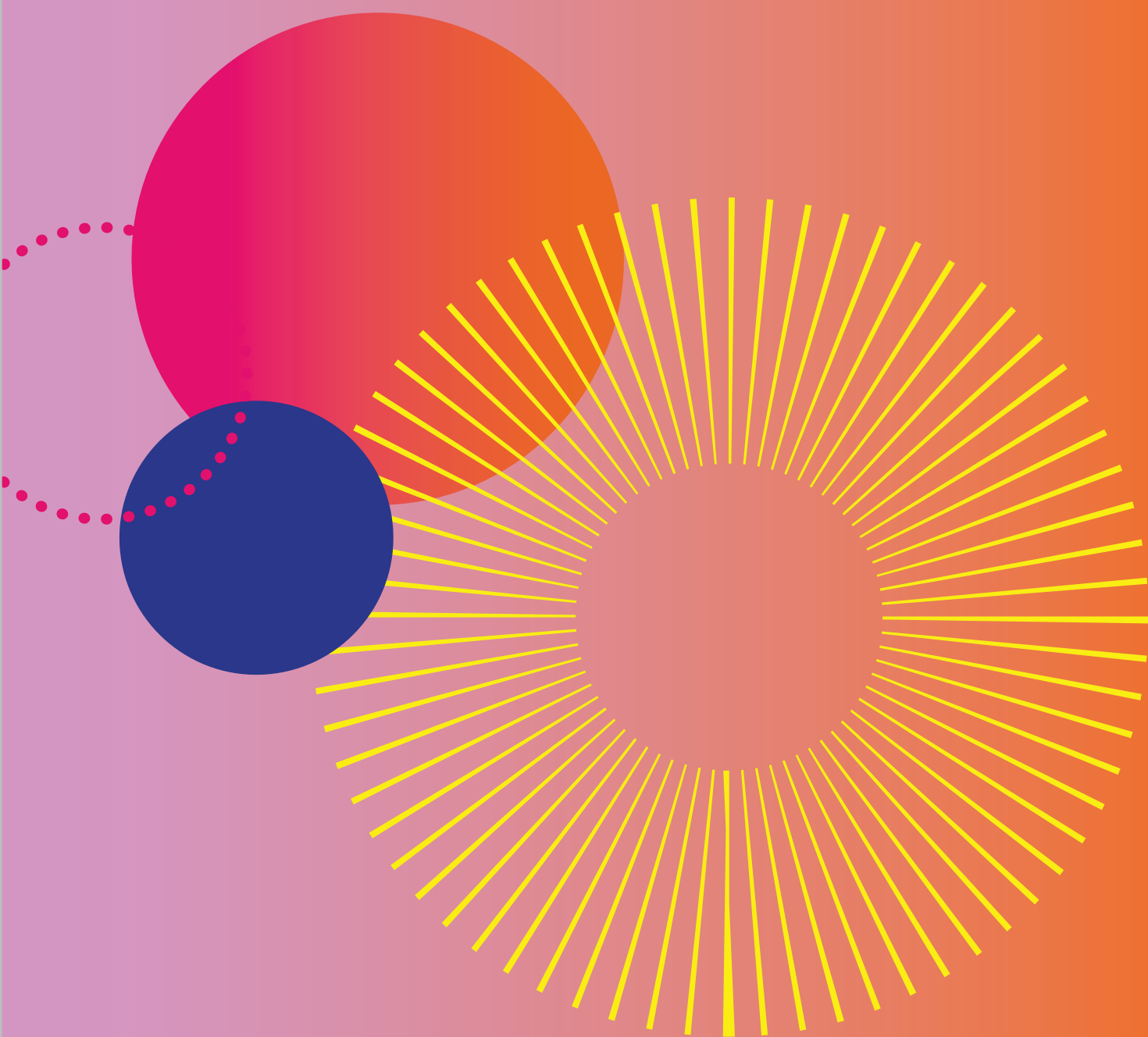
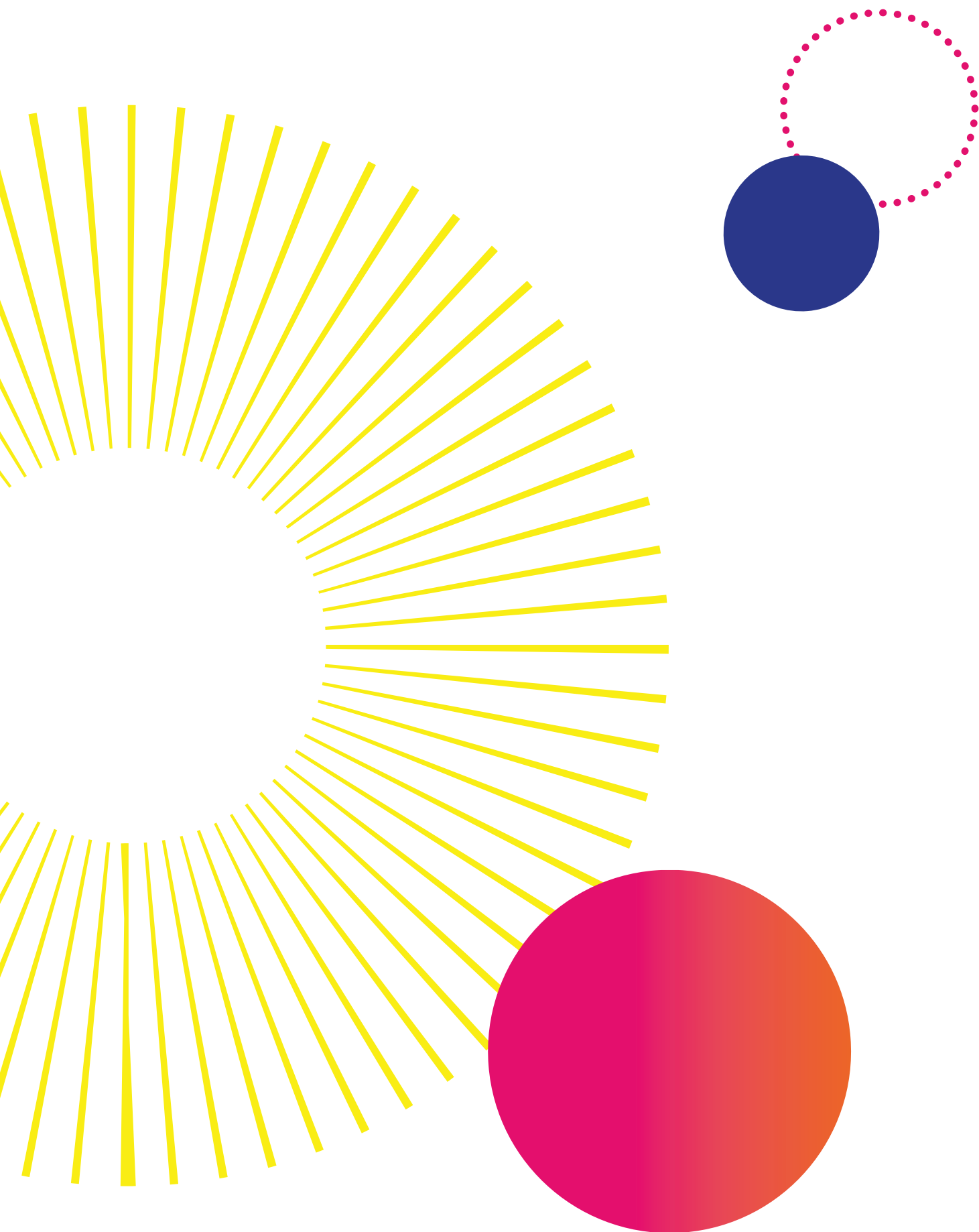


Shifting Sands

Navigating the patterns emerging
in the Irish labour market post-COVID-19





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About SOLAS and the SLMRU

SOLAS is the Further Education and Training Authority in Ireland. The Skills and Labour Market Research Unit (SLMRU) in SOLAS is a central data gathering, analytical and research resource to monitor the supply and demand of skills in Ireland's labour market. The Unit supports the work of SOLAS, the National Skills Council as well as other government bodies. The National Skills Bulletin, published annually, is the Unit's key output, summarising labour market trends at occupational level and identifying skills shortages and difficult-to-fill vacancies. This, along with other publications, allows education and training providers in Ireland to make data-informed decisions on programme content as well as providing relevant labour market information for school leavers and job seekers making career decisions.

The SLMRU has commissioned Emsi Burning Glass to analyse online job advertisements in order to capture the jobs and skills most in demand by employers in Ireland, and to identify career pathways, particularly for those whose employment has been impacted by COVID-19. Combined with insights from other labour market analyses, online job advertisements can help ensure that skills delivery in Ireland matches the needs of learners and employers alike.



About Emsi Burning Glass

Emsi Burning Glass delivers job market analytics that empower employers, workers, and educators to make data-driven decisions. The company's artificial intelligence technology analyses hundreds of millions of job postings and real-life career transitions to provide insight into labour market patterns. This real-time strategic intelligence offers crucial insights, such as what jobs are most in demand, the specific skills employers need, and the career directions that offer the highest potential for workers. For more information, visit Emsibg.com.

Authors

By Julia Nitschke, Rucha Vankudre, and Bledi Taska, with a special thank you to Mauro Pelucchi for his assistance with data collection and parsing.

Foreword

The impact of the COVID-19 pandemic put into sharp focus both the fragile nature of some occupations and working environments in Ireland but also the rapid acceleration of a future world of work not previously imaginable. It became evident across 2020 and into 2021 that it would be necessary to explore how the pandemic may be shaping the Irish labour market, not just from a national skills perspective but also at an occupational level.

This report, commissioned by SOLAS and led by the Skills and Labour Market Research Unit, in partnership with Emsi Burning Glass, sets out key areas of focus to help us shape the current and future skills requirements to respond to what is now a different landscape in Ireland.

