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Contents

Labour market recovery after a pandemic.....	3
Abstract.....	3
Introduction.....	4
Participation Gains.....	5
Who Are The Additional Workers?	13
Empirical Results.....	19
Earnings Developments.....	24
Conclusion.....	31
References.....	33
Appendix.....	35

Labour market recovery after a pandemic

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Abstract

Growth in employment in recent quarters has been mainly supported by women over 35 and young people. This reflects underlying trend improvements in participation, as well as the strength of the economic recovery. Currently, we find limited evidence of structural changes due to the pandemic.

Employment gains have supported economic growth and earnings have risen. As the labour market tightened in the 2021 recovery period, relatively larger increases in earnings were recorded for women, younger workers and those who changed employer. With the economy currently experiencing tight labour market conditions, policy actions to support additional sustainable employment growth will be important to avoid wage developments decoupling from productivity.

¹ Irish Economic Analysis. With thanks to Sharon Donnery, Mark Cassidy, Martin O'Brien, Thomas Conefrey, Terry Quinn, Yvonne McCarthy and Vasilios Madouros for comments and to the Labour team in the CSO for granular data access. Remaining errors are our own. The views expressed here do not necessarily reflect the views of the Central Bank of Ireland nor the European System of Central Banks. Corresponding author: tara.mcindocalder@centralbank.ie

Introduction

The labour market has seen a remarkable recovery from the effects of the Covid-19 pandemic. In the fourth quarter of 2021 there were 2.5 million people in employment, the highest on record and almost 150,000 more than at the end of 2019 (Figure 1). Employment in all but the worst affected sectors was above pre-pandemic levels as of the first quarter of 2022 (Figure 3). The recent pace of growth in employment has also outstripped the recovery in total actual hours worked, which has only just returned to pre-pandemic levels as of Q4 2021 (Figure 2). Further, the strong employment growth has occurred without a notable surge in migration. Rather, the employment surge was supported by an expansion of the domestic labour force.

These developments have led to questions around whether the pandemic ushered in structural changes that have enabled individuals on the margins of the labour force or outside it to take up employment. For example, perhaps the shift to greater remote working allowed people to work around childcare requirements, and that this disproportionately benefited women. Perhaps remote education or increases in the cost of living induced more young people to take up employment opportunities.

Employment increased above the medium-term trend, actual hours worked slower to recover to pre-pandemic levels, migration remains muted

Figure 1: Quarterly employment profile and linear trend

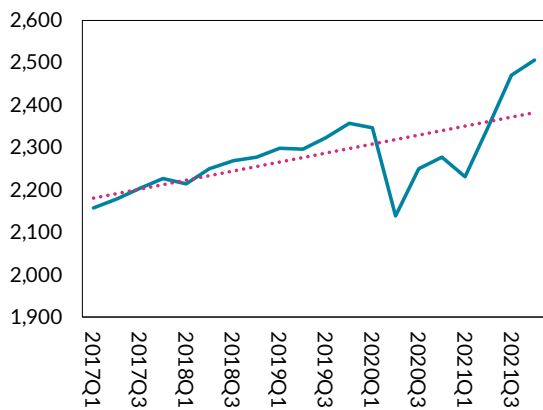
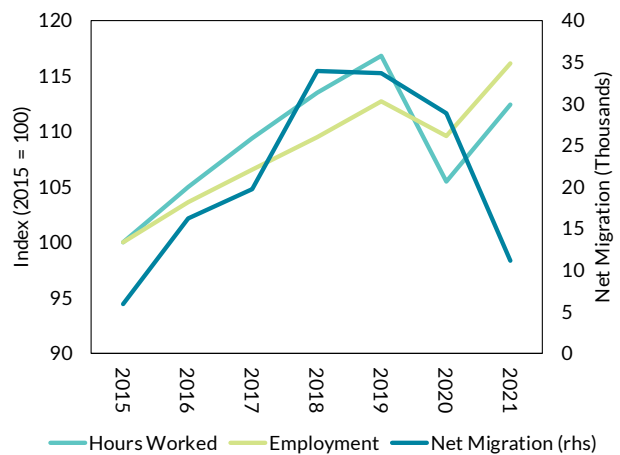


Figure 2: Indexation of employment, total actual hours worked and net migration flows



Source: CSO and authors' calculations.

The analysis in this paper suggests that there is no strong evidence to date that pandemic-related changes such as remote working are the dominant factors supporting the spike in employment. Rather, our analysis suggests that the participation expansion supporting employment growth in 2021 relates to under-25s and women over the age of 35. Our analysis shows that both of these groups tend to respond strongly to the state of the business cycle. For women, in particular those over 35, an additional “cohort” effect has seen trend increases in

their labour force participation that predate the pandemic and is expected to continue for some time to come. This occurs as older age groups, with lower propensities to participate in the labour force, are replaced by younger cohorts, with higher rates of labour force participation. These cohort effects reflect long-run societal and structural changes in the economy and were also evident in the pre-pandemic period.^{2 3}

The findings in this article have implications for both labour supply and wage developments. The strong employment gains since early 2021, supported primarily by an expansion of the labour force, alongside continued high levels of job vacancies, indicate that the labour market is heading towards full employment. In addition, the increase in participation may have affected wage dynamics directly, muting wage growth in some sectors for example. The marginal effect of increased participation on wage growth is, however, likely to fall as the available pool of workers shrinks.⁴

The remainder of this article is structured as follows. Section 2 describes recent labour market developments in more detail. Section 3 outlines our hypotheses on who the workers flowing from inactivity to employment are, drawing on analysis of the key aggregate developments that have occurred in the Irish labour market in recent quarters. Section 4 presents results of our empirical analysis that test our hypotheses by exploring the characteristics of workers in the Irish labour market and how this compares with the pre-pandemic growth period. In Section 5, we discuss what the participation gains and on-going employment expansion could mean for wage developments. Finally, Section 6 concludes.

Participation Gains

The measures introduced to halt the spread of the Covid-19 virus resulted in a significant drop in economic activity in Ireland. People were encouraged to work from home where possible and movement outside of the home was limited to essential reasons. Employment declined sharply as many economic sectors saw their operations curtailed and pandemic income supports were introduced for those whose jobs were in businesses affected by the economic contraction. Over 600,000 persons were in receipt of the Pandemic Unemployment Payment (PUP) scheme in May 2020.⁵ As the underlying methodology for the Labour Force Survey was not designed to reflect special pandemic-related schemes such as the PUP, many PUP recipients were classified as ‘out of the labour force’ rather than unemployed.⁶ This

² Bercholz, M., and Fitzgerald, J., (2016) Recent Trends in Female Labour Force Participation in Ireland. Quarterly Economic Commentary: Special Articles, Economic and Social Research Institute (ESRI).

³ Byrne and McIndoe-Calder (2019) “[Employment Growth: Where Do We Go From Here?](#)” Central Bank of Ireland Quarterly Bulletin Signed Article, QB3 2019.

⁴ Inward migration is historically correlated with economic growth, specifically employment growth, in Ireland. Indeed, despite international travel restrictions, Ireland issued similar numbers of work permits in 2020 as in 2019 (approx. 16,000). Understanding the likely path of migration flows going forward will be important.

⁵ Byrne et al., (2020) “[The Initial Labour Market Impact of COVID-19](#)” Central Bank of Ireland Economic Letter Series, Vol. 2020, No. 4.

