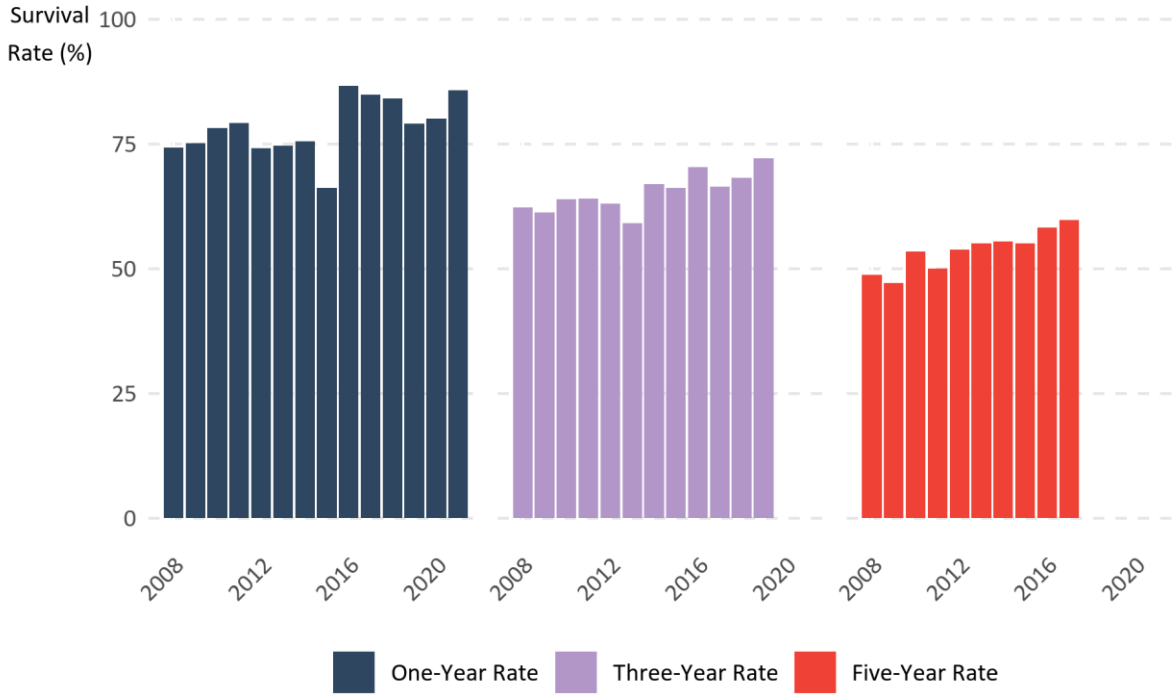
Survival rates provide a different perspective from entry and exit rates. While entry rates count any business which is active one year but not the previous year – including those re-entering after dormancy or switching industries – survival rates are more rigorous. They focus exclusively on businesses that are genuinely new to the market. This distinction is important: survival rates measure the resilience of newly established businesses whereas entry rates can

be inflated by businesses that are simply returning or relocating. Survival rates therefore provide a more accurate understanding of how well new businesses are able to establish themselves and persist in the market.

There are benefits and drawbacks to increasing survival rates. Rising short term survival rates may suggest low entry barriers and productive entrant businesses. On the other hand, rising long term survival rates may point to weakened competitive pressure and the presence of "zombie businesses", businesses that are no longer economically viable but continue to survive, consuming resources that could be reallocated to more productive businesses.

Survival rates are calculated per number of years of survival i.e. a one-year survival rate, two-year survival rate etc. for each birth year. The n-year survival rate for a given birth year is the number of businesses which were born in that birth year, and which are still active n years after the birth year, divided by the total number of business births in the birth year. To calculate survival rates, we identify the businesses which are newly active in a given year (the birth year). We then quantify the proportion of those businesses which are still active one year, two years, three years etc. later. We do not require that the business is active every year between year= n and the birth year.

Figure 19: Aggregate One-Year, Three-Year and Five-Year Survival Rates



Source: CCPC analysis using CSO Annual Services Inquiry microdata

Figure 19 shows the one-year, three-year, and five-year survival rates for all new businesses in the Services Sector combined. The birth year is on the x-axis and on the y-axis is the proportion of businesses which were born in the birth year which are still active one, three, or five years later. From this figure, it is clear that the survival rate of businesses is increasing steadily over the period. For all three measures of the survival rate, it is higher in 2017 than in 2008. The difference between the one-year survival rates in 2008 and 2021 is ten percentage points while the difference between the five-year survival rates in 2008 and 2017 is eleven percentage points. This means that businesses newly established in 2017 are significantly more likely to be still active one year, three years, and five years later compared to businesses newly established in 2008.

We also calculated survival rates at the industry level and found that this trend is consistent across the majority of industries. These results are available in appendix 2.

Our finding that survival rates are increasing over time is consistent with the trend reported in Canada (2023). The average survival rate in Canada increased from 2005 to 2020. However, the scale of the increase in Canada's whole-economy survival rate is much lower than in the Services Sector in Ireland.

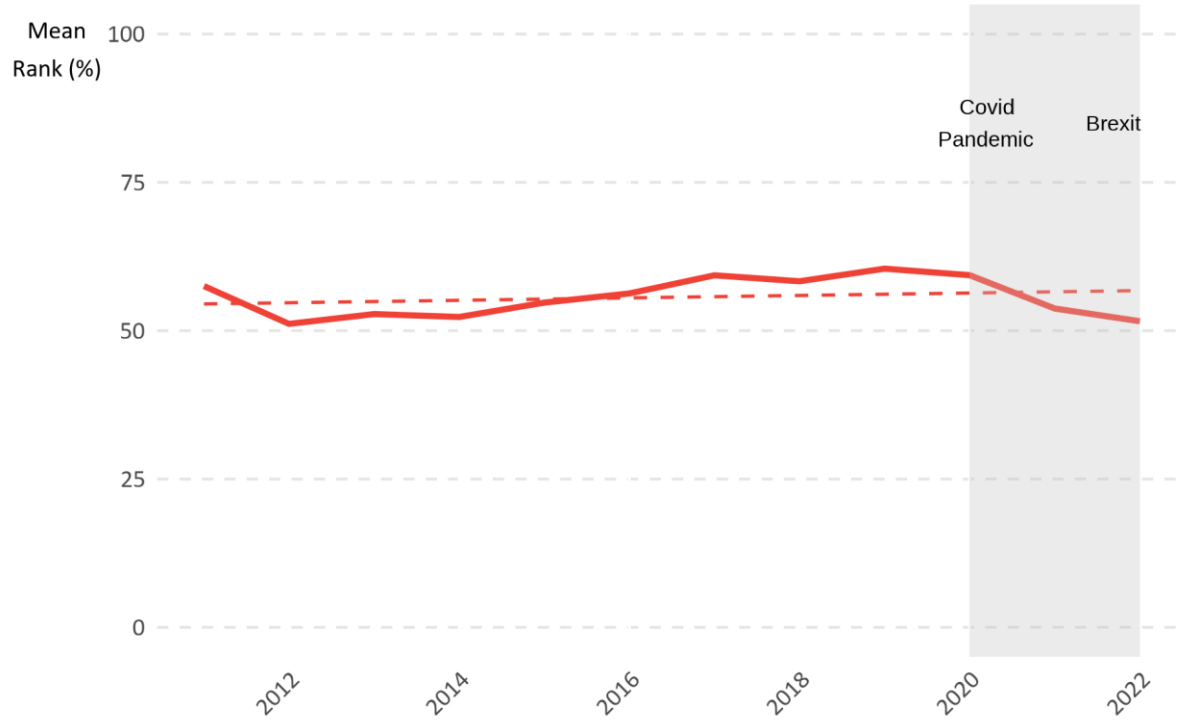
4.5 Rank Persistence

Entry and exit rates provide a useful snapshot of business churn within an industry. However, it is equally important to consider how turnover is distributed among the largest businesses. This allows us to assess whether smaller businesses can compete with high-turnover businesses in an industry.

Rank persistence refers to the proportion of top businesses that continue to hold their leading positions in the current year as well as in each of the three preceding years. A higher degree of rank persistence can be indicative of a less competitive industry, where the largest businesses consistently maintain their positions over time. This suggests that new entrants or existing competitors struggle to disrupt the ranking. In contrast, a lower level of rank persistence may suggest greater business dynamism, as businesses actively compete for turnover and prevent the same businesses from dominating the top positions.

We calculate rank persistence as the percentage of the ten highest-turnover businesses that have remained in the top ten in terms of turnover in each of the previous three years. This is estimated at the 2-digit NACE code level and then aggregated to the industry level using the turnover weights from the same 2-digit industries. Further information on how we calculate rank persistence is available in appendix 5.

Figure 20: Aggregate Rank Persistence



Source: CCPC analysis using CSO Annual Services Inquiry microdata

In Figure 20, rank persistence at the aggregate level remains relatively stable throughout with only minor deviations from the trendline. There are however notable differences when analysing industry trends. For instance, Figure 21 below illustrates declines in rank persistence within *Wholesale & Retail Trade* and *Information & Communication*. Meanwhile, the most pronounced upward trends occur in *Arts, Entertainment & Recreation* and *Other Services. Transport & Storage* have also experienced high levels of rank persistence throughout with a modest upward trend. The remaining industries see a relatively flat and stable trend throughout the given time period.

The overall trend of persistence in Ireland's Services Sector aligns with findings elsewhere. Both Canada (2023) and the UK (2024) observe rank persistence increases over the past 20 years, with the CMA noting that rank persistence rose across all industries examined.

Figure 21: Rank Persistence by Industry

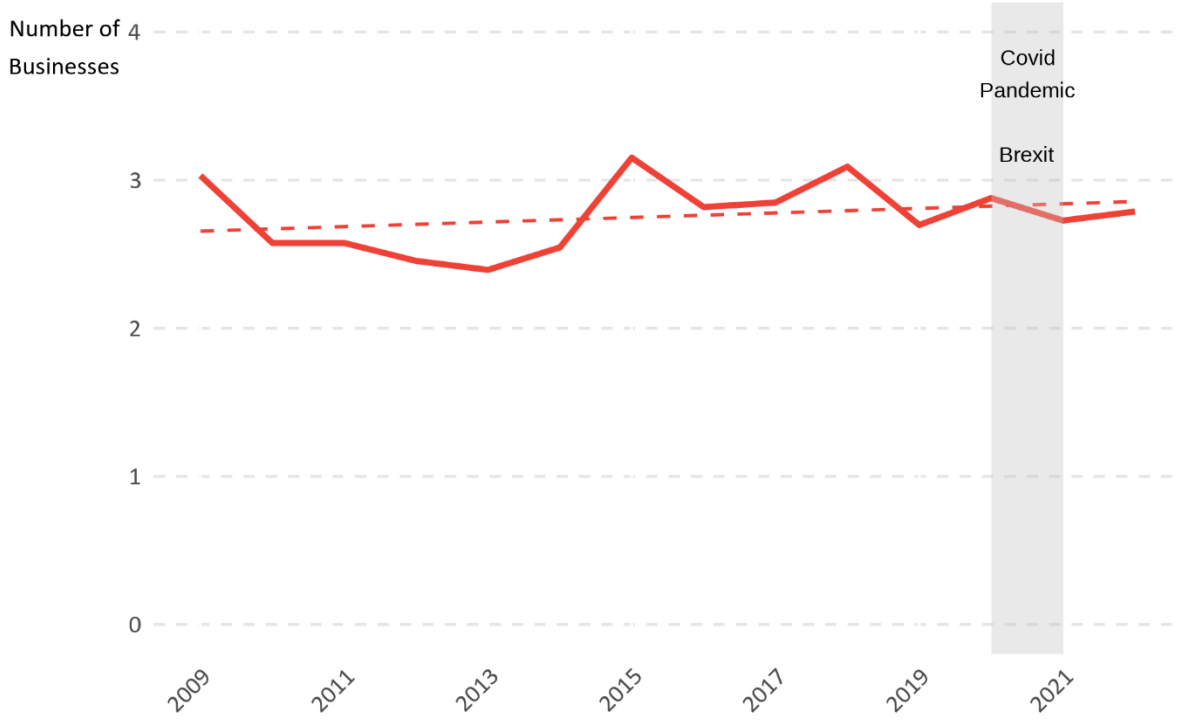
Source: CCPC analysis using CSO Annual Services Inquiry microdata

4.6 Entrenchment

Entrenchment tracks the year-on-year changes in the businesses that occupy the top four of their 2-digit industry (based on turnover), with higher levels indicating that leading businesses are less likely to be displaced. This is distinct to, rank persistence, which allows us to observe the ability of businesses to remain consistently near the top of their 2-digit Nace code at present and the three years previously. Considering both rank persistence and entrenchment allows us to see both the general stability amongst top businesses in addition to true barriers of displacement at the very top.

To measure competition between businesses at the top of an industry, we document the number of businesses that were part of the top four of their industry for two consecutive years. This methodology is utilised by Calligaris *et al.* (2024) and provides an indication of the likelihood that market leaders remain in their position from one year to the next. We conduct this analysis with 2-digit NACE code industries and aggregated at the industry level.

Figure 22: Aggregate Entrenchment



Source: CCPC analysis using CSO Annual Services Inquiry microdata

At the aggregate level, we see similar findings for entrenchment as we do for rank persistence. Figure 19 demonstrates that entrenchment remains relatively stable, at around 2.9 businesses remaining in the top four over two years in 2022. Calligaris *et al.* (2024) concluded

that average European entrenchment at an economy-wide level moved from around 3.2 businesses in 2008 to above 3.3 businesses in 2020. Our findings suggest that entrenchment levels in the Irish Services Sector are similar to those in Europe and are trending slightly upwards at the aggregate level.

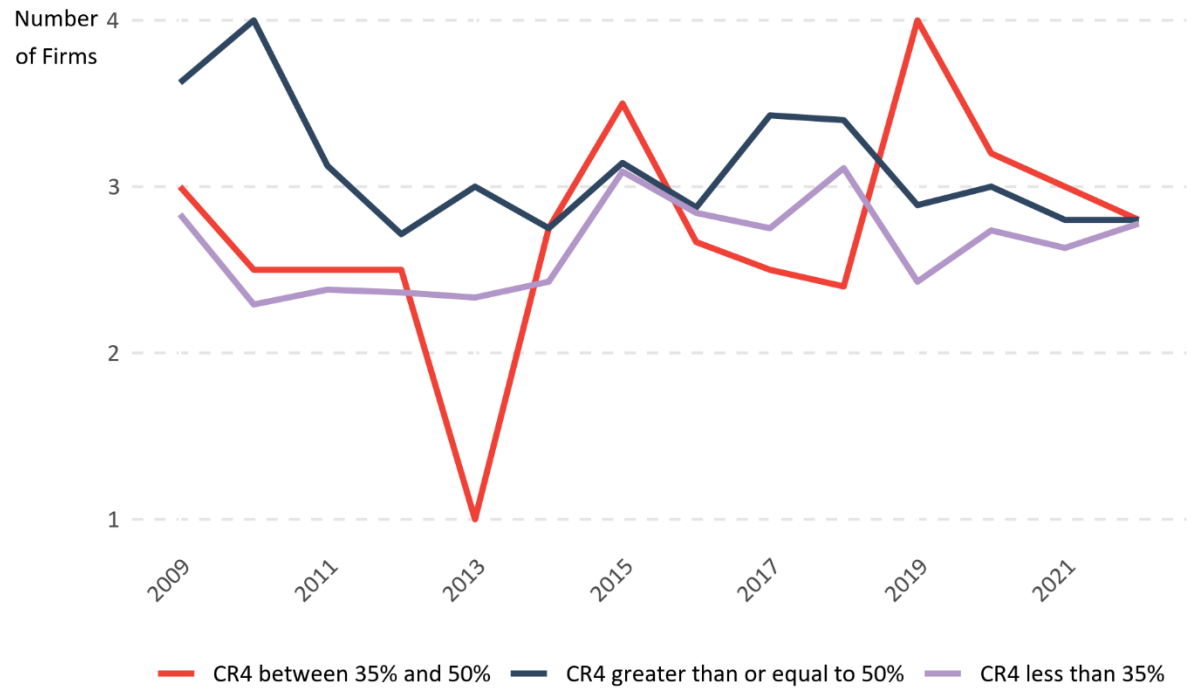
There is significant heterogeneity at the industry level in terms of trends as well as the number of businesses that remain in the top four consecutively. The most prominent downward trends present at the industry level are present in *Other Services* and *Transport & Storage*. However, these industries have higher levels of entrenchment generally.