The *Future FET: Transforming Learning National Strategy 2020-2024* sets out a vision for the FET system based on the key pillars of Building Skills, Fostering Inclusion and Creating Pathways. This report explores many aspects relevant to these strategic priorities; by identifying hard hit occupations and applying innovative skills adjacency modelling to provide potential pathways to future careers; by examining the occupations and jobs in demand and crucially, the skills required by employers for these occupations. The skills needs identified, which are generated through robust analysis of job vacancy postings in Ireland, are presented both in terms of 'growth' skills as well as 'demand' skills.

This research is critical for us in SOLAS and the Further Education and Training system, but it is equally of value across the wider tertiary education landscape and to many stakeholders navigating the skills needs for employers, for employees, for those seeking employment and for many people potentially displaced by the pandemic. Although employment levels in Ireland are now rising and the economic environment has improved there remain uncertainties.

There is no doubt the unevenness of the pandemic will have an influence on the current and future working environment. The report therefore also examines changing employment trends as well as labour market tightness, particularly in areas such as remote working environments and the benefits being offered by employers to potential employees. Given the need to respond to the current international crisis affecting Ukraine, it will also serve as a valuable resource.

This report makes it clear there are shifting sands in the Irish labour market with many aspects to navigate. There are opportunities to upskill and change careers, as well as to perhaps revolutionise some working environments. Skills that may not have been anticipated for certain jobs are now in demand and perhaps are growing in demand.

I hope this research will be beneficial to many stakeholders; it is a unique collaboration between SOLAS and a well-established global research partner, presenting an outlook for us all to consider in the context of current and future jobs, from the perspective of Irish employers.



Andrew Brownlee
CEO



Executive Summary

This report presents an analysis of the current state of the Irish labour market, and in particular an assessment of job displacement and the jobs and skills that can help displaced workers regain employment in Ireland. It offers a starting point for those requiring re-employment and identifies top job opportunities for the communities facing the most displacement, whether due to the pandemic or other factors.

- The first section analyses COVID-19's differential impact on the labour market by identifying occupations that had strong demand throughout both 2020 and 2021. Top occupations can be found across an array of job families, including Business Management and Operations, Manufacturing and Production and Healthcare. Within these in-demand occupations, we identify the top skills required by employers. We find that common skills across these occupations include customer service, budgeting, project management and data-related skills.
- Next, we investigate changing trends in skills with respect to selected job families, identifying how changes from COVID-19 and underlying labour market trends such as digitalisation have impacted these roles. We find that Manufacturing and Production occupations have become more technical over time while Finance occupations are increasingly looking for soft skills along with content expertise. Information Technology occupations are becoming more focused on data analysis and associated skills.
- In the following section, we identify jobs that were negatively affected by the pandemic and have not recovered. We use skill adjacency models to suggest career pathways based on two-step transitions into upwardly-mobile occupations with similar levels of education that could serve as lifeboats for displaced workers. We also identify the skills necessary to make these transitions so that training providers and workers have an understanding of what reskilling or upskilling efforts are required.
- Finally, we investigate labour tightness in the current job market by observing trends in the benefits offered by employers, including remote work availability and willingness to train new employees. We find that Manufacturing and Production; Construction, Extraction and Architecture; Transportation; Marketing and Public Relations; and Business Management and Operations show evidence of labour tightness across most components.

This report provides key insights to policymakers and workers looking to understand the effect of COVID-19 on the Irish labour market and highlights opportunity for reskilling and upskilling to help get displaced workers in-demand jobs.

Methodology

Using online job ads data

Online job posting data can provide insight into labour market trends in ways that are complementary to traditional data. This report uses a proprietary dataset collected by Emsi Burning Glass that includes more than 1 million unique online job postings in Ireland that have been collected since 2019. To build and maintain this database of job postings, Emsi Burning Glass collects job postings from close to 1,000 online job boards, newspapers, and employer sites on a daily basis and deduplicates postings for the same job, whether it is posted multiple times on the same site or across multiple sites. The online ads are then classified by location, employer, occupation, education required, skills required and any other type of information that can be extracted from the ad. The insights from these data provide a timely view of trends in the labour market because they allow for a detailed, real-time look at the skills employers seek.

Occupation and Skill Taxonomies

Key to this methodology is the ability to analyze skill demand and skill transferability in highly granular ways. Emsi Burning Glass draws on its industry-leading occupational and skill taxonomies. Based on analyses of real-time job titles and requirements for skills and education, Emsi Burning Glass Global Occupation Taxonomies were adapted to more accurately reflect current employer demand— separating out distinct occupations that the UK Standard Occupational Classification (SOC) system codes as one occupation in some cases, and consolidating similar occupations where real-time employer requirements did not vary significantly between job categories. The combination of BGTOCCS and the granularity that the Emsi Burning Glass data offers is a powerful tool for labour market analysis. However, in all cases, we also map BGTOCCs back to UK SOCs based on best fit so that results can be compared across reports.

Mapping Career Pathways

Traditionally, understanding potential career pathways is based on following transitions we have observed individuals make in the past. By looking at the previous transitions of individuals in similar occupations, we can make guesses about the likelihood of others making those same transitions. However, this method does not necessarily work in an environment where entire industries (e.g. Hospitality during COVID-19) may have been suffering from decreased demand.

Instead, we propose using a skill adjacency model to suggest potential pathways. By focusing on skill adjacency, we match occupations based on similarity of crucial job tasks, rather than previously realized transitions. This allows us to look for transitions that might make sense in the future, even if they are not yet common. We focus on three key factors in mapping skill adjacent career pathways:

- 1. Possibility:** Skill overlap between occupations
- 2. Feasibility:** Similar educational requirements, and stable or growing demand
- 3. Desirability:** Positive salary differentials

Using this methodology, we create a roadmap for helping individuals survive and thrive amidst economic uncertainty. In the case of this report, we define possibility as having three overlapping skills when comparing the top 10 skill lists for the hard-hit occupation and next-step occupation. Feasibility requires that the next-step occupation is growing from 2019-2020 and 2019-2021 and has at least 200 postings in 2021. Additionally, the education level of the next step occupation is at or below the level of the hard-hit occupation. Finally, desirability requires that the salary is higher for the next step occupation.

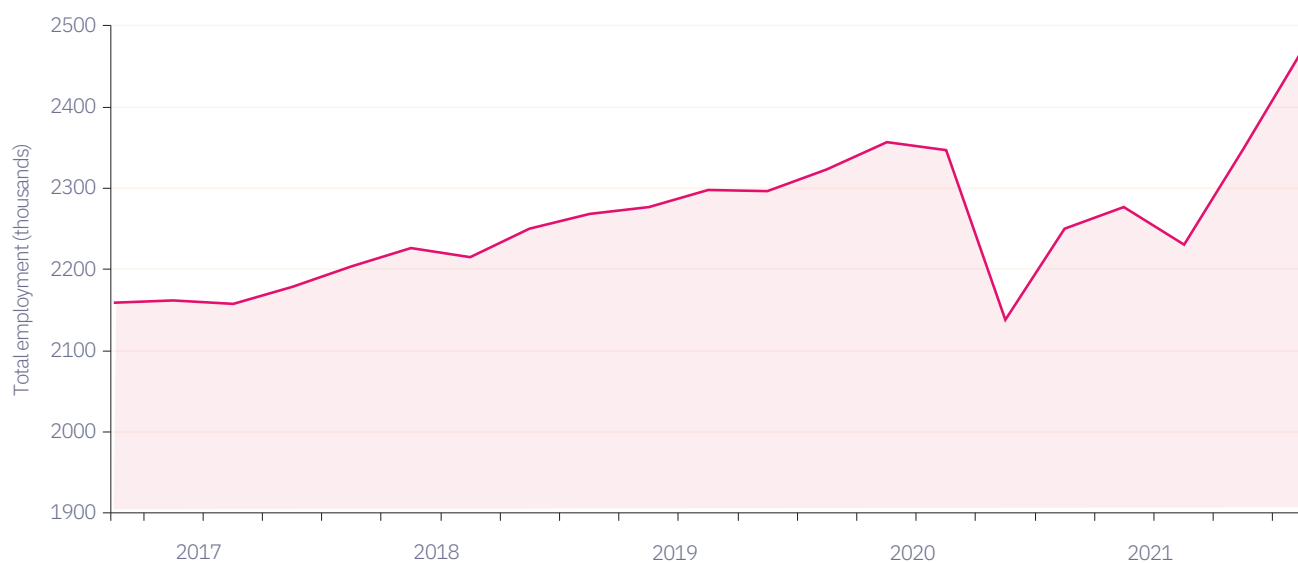
Introduction and Context

The Labour Market in Ireland

The COVID -19 pandemic had severe impacts on economies across the world. Employment in many countries plummeted and Ireland was no exception. At the beginning of the pandemic, employment dropped from 2.35 million in the first quarter of 2020 to 2.14 million in the second quarter of 2020, a decrease of 9 percent.

By 2021, the economy was quickly recovering, and employment had been growing consistently, particularly towards the end of the year. In the third quarter, it was up to 2.47 million the highest level recorded in the past twenty years.