⁶ Byrne and Keenan (2020) “[Measuring and Forecasting the Unemployment Rate during Covid-19](#)” Central Bank of Ireland Quarterly Bulletin Box D, QB4 2020.

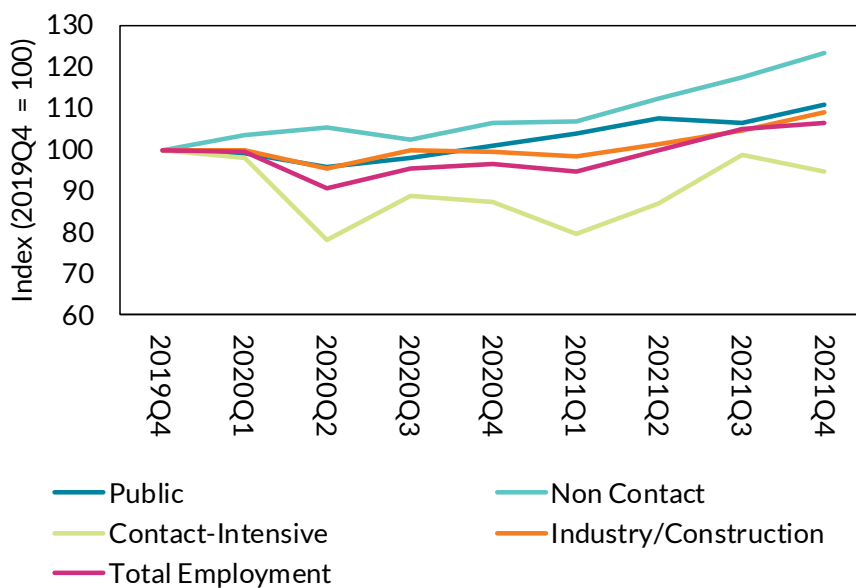
contraction in the labour force saw the participation rate (LFPR) fall from 62.2 per cent in the first quarter of 2020 to a series low of 56.9 per cent in Q2 2020 (Figure 4).

The effect of the pandemic on standard measures of employment and unemployment was mitigated to a degree by the introduction of the Temporary Wage Subsidy Scheme (TWSS), subsequently followed by the Employment Wage Subsidy Scheme (EWSS) during 2020. The primary goal of the wage subsidy schemes was to limit the number of people who became permanently unemployed, to reduce the potential for labour market scarring and to hasten the recovery in the economy such that employment could resume when the pandemic abated. The EWSS enabled firms to retain employees on the firm payroll by continuing to pay a proportion of their wages using subsidies received from the government. The scheme was successful in maintaining employment levels as workers may have otherwise been made redundant following the pandemic-induced reduction in economic activity. In May 2020, more than 1.2 million people who had been employed at the beginning of 2020 were either in receipt of PUP (i.e. not working due economic impact of the pandemic on their economic sector) or had a portion of their wages paid by the State via the TWSS/EWSS.

The rollout of the Covid-19 vaccination programme and the related easing of restrictions resulted in a rebound in economic activity during 2021. Modified domestic demand grew by 35.3 per cent between Q1 2021 and Q4 2021 as restrictions were eased and the economy reopened.

Employment growth in non-contact intensive sectors was evident throughout 2020 with non-contact sectors yet to fully recover by end 2021

Figure 3: Indexation of employment growth by broad sectoral group



Source: CSO and authors' calculations

Note: 'Public' economic sectors include Education, Health and Public Admin. 'Contact-Intensive' includes Accommodation, Retail, Transport, Admin and Other. 'Non-Contact' includes ICT, Finance and Professional

Throughout 2020 and early 2021, employment expansion occurred in essential and non-contact intensive sectors as well as tradable goods manufacturers less impacted by the pandemic and the related restrictions (Figure 3). The dual nature of the recession, where some sectors experienced on-going expansion despite the pandemic, is not typical of economic downturns associated with demand shocks, but rather is characteristic of exogenous shocks such as a pandemic.⁷ The expansion in essential and non-contact intensive sectors continued in 2021, reflecting strong export growth and continued growth in public sector employment.

In line with the recovery in economic activity, a sharp rise in employment was observed over the same period with levels increasing by 12.3 per cent or 275,000 persons between Q1 2021 and Q4 2021. The rise in employment was particularly large in Q2 and Q3 2021 with quarterly growth of 118,000 and 122,000 persons, which lifted aggregate employment levels markedly above its pre-pandemic peak. The employment expansion occurred in the absence of a substantial recovery in net inward migration flows that have been important contributors to labour force growth in Ireland since the early 2000s.⁸ Net inward migration levels declined from 28,900 persons in the year ending April 2020 to 11,200 in 2021 primarily due to a fall in non-EU immigration that coincided with international travel restrictions to halt the spread of Covid-19.

Employment has recovered, supported by strong LFPR gains across both gender and age categories

Figure 4: LFPR by gender

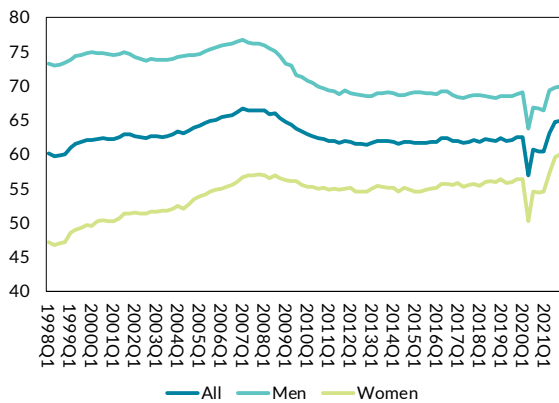
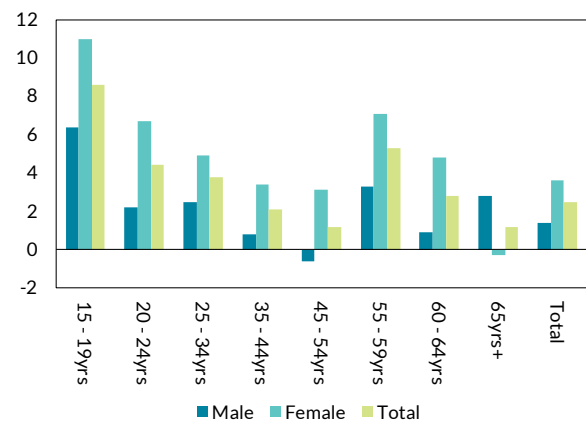


Figure 5: Change in LFPR by age category (Q4 2019 - Q4 2021)



Source: CSO and authors' calculations

In the absence of large-scale inward migration, the strong employment expansion was supported by a large rise in the domestic labour force. The female LFPR reached a new peak

⁷ Ma, Rogers and Zhou (2020) "[Modern Pandemics: Recession and Recovery](#)", International Finance Discussion Papers, Board of Governors of the Federal Reserve System.

⁸ Byrne and McIndoe-Calder (2019) "[Employment Growth: Where Do We Go From Here?](#)" Central Bank of Ireland Quarterly Bulletin Signed Article, QB3 2019.