As can be seen in Figure 23, Accommodation *& Food* has observed the most significant upward trend in entrenchment. The highest levels of entrenchment are present amongst the *Wholesale & Retail Trade* and *Transport & Storage* industries. These industries have displayed entrenchment levels above 3.5, illustrating a lack of displacement at the top of the two-digit level within these industries.

Figure 23: Entrenchment by Industry

Source: CCPC analysis using CSO Annual Services Inquiry microdata

Figure 24: Entrenchment by Concentration Level



Source: CCPC analysis using CSO Annual Services Inquiry microdata

The OECD (2024) examined entrenchment by levels of concentration. In doing so, the OECD found that industries characterised by high concentration exhibit elevated levels of entrenchment. This indicates that such industries may be drifting towards structural rigidity, where competitive pressure is weakened as incumbents consolidate their advantages.

Figure 24[28] above demonstrates that in keeping with the OECD findings, in the Irish Services Sector highly concentrated (CR4 greater than or equal to 50%) industries have experienced higher levels of entrenchment, though this has declined in recent years. There has been an overall increase in entrenchment in weakly concentrated industries (CR4 below 35%), alongside more volatile swings in entrenchment for industries with moderate concentration levels (CR4 between 35% and 50%). The convergence in entrenchment levels from 2019 onwards is particularly noticeable.

4.7 Conclusion

Over the period assessed, net entry in the Services Sector has been positive, with entry rates generally exceeding exit rates, though this aggregate trend masks industry divergence.

[28] For this analysis, CR4 is calculated at the 2-digit NACE level.

Increasing long-term survival rates, coupled with the declining exit rate highlighted in Section 4.1 may be a sign of a decrease in the level of business dynamism in the Services Sector in Ireland.

In less dynamic industries, the long-term survival rate is typically higher, as less productive and more inefficient businesses or "zombie businesses" remain active in the absence of challenge by rival businesses who can win customers from them. While it is positive that new businesses are able to successfully enter the market and win enough business from incumbent businesses to survive, an increase in longer-term survival rates can indicate a lessening in competition. This is of particular note in *Arts, Entertainment & Recreation* and *Wholesale & Retail Trade* where the entry rate is trending downwards. These patterns, coupled with the negative perception of entry barriers held by wholesale & retail businesses highlighted in our survey work, suggest that barriers to entry may be rising.

The decline in the number of business births in some industries at the end of the time series (set out in Appendix 2) reinforces findings about weakening business dynamism. It appears that while fewer businesses are being born, the ones which are established are more likely to survive at least one year. It is possible that these businesses are more likely to survive because there are fewer competitors entering alongside them. However, it may also be an indication that businesses are becoming better at dealing with competition through improved adaptability and efficiency.

Nonetheless, a dynamic industry is characterised not only by the churn of businesses, but also by the movement of workers across businesses. Job Reallocation has increased modestly, following a post-financial crash decline, suggesting that labour mobility remains relatively strong, as resources are reallocated to more productive businesses, supporting ongoing adaptation and innovation.

At the aggregate level, although both rank persistence and entrenchment trended upward, they have only done so modestly. While some industries show signs of greater turnover among leading businesses, others, such as *Wholesale & Retail Trade*, continue to display high levels of entrenchment and persistent market leadership. The overall trend towards increased rank persistence, coupled with elevated entrenchment in more concentrated industries,

suggests that competitive pressure at the upper positions of industries may be weakening, making it more difficult for new or smaller businesses to disrupt established positions.

Taken together, although Ireland's Services Sector demonstrates some positive signs of dynamism, such as positive net entry and a recovered rate of job reallocation, the trends of rising longer-term survival rates, increasing persistence among leading businesses and declining births point to an easing of competitive pressures in several industries.

5. Contribution of Younger Businesses

Younger businesses play a key role in both the level of dynamism in an economy as well as in the productivity of economic output. Previous research on businesses in Ireland has shown the importance of young businesses contribution to new job creation, with younger businesses of all sizes found to be greater contributors to job creation than older businesses (Lawless 2013). Similarly, Decker *et al*. (2014), examined the role that start-ups and young businesses play in the reallocation of productive resources between businesses in the US. This reallocation occurs as low productivity businesses contract and exit, whereas high productivity young businesses expand. This reallocation of resources includes a shift of workers to high productivity businesses

It is clear from such research that the performance and longevity of young businesses is significant in driving innovation and growing productivity. The analysis of entry, exit, and survival rates do not tell us about the characteristics of the entrants. It does not tell us whether these businesses grow over time to generate significant turnovers and employment. To address this gap, we have assessed the contribution of younger business to the Irish economy below through looking at the share of employment and turnover and productivity.

5.1 International Trends

The extent to which young businesses impact competition levels can vary by context and industry. Moreover, not all young businesses contribute equally – much depends on managerial motivation and innovation strategy.

Supporting a continuing flow of new enterprise start-ups is an important element of sustained economic growth. Young businesses may be more likely to accept short-term risks and invest in new activities to realise expansion, whereas older businesses may choose to pursue safer, more certain routines to maintain status quo. On the flipside, some younger businesses may be more cash-strapped to invest in indefinite returns. In their study of 282 Swedish businesses, McKelvie, Brattström and Wennberg (2017) note how the motivation of a young business's manager (growth orientation) is important for business growth, but by itself, does

not fully explain why some young businesses grow and others do not.[29] Instead, they argue that the relationship between growth orientation and actual growth is more likely influenced by what managers do. In this perspective, it is not just the number of new businesses entering the market that matters, but *how* they operate – ambitious start-ups engaged in innovation such as sharing market information or launching products tend to disrupt markets and competitors quickly.

In contrast, Shane (2009) cautions that the typical young business only marginally contributes to competition or growth, arguing that the average new business is not innovative, creates few jobs and generates little wealth. In this view, simply increasing the quantity of start-ups is not as effective as it may seem. From this perspective, competitive benefits are only realised by a subset of high-growth and innovative young businesses, noting that policy should therefore prioritise quality over quantity, targeting support to high-potential start-ups rather than subsidising all new businesses. This is broadly in line with observations of Lawless and Rehill (2025), who emphasise that policy initiatives in an Irish context should prioritise enhancing post-entry learning and productivity growth, particularly in the context of post-pandemic recovery. They also point out that many emerging businesses in Ireland are contending with volatile markets, and the adoption of productivity boosting measures, such as investment in digitalisation, may pose financial challenges.

Bijnens and Konings (2020) take a closer look at Belgium and document a long-term decline in dynamism (1985-2014), with the slowdown beginning around 2000 after a drop in start-up rates. They report fewer young businesses are becoming high-growth businesses and a declining ability of small (not necessarily young) businesses to experience fast growth, which results in an older, more entrenched business environment.

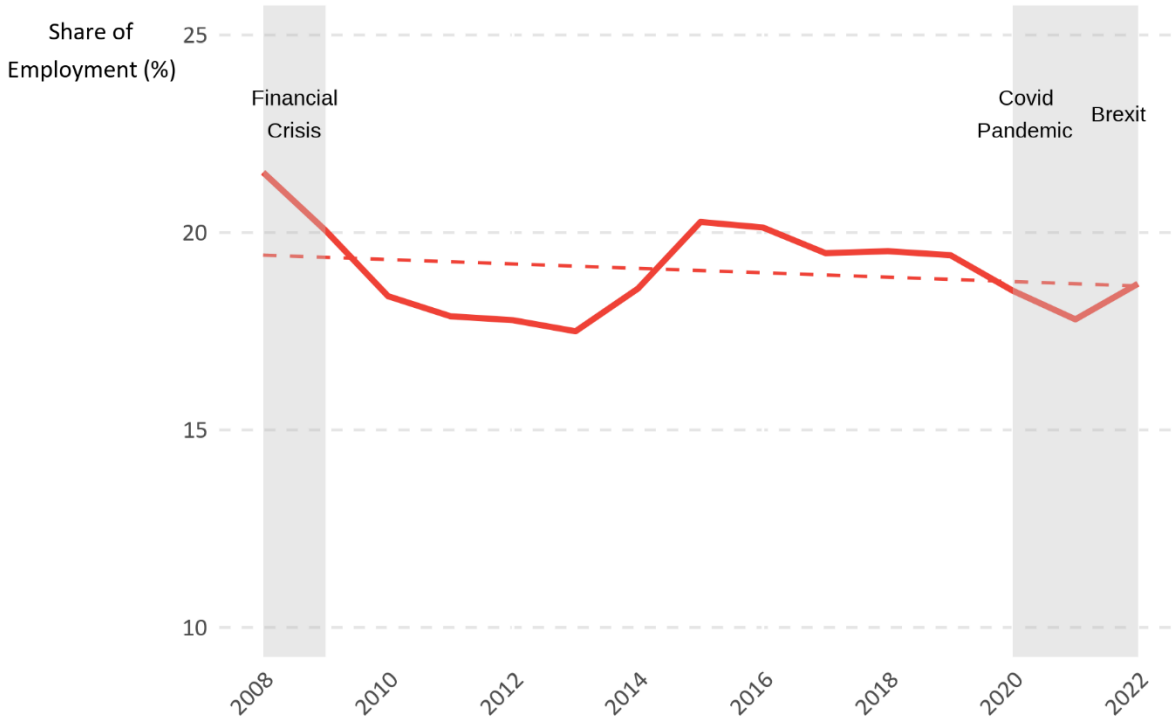
5.2 Share of Employment and Turnover

We define a young business as active businesses under 5-years old. To identify the businesses first year of activity, we use the same birth year as we used when calculating the survival rate. To calculate the employment share of young businesses in a given year, we divide the total number of employees of active young businesses by the total number of employees of all

[29] There is variation in how young businesses are defined, with McKelvie, Brattström and Wennberg's 2017 study taking active businesses under ten years old in Sweden into account.

active businesses in that year. The total number of employees of active young businesses is the sum of the number of employees of active businesses in that year which first became active in any of the four previous years. The same steps are followed in calculating the share of turnover held by young businesses We only require that the businesses first year of activity was within the previous four years, but it could be the case that the business was not active for all of the years between the current year and their first year of activity.

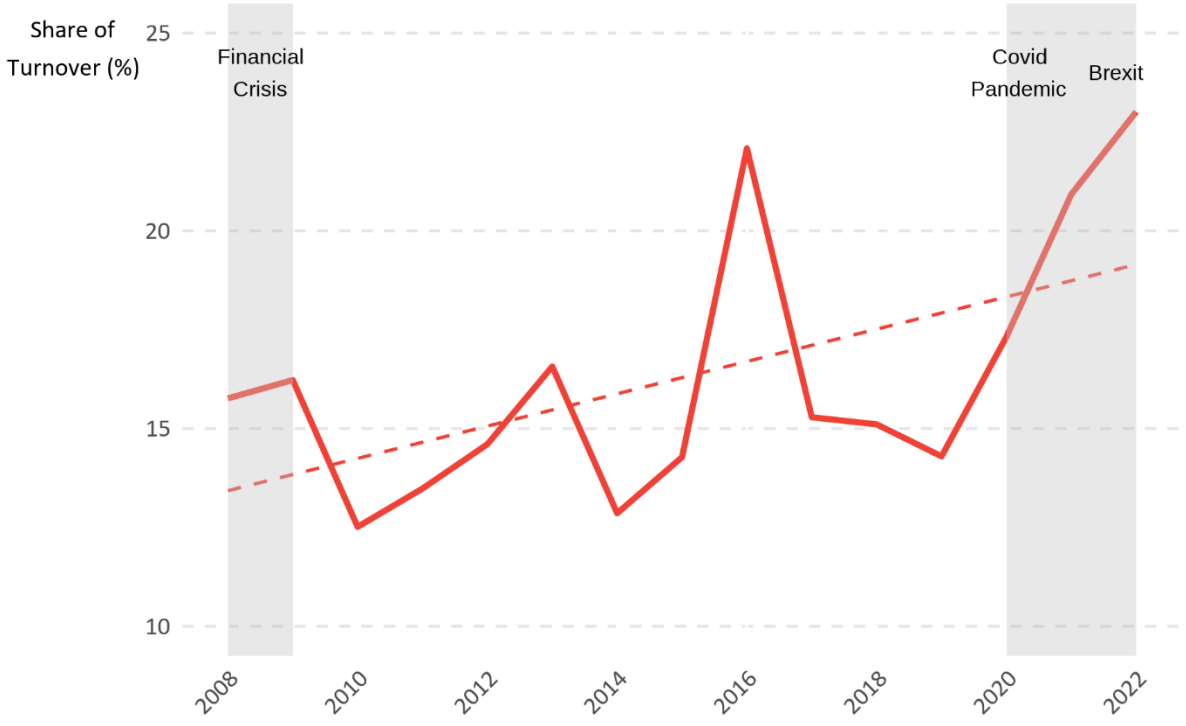
Figure 25: Aggregate Employment Share of Young Businesses



Source: CCPC analysis using CSO Annual Services Inquiry microdata

Figure 25 above shows the evolution of young business employment share across the Service sector. The chart illustrates that the employment share of businesses aged under 5 years old has fallen from 21.5% in 2009 to under 19% in 2021. This decrease is most notable in the years following the financial crash, between 2009 and 2013, then stabilising for a period before declining again in 2020.

Figure 26: Aggregate Turnover Share of Young Businesses



Source: CCPC analysis using CSO Annual Services Inquiry microdata

In contrast with share of employment of young businesses we find that the share of turnover of young businesses has increased over time (figure 26). In 2009, this share stood at just below 16%, rising by around 7pp to 23% in 2021.

In an international context, key studies in this area are based on economy-wide assessments and are not directly comparable with the analysis presented here. The CMA (2024) concluded that the contribution of young businesses in Britain had declined since 2005, with the share of turnover falling by around 6.5%. Biondi et al (2025) found over the last 20 years or so that young businesses share of employment declined in each of the 14 European countries examined. The same paper observed a similar trend for the share of sales attributed to young businesses across a wider group of 18 countries.

5.3 Productivity

In seeking to better understand the contribution of younger businesses in the Irish Services Sector and how this contribution may have evolved over time, we have also examined the productivity of Irish businesses. Strong competitive dynamics should force businesses to reduce costs and streamline their operations. Under such dynamics, uncompetitive

businesses either improve or exit the market, freeing up resources and raising overall productivity.

In the context of Ireland's Services Sector, analysing productivity provides critical insights into how competitive pressures translate into tangible economic outcomes. This section examines three key measures: total factor productivity (TFP), the TFP residual and labour productivity. Labour productivity captures the efficiency with which labour inputs are transformed into output,[30] while TFP and its residual component reflect broader efficiency gains, including those arising from technological progress, innovation, and improved management practices.

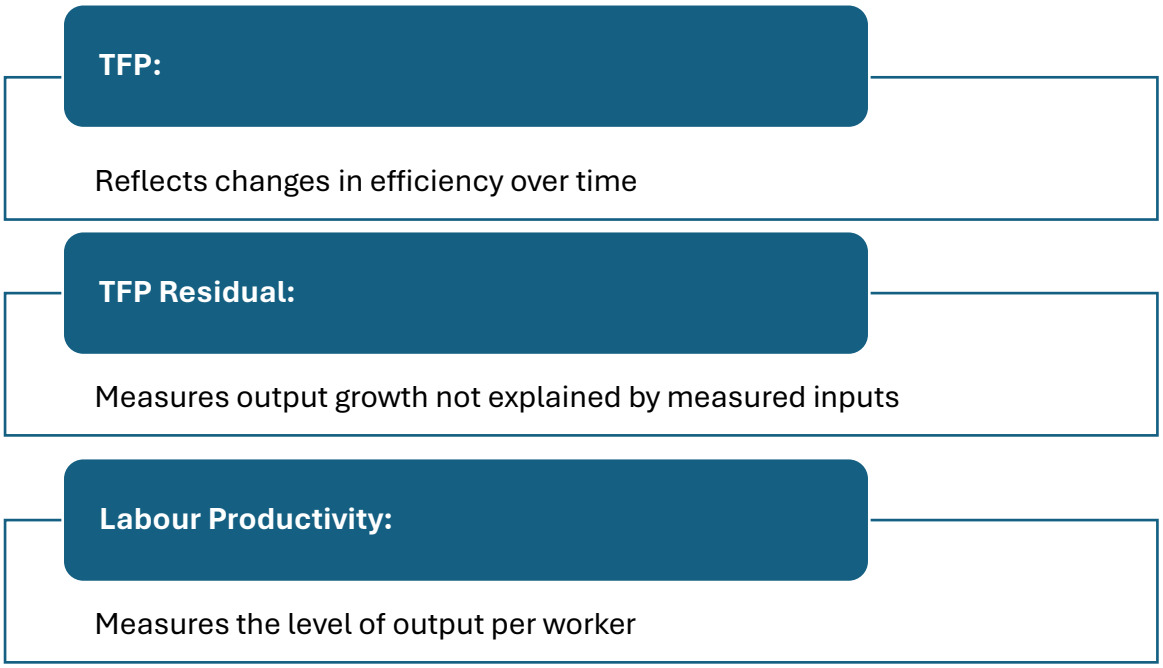
Understanding trends in these productivity measures is essential for several reasons. Firstly, productivity growth is a primary driver of long-term improvements in living standards and economic resilience. Secondly, shifts in productivity can signal changes in the competitive landscape—such as the entry of more innovative businesses the exit of less efficient incumbents, or the diffusion of new technologies. Thirdly, productivity analysis helps to contextualise other competition indicators presented in this report, such as concentration, markups, and business dynamism.