Fig 1. Total Quarterly Employment in Ireland, aged 15-89



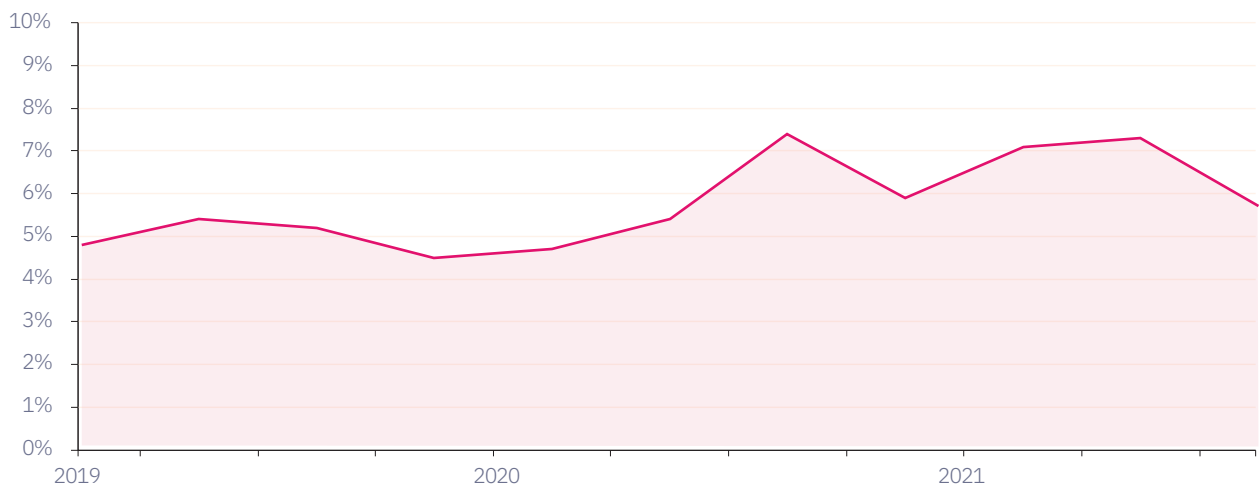
Source: Central Statistics Office, Ireland

Monthly unemployment data paints a slightly different picture. The unemployment rate spiked in the third quarter of 2020 and while it declined thereafter, it has remained higher than pre-pandemic levels.

In terms of monthly job postings data, we see a large drop between March and July 2020 during the height of the pandemic. Postings started to recover in late 2020 and were back at January 2020 levels by spring 2021, continuing to grow through the summer.

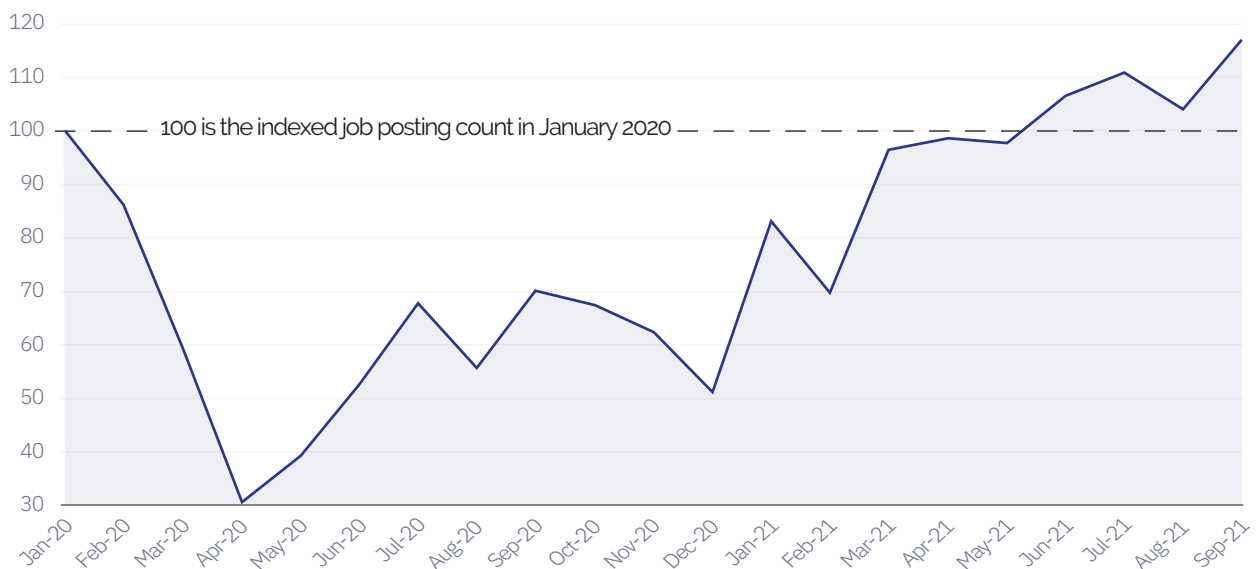
In light of these trends, it is clear that there are a still a number of persons requiring re-employment and that understanding current labour market dynamics at the occupation level is crucial to helping reduce unemployment. In the next section of this report, we examine trends in demand data to determine which occupations are growing and the skills needed to make successful transitions.

Fig 2. Total Quarterly Unemployment Rate in Ireland, aged 15-74



Source: Central Statistics Office, Ireland

Fig 3. Index of Job Posting Counts in Ireland



Source: Emsi Burning Glass

Top Growing Occupations

To understand which occupations are playing a growing role in Ireland's labour market, we compared occupation posting numbers between 2019 and 2021. Top Growing Occupations are those that show a large increase in market share, which demonstrates an increasing importance in today's economy and makes these occupations good bets for job-seekers. For each

of these occupations, we list the top 5 skills requested by employers. Top occupations can be found across an array of job families, including Business Management and Operations, Manufacturing and Production and Healthcare. Common skills across these occupations include customer service, budgeting, project management and data related skills.

Table 1. Top Growing Occupations

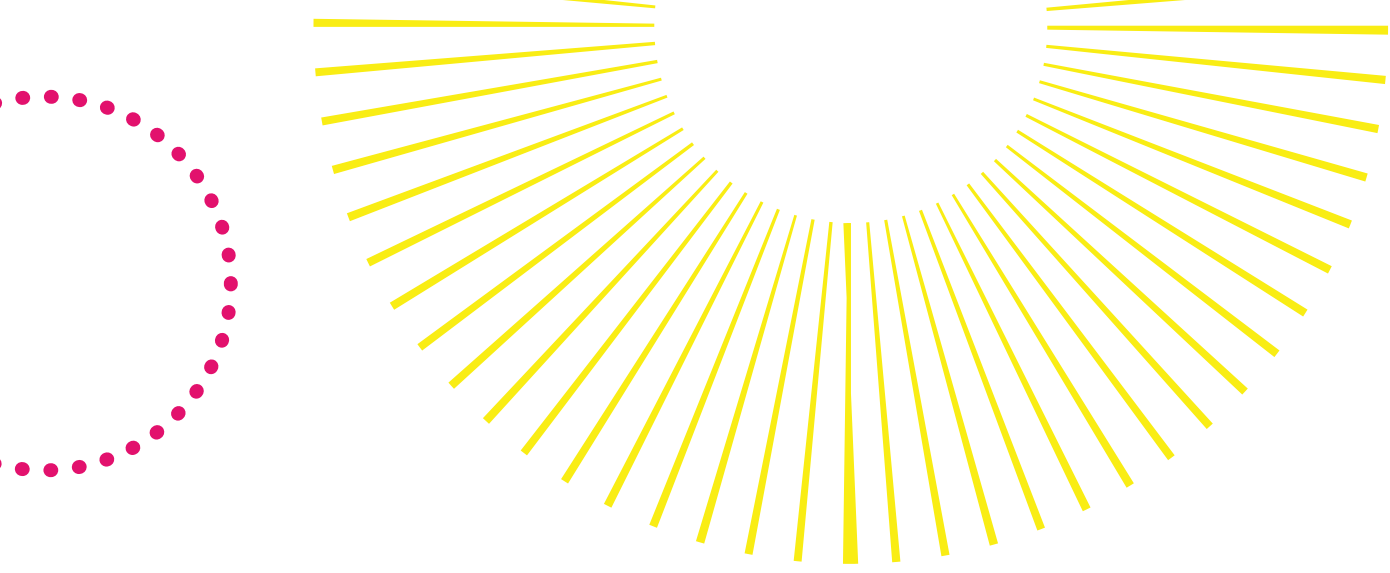
Job Family	Occupation	SOC4*	SOC4 Occupation Group Name	Occupation Share of All Postings in Jan-Sep 2019	Occupation Share of All Postings in Jan-Sep 2021	Percent Change in Occupation Share Jan-Sep 2019 to 2021	Top 5 skills
Transportation	Delivery Driver	8212	Van drivers	0.38%	0.94%	149%	Customer Service, Forklift Operation, Product Sales, Sorting, Heavy Lifting
Construction, Extraction, and Architecture	Electrician	5241	Electricians and electrical fitters	0.19%	0.43%	120%	Electrical Work, Wiring, Predictive / Preventative Maintenance, Electrical Systems, Customer Service
Transportation	Truck Driver	8211	Large goods vehicle drivers	0.19%	0.41%	110%	Haulage, Customer Service, Forklift Operation, Product Sales, Logistics
Healthcare	Nursing Assistant	6141	Nursing auxiliaries and assistants	0.38%	0.77%	105%	Patient Care, Working With Patient And/Or Condition: Mental Health, Care Planning, Dementia knowledge, Midwifery
Business Management and Operations	Labourer / Warehouse Worker	9260	Elementary storage occupations	0.35%	0.69%	96%	Forklift Operation, Cleaning, Sorting, Heavy Lifting, Customer Service
Manufacturing and Production	Manufacturing Machine Operator	5449	Other skilled trades n.e.c.	0.21%	0.38%	78%	Computer Numerical Control (CNC), Machining, Packaging, Cleaning, Engineering Drawings
Hospitality, Food, and Tourism	Restaurant / Food Service Supervisor	5436	Catering and bar managers	0.36%	0.57%	56%	Customer Service, Restaurant Management, Budgeting, Staff Management, Cost Control
Sales	Retail Sales Associate	7111	Sales and retail assistants	0.60%	0.93%	54%	Sales, Customer Service, Retail Industry Knowledge, Retail Sales, Product Sales
Manufacturing and Production	Production Worker	8139	Assemblers and routine operatives n.e.c.	0.47%	0.69%	45%	Cleaning, Packaging, Quality Assurance and Control, Production Planning, Hand Tools