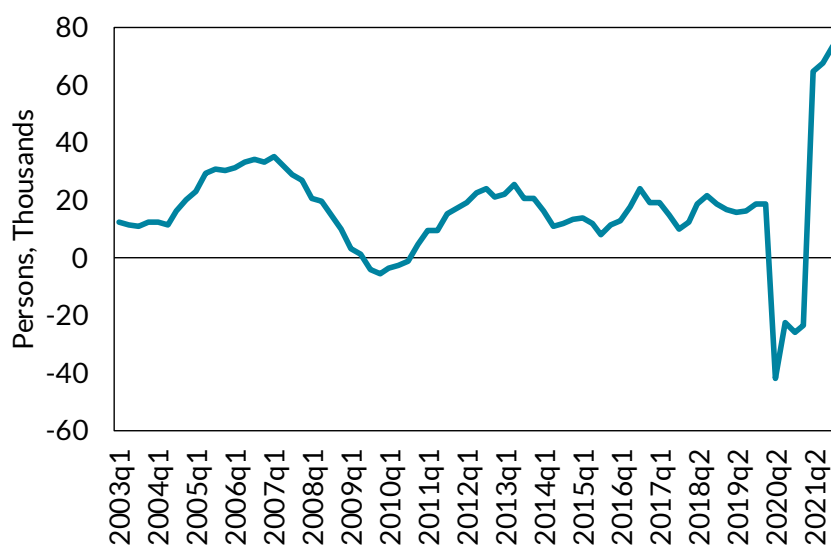
level of 60.1 per cent in Q4 2021, approximately five percentage points higher than the levels recorded during the pre-financial crisis period. The composition of the female working age population (those aged over 15 years) changed, with an increase in the share of persons aged over 45 years in Q4 2021 relative to Q4 2019. The shift from 49.2 per cent to 50.3 per cent has important implications on the LFPR that are explored in further detail in the next section. The LFPR for males also increased and across the age distribution (Figure 5).

To investigate who these additional labour market participants are, we first use Labour Force Survey (LFS) microdata from the CSO to calculate the average level of quarterly net flows from inactivity into the labour force.⁹ In periods of economic growth, the net flow to the labour force among the resident population is positive, due to an increase in labour demand and wage growth, which typically serves to draw in additional supply from those outside of the labour force.¹⁰

Figure 6 uses a four-quarter moving average to show the trend from 2003 onwards. The fall in the number of workers transitioning from outside the labour force into employment during the pandemic period (Q1 2020 – Q1 2021) was sharp and sudden but was followed by a sizeable rebound in labour force levels in Q3 2020. The negative net flow of 216,000 in Q2 2020 was subsequently followed by a positive net flow of 114,000 in Q3 2020.

Large rebound in labour force levels as Covid-related restrictions lifted

Figure 6: Net flows from inactivity to the labour force



Source: CSO and authors' calculations

Note: Data are calculated using a four-quarter moving average. Last observation is Q4 2021

⁹ The LFS microdata provides detailed information on the full sample of households who are surveyed each quarter to provide published labour force aggregates, which include the official measures of employment and unemployment. Access is provided by the CSO for research purposes upon successful application.

¹⁰ Byrne and Conefrey (2017) "[A non-employment index for Ireland](#)", Economic Letter Vol 2017, No. 9, Central Bank of Ireland.

Figures 7 and 8 provide a breakdown of the average net flows in the resident population by gender and age category for recent periods of economic growth and decline in Ireland. The scale of the net flows in the pandemic recovery period (Q2 - Q4 2021) appear substantially higher than other previous phases of economic growth with an average net flow of 97,000 persons from inactivity to the labour force compared to a figure of 24,000 in the pre-financial crisis period (Q1 2003 – Q3 2008).¹¹ The average net flows are higher for women (56,000) relative to men (41,000).

Net flows from resident population into the labour force during Q2 and Q3 2021 were substantially higher than previous labour force expansions

Figure 7: Average net flows to/from inactivity to labour force by gender

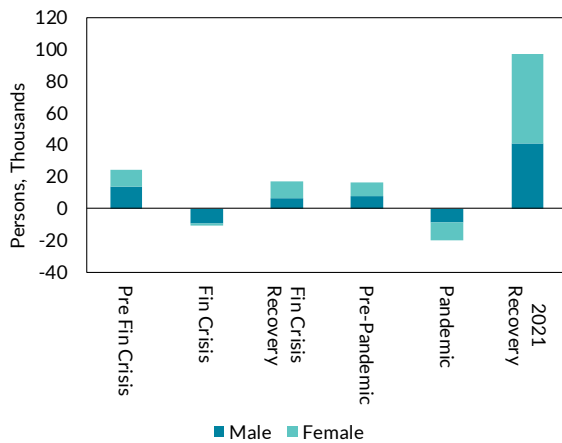
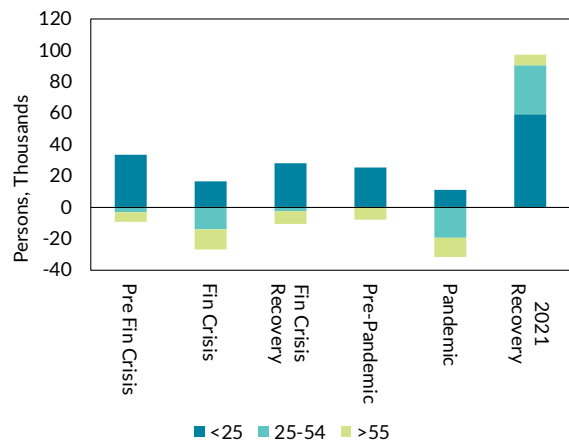


Figure 8: Average net flows to/from inactivity to labour force by age group



Source: CSO and authors' calculations.

Note: The time periods are Pre Financial Crisis (Q1 2003 – Q3 2008), Financial Crisis (Q4 2008 – Q1 2010), Financial Crisis Recovery (Q2 2010 – Q4 2014), Pre-Pandemic (Q1 2015 – Q4 2019), Pandemic (Q1 2020 – Q1 2021), and Pandemic Recovery (Q2 2021 – Q4 2021)

Of the total 97,100 who transitioned from inactivity into the labour force during the pandemic recovery period, 61 per cent were aged under 25 years. Analysis by Boyd et al. (2022) showed that employment gains in the pandemic recovery period for younger people were mainly in contact-intensive sectors, such as Retail and Accommodation & Food services. 54 per cent of the total net flows into the labour force can be attributed to under 25s who are still enrolled in tertiary education. Additionally, there was a large positive net flow of women aged between 35 and 59.

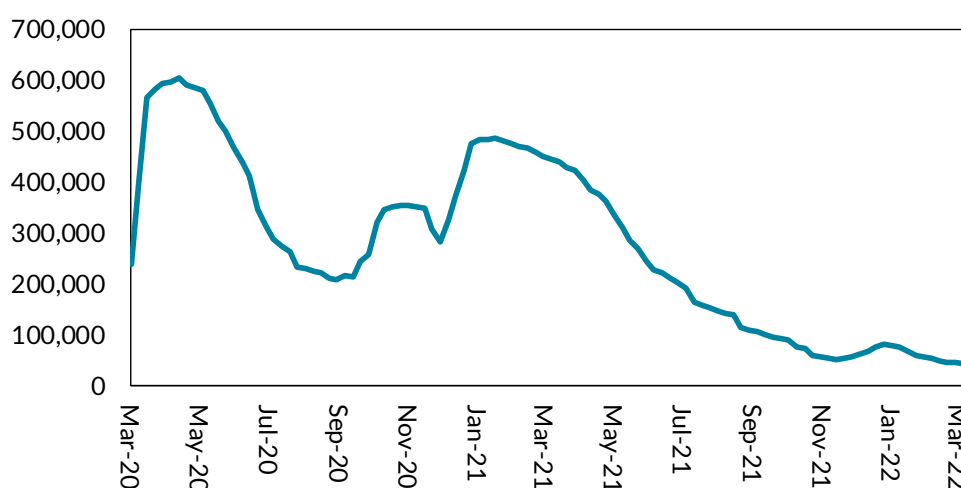
¹¹ For context, the maximum and minimum range of quarterly net flows to the labour force prior to the pandemic ranged from -28,900 to 65,700.