By situating productivity alongside other measures, this section aims to provide a comprehensive view of how competition is evolving in Ireland's Services Sector and to inform both policy and academic debate on the drivers of economic performance.

Figure 27 below outlines how the three selected measures of productivity inform us about business efficiency in different ways:

[30] Although labour productivity measures output per worker, it does not account for changes in capital intensity. Therefore, capital deepening, where businesses invest more capital per worker, could result in improved labour productivity without actual improvements in labour efficiency.

Figure 27: TFP and Labour Productivity



5.3.1 TFP

TFP is estimated at the business-level using a Cobb-Douglas production function, capturing the efficiency with which businesses combine labour and capital to generate output. The TFP index reflects changes in efficiency over time, while the TFP residual represents the portion of output growth not explained by measured inputs. In practice, the TFP residual is calculated as the difference between observed output and the output predicted by the production function, and is often interpreted as a proxy for innovation, technological progress, or other unmeasured factors.

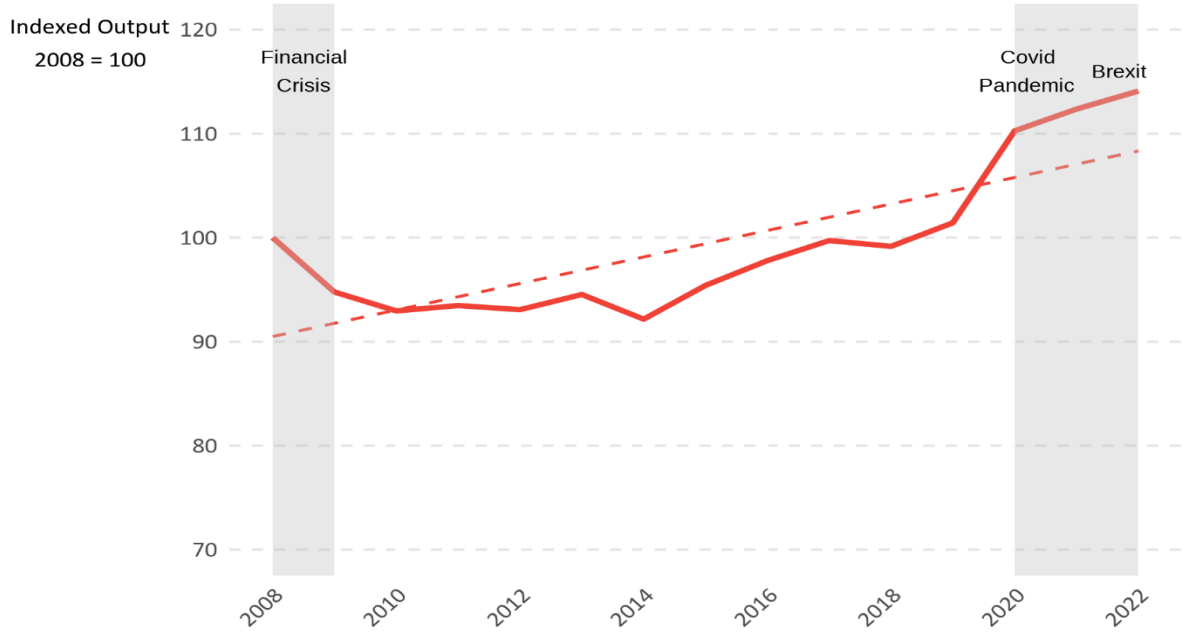
In this report, TFP is estimated using a Cobb-Douglas production function, which is widely employed in productivity analysis.[31] We regress the logarithm of gross value added on the logarithms of labour and capital inputs.[32] The residual from this regression is interpreted as log-TFP. To ensure that aggregate TFP trends reflect the economic significance of larger businesses, business-level TFP indices are aggregated using gross value added weights. This approach allows us to quantify the efficiency with which businesses combine labour and

[31] Further detail of TFP methodology is set out in the Appendix.
[32] Capital inputs are derived following the same method as outlined in methodology on the estimation of markups.

capital to generate output, and to isolate the contribution of factors such as innovation and technology.

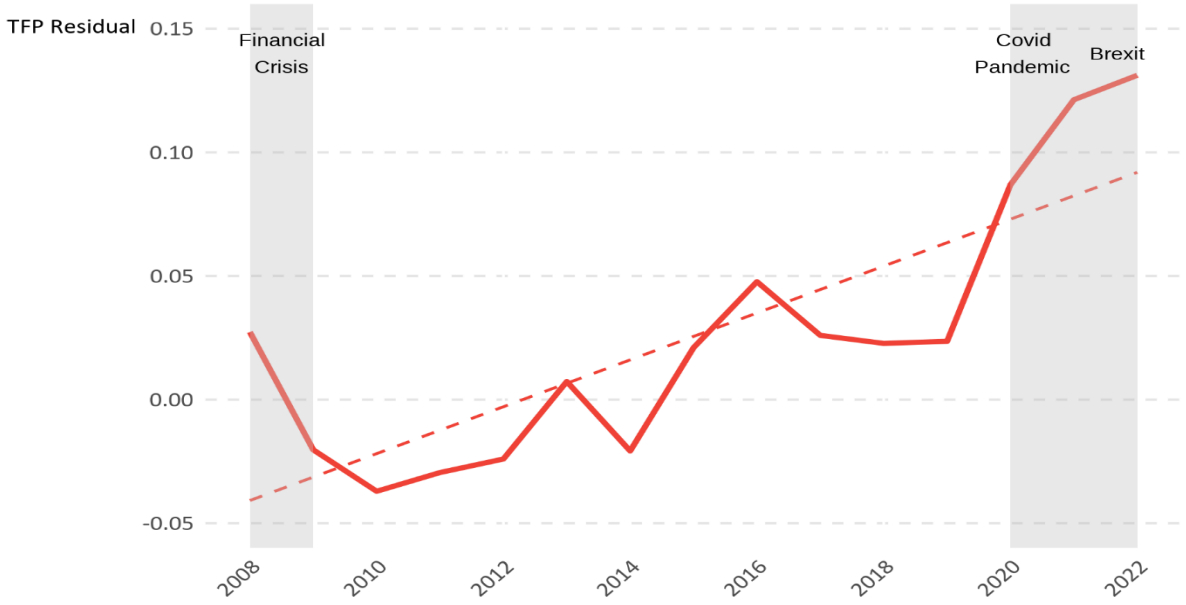
Trends in TFP

Figure 28: Total Factor Productivity Index



Source: CCPC analysis using CSO Annual Services Inquiry microdata

Figure 29: Total Factor Productivity Residual

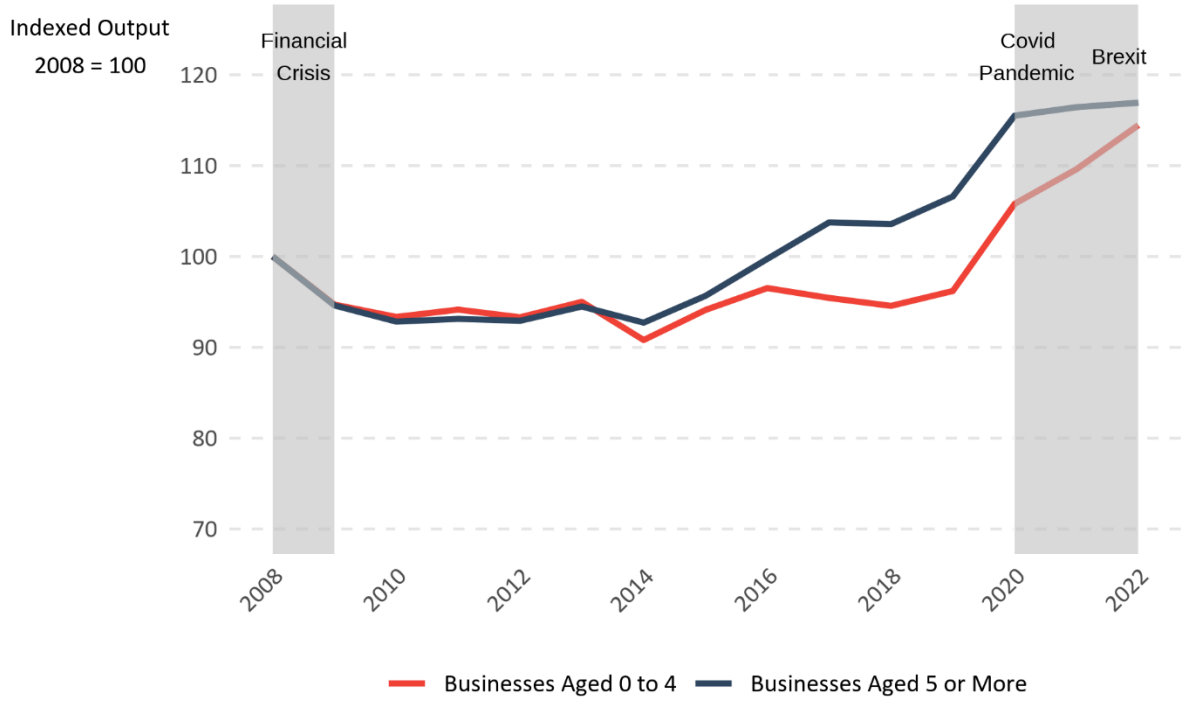


Source: CCPC analysis using CSO Annual Services Inquiry microdata

Figures 28 and 29 above present the evolution of the TFP index and the TFP residual in Ireland's Services Sector over the period 2008 to 2022. Figure 28 displays the TFP index, normalised to 100 in the base year (2008). TFP declined in the years following the financial crisis, reaching a trough around 2014. From 2014 onwards, the index shows a steady upward trend, with particularly strong gains observed from 2019 to 2022. By the end of the period, sectoral TFP stands approximately 20pp above its post-crisis low and more than 15pp above the base year.

Figure 29 illustrates the annual rate of change for the TFP residual, which captures the portion of output growth not explained by measured labour and capital inputs. The TFP residual is the log deviation from predicted output. The chart shows a modest decline in the aftermath of the financial crisis, with the residual dipping to negative levels in 2010 and remaining subdued until 2014. From 2015 onwards, the TFP residual begins to recover, with a large increase from 2019. By 2022, the residual reaches its highest level, suggesting a significant improvement in sector-wide efficiency, innovation, or other unmeasured factors.

Figure 30: Total Factor Productivity Index by Business Age



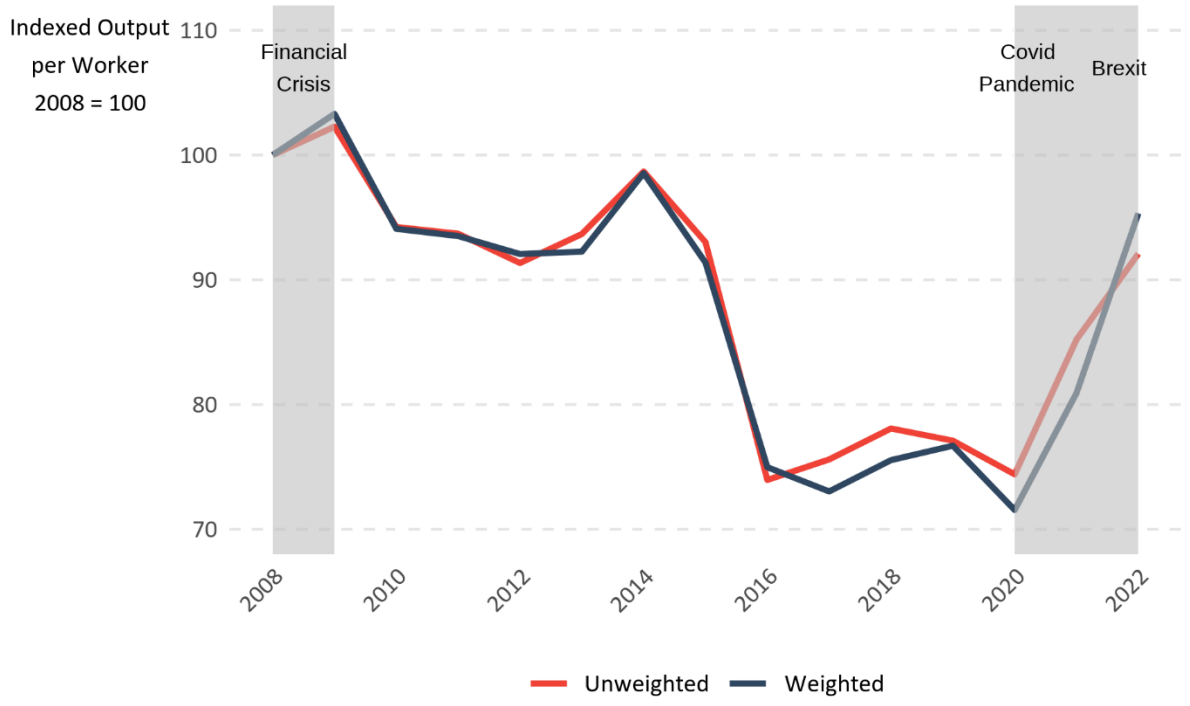
Source: CCPC analysis using CSO Annual Services Inquiry microdata

Figure 30 presents trends in the TFP index looking at younger businesses (under 5 years old) and more established businesses (aged 5 years and older) over the period 2008–2022. The parallel upward trends in TFP for both younger and more established businesses suggest that recent improvements in sectoral productivity are evident for both, with older businesses gaining productivity after 2013.

5.3.2 Labour Productivity

Labour productivity is calculated as the ratio of gross value added to the number of persons employed at the business level, providing a measure of output per employee. To better reflect the economic significance of larger businesses within the sector, a weighted approach is applied in aggregating labour productivity across all businesses to account for gross value added.