* This is the mapping of Global Occupation to the UK SOC taxonomy

Table 1 (Continued). Top Growing Occupations

Job Family	Occupation	SOC4*	SOC4 Occupation Group Name	Occupation Share of All Postings in Jan-Sep 2019	Occupation Share of All Postings in Jan-Sep 2021	Percent Change in Occupation Share Jan-Sep 2019 to 2021	Top 5 skills
Information Technology	Data Engineer	3131	IT operations technicians	0.18%	0.26%	43%	SQL, Python, Extraction Transformation and Loading (ETL), Data Engineering, Pipeline (Computing)
Marketing and Public Relations	Product Manager	3545	Sales accounts and business development managers	0.40%	0.56%	41%	Product Management, Product Development, Product Sales, Stakeholder Management, Project Management
Sales	Retail Store Manager / Supervisor	7130	Sales supervisors	1.00%	1.40%	40%	Store Management, Retail Industry Knowledge, Key Performance Indicators (KPIs), Retail Management, Customer Service
Construction, Extraction, and Architecture	Construction Manager	1122	Production managers and directors in construction	0.16%	0.22%	36%	Project Management, Budgeting, Construction Management, Site and Study Management, Customer Service
Planning and Analysis	Medical Scientist	2112	Biological scientists and biochemists	0.22%	0.30%	34%	Pathology, Biochemistry, Microbiology, Quality Assurance and Control, Haematology
Science and Research	Researcher / Research Associate	2426	Business and related research professionals	0.39%	0.52%	34%	User Research, Market Research, Experiments, Data Analysis, Project Management
Maintenance, Repair, and Installation	Repair / Service Technician	5223	Metal working production and maintenance fitters	0.20%	0.27%	33%	Customer Service, Technical Support, Mechanical Engineering, Predictive / Preventative Maintenance, Mechanical Maintenance
Community and Social Services	Social Care Worker	2442	Social workers	0.23%	0.30%	33%	Social Work, Child Protection, Working With Patient And/Or Condition: Mental Health, Care Planning, Family Support
Business Management and Operations	Storage / Distribution Manager	1162	Managers and directors in storage and warehousing	0.18%	0.24%	32%	Warehouse Management, Key Performance Indicators (KPIs), Budgeting, Project Management, Stakeholder Management
Healthcare	Home Health Aide	6145	Care workers and home carers	0.25%	0.33%	31%	Care Planning, Senior Care, Meal Preparation, Home Care, Dementia knowledge

* This is the mapping of Global Occupation to the UK SOC taxonomy



Top Skills by Job Family

Next, we identify the top skills in a selection of job families in terms of both demand and growth to understand patterns in how skill demand has changed in occupations.

Transportation

Looking first at jobs in Transportation, there has been a growing emphasis on occupational health and safety as well as on Customer Service and Customer Contact Skills, demonstrating an increase in focus on human skills that have become more crucial for the industry likely due to the pandemic. Additionally, requests for sales skills have been growing as well.

Fig 4. Top Growing Transportation Skills

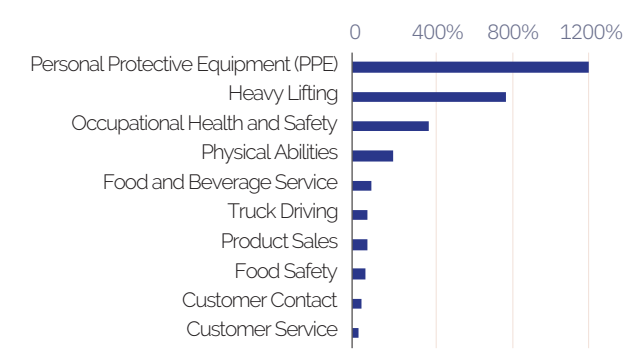
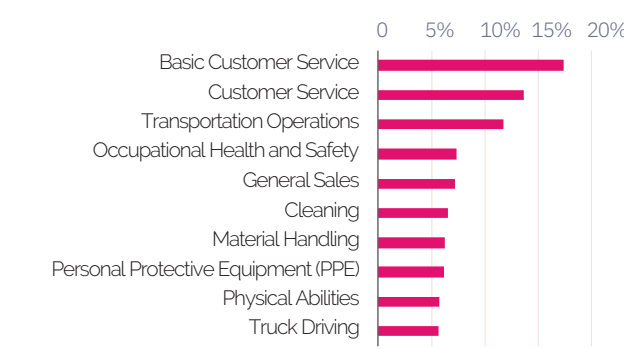


Fig 5. Top Demanded Transportation Skills



Manufacturing and Production

Within the Manufacturing and Production job family, occupations have become more technical in nature, with growing demand for Computer-aided Manufacturing and Computer Numerical Control (CNC). Quality Assurance and Control is the most demanded skill, with over 30% of postings in Manufacturing and Production requesting this specific skill.

Fig 6. Top Growing Manufacturing and Production Skills

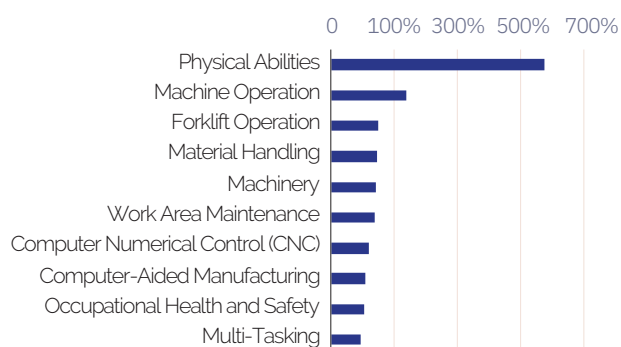


Fig 7. Top Demanded Manufacturing and Production skills



Finance

In the Finance job family, top growing skills include interpersonal and human skills, including Creativity, Verbal/Oral Communication, Mentoring, and being a Self-Starter. This contrasts with the top demanded skills, almost all of which focus on job-specific tasks and knowledge. Interestingly, this marks a shift towards placing greater value on soft skills in the traditionally content-focused Finance job family.

Fig 8. Top Growing Finance Skills

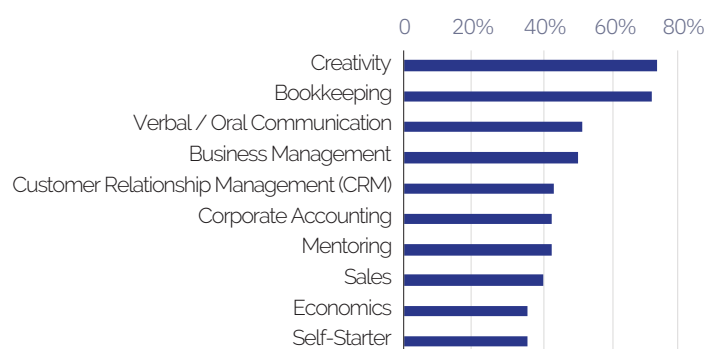


Fig 9. Top Demanded Finance skills



Information Technology

Within Information Technology jobs, there is an increased demand for data analysis and associated skills such as Data Techniques, Machine Learning, and PostgreSQL. Most of the top demanded skills are related to Software Development, as that occupation tends to dominate the overall IT job family.

Fig 10. Top Growing Information Technology Skills

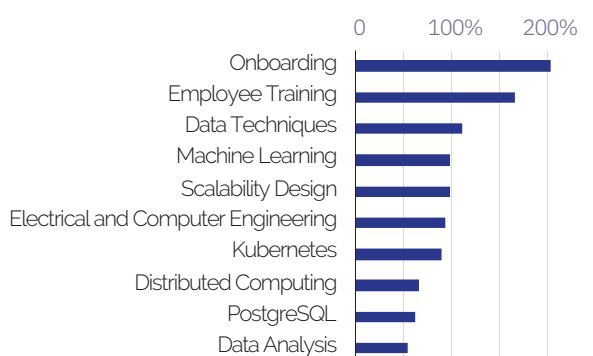
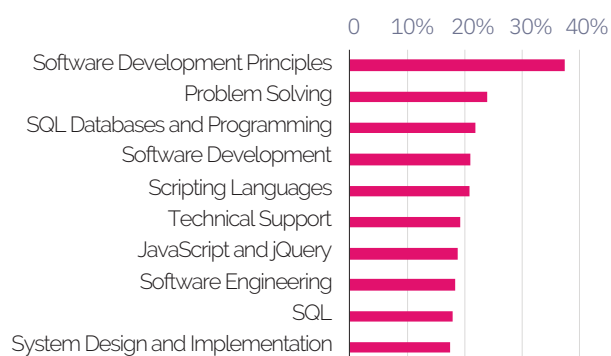


Fig 11. Top Demanded Information Technology skills



Hospitality, Food, and Tourism

Finally, looking at occupations within the Hospitality, Food, and Tourism job family, we see a growing emphasis on cleaning and occupational health and safety, a trend that is present in other countries as well after the emergence of the pandemic.

Fig 12. Top Growing Hospitality, Food, and Tourism Skills



Fig 13. Top Demanded Hospitality, Food, and Tourism skills



Reskilling and Upskilling Opportunities

With a clearer idea of the growing occupations and skills in the economy, we now turn our attention specifically to reskilling and upskilling opportunities for individuals whose occupations were negatively affected by the COVID-19 pandemic. We first identify the jobs which had the largest decrease in demand and have not recovered in 2021. These are occupations that should be focus areas for reskilling and upskilling. They are found across a variety of job families, including Hospitality, Food and Tourism; Clerical and Administrative, and Finance among others.

Several trends emerge. First, occupations focused around events and the gathering of large groups of people, such as Event Specialist and Reservation/Ticket Agent had large decreases. Second, jobs focused on maintaining spaces that shutdown during the pandemic, such as Administrative / Office Manager, and Facilities Manager were hard-hit. Third, the pandemic seems to have exacerbated underlying trends toward automation, perhaps for health safety and cost reasons. Meanwhile, jobs that are at high risk for automation, such as Insurance Underwriter, Payroll Specialist, and Legal Secretary, had large decreases in demand.