Box A: Duration on the Pandemic Unemployment Payment

The impact of an economic shock on the labour market can result in scarring effects for those out of work for extended periods. These effects can increase the likelihood of being unemployed in the future and have a negative effect on prospective earnings as seen in the aftermath of the global financial crisis.¹² Scarring effects have accompanied previous economic downturns, including after the global financial crisis when the length of unemployment duration increased and youth labour force participation fell (Lydon and Lozej, 2016).¹³ In the case of the pandemic, the introduction of public health restrictions led to a substantial number of workers flowing onto the Pandemic Unemployment Payment (PUP) scheme. As the economy reopened during 2021, the numbers in receipt of the PUP declined sharply (Figure A1). At the point of the closure of the scheme in March 2021, just over 44,000 were still registered for the payment, down from a peak of 605,000 in May 2020. This box reviews the characteristics of those in receipt of the PUP, with a particular focus on duration of time in receipt of the payment and assesses developments in unemployment following the ending of the PUP in March 2022.

PUP levels declined steadily throughout 2021

Figure A1: PUP recipient levels



Source: DSP

PUP recipient levels peaked as economic activity was severely curtailed by public health restrictions in place due to the pandemic, with only designated essential activities permitted to continue. Job losses were initially greater among younger and part-time workers in non-essential, contact-intensive sectors relative to their share of pre-pandemic employment.¹⁴ As

¹² Arulampalam, Gregg, and Gregory (2001) "[Introduction: unemployment scarring](#)". The Economic Journal, 111(475), F577-F584.

¹³ Lydon and Lozej (2016) "[The Flexibility of New Hires' Earnings in Ireland](#)" Central Bank of Ireland Research Technical Paper Series, Vol. 2016, Issue 6.

¹⁴ Byrne et al., (2020) "[The Initial Labour Market Impact of COVID-19](#)" Central Bank of Ireland Economic Letter Series, Vol. 2020 Issue 4.

restrictions eased and sectors re-opened, many people quickly flowed off the PUP to go back to their previous employment role or moved to different sectors. IGEES analysis of post-PUP activity identifies that of the cumulative 871,500 people to have received at least one PUP payment, 74 per cent had returned to employment with an approximate split of 304,700 returning to their pre-PUP employer and 248,700 working for a different employer or in a different economic sector.¹⁵ We use a detailed PUP dataset provided by the Dept. of Social Protection (DSP) that includes all 871,475 persons to have received at least one PUP payment between March 2020 and August 2021 by gender, age, sector and number of payments received.¹⁶ In order to avoid distortions arising from persons flowing onto the scheme at various times due to the re-introduction of restrictions, we calculate the longest continuous duration of each recipient.

PUP durations

Figure A2 shows that an 8-week continuous period was the most common length of time for a person to receive a PUP payment (31,511 persons); followed by a 20-week period (29,782) and a 74-week period (29,472). This last group represents persons who have been in receipt of the payment each week since the beginning of the scheme through to August 2021. Focusing on the right tail of the distribution, those in receipt of a payment for a long-term period (classed as at least a 52-week continuous period) accounted for 13.9 per cent of all those claiming the PUP as of August 2021. The demographic breakdown of these long-term recipients (Figure A3) shows that there is a relatively greater share of females, persons aged over 45 years and those previously employed in a contact-intensive sector compared to the total population of recipients. Restaurants and hotel activities account for the largest number of persons from the NACE 2-digit sector data with activities in this area among the most constrained during the various periods of restrictions.

PUP data at the closure of the scheme at end-March 2022 show that persons previously employed in the Accommodation & Food, Wholesale & Retail Trade and Administrative & Support services sectors accounted for the highest share of PUP support recipients (46 per cent).¹⁷ The re-opening of the PUP scheme in December 2021 does not appear to have considerably changed the overall composition of recipients compared to the position as of August 2021. Half of the 8,160 new entrants were from the three aforementioned sectors, reflecting the nature of the winter 2021 restrictions.

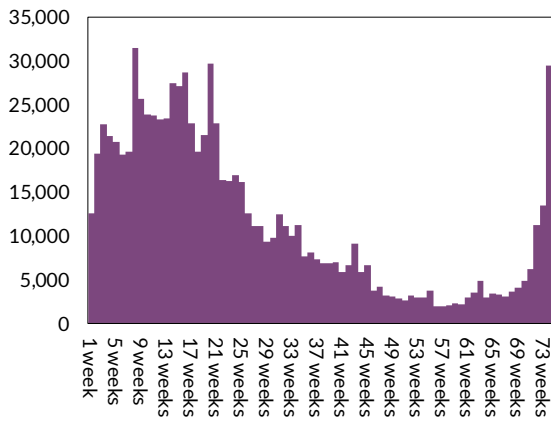
¹⁵ Dwan-O'Reilly and McNelis (2022) "[Trends in Post-PUP Employment](#)" IGEES Working Paper.

¹⁶ This figure accounts for 99 per cent of the total cumulative number of recipients to date as the scheme was re-opened in late-2021 due to the re-introduction of sector-specific restrictions.

¹⁷ Department of Social Protection – PUP data: <https://data.gov.ie/dataset/pandemic-unemployment-payment>

1 in 7 recipients were on the scheme continuously for over a year

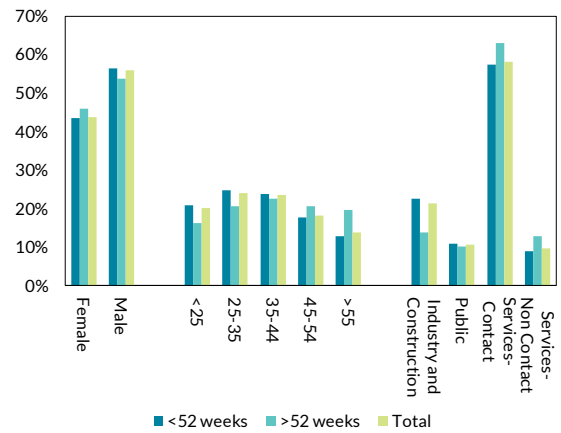
Figure A2: Longest cumulative duration of recipients



Source: DSP and authors' calculations

Long-term PUP recipients more likely to be older

Figure A3: Demographic breakdown of long-term recipients relative to total recipients