Figure 31: GVA-Weighted and Unweighted Labour Productivity



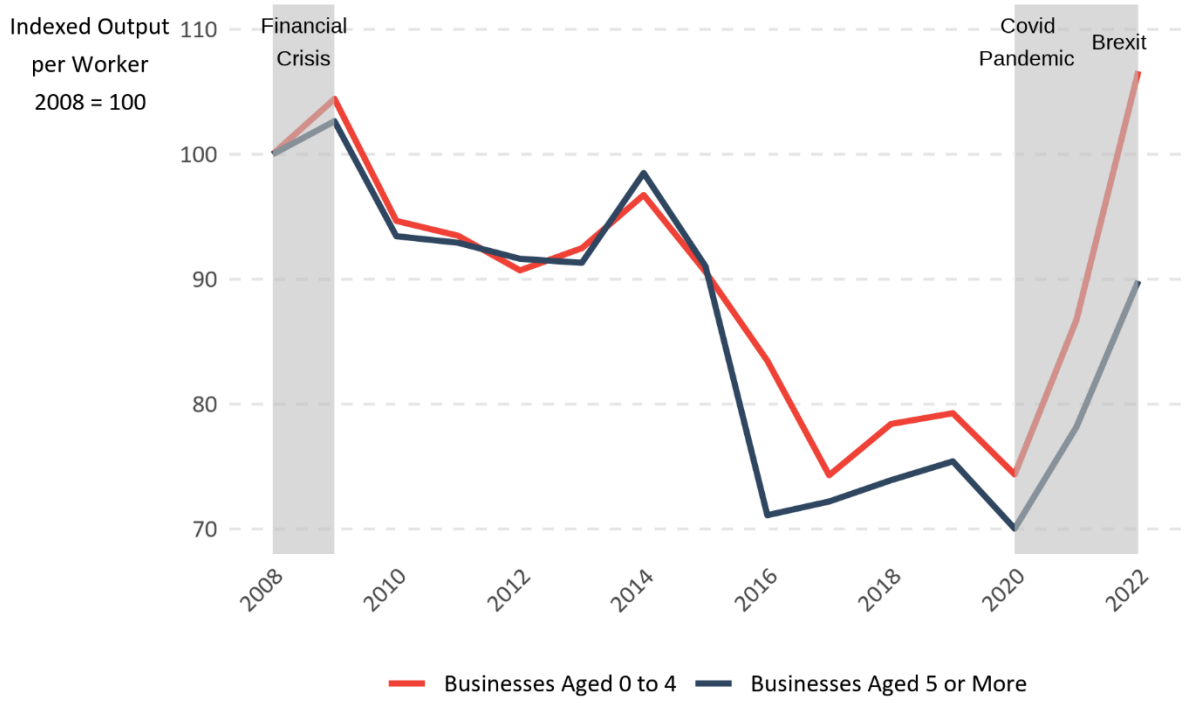
Source: CCPC analysis using CSO Annual Services Inquiry microdata

Figure 31 presents the evolution of labour productivity in the Irish Services Sector, indexed to 2008. Labour productivity was relatively volatile in the immediate post financial crisis years, before declining steadily from 2014 onwards. By 2020, weighted labour productivity had

fallen to its lowest point, indicating a broad-based reduction in average output per worker among the sector's largest businesses The most striking feature is the sharp and sustained increase from 2020 onwards, with weighted labour productivity rising rapidly and reaching its highest recorded level since 2015 in 2022, potentially driven by post-pandemic market adjustments.

As illustrated in Figure 31, there is little difference in the trends between weighted and unweighted labour productivity. This indicates that productivity gains and losses have not been disproportionately driven by either the largest businesses or smaller enterprises; rather, changes in output per employee have been distributed relatively evenly across the sector.

Figure 32: Labour Productivity by Business Age



Source: CCPC analysis using CSO Annual Services Inquiry microdata

Figure 32 above demonstrates similar trends between younger and more established businesses for labour productivity as was the case for TFP. The broadly similar evolution of labour productivity for both younger and established businesses suggests that productivity improvements have not been confined to either younger or older businesses with both exhibiting an upward trend from around 2016.

Productivity and Competition[33]

The sharp rise in labour productivity observed since 2019 may, at least in part, reflect capital deepening, such as increased investment in digitalisation and automation, rather than pure efficiency improvements. To assess whether these gains are due to genuine improvements in efficiency, it is necessary to examine trends in labour productivity alongside TFP. Both TFP and labour productivity exhibit notable growth from 2019 onwards, suggesting that at least some of the observed productivity gains are attributable to genuine improvements in efficiency rather than capital deepening alone.

Typically, productivity growth at a sectoral level arises through either (i) within-businesses efficiency, whereby individual businesses become more efficient; or (ii) reallocation across businesses, whereby turnover shifts from less productive to more productive businesses. Although our analysis does not break labour productivity or TFP growth down into these components, the parallel dynamics exhibited by older and younger businessess in Figures 30 and 32 suggest that both mechanisms may be of influence. Similarly, such similarities in growth patterns between older and younger businesses suggests a broad-based diffusion of new technologies and digital tools throughout the Services sector.

Among our Services industries, *Information & Communication* exhibits the most notable and sustained rise in TFP, which has coincided with increases in concentration and markups. Such a pattern, whereby productive businesses expand their market share and, in doing so, drive up both sectoral productivity and measures of market power, is often associated with the concept of superstar businesses.

Overall, our productivity analysis reveals improvements in TFP and to some extent in labour productivity, especially since 2019. These gains are evident for both younger and more established businesses, suggesting that efficiency improvements are not confined to any particular group. The rise in turnover among young businesses may reflect this higher efficiency or the adoption of innovative business models that require less labour input.

[33] For overview of relevant literature see appendix 4.

5.4 The changing role of younger businesses

The findings above reveal a complex evolution in the role of young businesses within Ireland's Services Sector. Their share of turnover has increased, suggesting that new entrants are increasingly capable of generating greater revenue with fewer employees.

However, these gains in turnover are not seen in job creation. The rate of job creation attributable to new entrants has fallen, incumbent businesses remain responsible for the largest proportion of employment growth. This points to a Services Sector where young businesses are increasingly more well equipped to survive in their industry but are less significant as engines of job creation.

Productivity gains add further complexity to this picture. Improvements in both total factor productivity and from the mid-point in our sample period, labour productivity have been observed. The rise in turnover among young businesses may, in part, reflect higher efficiency or the adoption of innovative business models that require less labour input.

5.5 Conclusion

The patterns identified in this chapter point to the complex role of younger businesses within the Services Sector. Although younger business's ability to generate turnover and maintain market presence appears to have enhanced, the same is not true of the role of such in businesses in job creation. This divergence of turnover gains from job creation suggests that new entrants may be leveraging technology, innovation, or more efficient business models that require fewer employees. On the one hand, this finding reflects positively on capacity of businesses in the Irish Services Sector to adapt and innovate, but it also raises questions over the broader economic impact of new entrants and younger businesses as drivers of employment growth.

Similarly, while shared productivity gains between young and established businesses may highlight a trend towards greater operational efficiency, enhancing the competitiveness of Irish businesses, this may too have the effect of intensifying entry and expansion barriers for potential future competitors to incumbents. To mitigate these risks, policy should focus not only on encouraging new entrants, but also on supporting their scaling, encouraging innovation diffusion, and actively reducing structural barriers to entry and expansion.

The parallel gains in productivity among both young and more established businesses suggest a broad-based diffusion of efficiency improvements. However, the simultaneous rise in concentration and markups in *Information & Communication* raises important questions about the underlying drivers of these trends, and whether they are a consequence of dynamic competition or heightened market power.

Achieving a competitive and productive Services Sector with sustainable growth in the years ahead will require deliberate efforts to ensure that the benefits of competition and innovation are shared widely throughout the sector.

6. Barriers to Entry and Expansion

As part of State of Competition programme of work, the CCPC commissioned[34] two surveys with over 1,000 commercial decision-makers across multiple industries and regions. A detailed overview on methodology and results can be found in the *State of Competition: Barriers to Entry* report and the *State of Competition: Barriers to Expansion* report. A summary of the findings is set out in this chapter.

6.1 Competition Perception Amongst Businesses

Nearly half of Irish businesses perceive competition in their industry as high, but this varies significantly by industry and business size. *Wholesale & Retail* report the highest competitive intensity, while *Hotels & Restaurants* report the lowest. Larger businesses are more likely to perceive high competition as a barrier, suggesting that scale influences both exposure to and awareness of competitive pressures.

The *Wholesale & Retail*, *Manufacturing*, and *Hotels & Restaurants* industries report the most severe barriers, particularly around access to funding, costs and profitability. Larger businesses report greater challenges with legal fees and processes, while smaller businesses struggle more with finance and regulatory compliance.

6.2 Expansion Activity

More than half of Irish businesses (54%) have not expanded in the past three years, and 56% have no plans to do so in the next three years. Satisfaction with current operations, operational constraints and demographic factors such as retirement are the main reasons cited. This inertia dampens market dynamism, reduces competitive pressure and restricts innovation and consumer choice.

Expansion plans are notably higher among Dublin-based businesses (52%) than in other regions (32–36%). Manufacturing and hospitality industries, as well as smaller businesses,

[34] Fieldwork conducted by Ipsos MRBI in 2025. Analysis conducted by the CCPC.

face the most acute barriers, particularly around regulatory compliance, financial constraints and staffing.

6.3 Barriers to Entry and Expansion

Based on principal factor component analysis, barriers to entry in Ireland can be characterised under four main factors:

Barriers to Entry in Ireland
Incumbency advantages, barriers include: • *price agreements and other anti-competitive strategies by established businesses* • *wide range of products/services offered by established businesses* • *spare or excess capacity allowing established businesses to lower prices* • *extensive advertising and promotional campaigns by established businesses* • *difficulty determining the optimal scale of production* More likely to affect businesses in the Hotel & Restaurant, Wholesale & Retail and Manufacturing industries.
Legal Framework, barriers include: • *legal fees and processes associated with running a business in this market* • *difficulty accessing specific technologies (e.g. those protected by patent)* • *complying with industry-specific regulations* More likely to affect businesses in the Hotel & Restaurant, Wholesale & Retail and Professional, Scientific & Technical industries.
Financial Capacity, barriers include: • *achieving profitability* • *cost disadvantages compared to established businesses* • *raising sufficient capital/funding (including access to loans and credit)* More likely to affect businesses in the Hotel & Restaurant, Wholesale & Retail and Manufacturing industries.
Supply Chain Access, barriers include: • *established businesses controlling access to raw materials and intermediate products* • *accessing distribution and sales channels*

More likely to affect businesses in the Hotel & Restaurant, Wholesale & Retail, Manufacturing and Professional, Scientific & Technical industries.

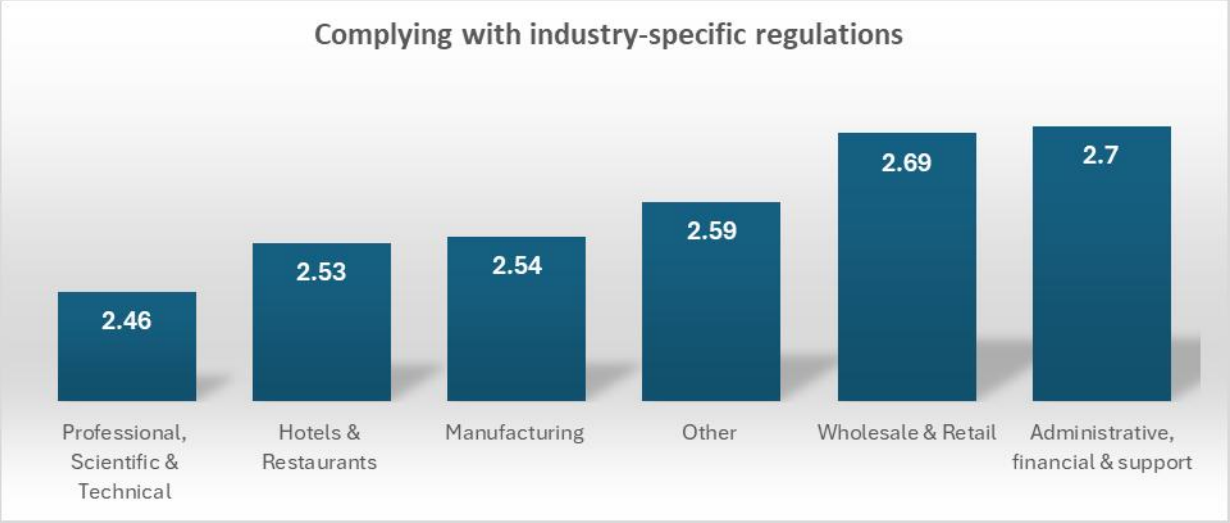
Unlike Barriers to Entry, the industry in which businesses operated was not statistically significant for expansion barriers. As such, the below barriers are relevant across all industries.

Barriers to Expansion in Ireland
Competitive Environment*,* barriers include: • *Price agreements and other anti-competitive strategies by established businesses* • *Competing with established businesses* • *Achieving profitability*
Knowledge Gap, barriers include: • *Lack of information on market opportunities at national level* • *Lack of information on market opportunities abroad* • *Difficulty accessing mentoring or advisory supports*
Financial Capacity, barriers include: • *Raising capital via banks (includes loans and credit)* • *Raising capital via private institutions* • *Cash flow limitation* • *Raising capital via govt supports (includes loans)*
Administration and Skills, barriers include: • *Recruiting suitable employees* • *Administration burden* • *Retraining skilled staff*

6.4 Work of the CCPC

The CCPC plays a pivotal role in safeguarding fair competition and consumer welfare in Ireland. Some of the barriers highlighted in this research are not just relevant – they are central to our enforcement, advocacy and research agendas.

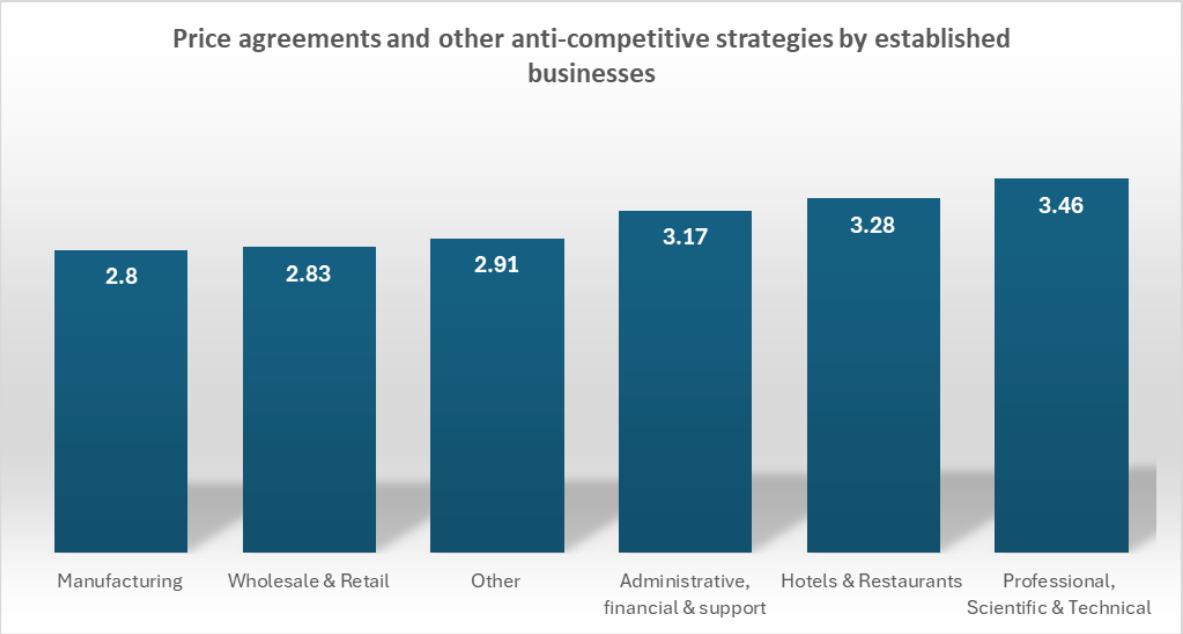
Regulatory compliance stands out as one of the most significant barriers to entry for Irish businesses. Regulatory burdens can be formidable obstacles for new entrants, driving up costs, increasing administrative complexity, and causing delays that stifle investment and innovation. This challenge is especially acute in the *Professional, Scientific & Technical Services* industry.



Note: Scale applied where 1 was a major challenge and 5 was not a challenge at all. Mean for all barriers 2.98.

The CCPC has provided significant sets of guidelines for businesses to assist them in complying with the laws that we enforce and has been a strong advocate for lowering regulatory barriers to entry in a wide range of professional services. We have also advocated for measures such as the use of the SME Test across Government to ensure that new rules are designed to minimise the burden on smaller businesses. It is essential that the government's intentions relating to better regulation under the Action Plan for Competitiveness and Productivity are pursued and implemented.

Anti-competitive practices such as price agreements, exclusionary conduct and other anti-competitive strategies by established businesses are reported as an impediment to market entry (and expansion), particularly in the *Manufacturing* industry.