Table 2. Hard-Hit Occupations

Job Family	Occupation	SOC4*	SOC4 Occupation Group Name	Occupation Share of All Postings in Jan-Sep 2019	Occupation Share of All Postings in Jan-Sep 2021	Percent Change in Occupation Share Jan-Sep 2019 to 2021	Occupation Share of All Postings in Mar-Dec 2019 to 2020	Percent Change in Occupation Share March-Dec 2019 to 2020
Hospitality, Food, and Tourism	Event Specialist	3546	Conference and exhibition managers and organisers	0.17%	0.11%	-36%	0.06%	-61%
Clerical and Administrative	Legal Secretary	4212	Legal secretaries	0.32%	0.12%	-62%	0.12%	-60%
Hospitality, Food, and Tourism	Reservation / Ticket Agent	7219	Customer service occupations n.e.c.	0.18%	0.16%	-7%	0.06%	-56%
Clerical and Administrative	Administrative / Office Manager	4161	Office managers	0.29%	0.14%	-53%	0.15%	-52%
Finance	Insurance Underwriter	3533	Insurance underwriters	0.15%	0.07%	-53%	0.07%	-47%
Finance	Payroll Specialist	4122	Book-keepers, payroll managers and wages clerks	0.34%	0.20%	-39%	0.19%	-44%
Business Management and Operations	Facilities Manager	4161	Office managers	0.12%	0.10%	-16%	0.08%	-30%

* This is the mapping of Global Occupation to the UK SOC taxonomy

Career Pathways

The next stage in our reskilling analysis is to select next-step occupations that provide viable transition options for workers in each of the hard-hit occupations. Relying on the skill adjacency model (as described in the methodology section), we look for transitions with high demand, salary growth and education and skill overlap.

We then repeat this process to find target occupations that are viable transitions from the next-step occupations. We present our two step career pathways for the hard-hit occupations below.