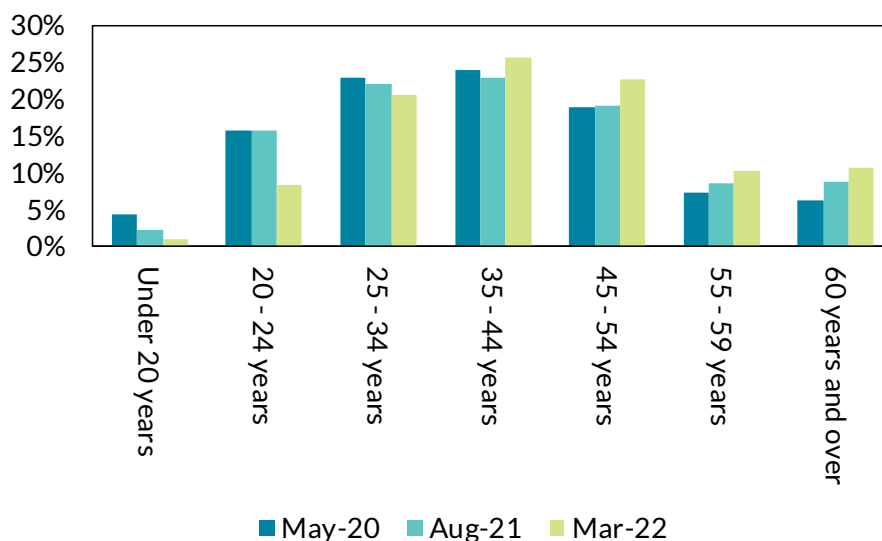


Source: DSP and authors' calculations
 Note: 'Public' economic sectors include Education, Health and Public Admin. 'Services - Contact' include Accom, Retail, Transport, Admin and Other. 'Services - Non Contact' include ICT, Finance and Professional

Looking at the demographic breakdown in March 2022, younger workers (aged under 25 years) accounted for the smallest share of total (combined 9.6 per cent). This had declined markedly relative to their respective share of the May 2020 peak level (20.3 per cent). In contrast, the age share of March recipients had increased for all categories aged over 35 years (Figure A4).

Older workers constitute a greater share of March 2022 recipients

Figure A4: Age breakdown of PUP recipients



Source: DSP and authors' calculations

Labour Market Recovery

With more than one-in-ten of those on the PUP, as of August 2021, having been on the payment for a continuous 52-week period, this suggested a risk that some of these individuals could become long-term unemployed. Instead, the strength of the labour market recovery has eased concerns over the extent of any long-term unemployment problem from the pandemic. Between August 2021 and March 2022, over 100,000 people transitioned off the PUP reducing the overall number of recipients to just over 44,000 when the scheme closed. The easing of social distancing restrictions from March 1st 2022 onwards has facilitated increased economic activity particularly in contact-intensive sectors, supporting continued growth in labour demand. Early-stage indicators from Live Register data show a 19,000-person increase in the week the PUP scheme was closed. In subsequent weeks, the number on the Live Register has declined steadily. Similarly, the monthly unemployment rate had fallen below 5 per cent by April 2022 and the COVID-adjusted unemployment rate was discontinued. The modest increase in the Live Register following the ending of the PUP, and the decline in the Live Register in subsequent months, suggests that a significant number of the remaining PUP recipients at end-March may have either successfully reintegrated into the labour force or have transitioned out of the labour force. The relatively low increase in traditional supports is a more positive outcome than would have been previously anticipated given the demographic breakdown of long-term recipients and points to the strength of the recovery in economic activity and labour demand. To encourage the remaining workers who opted to leave the labour force in Q1 2022 back into employment, activation programmes and other policy initiatives may need to be considered.¹⁸

Who Are The Additional Workers?

The LFS released immediately before the onset of the Covid-19 pandemic (for Q4 2019) showed that the number of persons participating in the labour force at that point stood at 2.47 million. As of the fourth quarter of 2021, this had risen to 2.63 million, a net increase of 165,500 or 6.7 per cent. The easing of pandemic-related restrictions was expected to result in many people flowing back into employment as the economy recovered. However, Section 2 shows that the scale of the participation response was larger than both the fall in participation during the pandemic and when compared to participation responses during previous tight labour market periods.

To investigate this surge in the labour force, we examine which sub-groups of the population drove the increases in participation over the period Q4 2019 to Q4 2021. Table 1 shows that, of the 6.7 per cent increase in the labour force level (165,500 persons), the largest

¹⁸ A logit regression was run to investigate the factors influencing the likelihood of a person being in this long-term category. Controlling for other observable characteristics, these persons were more likely to be aged 45 years or over, on the lowest payment rate of €203 and have been previously employed in a contact-intensive sector. Separate regression analysis including a continuous age-squared variable exhibits a positive effect of age and a positive effect of age-squared meaning that as people get older the likelihood of being a long-term PUP recipient is stronger.

contributors were people aged 15-24, who accounted for just under 30 per cent and women aged between 35 and 59 who contributed just under one third of the increase.

Table 1: 2021 Labour force participation gains compared to 2019, contributions by age and gender

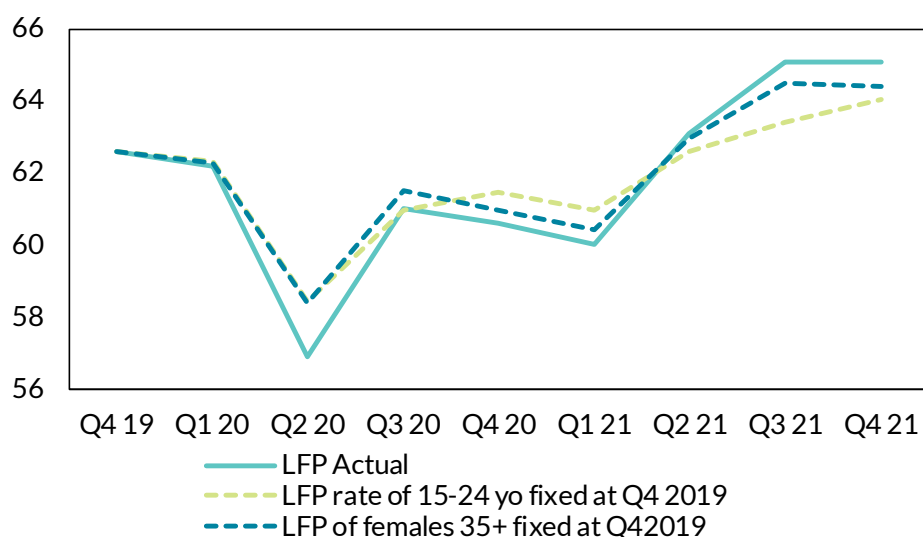
	Males		Females		All	
	000	% Contribution	000	% Contribution	000	% Contribution
15-24	19.7	0.8%	30.8	1.2%	50.5	2.0%
25-34	6.4	0.3%	10.8	0.4%	17.2	0.7%
35-44	-1.1	0.0%	16.3	0.7%	15.2	0.6%
45-54	8.9	0.4%	21.7	0.9%	30.5	1.2%
55-59	8.9	0.4%	14.1	0.6%	22.9	0.9%
60-64	4.7	0.2%	9.7	0.4%	14.4	0.6%
65+	14.1	0.6%	0.7	0.0%	14.9	0.6%
Total	61.5	2.5%	104	4.2%	165.5	6.7%

Source: CSO and authors' calculations

We can illustrate the impact of the increases in participation for these two sub groups on the aggregate LFPR using a simple counterfactual exercise. In Figure 9, the dark green line shows the evolution of the labour force participation rate from Q4 2019 to present.