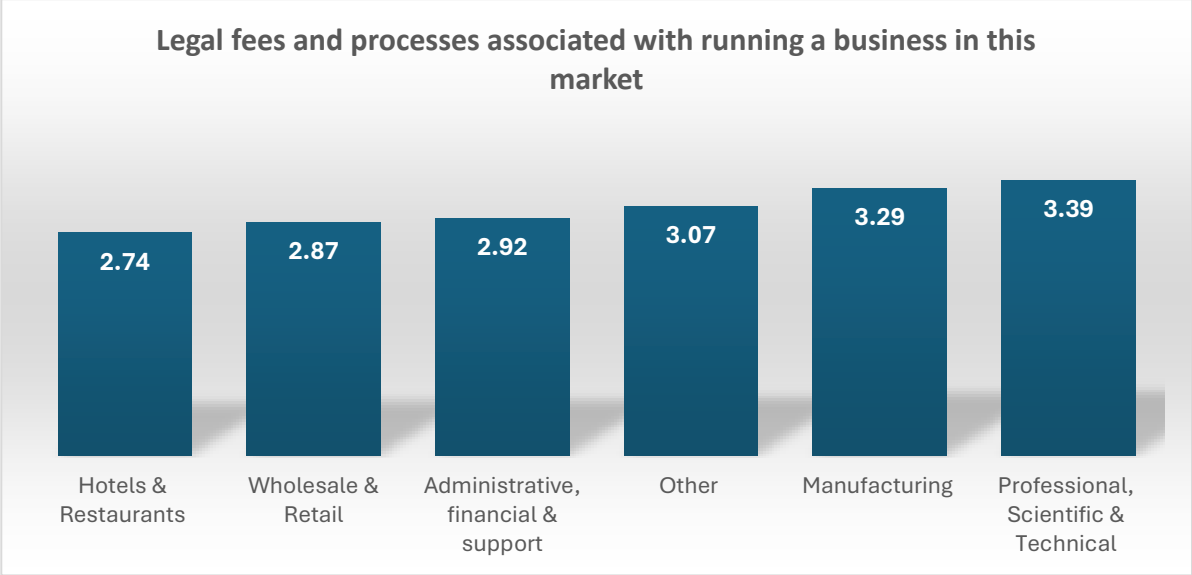
Note: Scale applied where 1 was a major challenge and 5 was not a challenge at all. Mean for all barriers 2.98.

The CCPC addresses these challenges through criminal and civil investigations into cartels, abuse of dominance and exclusionary conduct. Targeting such practices helps to protect smaller and newer entrants, providing all businesses with a fair opportunity to compete and expand. Effective enforcement of competition law is essential to ensuring an open, competitive environment and addressing barriers to business growth.

In addition, the CCPC's competition complaints helpline is a crucial avenue for consumers and businesses to raise concerns about anti-competitive behaviour, empowering market participants to play an active role in safeguarding fair competition. Information received through the helpline enables the CCPC to identify patterns of problematic behaviour, prioritise investigations, and intervene where necessary. Our analysis bears out the importance of the helpline, as businesses with resource constraints or heightened vulnerability to unfair practices – are most in need of an accessible mechanism for reporting competition concerns. Businesses taking a proactive approach in reporting anti-competitive

conduct not only helps to resolve their own individual case but also strengthens overall market integrity.

Legal costs and delays stemming from complex legal requirements and high fees can significantly hinder investment decisions and slow market entry, with the *Hotel & Restaurant* industry most affected.



Note: Scale applied where 1 was a major challenge and 5 was not a challenge at all. Mean for all barriers 2.98.

The CCPC has long called for reforms in the legal industry, including ending monopolies in education and training, the introduction of new business models, enhanced price transparency, improved data availability, and raising the threshold of the Small Claims Court, to ensure access to justice. Improvements to the legal services sector alongside reforms to the Courts system should reduce costs for consumers and businesses alike. The speed at which legal services are delivered is critical for businesses, as delays can hinder investment decisions and slow market entry. Equally, the cost of accessing legal expertise directly impacts businesses' ability to compete, making affordable and efficient legal support a key priority for a dynamic business environment.

Other areas of relevance

- **Simplified merger notification procedure:** Our analysis identified administrative burdens as a significant barrier to expansion for many businesses. The simplified merger notification procedure (SMNP), introduced by the CCPC in 2020, directly addresses this barrier by reducing the time, resources and cost to businesses seeking to expand through acquisition or consolidation. This is particularly beneficial to businesses with expansion potential but are otherwise resource constrained. In its first year of operation in 2021, approximately 40% of mergers notified to the CCPC were cleared using the SMNP. In 2024, this had risen to 71% (a 66% increase on 2023) reflecting its success in delivering for both the CCPC and relevant businesses.

- **Banking:** Access to finance stands out as a major barrier to entry for many Irish businesses, especially smaller businesses and new market entrants. The structure and competitiveness of the banking sector play a decisive role in shaping these barriers. When competition among banks is limited, incumbent institutions can impose stricter lending criteria, higher costs, and less favourable terms. This restrictiveness may make it harder for businesses—particularly those without established track records or collateral—to secure the funding needed to enter and grow in the market.[35] As a result, smaller enterprises may face disproportionate challenges in obtaining bank financing compared to larger, more established businesses. The CCPC, through its advocacy function, has consistently highlighted the need for greater market entry and innovation to reduce the reliance on a small number of full-service banks. In its submissions to Government reviews and international forums, the CCPC has advocated for reforms to encourage new entrants such as revision of the regulatory framework applying to credit unions, measures to encourage entry and innovation such as the Central Bank's Innovation Sandbox, as well as an enhanced focus by the Central Bank on encouraging competition in financial services. The CCPC notes the EU Savings and Investment Union initiatives which are intended to reduce the reliance of

[35] SME Credit Demand Survey 2024 from Department of Finance noted that the primary reason for banks declining an application was that their lending criteria was not met. However, from the perspective of businesses that did not seek credit, 'possible rejection' was not a key concern at 3%.

businesses across the Union on bank finance and promote other ways of delivering risk finance to encourage new entry and expansion.

- **Financial literacy for businesses**: Financial capacity has presented itself in this research as a key factor in the challenges facing businesses. In its submission to the Department of Finance's 'Retail Banking Review', the CCPC highlighted the issues facing micro, small and medium enterprises (MSMEs) in accessing finance and recommended that "measures to improve levels of financial literacy among SMEs, with a particular focus on MSMEs, should be prioritised as part of the ongoing work of the SME Taskforce". The CCPC welcomed the inclusion of an action related to "improving levels of SME financial literacy and programmes focussed on entrepreneurs" in the National Financial Literacy Strategy Action Plan 2025.[36]

- **Research:** This research forms part of the CCPC's programme of work on the State of Competition in Ireland. The intention is to use this benchmark analysis to identify markets that warrant further examination through a market study. By deepening our understanding of how competition evolves within these markets, the CCPC will be equipped to implement and advocate for more effective, evidence-based interventions. In addition, the CCPC is also undertaking research to understand the degree to which accommodation businesses (such as hotels) who use online travel agents face problematic anti-competitive practices which can potentially act as deterrents for new entrants or small businesses.

[36] For more detail see: national-financial-literacy-strategy-action-plan-2025.pdf

7. Implications of Findings

As noted at the outset of this paper, it is important when considering the evolution of competition in the Services Sector over time, that we assess our different metrics collectively. Below, we assess our findings across the range of competition measures employed at both an aggregate Services Sector level, as well as at a Services industry level.

7.1 Services Sector – Aggregate Level

Table 4 below summarises the key competition metrics assessed at the aggregate level for Ireland's Services Sector. Each metric is accompanied by a signal—using a red, amber, or green (RAG) indicator—to reflect the direction and potential implications of recent trends. This overview is intended to provide a concise snapshot of where competitive pressures may be intensifying or easing, and to highlight areas that may warrant further attention. The RAG rating is used as a visual guide only and should not be interpreted as inherently positive/negative.

Table 4: Services Sector Metric Summary

Metric	Signal	Summary
Concentration (Change)	Red	Aggregate concentration increased, in particular after 2016.
Markups	Amber	Markups exhibited a modest upward trend.
Entry, Exit, and Survival Rates	Amber	Entry rates moving upwards modestly. Exit rates declining slightly, while survival rates are increasing.
Rank Persistence	Amber	Persistence remained stable.
Entrenchment	Amber	Slight upward trend in entrenchment levels.
Young Business Employment Share	Amber	Employment share of young businesses declined modestly.
Young Business Turnover Share	Green	Turnover share of young businesses rose.
Job Reallocation	Green	Job reallocation rate rose modestly.

TFP	Green	TFP improved, especially post-2019.
Labour Productivity	Amber	Labour productivity fell from its 2009 high, but then improved, post-2016.

Notably, the table highlights that aggregate concentration, markups, rank persistence and entrenchment have increased moderately, suggesting a trend towards greater market power among leading businesses. Entry, exit and survival rates are marked amber, indicating mixed signals; higher survival and fewer exits may indicate a decline in business dynamism. The decline in the employment share of young businesses contrasts with a rise in their turnover share, pointing to nuanced shifts in the role of younger enterprises. Meanwhile, improvements in TFP and labour productivity suggest that, despite some competitive challenges, the Services Sector has achieved efficiency gains in recent years. Overall, the table highlights the importance of interpreting these metrics collectively, as no single indicator fully captures the complexity of competition dynamics.

7.2 Services Industries

Table 5 presents a breakdown of competition indicators across the services industries. For each industry, the table reports the signal for concentration, markups, entry and exit rates, survival rates, rank persistence, and entrenchment. This allows for a more granular understanding of how competitive dynamics differ across the diverse landscape of Ireland's services industries. The RAG rating is used as a visual guide only and should not be interpreted as inherently positive/negative.

Table 5: Services industries metric summary

	Concentration (change)	**Markups**	**Entry, Exit and Survival Rates**	**Rank Persistence**	**Entrenchment**
Wholesale & Retail; Repair of Motor Vehicles	Amber	Amber	Red	Green	Red
Transport & Storage	Amber	Green	Green	Green	Green
Accommodation & Food	Amber	Amber	Amber	Amber	Red

Information & Communication	Red	Red	Amber	Green	Amber
Professional, Scientific & Technical	Red	Red	Amber	Amber	Amber
Administrative & Support Services	Amber	Green	Amber	Amber	Amber
Arts, Entertainment & Recreation	Green	Green	Red	Red	Amber
Other Service Activities	Amber	Green	Amber	Red	Green

Increased Concentration and Market Power in Digitally intensive industries:

Industries such as *Information & Communication*, and *Professional, Scientific & Technical activities* are marked by red signals for concentration and markups. This indicates that a small number of businesses hold significant market power and that the leading businesses tend to retain their positions over time. These industries may warrant closer scrutiny, as high concentration and persistent market leadership can limit entry opportunities and reduce competitive pressures. In producing such findings for *Information & Communication*, particular activities of note include computer programming. In *Professional, Scientific & Technical activities*, such activities include accountancy and auditing, as well as legal services.

Risks observed in *Wholesale & Retail Trade*:

Wholesale & Retail Trade (including repair of motor vehicles) displays amber signals for concentration and markups but red for entry and exit rates, survival rates, and entrenchment. This pattern suggests that while overall market share concentration is moderate, established businesses maintain a strong foothold, making it challenging for new entrants to disrupt the status quo. While it is beyond the scope of this report to identify explanations for this pattern, one potential contributing factor could be the growth of franchises and chains. The downward trend in entry rates and persistent positioning of incumbents point to potential barriers to entry and reduced dynamism. Businesses which do enter the industries are surviving longer and fewer businesses overall are exiting the market. While this has not led to very high levels of concentration, the trends overall suggest that dynamism may be cooling in this industry. In reaching this finding, particular aspects of both (i) the retail trade, such as the sale of electrical

household appliances; and (ii) the wholesale trade, such as the sale of tobacco and machine tools, were notable.

In addition, recent research from the CCPC on barriers to entry found that businesses in the *Wholesale and Retail* industry reported the most severe barriers, with this industry having high levels of exposure to all four factors barriers identified relating to incumbency advantages, financial capacity, supply chain access and legal framework (i.e. regulatory/legal burden and costs).

Mixed Signals in *Arts, Entertainment & Recreation*:

This industry stands out with green signals for concentration and markups, indicating a more competitive environment. However, the red signal for entry, exit, survival rates and rank persistence indicates declining numbers of entrants and exits and increasing survival rates and rank persistence. This suggests that, despite high levels of dynamism by some metrics, there may be barriers to entry affecting the competitive dynamics of this industry. Despite the overall positive signals for *Arts, Entertainment & Recreation*, these trends are not universal across the industry, with particularly notable negative trends relating to gambling and betting activities.

Amber Signals Across Many Industries:

The prevalence of amber signals for entry and exit rates, survival rates, and entrenchment across most industries points to a mixed picture. Although there are positive trends in some areas, competitive pressures are not uniformly strong. Trends should be monitored closely to ensure that competitive pressures are maintained and that early risks of market power or reduced dynamism are detected.

7.3 Conclusion

The findings of this report highlight the complex and continually evolving competitive landscape of Ireland's Services Sector. The interplay of increasing concentration, modestly rising markups, and shifts in business dynamism and productivity underscores this complexity, with notable variation across industries. These trends are of particular note in industries such as *Information & Communication*, *Professional, Scientific & Technical activities*, and *Wholesale*

& Retail Trade, where persistent market leadership and reduced churn raise questions about the robustness of competitive pressures.

The evolution of competition in the Services Sector cannot be understood in isolation from the wider forces of globalisation and technological development. Globalisation has enabled leading businesses—especially in digitally intensive industries—to scale rapidly and consolidate their market positions, while technological change has accelerated the pace of disruption and innovation. At the same time, country-specific factors remain highly influential. In Ireland, barriers such as financial capacity, regulatory burdens, and legal fees continue to shape the competitive environment, potentially amplifying the effects of global trends and making it more challenging for new entrants to compete. Taken together, these findings point to a Services Sector where competitive pressures are uneven and, in some areas, clearly diminishing. While the sector demonstrates adaptability and resilience—evidenced by rising entry rates, short-term survival rates and job reallocation—the increases in concentration and market power, particularly in digitally intensive industries, raise questions about the long-term health of competition.

In addition to using the insights from the State of Competition analysis to help guide the selection of a future market study[37], many of the findings from this report vindicate the selection of current areas of CCPC activity. The CCPC is already active in the industries identified as exhibiting weakening competitive dynamics. For instance, work is ongoing in *Wholesale & Retail*, in relation to electrical appliances; in *Information & Communication*, regarding ICT healthcare; and in *Professional, Scientific & Technical*, and *Arts, Entertainment & Recreation*, focusing on betting.

For future research on the State of Competition in Ireland, there are additional themes of analysis to be explored that are not incorporated into this report owing to data limitations. Such additional areas of research include:

- The role of common ownership
- The impact of international trade

[37] The CCPC will engage with government on the potential expansion of its functions relating to market studies, including a requirement for government to respond to recommendations within 12 months of publication.

- The roles of indigenous businesses and multinational corporations
- Labour market dynamics
- Analysis of patterns of business expansion
- Examining markups across different estimation models

As part of this analysis, the CCPC identified an international dataset complied by the Competitiveness Research Network (CompNet)[38], however this could not be utilised as Ireland does not currently participate in this network. We note the government's intention under the Action Plan for Competitiveness and Productivity to participate in the Microdata Infrastructure (MDI)[39] for productivity research run by the European Commission and recommend that this participation be extended to CompNet which would allow for stronger international comparison on key competition measures such as concentration ratios and HHI.

[38] Established in 2012 by the **European System of Central Banks**, CompNet's objective is to foster collaboration between policymakers and researchers on competitiveness-related issues.

[39] A secure, harmonised platform that enables researchers and policymakers to access and analyse confidential firm-level data across countries. The MDI was developed under the EU-financed project MICROPROD in 2019.

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Appendix

Appendix 1: Data

1.1 Data Sources

The Business Register and the Annual Services Inquiry in the form of Researcher Microdata Files (RMFs) were obtained from the CSO.

The business register is a dataset of all active enterprises in the economy and is available on an annual basis. This data is based on activity recorded by the Revenue Commissioners. This activity can be in the form of VAT activity, or annual P35 employment, Corporation Tax, or Income Tax returns. VAT, employer, Corporation Tax, or Income Tax registrations are also considered activity. As well as registering businesses as active in the economy, the Business Register records a number of demographic variables for each business including its NACE code, registration years, and number of employees.

The ASI is an annual survey of enterprises engaged wholly or primarily in distribution and services. The business register is the sampling frame for the Annual Services Inquiry (ASI). The principal variables of the ASI are turnover, stocks, capital assets, personnel costs, value added tax, purchases, employment, location, exports, and imports. Non-response datasets contain data from the Revenue Commissioners on active enterprises which do not complete a survey return. This data is included in the RMFs from the CSO.

1.2 Data Cleaning

To produce the final dataset of active businesses which is used in the analysis, the Business Register data was first combined with the ASI data using a unique business identification number. The following cleaning steps were then applied to the dataset of active businesses

- Businesses with the 4-digit NACE code 7735 which is businesses engaged in the ‘Renting and leasing of air transport equipment’ were removed due to data reliability considerations and distortionary effects.

- Businesses in the NACE industry 'Real Estate Activities' were removed on the basis of not following standard cost-minimising behaviour.