Fig 14

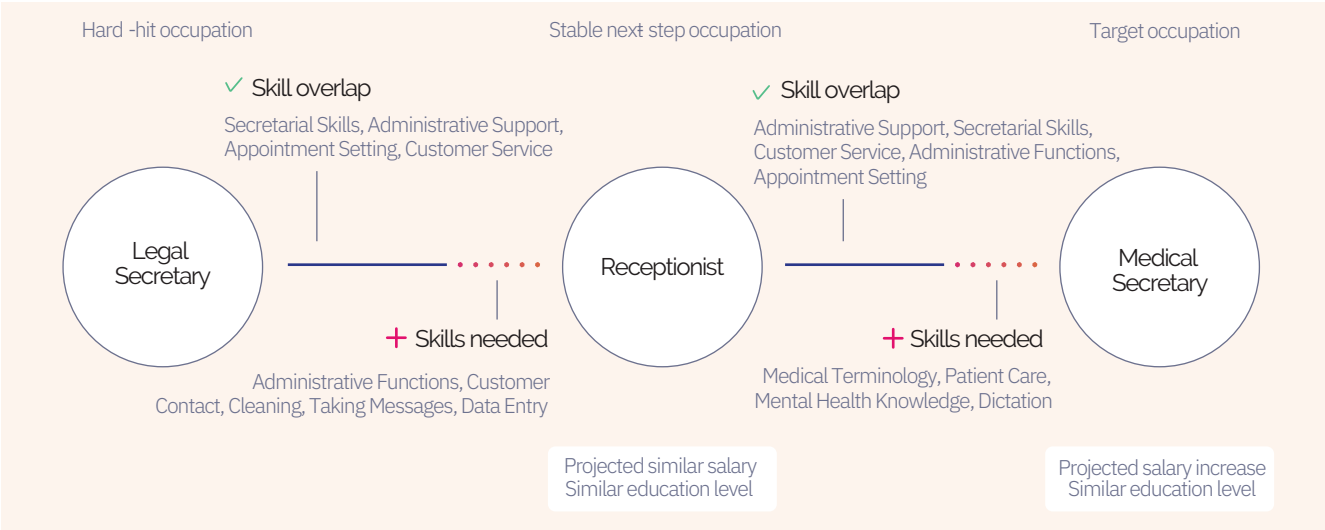


Fig 15

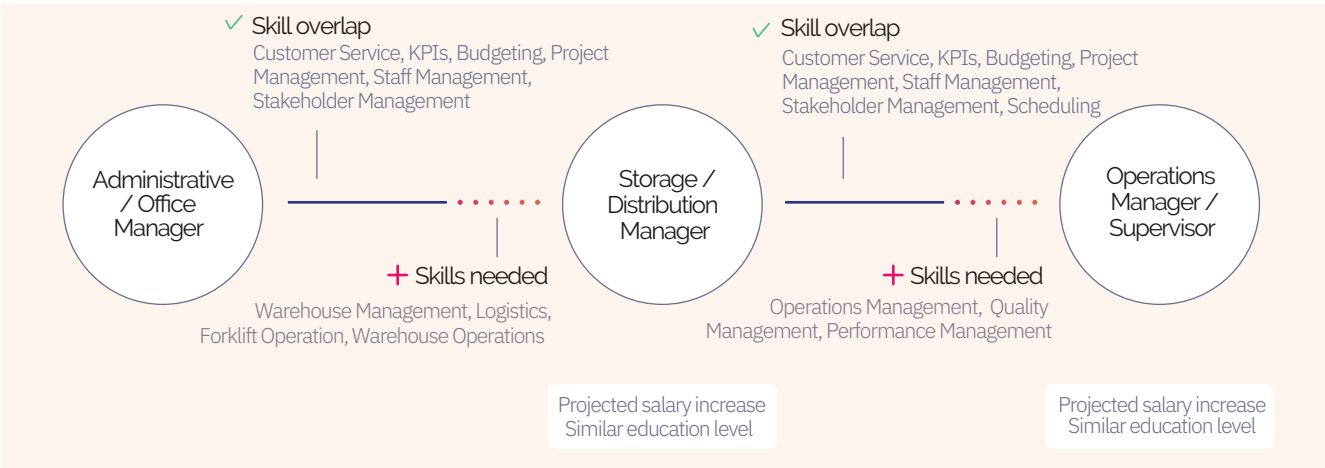


Fig 16

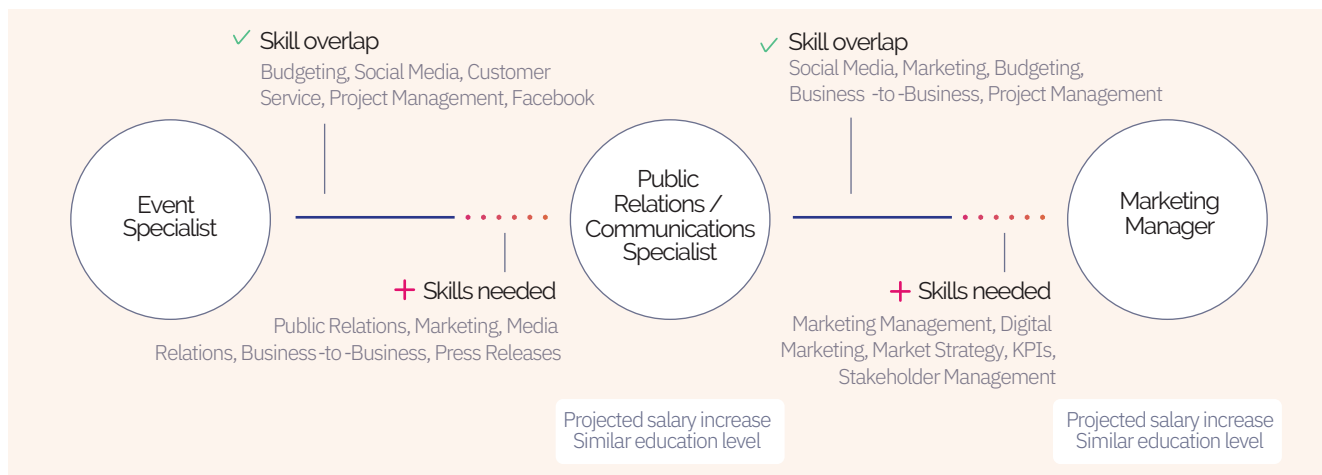


Fig 17

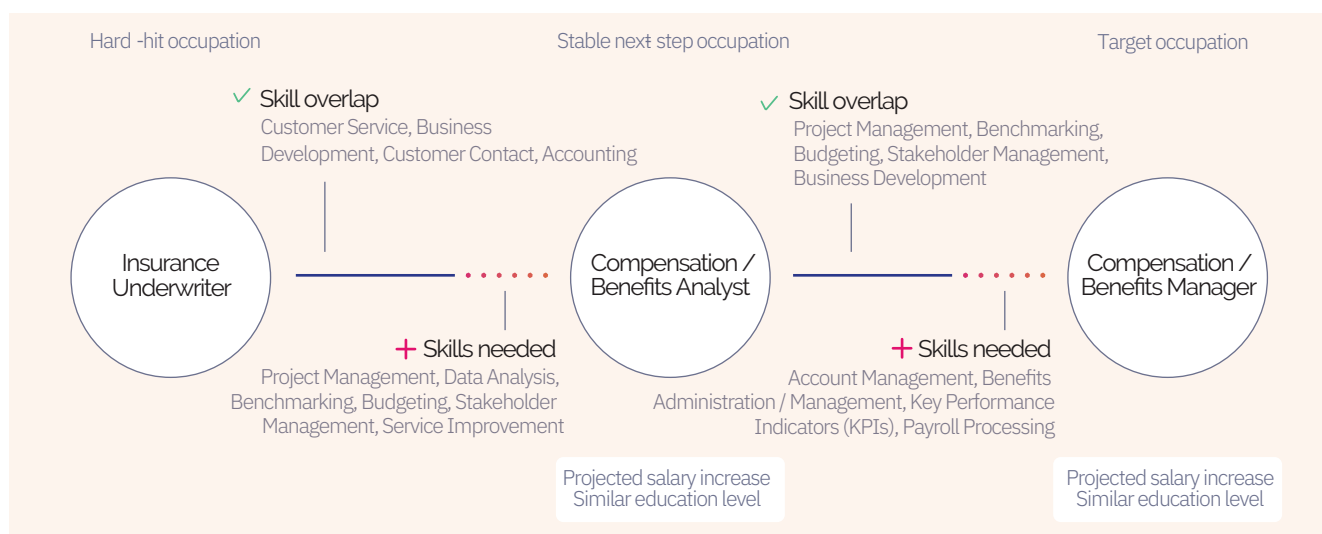


Fig 18

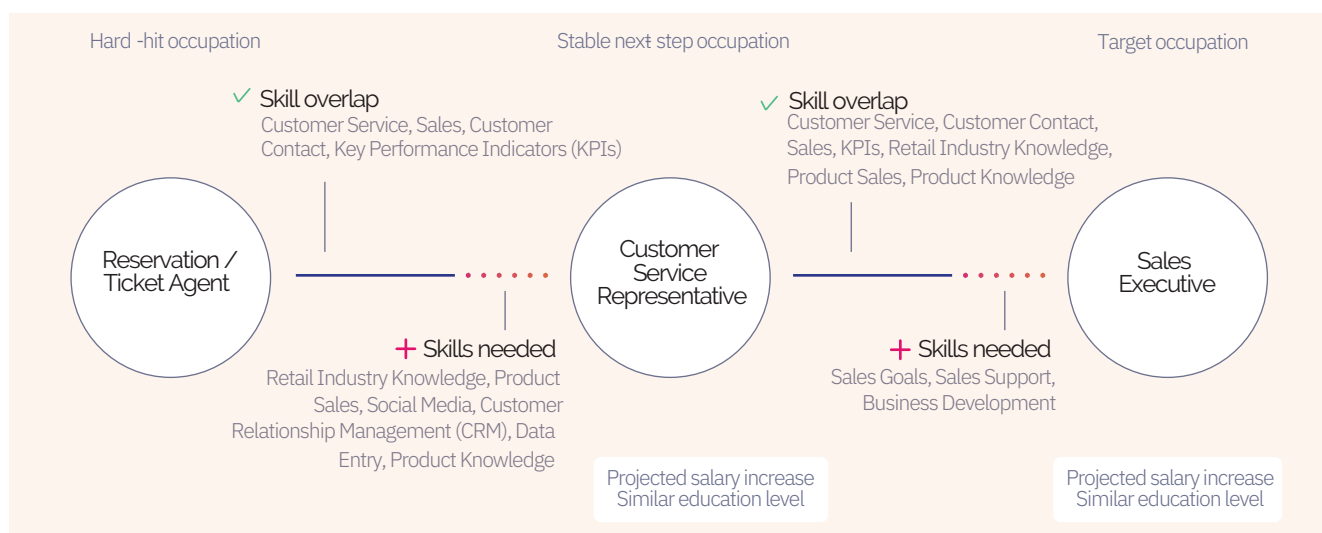


Fig 19

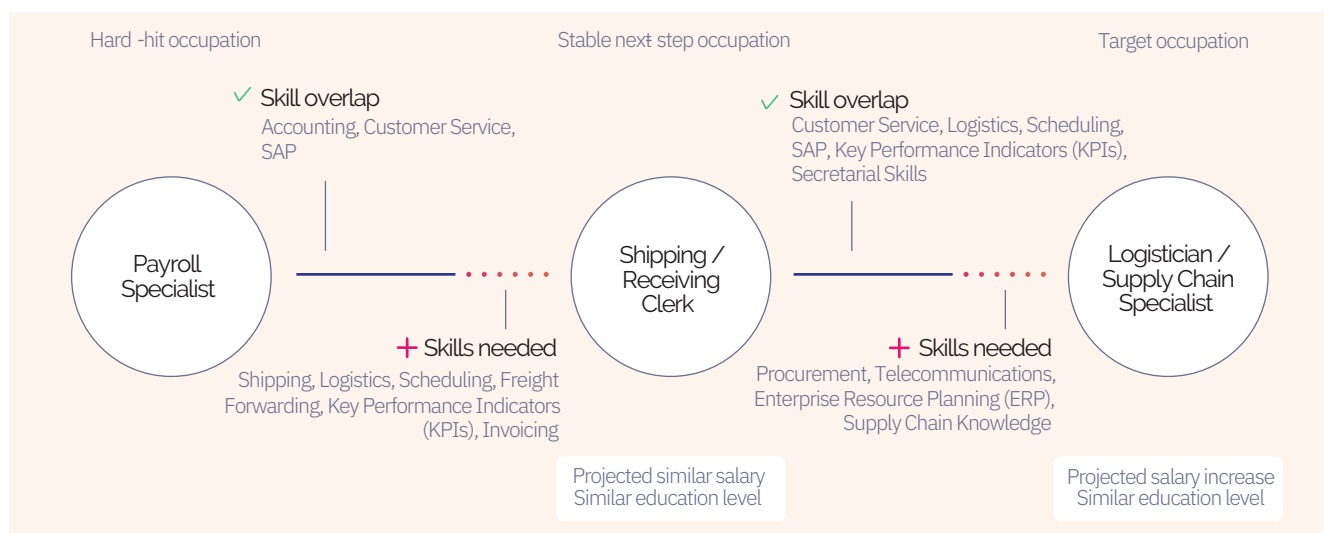
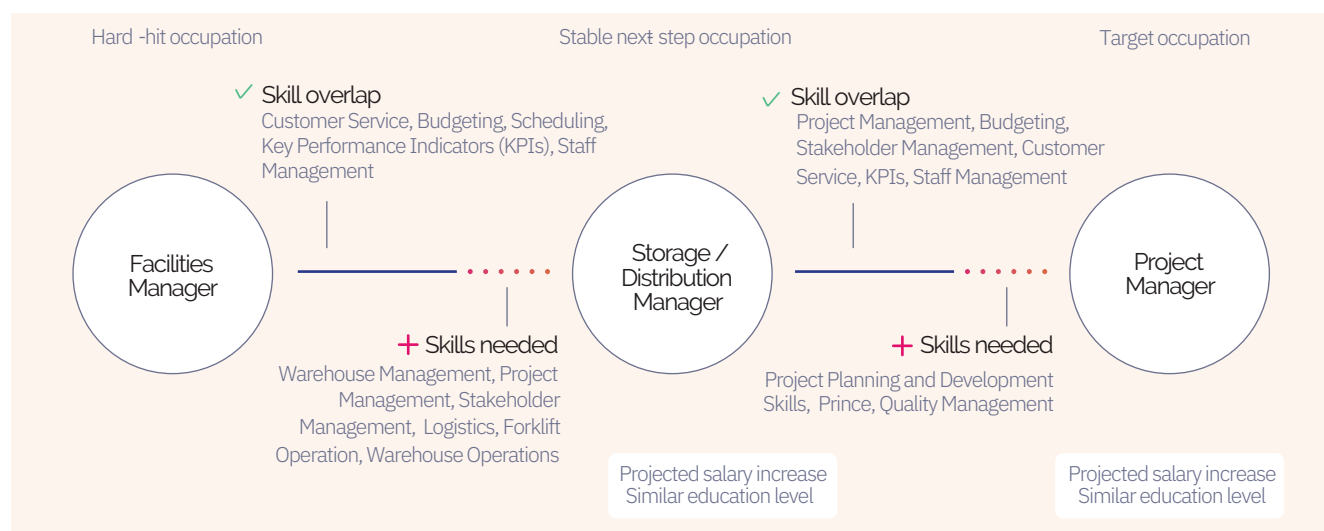


Fig 20



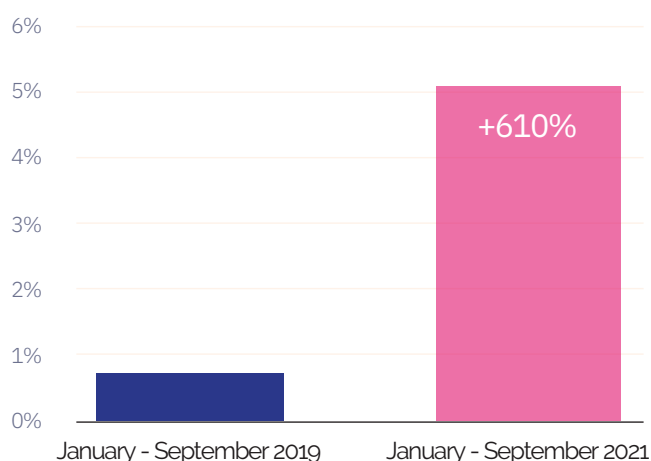
Labour Tightness Analysis

Finally, we use our postings data to understand the extent of labour tightness in the current market. We construct metrics that look at the prevalence of remote work and training offerings across job postings. Across all metrics, we see evidence of labour tightness. By job family, we find that Manufacturing and Production; Construction, Extraction and Architecture; Transportation; Marketing and Public Relations; and Business Management and Operations have high increases across most components.

Remote Work

Remote work has become increasingly common in the pandemic economy. It can be an indicator of labour tightness, particularly when employers are competing with other firms and want to widen candidate pools outside their local area, but it may also just indicate changing preferences on the part of employers no longer

Fig 21. Change in share of postings offering remote work from 2019 to 2021 by occupation grouping



wanting to rent office space or still concerned about health risks. We find that the percentage of postings mentioning remote work (including keywords such as "work from home" and "work remotely") increased 610% between 2019 and 2021.

Science and Technology occupations have experienced the largest change in share of postings offering remote work, up over 2000%. Top titles in this group include Research Agent, Environmental Consultant and Cloud Engineer. Other job families with large increases in remote work postings are Customer and Client Support and Clerical and Administrative positions. Healthcare also appears high on our list because of remote eligibility in positions like Clinical Project Manager, Clinical or Education Psychologist and Medical Administrator.