Growth in the total LFPR driven by rising participation of the young (under 25) and women over 35

Figure 9: Actual aggregate LFPR and counter-factual aggregate LFPR



Source: CSO and authors' calculations

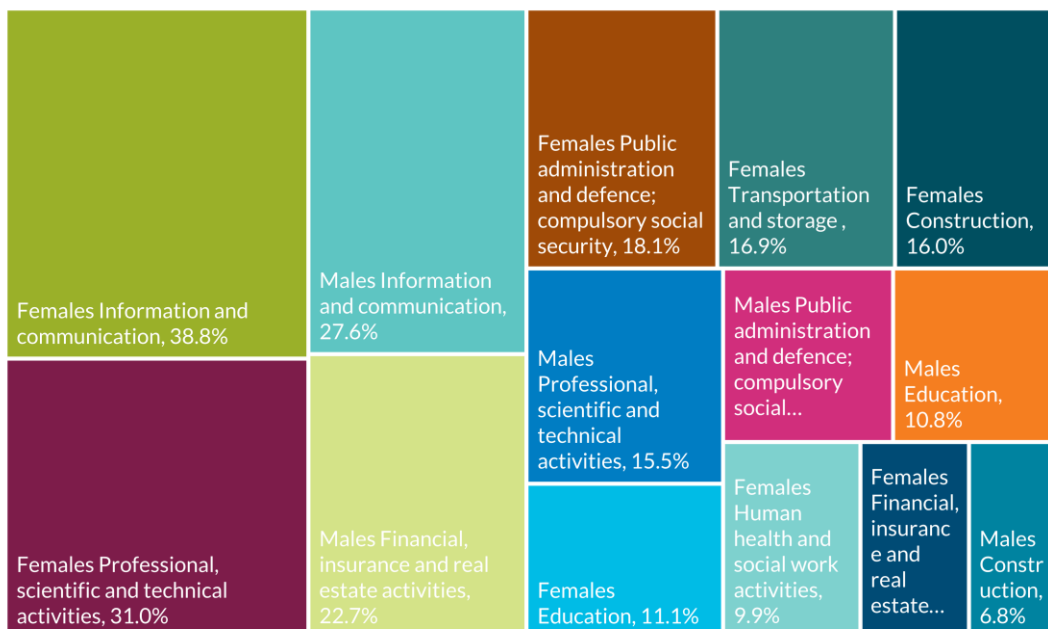
Note: This figure can be interpreted similarly to a shift-share analysis.

The dashed purple line shows a counterfactual aggregate LFPR where the participation rate of 15-24 year olds is held fixed at its Q4 2019 level but the working age population across all age groups continues to grow as it has done in the realised data. Comparing the two shows that at the beginning of the pandemic in Q2 2020, the actual aggregate LFPR was 1.1 percentage points lower than if 15-24 year olds had kept participating at their 2019 level. However, by Q4 2021 the surge in the participation rate of this age group meant that the actual aggregate LFPR was 1.1 percentage points *higher* than the counterfactual rate had participation rate of 15-24 year olds remained unchanged at its 2019 level. The orange dashed line shows that a similar counterfactual exercise for women aged 35 and over yields a smaller difference in the overall participation rate, but still points to the fact that the participation rate for women over 35 has also driven part of the increase in the *aggregate* participation rate. We examine the reasons behind this in Section 4.

The increase in female employment does not appear to be explained by growth in sectors of the economy that have traditionally employed a greater proportion of women. Rather the increase in employment has been distributed across the fastest growing sectors of the economy, including *Information & Communication* and *Professional, scientific & technical activities*. Figure 10 shows that the increases in employment in these sectors were comparatively larger for women, which suggests another explanation is required.

Fast growing, productive sectors lead the contribution to employment growth

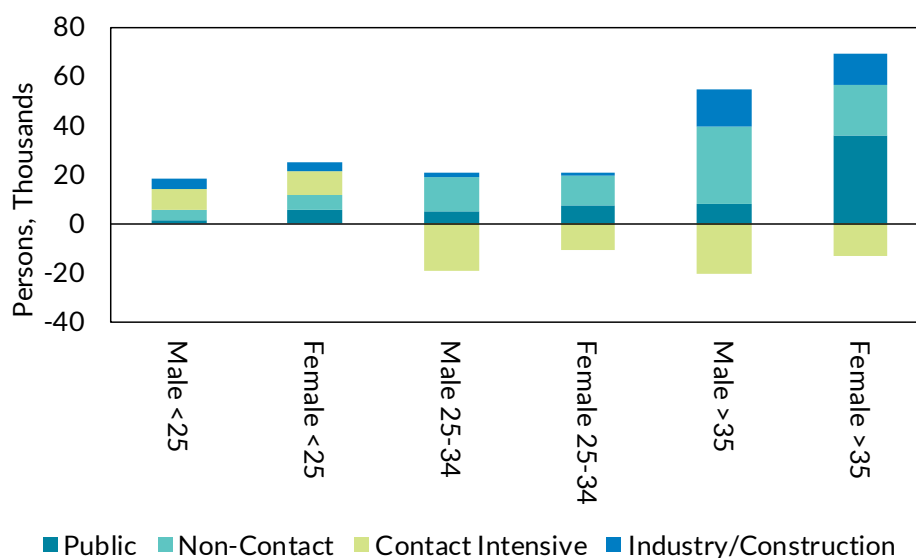
Figure 10: Increase in employment within sector, by gender (Q4 2019 – Q4 2021)



Source: CSO and authors' calculations

Workers over 25 years of age transition out of contact-intensive sectors, while younger workers flow into jobs across all sectors

Figure 11: Sectoral increase in employment, by gender and age category (Q4 2019 – Q4 2021)



Source: CSO and authors' calculations

Cohort Effects

Recent literature has pointed to the importance of cohort effects in understanding dynamics in aggregate female labour force participation.¹⁹ In Figure 12, we illustrate changes in participation rates for women for different age groups over 35 since the beginning of the LFS dataset in 1998. Byrne and O'Brien (2017) show that female participation in Ireland is a function of both *age* and *cohort* effects. An example of the age effect is that a woman aged 30 is more likely to participate in the labour force than a woman aged 20. This is similar for males and is a result of 20 year olds being more likely to be in education. The cohort effect is that a woman aged 40 in 2021 is far more likely to participate than a 40-year-old woman in 1998. Her cohort, or the year in which the woman was born (1981 vs 1958 in our example), is capturing the effect of all of the societal changes around female participation in the labour force over those years. As a result, the aggregate female LFPR has been increasing steadily over the past 20 years as older women with very low participation rates retire and are replaced by younger women whose participation rates are much higher. Byrne and McIndoe-Calder (2019) found that the female LFPR was arithmetically increasing over time as a result of this effect.