- Within the NACE industry 'Arts, entertainment and recreation', only the 2-digit industries 'Gambling and betting activities' and 'Sports activities and amusement and recreation activities' are included in the analysis. This means that the 2-digit industries 'Creative, arts and entertainment activities' and 'Libraries, archives, museums and other cultural activities' are not included in this analysis on the basis of not following standard cost-minimising behaviour.

- Within the NACE industry 'Other service activities', only the 2-digit industries 'Repair of computers and personal and household goods' and 'Other personal service activities' are included in the analysis. This means that the 2-digit industry 'Activities of membership organisations' is not included in this analysis on the basis of not following standard cost-minimising behaviour.

- Duplicate entries were removed.

- Entries with invalid NACE codes were removed.

- Businesses which have more than one entry in one year were removed.

- Missing turnover values are changed to zero and the bottom 1% of businesses by turnover were removed including zeros.

Table A shows the total number of business-year observations for each services industry after the above cleaning steps were applied. The summary statistics in Table C were calculated after the data cleaning steps.

Table A: Number of Observations by Industry

Industry	**Number of Business-year observations**
Accommodation & Food	268,359
Administrative & Support	213,378

Arts, Entertainment & Recreation	65,232
Information & Communication	194,803
Other Service Activities	206,354
Professional, Scientific & Technical	580,446
Transport & Storage	376,683
Wholesale & Retail	675,576
Total	2,580,831

Table B: Mean of Key Variables by Business Size

Businesses with less than 20 employees					
Industry	**Persons Employed**	**Business Age**	**Gross Value Added**	**Wages and Salaries**	**Costs of Sales**
Accommodation & Food	4.16	11.91	94,527.22	63,027.23	88,112.79
Administrative & Support	2.13	11.15	153,787.51	56,444.25	209,176.55
Arts, Entertainment & Recreation	2.90	12.47	140,659.22	56,649.56	130,912.77
Information & Communication	1.94	7.88	256,327.94	90,388.58	288,836.76
Other Service Activities	2.14	9.68	54,741.00	32,202.48	30,912.19
Professional, Scientific & Technical	2.00	10.74	151,712.27	71,867.79	133,495.22
Transport & Storage	1.67	12.55	98,828.15	45,747.74	74,100.15
Wholesale & Retail	3.26	14.38	169,593.66	86,969.68	1,044,549.42
Businesses with 20 or more employees					
Industry	**Persons Employed**	**Business Age**	**Gross Value Added**	**Wages and Salaries**	**Costs of Sales**
Accommodation & Food	62.40	15.49	1,606,183.62	1,175,405.90	1,075,323.81
Administrative & Support	140.45	15.85	5,766,246.14	4,221,193.16	4,493,595.26
Arts, Entertainment & Recreation	63.98	22.09	2,634,002.79	1,698,607.25	5,075,684.44

Information & Communication	99.39	16.04	16,493,125.00	6,713,954.42	18,327,119.84
Other Service Activities	77.83	15.50	2,096,579.79	1,796,777.97	993,049.91
Professional, Scientific & Technical	80.01	17.74	8,133,079.90	4,191,187.68	7,259,267.97
Transport & Storage	123.37	20.70	9,230,531.90	5,763,811.54	6,185,417.86
Wholesale & Retail	81.04	23.73	4,920,532.69	2,493,189.91	25,967,857.41

Turnover

For the analysis which uses the turnover variable, entries where turnover spikes or falls drastically are removed. If the value of turnover in any year is greater or smaller than the value of turnover the previous year and following year by a factor of fifty or more, the data entry is removed. This removes 1,142 outlier observations in total.

Table C: Mean of Turnover Before and After Outliers Are Removed

Industry	**Mean Turnover**	**Mean Turnover, outliers excluded**
Accommodation & Food	572,903	568,928
Administrative & Support	1,111,108	1,105,562
Arts, Entertainment & Recreation	885,824	878,430
Information & Communication	3,440,422	3,426,647
Other Service Activities	150,758	150,538
Professional, Scientific & Technical	883,343	866,161
Transport & Storage	803,323	790,942
Wholesale & Retail	3,466,244	3,461,683

Business Birth Years

In order to conduct our analysis of survival rates and the contribution of newly established businesses we assign a birth year to every business using data on businesses registration years

provided to us by the CSO as part of the Business Register. This data includes the year of registration with the Companies Registration Office (CRO), and/or the years of registration for corporation tax, income tax, value added tax, or employer tax. No one of these registration types has 100% coverage for all businesses

Where there are multiple different registration years for one business we take the earliest registration year as the birth year. Where there is no registration year available, we take the year of first recorded activity in the sample as the birth year with the condition that there must have been two years of inactivity prior to that year. The time series begins in 2008, but the CSO provide us with data on the businesses which were active in 2008 and 2009 but were inactive for at least two years prior. There is a very small number of enterprises in the sample (n=10,400) which we do not assign a birth year to because we do not have data on their registration years, and they were active in the years prior to 2008. These businesses without a birth year are excluded from the analysis of survival rates and the contribution of young businesses

The figures we have presented for the annual number of business births and the survival rate of new businesses differ from the figures published annually by the CSO because the CSO does not use registration years to quantify business births. Instead, the CSO classify a birth as a business which is active in a given year but was not active in the previous two years. This may be a completely new business, or it may be a business that was previously active three or more years before. The CSO classifies inactive businesses as deaths after two years of inactivity. These definitions are used when quantifying the number of births, deaths, and surviving businesses The CSO also carries out profiling work and weighting of the births and deaths data which we do not do.

1.3 Distribution of businesses/employees, Job Creation and Destruction

Table D: Distribution of businesses by age and size (by number of employees) across all years

	<5 Years	**5-10 Years**	**11-20 Years**	**20+ Years**	**Total**
<10 Employees	653,549	527,910	562,827	460,234	2,204,520
%	26.7	21.6	23	18.8	90.2
10-49 Employees	33,764	45,509	57,614	65,752	202,639
%	1.4	1.9	2.4	2.7	8.3
50-249 Employees	3,558	6,178	8,957	13,084	31,777

%	0.2	0.3	0.4	0.5	1.3
250+ Employees	345	687	1,316	2,567	4,915
%	.01	0.03	0.05	0.11	0.2
Total	691,216	580,284	630,714	541,637	2,443,851
%	28.1	23.7	25.8	22.2	100

Table E: Distribution of employees by business age and business size (by number of employees) across all years

	<5 Years	**5-10 Years**	**11-20 Years**	**20+ Years**	**Total**
<10 Employees	1,226,015	1,089,278	1,161,415	1,013,746	4,490,472
%	7.9	7	7.5	6.5	28.8
10-49 Employees	606,505	853,805	1,114,294	1,310,646	3,885,250
%	3.9	5.5	7.2	8.4	24.9
50-249 Employees	333,902	572,780	860,750	1,244,597	3,012,029
%	2.1	3.7	5.5	8	19.3
250+ Employees	204,085	412,222	890,188	2,682,624	4,189,119
%	1.3	2.7	5.7	17.2	26.9
Total	2,370,507	2,928,085	4,062,647	6,251,613	15,577,870
%	15.2	18.8	25.9	40.1	100

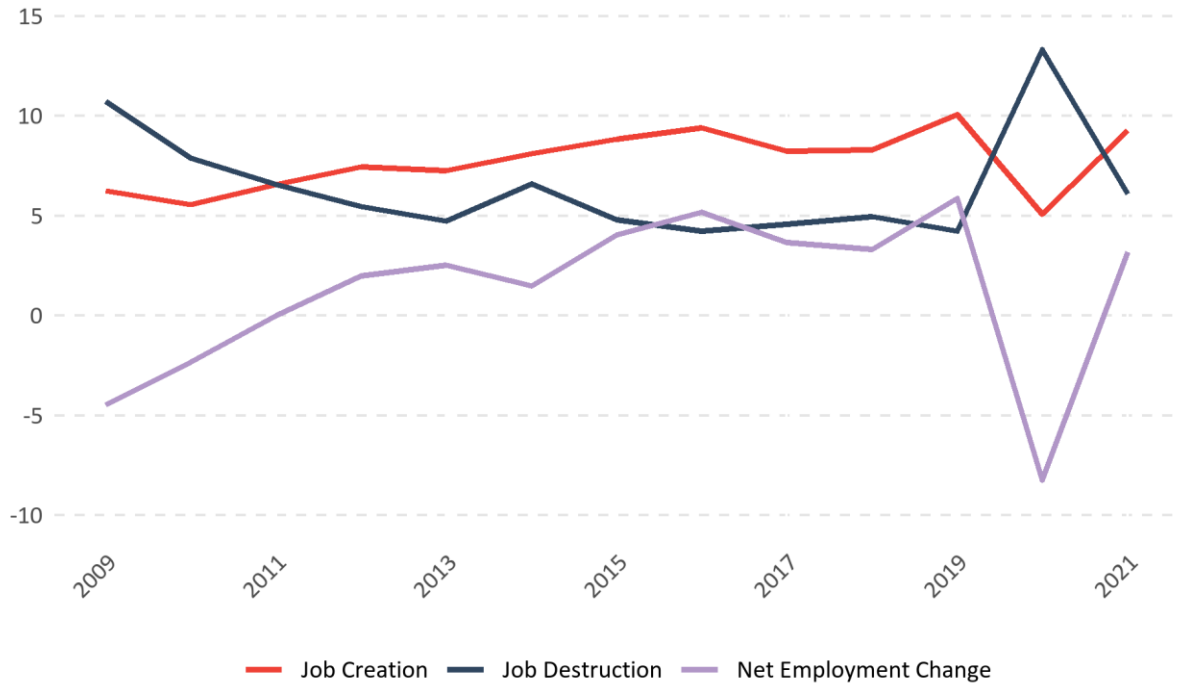
Tables D and E above demonstrate that although the population of businesses over our time period comprises largely of micro businesses defined by the CSO as businesses with less than 10 persons employed (90%), these businesses account for only 29% of employment. Similarly, although 15% of our database comprises of young businesses the level of employment associated with these businesses is 28%.

Appendix 2: Employment Changes

In keeping with previous analysis on job reallocation in Ireland (Lawless 2013), we follow the approach of Davis and Haltiwanger (1992, 1999) in the calculation of job flow measures. In doing so, we calculate job reallocation as the sum of job creation and job destruction. Job creation in a given year is the jobs gained divided by the number of businesses that expanded or set up between the given year and the previous year.

Similarly, job destruction is the number of jobs lost divided by the number of businesses that contracted or exited in one year versus the previous year. We convert these measures into rates as done so by Lawless (2013). Therefore, we divide the change in employment from one year to the next by the average employment of the earlier year and the following year. This provides us with positive growth rates, summed to find the job creation rate; and negative growth rates, summed to produce the job destruction rate. The difference between these rates provides us with net employment growth. The Job reallocation rate is sum of job creation and destruction.

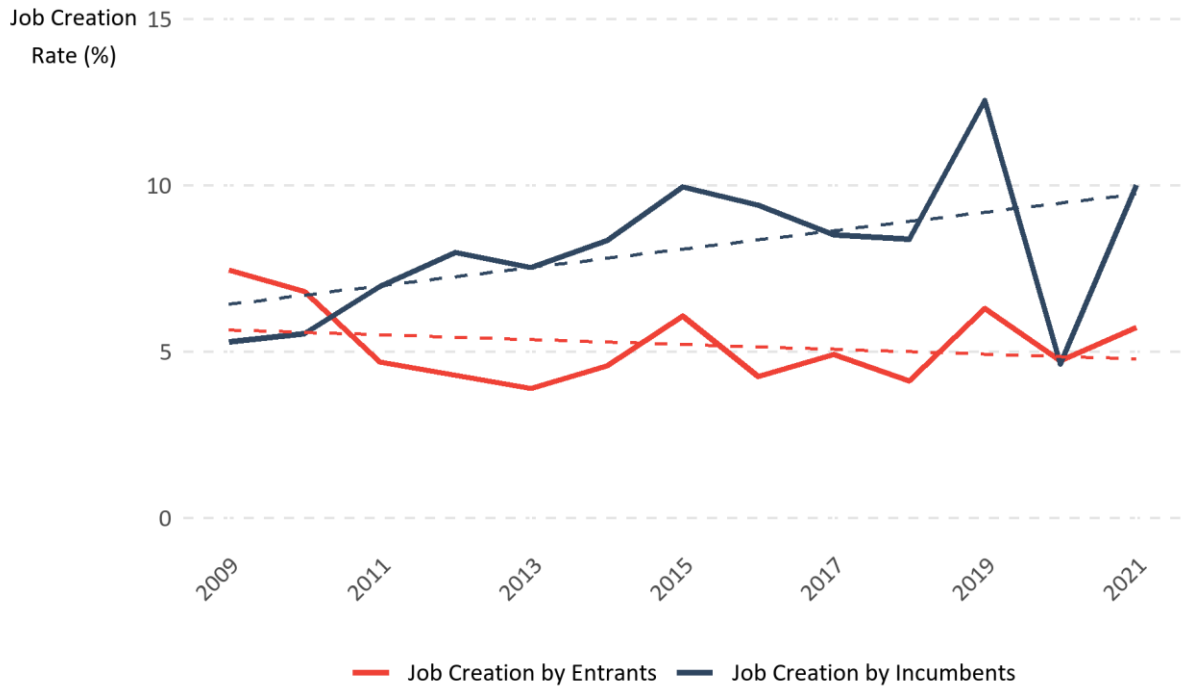
Figure A: Aggregate Job Creation, Job Destruction and Net Employment Change



Source: CCPC analysis using CSO Annual Services Inquiry microdata

In the years following the financial crash, we see the job destruction rate decline and fall below the steadily recovering job creation rate, as the net employment change gradually returns above zero (figure 26). From 2018 into 2019, net employment jumps, caused by both an uptick in the job creation rate as well as minor drop off in the rate of job destruction. With the Covid-19 pandemic in 2020, net employment decreases sharply as job destruction peaks and job creation falls to its lowest point at any time in our years of data. In 2021, both job creation and job destruction recover with the rate of job creation moving back above that of job destruction.

Figure B: Job Creation by Entrants and Incumbents

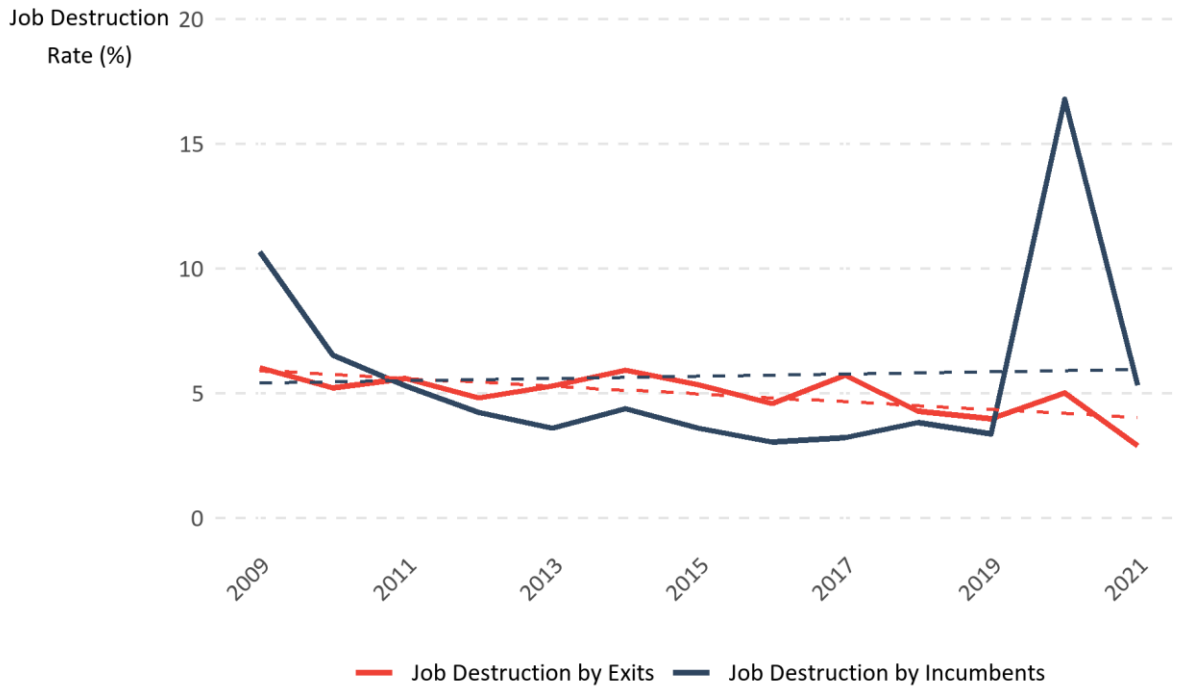


Source: CCPC analysis using CSO Annual Services Inquiry microdata

As illustrated in Figure 25, job creation in the Irish Services Sector by entrant and incumbent businesses has diverged to some degree between 2009 and 2021. Job creation by incumbents trended upwards from 2009 reaching its highest rate in 2019, having close to doubled over the decade. Although incumbent business job creation falls to its lowest level in 2020, it rebounds in 2021 to around 10%. In contrast, the rate of job creation by new entrants to the Services Sector has declined. Perhaps surprisingly, the new entrant job creation rate of just under 8% in 2009 after remains the highest level reached. A new entrant job creation rate of

close to 6% in 2021 ensured a return to the divergence in the trends of incumbent and entrant job creation following Covid-19.