Fig 22. Change in share of postings offering remote work from 2019 to 2021 by occupation grouping



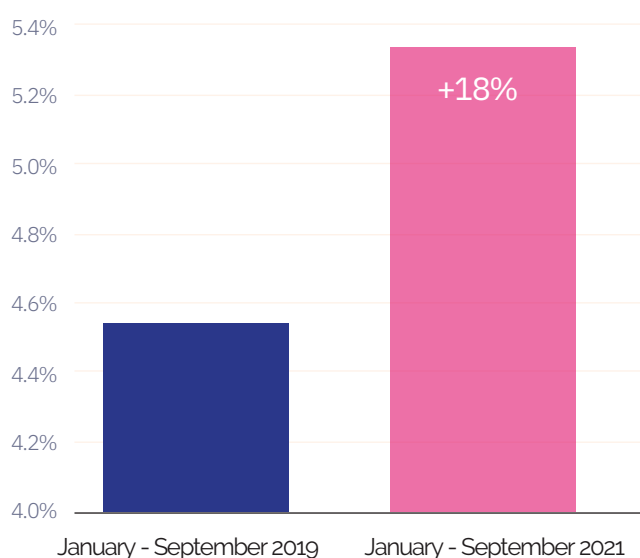
Table 3

Job Family	Top Titles Offering Increase in Remote Work
Science and Research	Research Agent, Senior Environmental Consultant, Senior Ecologist, Environmental Consultant, Cloud Engineer
Customer and Client Support	Customer Service Advisor, Customer Service, Customer Support Agent, Customer Service Administrator, Customer Service Representative
Healthcare	Clinical Project Manager, Case Manager, Speech & Language Therapist, Clinical Or Educational Psychologist, Medical Administrator
Clerical and Administrative	Office Administrator, Administrator, Customer Success Manager, Clerical Officer, Personal Assistant
Finance	Finance Manager, Financial Accountant, Management Accountant, Assistant Accountant, Accounts Assistant

Training

In times of labour market tightness, employers may attempt to expand their applicant pool by requiring fewer skills at the outset and instead offering training to employees once they have started. Between January-September 2019 and January-September 2021, the share of job postings mentioning training increased 18%. Variations of training keywords include "on-the-job training", "training provided", "will train", "full training".

Fig 23. Change in share of postings offering training from 2019 to 2021



Manufacturing and Production had the largest increase in percentage of postings offering training, up 147% between 2019 and 2021. Planning and Analysis had an increase of 96% and Marketing and Public Relations had an increase of 88%. Within Manufacturing and Production, top titles offering increases in training include Production Operative, Machine Operator, Production Operator, and Production Manager.

Fig 24. Change in share of postings offering training from 2019 to 2021

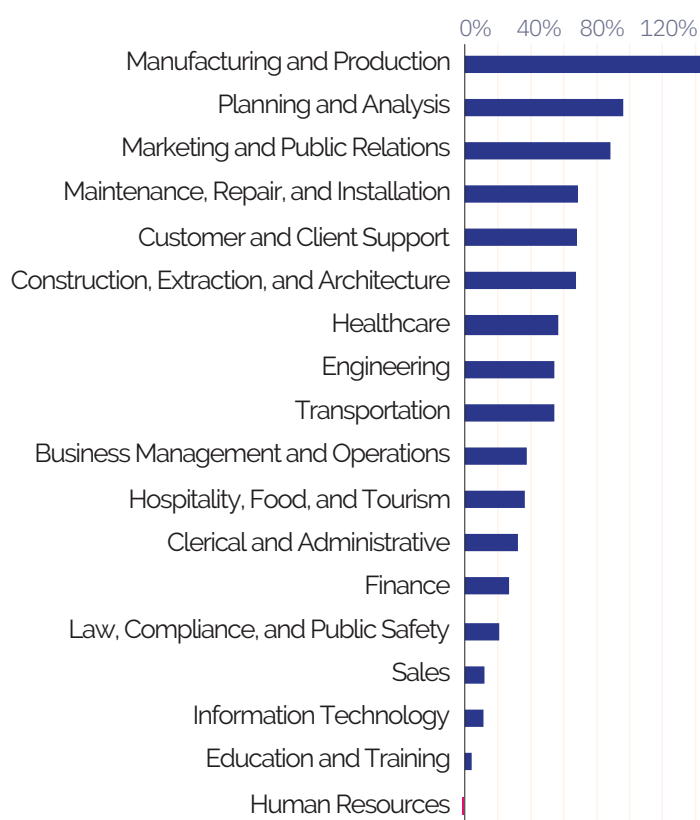


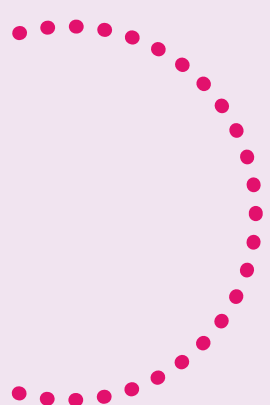
Table 4

Job Family	Top Titles Offering Increase in Training
Manufacturing and Production	Production Operative, Machine Operator, Production Operator, Production Manager, Service Technician
Planning and Analysis	Community Operations Analyst, Senior Analyst, Senior Medical Scientist, Transport Planner, Business Development Executive
Marketing and Public Relations	Product Marketing Manager, Customer Success Executive, Brand Manager, Marketing Manager, Social Media Administrator
Maintenance, Repair, and Installation	Maintenance Technician, Maintenance Operative, Traffic Management Operative, IT Field Service Engineer, Field Technician
Customer and Client Support	Customer Service Representative, Client Service Manager, Customer Service Associate, Customer Service Executive, Contact Centre Agent



Conclusion

This report presented an analysis of the current state of the Irish labour market and trends in occupations and skill requests from employers. We find that a number of occupations across a variety of job families are still in demand while others, particularly those that involve maintaining spaces shut down during the pandemic or at high risk for automation, suffered large decrease in market share and still have not recovered. We find that many job families are experiencing shifting trends in requested skills, with Manufacturing and Production occupations becoming more technical while Finance occupations become more focused on soft skills. Finally, we find evidence of labour market tightness as employers indicate remote work availability and willingness to train new employees. It is our hope that these insights may be used by policymakers and workers to provide opportunities for economic success.



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Appendix

Table 5

Job Family	Occupation	Best fit SOC4*	SOC4 Occupation Group Name	Occupation Share of All Postings in Jan-Sep 2019	Occupation Share of All Postings in Jan-Sep 2021	Percent Change in Occupation Share Jan-Sep 2019 to 2021	Top 5 skills
Transportation	Delivery Driver	8212	Van drivers	0.38%	0.94%	149%	Customer Service, Forklift Operation, Product Sales, Sorting, Heavy Lifting
Law, Compliance, and Public Safety	Security Officer	9241	Security guards and related occupations	0.12%	0.30%	140%	Customer Service, Emergency Services, Loss Control / Prevention, Facility Management, Customer Contact
Business Management and Operations	Forklift / Pallet Jack Operator	8222	Fork-lift truck drivers	0.12%	0.25%	121%	Forklift Operation, Delivery Unload and Breakdown, Heavy Lifting, Cleaning, Stock Control
Construction, Extraction, and Architecture	Electrician	5241	Electricians and electrical fitters	0.19%	0.43%	120%	Electrical Work, Wiring, Predictive / Preventative Maintenance, Electrical Systems, Customer Service
Transportation	Truck Driver	8211	Large goods vehicle drivers	0.19%	0.41%	110%	Haulage, Customer Service, Forklift Operation, Product Sales, Logistics
Healthcare	Nursing Assistant	6141	Nursing auxiliaries and assistants	0.38%	0.77%	105%	Patient Care, Working With Patient And/Or Condition: Mental Health, Care Planning, Dementia knowledge, Midwifery
Business Management and Operations	Labourer / Warehouse Worker	9260	Elementary storage occupations	0.35%	0.69%	96%	Forklift Operation, Cleaning, Sorting, Heavy Lifting, Customer Service
Business Management and Operations	Inventory Associate	9260	Elementary storage occupations	0.23%	0.43%	90%	Forklift Operation, Sorting, Cleaning, Heavy Lifting, Key Performance Indicators (KPIs)
Manufacturing and Production	Manufacturing Machine Operator	5449	Other skilled trades n.e.c.	0.21%	0.38%	78%	Computer Numerical Control (CNC), Machining, Packaging, Cleaning, Engineering Drawings
Design, Media, and Writing	Graphic Designer / Desktop Publisher	3421	Graphic designers	0.13%	0.21%	56%	Graphic Design, Adobe Photoshop, Adobe InDesign, Adobe Illustrator, Adobe Acrobat
Hospitality, Food, and Tourism	Restaurant / Food Service Supervisor	5436	Catering and bar managers	0.36%	0.57%	56%	Customer Service, Restaurant Management, Budgeting, Staff Management, Cost Control

* This is the mapping of Global Occupation to the UK SOC taxonomy

Table 5 (continued)