Looking in detail at Figure 12, while the trend female participation rate by age bracket is monotonically increasing, the speed of increase in the participation rate of prime working age

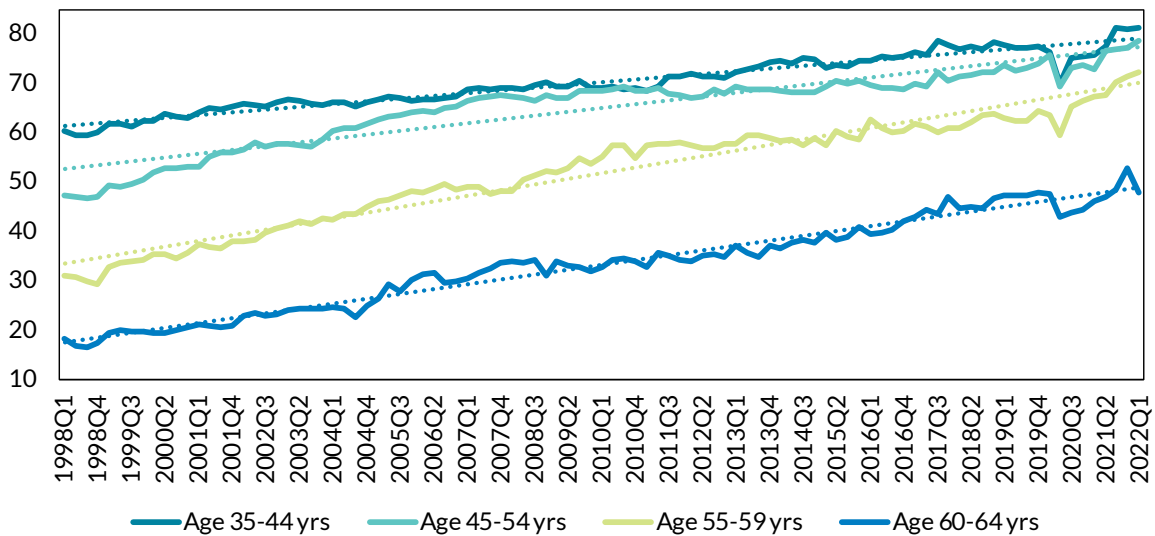
¹⁹ Nientker and Alessie (2019) "[Female labour market participation across cohorts: evidence from the Netherlands](#)" *De Economist* 167, 407-433 and Fallick and Pingle (2007) "[A cohort-based model of labour force participation](#)" Finance and Economics Discussion Series, Federal Reserve Board.

women is also a function of the economic cycle. In strongly expansionary periods, women who had been inactive are more likely to transition into the labour force. In all cases however, the participation rate increases of these age groups in recent quarters are a return to a trend that has been in progress for the past twenty years (dashed lines in Figure 12). For three of the four age groups in Figure 12 (for women aged 35-44, 45-54 and 55-59 years old), participation has surpassed the linear pre-Covid-19 participation rate trend, pointing to the additional role of strong cyclical forces also contributing to the recent rise in female participation.

The strong increases in female participation seen in 2021 appear to be the result of the interaction of both of these forces, the continuation of the increasing trend participation rate of women aged over 35 and the very strong expansion in economic growth during the period. For some age groups, in particular for females aged 35-44, the rise in participation over recent quarters have been especially strong with the rate now above the trend rate. This is likely to reflect a degree of catch-up in the participation rate for this group following the below trend rates during 2020.

Labour force participation of women is jointly determined by cohort and cyclical effects

Figure 12: Female LFPR and linear growth trend, by age group



Source: CSO and authors' calculations

The long-run trend in the share of women in high-skilled occupational employment is flat between 2007 and 2021 (Figure 13).²⁰ Employment expansion throughout 2020 and 2021, in sectors characterised by relatively high-skilled occupations (Figure 10), has resulted in a shift towards higher-skilled occupations in aggregate, with the skill mix in new hires returning to trend by the end of 2021. These new roles have been filled by men and women at rates similar

²⁰ Compositional effects related to the specific impacts of the pandemic on medium and lower skilled occupations during 2020 and early 2021 are evident in Figure 13.

to the pre-pandemic trend, in aggregate, albeit with important sector differences.²¹ The cohort effect for women then, is synonymous with increased educational and occupation skill-level attainment for women, over time.²² The period from Q2 2021 onwards represented a recovery in the sectors and specific jobs disrupted by the pandemic. For example, the net flows analysis in Figure 14 shows low skilled occupations accounting for the dominant share of jobs lost in the pandemic period, and a relatively large number of these returning in the recovery period. However the recovery period saw a large net expansion in medium and higher skilled roles, thus appearing far more like the full employment period prior to the pandemic or global financial crisis than the recovery period after the financial crisis of 2008 (Figure 14).

Female share in high-skilled occupations remains flat even as large numbers of women over 35 years old flow into highly-skilled employment

Figure 13: Female share in employment, by occupational skill level

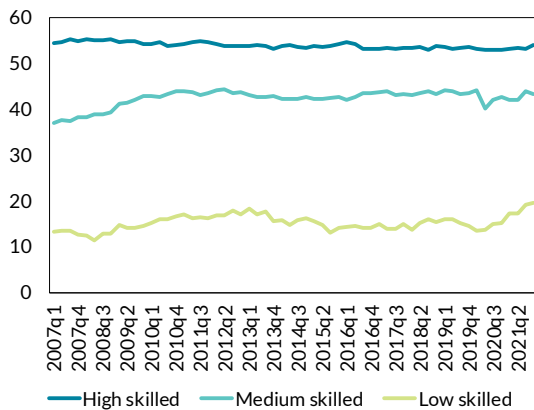
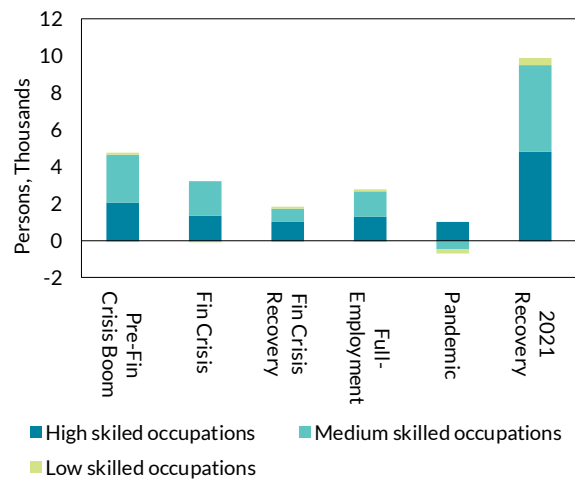


Figure 14: Net flows by women over 35 to labour force by occupational skill level



Source: CSO and authors' calculations

²¹ For example, in the fastest growing sectors in 2020 and 2021, women took up relatively more roles in both the NACE sectors of public administration & defence as well as professional & scientific; whereas men took up relatively more roles in information & telecommunications as well as finance. Trends in the female share of employment at sectoral level do not appear – at this time – to have been disrupted by the pandemic.

²² This is consistent with forecasts by Bercholz and Fitzgerald (2016), namely that educational attainment of women over 30 would rise in the medium term, supporting participation rates, particularly for those cohorts with relatively low participation rates in 2016.

Empirical Results

To examine the trends above more formally, we estimate a regression model that predicts an individual's probability of transitioning from inactivity to employment based on a range of personal and job characteristics.²³ We estimate the model over the tight labour market before the pandemic (2015-2019) as well as during the 2021 recovery period (2021 Q2-Q4) in order to understand whether the impact of these personal and job characteristics has changed over time. We also estimate the regression for sub-groups of the population, reflecting the disproportionate contributions to the labour force of those under 25 and women over 35, to explore whether the predictive power of observable characteristics differs substantially between these groups and the total active age population.

We follow Kiiver and Espelage (2016) and Byrne and O'Brien (2017) in our choice of observable characteristics likely to have predictive power in explaining observed transitions of individuals between inactivity and employment.²⁴ These include job characteristics - skill level, sector of employment, employment intensity (measured here using a part-time indicator) and employment precariousness (proxied here by a measure of temporary employment) – as well as demographic characteristics – age, presence of young children, migrant status and education status. Table 2 shows the average of these job and demographic characteristics for those transitioning from inactivity to employment for two time periods and two sub-samples of the total population.