Figure C: Job Destruction by Exits and Incumbents



Source: CCPC analysis using CSO Annual Services Inquiry microdata

Outside of the two economic shocks that occurred over our sample period, exiting businesses have typically driven the rates of job loss in the Irish Services Sector. Excluding 2020 with the onset of Covid-19, the fall in the rates of job destruction reflected in Figure 26 above is consistent with a falling business exit rate in the Services Sector.

Appendix 3: Business Births and Survival Rates by Industry

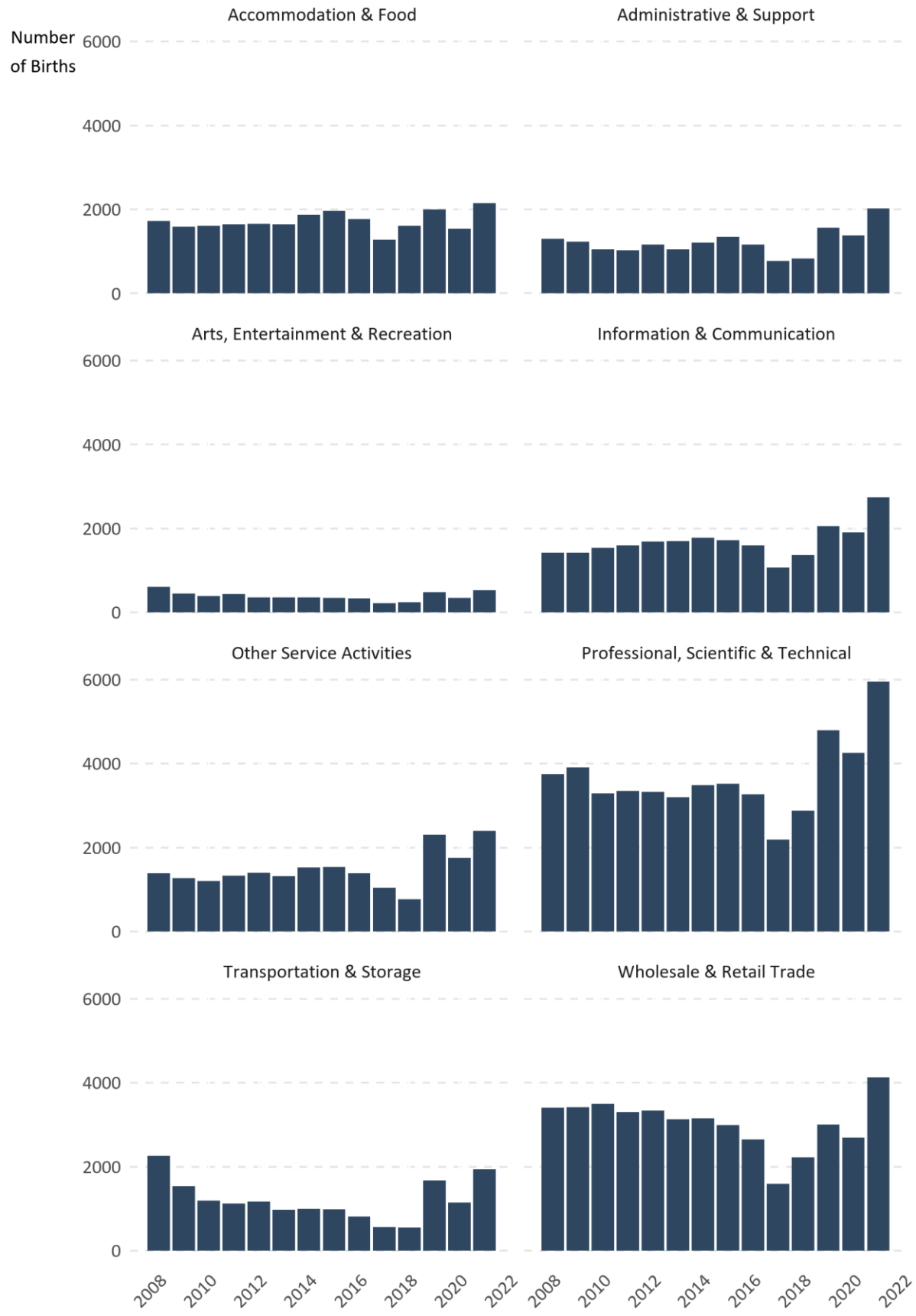
Business Births by Industry

The analysis of survival rates in Chapter 4.2 is limited to new businesses also known as business births. Business births are different to entrants, which are included in the work on entry and exit rates. Entrants to the market include businesses which are pre-exiting. They may be dormant businesses which were inactive for one or several years before becoming active again or they may be businesses which were active in a different industry and switch to a new industry in which case they are treated as entrants to the new industry. In contrast, business births are newly registered businesses which were never active before. The method for identifying them uses the businesses birth year, as outlined above.

At an aggregate level, business births fell in the years following the financial crash before recovering towards the end of the 2010s despite some volatility. Figure A shows the number of business births by year and industry. Births are relatively high in large industries like *Professional, Scientific & Technical Activities* and *Wholesale & Retail Trade*.

Business births in most industries follow a similar pattern over the time period. There is an initial decline in 2009 and then they recover to a similar or higher level by the end of the period. Notably, births in *Wholesale and Retail, Transportation & Storage* and *Arts and Recreation* follow a different pattern to most industries. In these industries, the births are lower in 2022 than they were in 2008. The pattern of business births in the *Information & Communication* industry is distinct from other industries. Instead of an initial decline, there is a steady increase until it declines sharply, falling to its lowest point in 2016.

Figure A: Business Births by Industry



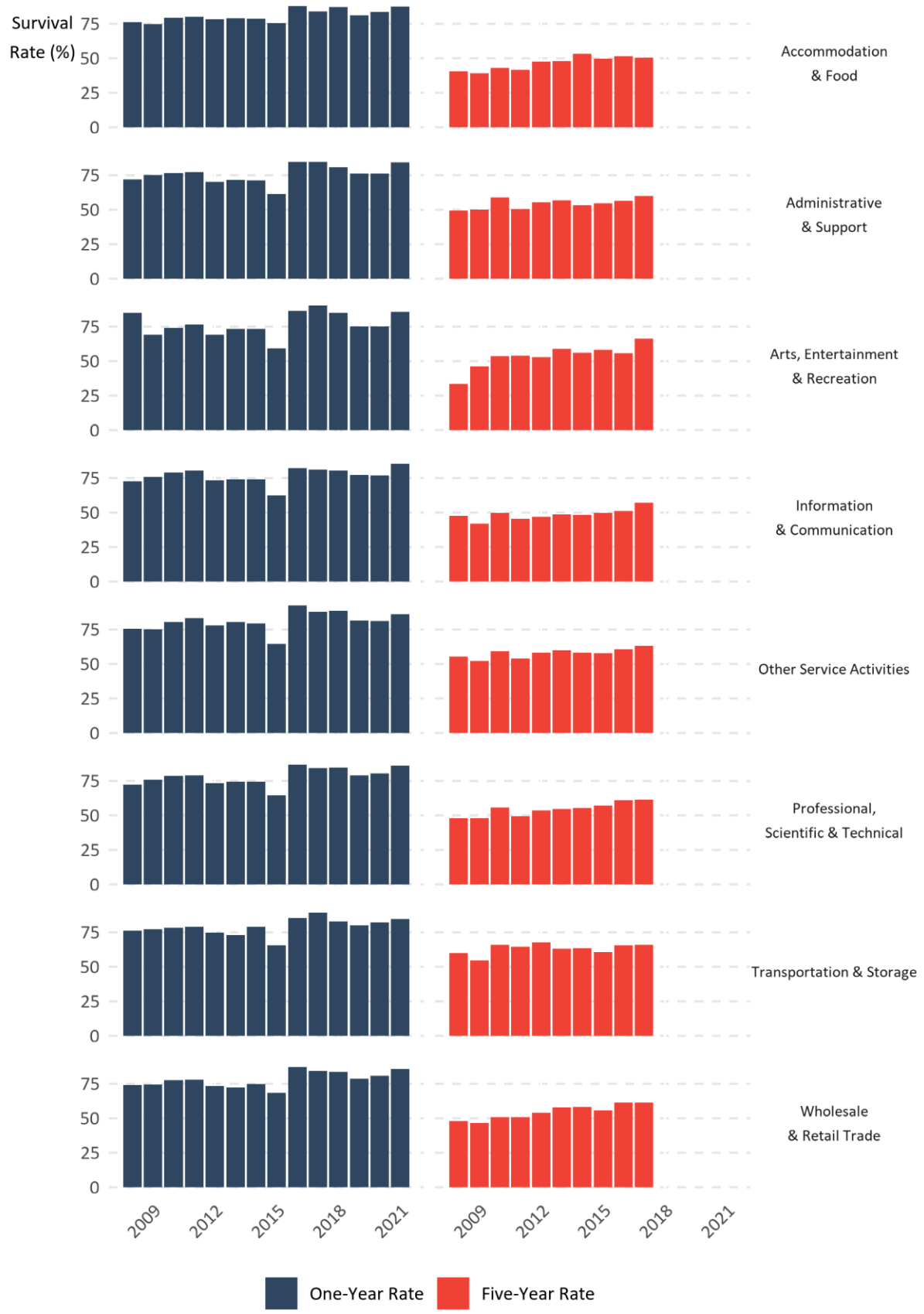
Source: CCPC analysis using CSO Annual Services Inquiry microdata

Survival Rates by Industry

As well as analysing the survival rates of all new businesses in the services sector, we also analysed the one-year and five-year survival rates of new businesses by industries. Figure B shows the one-year and five-year survival rates of new businesses broken down by industry. While there is a lot of variation in the one-year survival rate over the period, the increasing trend in the five-year survival rate which was identified at the aggregate level can also be seen in almost all services industries. This robustness check of this finding shows that the increase in the five-year survival rate is not driven by one large industries, but it is seen across the industries.

The five-year survival rate in *Transportation & Storage* is the exception to the trend. Both the one-year and five-year survival rates are volatile throughout the period in this industry. In all other services industries, the proportion of businesses still active five years after their birth is increasing steadily over time. The largest increase in the five-year survival rate is in *Arts, Entertainment & Recreation*, followed by *Professional, Scientific & Technical Activities* and *Wholesale & Retail Trade*.

Figure B: One-Year and Five-Year Survival Rate by Industry



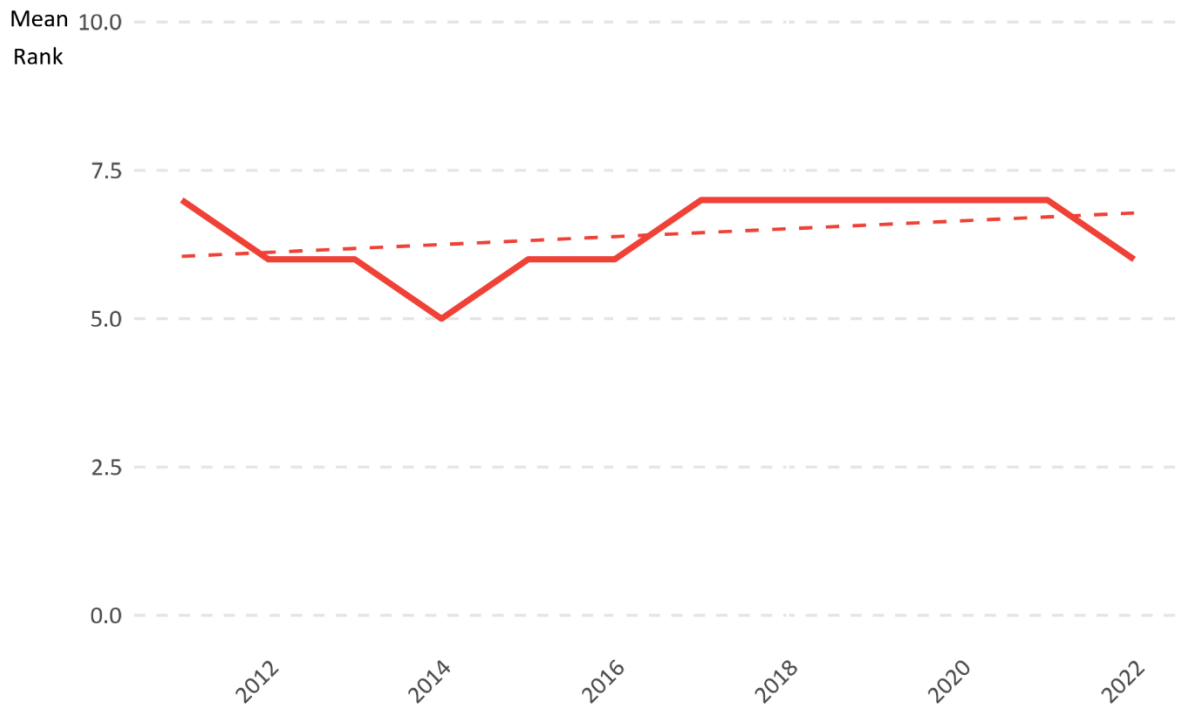
Source: CCPC analysis using CSO Annual Services Inquiry microdata

Appendix 4: Industry Rank Persistence – Supplementary Analysis

To supplement our analysis, we have also replicated an earlier version of the rank persistence methodology used by the CMA (2022). Unlike the 2024 study, which calculates rank persistence at the 2-digit NACE level, this approach estimates persistence at the broad sectoral level – using NACE sector letters. Specifically, this measures the number of businesses within the top ten of each industry (based on turnover) that were also in the top ten three years ago.

The y-axis measures the number of businesses that were in the top ten from three years earlier that have maintained their position within the top 10 at the sectoral letter level. For example, in 2015, we see on average, that seven of the top ten businesses at the sectoral level were also in the top ten in 2012. At the aggregate level we observe a slight upward trend, beginning with just below seven businesses rising to above seven businesses on average maintaining their top ten position.