Job Family	Occupation	Best fit SOC4*	SOC4 Occupation Group Name	Occupation Share of All Postings in Jan-Sep 2019	Occupation Share of All Postings in Jan-Sep 2021	Percent Change in Occupation Share Jan-Sep 2019 to 2021	Top 5 skills
Planning and Analysis	Data Scientist	2139	Information technology and telecommunications professionals n.e.c.	0.14%	0.21%	54%	Data Science, Python, Machine Learning, SQL, Artificial Intelligence
Sales	Retail Sales Associate	7111	Sales and retail assistants	0.60%	0.93%	54%	Sales, Customer Service, Retail Industry Knowledge, Retail Sales, Product Sales
Construction, Extraction, and Architecture	Construction Helper / Worker	5319	Construction and building trades n.e.c.	0.13%	0.20%	52%	Plumbing, Painting, Carpentry, Cleaning, Materials Transport
Manufacturing and Production	Production Worker	8139	Science, engineering and production technicians n.e.c.	0.47%	0.69%	45%	Cleaning, Packaging, Quality Assurance and Control, Production Planning, Hand Tools
Information Technology	Data Engineer	3131	IT operations technicians	0.18%	0.26%	43%	SQL, Python, Extraction Transformation and Loading (ETL), Data Engineering, Pipeline (Computing)
Healthcare	Pharmacist / Pharmacy Director	2213	Pharmacists	0.26%	0.36%	43%	Patient Care, Primary Care, Patient Safety, Optimisation, Store Management
Marketing and Public Relations	Product Manager	3545	Sales accounts and business development managers	0.40%	0.56%	41%	Product Management, Product Development, Product Sales, Stakeholder Management, Project Management
Sales	Retail Store Manager / Supervisor	7130	Sales supervisors	1.00%	1.40%	40%	Store Management, Retail Industry Knowledge, Key Performance Indicators (KPIs), Retail Management, Customer Service
Business Management and Operations	General Manager	1259	Managers and proprietors in other services n.e.c.	0.40%	0.55%	38%	Budgeting, Staff Management, Home Management, Key Performance Indicators (KPIs), Cost Control
Construction, Extraction, and Architecture	Construction Manager	1122	Production managers and directors in construction	0.16%	0.22%	36%	Project Management, Budgeting, Construction Management, Site and Study Management, Customer Service
Hospitality, Food, and Tourism	Bartender	9274	Bar staff	0.12%	0.16%	35%	Bartending, Customer Service, Cleaning, Cash Handling, Up-selling Products and Services
Sales	Sales Assistant	7129	Sales related occupations n.e.c.	0.61%	0.82%	34%	Sales, Customer Service, Retail Industry Knowledge, Customer Contact, Sales Goals

* This is the mapping of Global Occupation to the UK SOC taxonomy

Table 5 (continued)

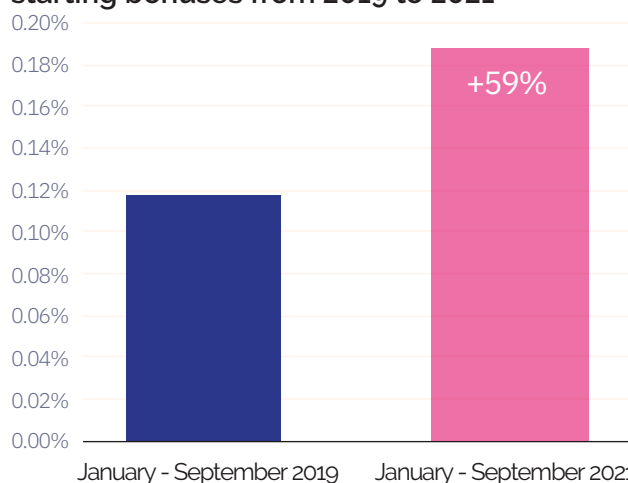
Job Family	Occupation	Best fit SOC4*	SOC4 Occupation Group Name	Occupation Share of All Postings in Jan-Sep 2019	Occupation Share of All Postings in Jan-Sep 2021	Percent Change in Occupation Share Jan-Sep 2019 to 2021	Top 5 skills
Planning and Analysis	Medical Scientist	2112	Biological scientists and biochemists	0.22%	0.30%	34%	Pathology, Biochemistry, Microbiology, Quality Assurance and Control, Haematology
Science and Research	Researcher / Research Associate	2426	Business and related research professionals	0.39%	0.52%	34%	User Research, Market Research, Experiments, Data Analysis, Project Management
Maintenance, Repair, and Installation	Repair / Service Technician	5223	Metal working production and maintenance fitters	0.20%	0.27%	33%	Customer Service, Technical Support, Mechanical Engineering, Predictive / Preventative Maintenance, Mechanical Maintenance
Community and Social Services	Social Care Worker	2442	Social workers	0.23%	0.30%	33%	Social Work, Child Protection, Working With Patient And/Or Condition: Mental Health, Care Planning, Family Support
Community and Social Services	Caregiver / Personal Care Aide	6145	Care workers and home carers	0.30%	0.39%	32%	Working With Patient And/Or Condition: Mental Health, Autism Diagnosis / Treatment / Care, Cooking, Cleaning, Care Planning
Business Management and Operations	Storage / Distribution Manager	1162	Managers and directors in storage and warehousing	0.18%	0.24%	32%	Warehouse Management, Key Performance Indicators (KPIs), Budgeting, Project Management, Stakeholder Management
Healthcare	Healthcare Administrator	1181	Health services and public health managers and directors	0.25%	0.33%	31%	Staff Management, Working With Patient And/Or Condition: Mental Health, Budgeting, Care Planning, Home Management
Healthcare	Home Health Aide	6145	Care workers and home carers	0.25%	0.33%	31%	Care Planning, Senior Care, Meal Preparation, Home Care, Dementia Knowledge

Additional Measures of Labour Market Tightness

Starting Bonuses

Starting bonuses can be used to encourage workers to get in the door more quickly. Our definition includes variations on the terms "sign up bonus", "joining bonus", "welcome bonus", "golden hello", "starting bonus", "hiring bonus". We find that the share of job postings mentioning a starting bonus or sign-on bonus has increased greatly between 2019 and 2021. Between January-September 2019 and January-September 2021, the share of postings mentioning a starting bonus increased +59%.

Fig 25. Change in share of postings offering starting bonuses from 2019 to 2021



Pensions

Pension contributions are often used as enticements for workers. We searched for the terms “retirement plan”, “pension scheme”, and “pension contribution”. The share of postings mentioning pension benefits increased 29% between January–September 2019 and January–September 2021.

Construction, Extraction and Architecture postings had the largest increase in the share of postings mentioning pension schemes with an increase of over 75% followed by Maintenance, Repair and Installation job family with an increase of 56%. Within Construction, Electrician postings were among the top occupations with an increase in the share offering pensions.

Fig 26. Change in share of postings offering pension schemes from 2019 to 2021

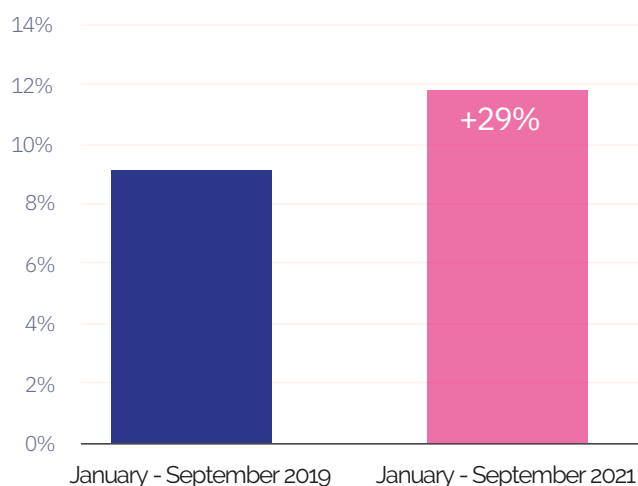


Fig 27. Change in share of postings offering pensions schemes from 2019 to 2021 by occupation grouping

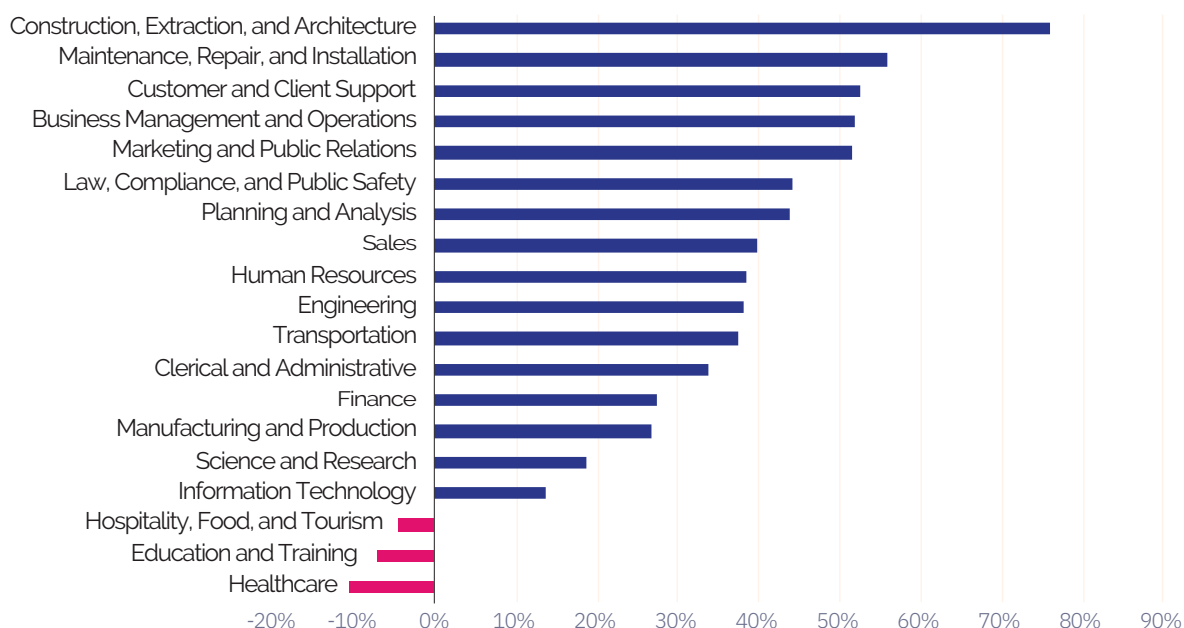


Table 6

Job Family	Top Titles Offering Increase in Pension Schemes
Construction, Extraction, and Architecture	Qualified Electrician, Project Worker, Electrician, Construction Manager, Industrial Electrician
Maintenance, Repair, and Installation	Automotive Technician, Commercial Manager, Maintenance Fitter, E&I Technician, Technical Services Engineer
Customer and Client Support	Customer Service Assistant, Customer Care Specialist, Customer Consultant, Service Coordinator, Customer Service Advisor
Business Management and Operations	Warehouse Operative, Head Of Operations, Transport Manager, Program Manager, Warehouse Team Leader
Marketing and Public Relations	Product Marketing Manager, Social Media Content Analyst, Commercial Director, Communications Manager, E-Commerce Manager