Figure A: Aggregate Industry Rank Persistence

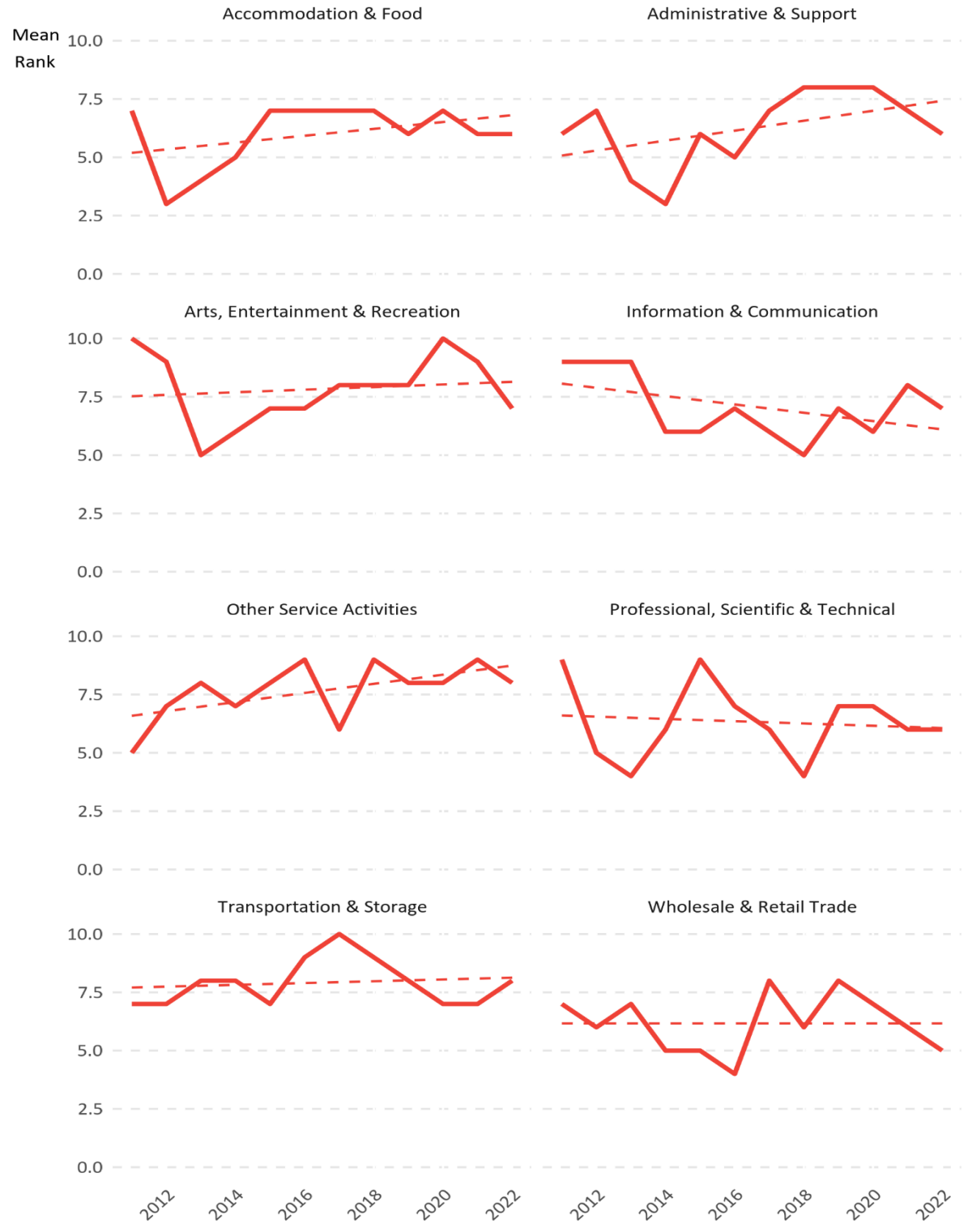


Source: CCPC analysis using CSO Annual Services Inquiry microdata

While most industries have shown increasing rank persistence over time, two notable exceptions are *Professional Activities* and *Information & Communication*. Both have

experienced with the latter showing a significantly steeper drop. *Information & Communication* has a much steeper decline than Professional Activities. Although *Information & Communication* had much higher levels of industry rank persistence in its earlier years.

Figure B: Industry Rank Persistence by Industry



Source: CCPC analysis using CSO Annual Services Inquiry microdata

Transport & Storage, Arts & Entertainment Activities and *Other Service Activities* have shown the highest levels of rank persistence as well as an upward trend in this measure. These industries recorded a rank persistence of nine in numerous years. *Transport & Storage* and *Arts & Entertainment Activities* have illustrated a rank persistence score of ten in some years. This essentially states that the ten businesses at the top of these industries have maintained their position in the top ten from three years previously.

The steepest upward trends *occur in Administration & Support Service Activities, Other Service Activities* and *Accommodation & Food Services*. The most pronounced downward trends were present in *Accommodation & Food Services* and the *Information & Communication* industries. Although it must be noted that this can be attributed to the significantly higher levels present in earlier years.

Appendix 4: Productivity Literature and Measures

Productivity and total factor productivity (TFP) are influenced by an interplay of a range of different factors. When examining productivity growth, it is important to consider the various processes that may be behind it. Pilat (1996) points out three ways to growth: the result of innovative activities, reduced (technical) inefficiencies, entry of efficient businesses and exit of inefficient businesses (creative destruction).[40] Key drivers of these processes include the level of competition in the market (European Commission 2024) which can spur innovation and force inefficient businesses to exit; the quality and accumulation of human capital (Griffith *et al.* 2004; Botrić *et al.* 2017),[41] which enhances both direct production lines and the firm's ability to adopt new technologies; and the scale of investment in research and development (R&D) and in information communication technologies (ICT), which can fuel both knowledge diffusion and technological progress (Gehringer *et al.* 2016).[42] In addition, globalisation and openness to trade and foreign direct investment can influence productivity by exposing businesses to new ideas and competitive pressures, though their effects may vary by industry and region.

Trends in TFP growth in Europe reveal a slowdown since the early 2000s, which has contributed to a widening productivity gap with the US. The European Commission (2020) observe that a few service industries, including wholesale and retail trade, business services and to a lesser degree, financial services, were at the forefront of the productivity slowdown during the mid-90s. At that time, the European Commission points out that the US experienced a revival in productivity growth, whereas in Europe these sectors lagged behind the growth opportunities associated with the ICT revolution. Despite more use of ICT and a better skilled workforce, efficiency gains from technological change did not lead to

[40] Pilat, Dirk (1996) 'Competition, productivity and efficiency', *OECD Economic Studies,* 27, pp. 108 -146.

[41] Griffith, R., Redding, S. and Van Reenan, J. (2004) 'Mapping the two faces of R&D: productivity growth in a panel of OECD industries', *The Review of Economics and Statistics,* 86: 4, pp. 883-895, available at: https://doi.org/10.1162/0034653043125194. Also see Botrić, V., Božić, Lj., and Broz, T (2017) 'Explaining firm-level total factor productivity in post-transition: manufacturing vs. services sector', *Journal of International Studies,* 10(3), pp. 77-90, available at: https://doi.org/10.14254/2071-8330.2017/10-3/6.

[42] Gehringer, A., Martínez-Zarzoso, I., and Danzinger, F.N.L. (2016) 'What are the drivers of total factor productivity in the European Union', *Economics of Innovation and New Technology,* 25: 4 (2016), pp. 406-434, available at: https://doi.org/10.1080/10438599.2015.1067007.

substantially higher productivity in Europe. However, it is noted that technology diffusion rates vary across countries.

There are variations in TFP between countries, with Southern and Eastern European economies generally underperforming relative to Northern and Western counterparts. In an earlier study performed on a sectoral basis, Gehringer *et al.* (2016) find that TFP developed smoothly between 1995 and 2007[6], with many industries, such as chemicals, electrical equipment, machinery, manufacturing and others showing an upward trend. Sectors showing mixed TFP included food, where it experienced a decline in Germany, Greece, Denmark and Hungary; textiles, which saw downward trends in Italy, Spain, Denmark, and Hungary; and transport equipment in Greece, Italy, Spain and Demark, among others. Meanwhile, countries that often experienced declines in TFP were Greece, Spain and Hungary. Countries where TFP increased included Austria, Belgium, Finland, Germany, the Netherlands, Sweden and the UK. When taken together, Gehringer *et al.* (2016) emphasise the importance of accounting for the historical experiences of Southern and Eastern European countries, which may be continuing to have an impact on TFP measurements.

The level of competition within an industry is a key factor in how industries experience productivity gains and overall growth. While it is generally accepted that increased competition leads to higher efficiency and productivity, there are three main ways in which competition affects productivity, which is adequately summed up by the European Commission (2024). The first is the 're-allocation effect' (also referred to by others as the 'between businesses'[43] or 'selection'[44] effect), where competition encourages the movement of market share from less efficient businesses to more efficient ones. As a result, the inefficient businesses may shrink and eventually exit the market, which can lead to an overall improvement in sector productivity. The second mechanism identified by the European

[43] Arnold, J. M., Nicoletti, G., and Scarpetta, S. (2008). 'Regulation, allocative efficiency and productivity in OECD countries: industry and firm-level evidence', OECD Economics Department Working Papers, Working Paper 616, available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2008/06/regulation-allocative-efficiency-and-productivity-in-oecd-countries_g17a1ac8/241447806226.pdf.

[44] Ahn, S., 'Competition, innovation and productivity growth: a review of theory and evidence', *OECD Economics Department Working Papers,* Working Paper 317, available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2002/01/competition-innovation-and-productivity-growth_g17a1474/182144868160.pdf.

Commission is the 'within business' effect.[45] This is where strong competition encourages business managers to improve their operational practices and seek more effective ways to run their businesses, where the internal drive for better performance may result in enhanced business efficiency. Third, competition can equally encourage businesses to invest in innovation, which is referred to as the 'dynamic effect'. Additionally, Giannakis and Mamuneas (2022) note that strong competition not only boosts sector productivity but also improves its ability to handle crises. This is expanded on by Biondi *et al.* (2025). On the flipside, Pilat (1996) points out that a lack of competition may reduce the pressure on businesses to use better technology, limit organisational slack and enhance overall business performance. However, the impact of competition on overall productivity depends on industry structure and market regulation, technological gaps, and the initial level of competition.

Other influential factors in the literature on TFP include human capital, R&D investment, ICT adoption, and openness to trade and foreign direct investment (FDI). Human capital, which includes education and skills, consistently emerges as the most important driver of TFP. Human capital not only directly impacts the production process but also determines a business's capacity to absorb and implement new technologies (Gehringer *et al.* 2016; Griffith *et al.* 2004). Griffith *et al.* (2004) point out R&D investment plays a dual role in fostering productivity growth. On the one hand, R&D can encourage innovation through the creation of new technologies.[46] On the other hand, it enables businesses to both adopt and adapt technologies that were developed elsewhere for their own use. ICT investment is also playing an increasingly important role, but evidence suggests that its positive effects on TFP tend to materialise with a longer time lag compared to R&D. For example, new knowledge generated through R&D can be quickly applied to improve product quality or enhance production mechanisms, whereas it typically takes businesses longer to fully integrate and use new information technologies to maximum efficiency.

[45] Giannakis, E. and Mamuneas, T. P. (2022), 'Labour productivity and regional markets resilience in Europe', *Annals of Regional Science,* 68, pp. 691-712, available at: https://doi.org/10.1007/s00168-021-01100-y.

[46] Griffith, R., Redding, S. and Van Reenan, J. (2004) 'Mapping the two faces of R&D: productivity growth in a panel of OECD industries', *The Review of Economics and Statistics,* 86: 4, pp. 883-895, available at: https://doi.org/10.1162/0034653043125194.

Edquist and Henrekson (2017) find a seven to eight year lag between the initial implementation of ICT and its measurable impact on TFP in the Swedish business sector, whereas investments in R&D were realised in TFP gains much faster.[47] They also note that the extent of this delay in realising long-term productivity benefits is linked to the level of investment in respective ICT systems. Meanwhile, in their study on the effects of broadband availability on TFP in the services sector in Ireland between 2006 and 2012, Haller and Lyons point out that broadband was only found to have significant productivity effects on two of industries – Information and Communication and Administrative & Support Services – industries where information technologies were already playing a major role.[48] They also note, however, that the roll out of high-speed forms internet in Ireland was slower than in many other developed countries.

The effects of trade and FDI on TFP have been more mixed. While trade and FDI can encourage innovation and knowledge spillovers, their effects vary across industries and countries. In some cases, globalisation pressures may even negatively affect TFP in advanced economies. In their study on TFP drivers in the EU, Gehringer *et al.* (2016) highlight that the increased flows of goods and services between countries can incentivise domestic industries to innovate to remain competitive both at home and abroad. Besides human capital and ICT, they identify 'rationalisation' – driven by European integration and the free movement of production – as an additional factor influencing TFP and productivity trends in the EU. They also note that FDI is important to both the host and home economies where the entry of foreign businesses can enhance competition, facilitate knowledge diffusion, and enable technological transfers. Javorcik (2004) similarly demonstrates that inter-industry linkages though the purchase of inputs from multi-national companies led to positive knowledge spillovers for domestic businesses in Lithuania.[49]

Bournakis *et al.* (2022) examine the interaction of these factors with competition, noting how domestic businesses may lose market share to the multi-national companies, which can

[47] Edquist, H. and Henrekson, M. (2017) 'Do R&D and ICT affect total factor productivity growth differently?', *Telecommunications Policy,* 41, pp. 106-119, available at: http://dx.doi.org/10.1016/j.telpol.2016.11.010.
[48] Haller, S. A., and Lyons, S. (2019) 'Effects of broadband availability on total factor productivity in service sector firms: evidence from Ireland', *Telecommunications Policy,* 43 (2019), pp. 11-22, available at: https://doi.org/10.1016/j.telpol.2018.09.005.
[49] Javorcik, B. S. (2004) 'Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages', *The American Economic Review,* 94 (3), pp. 605-627.

in turn spur a reallocation process within the industry.[50] This can occur at precisely the time where the multinational company may have a cost advantage, which can further enforce competition among domestic rivals. However, the impact of trade openness differs depending on the context. While Gehringer *et al.* (2016) find that trade openness within the EU only had a modest positive effect on TFP, openness in relation to non-EU countries had a significant negative impact on TFP. This suggests that globalisation pressures, especially from less developed and more cost-competitive regions – can contribute to lower TFP in some cases. Overall, trends show that productivity growth varies widely across regions and industries, with core EU countries and technologically advanced industries typically outperforming others.

TFP

TFP was estimated using a Cobb-Douglas production function approach, the model takes the form:

$$\ln(Y_{it})=\alpha\ln(L_{it})+\beta\ln(K_{it})+\varepsilon_{it}$$

where $Y_{it}$is business-level gross value added (GVA), L_{it}represents labour input (wages and salaries), K_{it}denotes capital input, and $\varepsilon_{it}$is the residual interpreted as log-TFP. All variables were log-transformed to linearise the function. Two regressions were estimated: an unweighted ordinary least squares model and a weighted model using GVA weights to account for business size. The residuals from these regressions were exponentiated to obtain TFP in levels, which were then indexed to a base year (2008 = 100) for comparability over time. To mitigate the influence of outliers, indices were trimmed at the 1st and 99th percentiles. Finally, business-level TFP indices were aggregated to the services-wide level, with weighted estimates reflecting sectoral GVA share.

[50] Bournakis, I., Papaioannou, S. and Papanastassiou, M. (2022), 'Multinationals and domestic total factor productivity: competition effects, knowledge spillovers and foreign ownership', *World Economy,* 45, pp. 3715-3750, available at: DOI: 10.1111/twec.13298.

Labour Productivity

Labour productivity is calculated as a measure of output per worker, using business-level data on GVA and employment. Labour productivity is calculated as:

$$LP_{it} = \frac{GVA_{it}}{Employees_{it}}$$

Where GVA_{it} is business-level GVA and $Employees_{it}$ is the number of persons employed at business-level. For our analysis, a natural logarithm of labour productivity was calculated:

$$\ln(LP_{it}) = (\frac{GVA_{it}}{Employees_{it}})$$

Labour productivity was then indexed to a base year (2008 = 100) to track changes over time. Both unweighted averages and GVA-weighted estimates were produced. Business-level indices were aggregated to the services-wide level.

Appendix 5: Rank Persistence Calculation

In order to calculate rank persistence, we first must identify the top ten businesses in each 2-digit NACE code(s), we do this by first

- Rank all businesses in sector s by annual turnover in descending order.
- Select the first $N = 10$businesses

$$\text{Top}_{s,t} = \{i_1, i_2, \ldots, i_{10} \mid \text{sorted by turnover in } t\}$$

When these businesses have been identified we must then calculate the level of persistent at the 2-digit level. A business is persistent if it appears in the top N(by turnover) for the current year and the previous three years:

$$\text{Persistent}_{s,t} = \{i \mid i \in \text{Top}_{s,t} \cap \text{Top}_{s,t-1} \cap \text{Top}_{s,t-2} \cap \text{Top}_{s,t-3}\}$$

In order to compute figures for this in each year we gather the amount of businesses that we define as persistent and divide by N.

$$RP_{s,t} = \frac{|\ \text{Persistent}_{s,t}\ |}{N}$$

Where:

- $N = 10$(top 10 businesses by turnover)
- $|\cdot|$denotes the number of businesses in the set

We additionally, calculate the weights of each two-digit Nace code(s) by dividing the total turnover of s divided by the sectoral level.

$$w_{s,t} = \frac{\text{Turnover}_{s,t}}{\text{Turnover}_{L,t}}$$

Where:

- $\text{Turnover}_{s,t}$= total turnover of sector s
- $\text{Turnover}_{L,t}$= total turnover of all sectors under letter L

Finally, we multiply the persistent figures that have been gathered by it's appropriate weighing in order to produce results at the aggregate level in addition to the sectoral results.

$$RP_{L,t} = \sum_{s \in L} w_{s,t} \cdot RP_{s,t}$$

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