Table 2 highlights the increasing skill level of women aged over 35 in the 2021 period. The highly skilled share rises to 52 per cent from 51 percent, compared to the pattern for the whole sample, which is static. The dominant effect of the recovery in contact-intensive services in 2021 is apparent (accounting for nearly 57 per cent of the newly employed) for all groups and almost two-thirds of those under 25. Whilst the share of women over 35 moving to contact intensive sector roles increased from under two-fifths prior to the pandemic to just over half in 2021.

At the aggregate level, fewer parents with young children moved into employment than was the case before the pandemic (and also for women over 35), whilst the share in education has risen (in particular for those under 25). This suggests a mixed picture for pandemic-induced work flexibility in supporting the labour force expansion in 2021, for example remote education may have supported labour force participation, whilst presence of young children may have represented additional caring responsibilities for parents hindering labour force participation. Finally, Table 2 examines the employment intensity and precariousness of jobs for those moving into the labour force from inactivity. Whilst the share of those in part-time

²³ A logit model allows the estimated effects of explanatory variables on a binary outcome (move from inactive to employed, or not) to be bounded between 0 and 1. The marginal effects reported in Table 2 above describe the change in the probability of moving from inactive to employed, given a one unit change in each explanatory variable, holding all the other explanatory variables at their sample mean.

²⁴ Kiiver and Espelage (2016) "[The use of regression models in labour market flow statistics](#)" European Conference on Quality in Official Statistics, Eurostat; Byrne and O'Brien (2017) "[Understanding Irish Labour force Participation](#)" *Economic and Social Review*, Vol. 48, No. 1.

employment is rising for women aged over 35 (up from 64 per cent to 66 per cent), it is roughly similar for those aged under 25 when compared to the pre-pandemic period. The share of temporary employment for those recently employed has fallen for all groups in the pandemic recovery period, suggesting the new employment is not more precarious than before the pandemic.

Table 2: Observable characteristics of those moving from inactivity to employment

	All		<25		Women 35-65	
	2015-2019	2021Q2-Q4	2015-2019	2021Q2-Q4	2015-2019	2021Q2-Q4
Occupational skill level* (current/previous employment), share						
Low	5.7	6.7	-	-	-	-
Medium	64	63.2	78.7	76.7	46.7	47.4
High	30.4	30.2	19.8	20	51	52.3
Sector* of current/previous employment, share						
Primary	9.3	8.7	6.9	-	-	-
Industry	8	6	6.7	-	-	-
Construction	5.8	6.4	4.3	-	-	-
Private services, contact-intensive	29.2	56.7	66.6	64.8	37.1	51.2
Private services, non-contact-intensive	7.1	9.2	6.4	-	12	9.9
Public services	14.2	13	8.5	8.9	33.1	21.4
Demographics						
Age, mean	33	34.5	19.3	19.2	48.2	49.5
Female share	53.2	53	48.1	52.1	100	100
Has children under 14, share	15.2	12.8	0.7	0	39.8	36.1
Married, share	29.6	30.6	0.5	0.3	74.2	73.7
Migrant, share	11.2	10.6	5.5	4	13.4	16.2
Employed in Dublin, share	27.3	21.5	26.9	21.6	26.3	17.7
In education, share	40.3	42.5	71.6	78.1	5	4.4
Work intensity, permanence						
Part-time share	64.2	62.3	73.7	72.6	64.3	66.9
Temporary share	41.4	36.9	60	58.6	20.9	14.5

Source: CSO and authors' calculation

Note: Sample limited to respondents appearing at least twice in LFS data.

* Occupational skill level and sector of (previous) employment known for approximately 30% of sample

- Cell size does not permit reporting for these characteristics

In order to test whether there were meaningful differences before and after the pandemic in the factors that led those who are considered economically inactive to supply their labour; we run the regression over two time periods. First for the employment expansion period between 2015 and 2019 and second for the latter three quarters of 2021. This allows us to examine whether the characteristics predicting transitions from inactivity to employment *after* the pandemic are substantially different to those *before* the pandemic. Moreover, this allows us to abstract from the five quarters between 2020 Q1 and 2021 Q2 when individuals' decisions to participate in the labour force were complicated by the public health restrictions in place to

limit the spread of Covid-19. In 2021, it is specifically those who moved directly from inactivity to employment that drove the participation rate increase, as described in Section 2. Thus, our focus on transitions from inactivity to employment allow us to test the hypotheses put forward in Section 3.

Table A1 in the appendix reports marginal effects from the logit regression. Columns (1) and (2) report marginal effects for all working age LFS respondents. Whilst the size of some of the marginal effects differs between the pre-pandemic and 2021 recovery periods, the signs and significance on variables relating to age, gender, skill-level and sector of employment remain broadly consistent between the time periods of interest.²⁵ As in other published work on the determinants of labour force participation, we find age to enter the regression non-linearly. That is, transitions to employment are falling in age, up to approximately 48 years of age and are then increasing. Our finding on women being significantly more likely to transition from inactivity to employment is consistent with women being more likely to transition outside of the labour force during spells of non-employment (for example to carry out caring responsibilities) than men, who are more likely, all else equal, to remain in unemployment when not working. Compared to those in lower skilled occupations, those in high or medium skilled occupations are less likely to transition to employment from inactivity. This likely reflects the higher wage-penalty for absences from employment in medium and high skilled jobs, compared with lower skilled occupations.²⁶ It is also consistent with lower skilled jobs being more likely to be temporary or atypical and therefore subject to more churn.²⁷ This effect is pronounced in the pandemic-recovery period, reflecting the relatively high share of lower skilled, contact intensive service roles available once pandemic restrictions were eased from Q2 2021.²⁸ In fact, the coefficients on the sectors of employment reinforce this point, apart from construction; all non-primary sectors display large, negative effects on the probability of transitioning, when compared to the base sector, private contact-intensive services.

Columns (3) and (4) report marginal effects for the under-25 cohort. The absence of significance on the gender, skill level and sectoral variables in the 2021 recovery period indicate the widespread nature of employment growth for young workers: both men and women under 25 flowed into vacant roles across the skill and sectoral distribution as the economy began its recovery from the pandemic.

²⁵ Whilst total sample sizes are large in both time periods examined, actual transitions to employment comprise between 2 and 6 per cent of all those inactive across the sub-samples included, a relatively small number that may affect standard errors.

²⁶ There is a substantial literature on the positive labour market effects of developing human capital and the role of occupation in explaining wage differentials. For example, lower education is often cited as an explanation for long periods of unemployment or inactivity (Devins et al., 2011), while Abraham & Speltzer (2009) show that jobs requiring more analytical activity pay significantly higher wages. More recently, Hampf et al. (2017) shows skill improvement is associated with potentially substantial gains in hourly wages and likelihood of being employed.

²⁷ Dabla-Norris et al. (2022) notes temporary and zero-hours contracts are more prevalent in low-skilled sectors, and for part-time work, and are more prevalent among younger workers.

²⁸ The pandemic period has been noted for its high job churn. For example, Macaluso (2021) describes the much higher flows from employment into out of the labour force in the US in 2020 compared to during the Global Financial Crisis (2007–09), especially for roles in food, hospitality and maintenance/cleaning.

Columns (5) and (6) focus on women over 35. The strength of the recovery in private contact intensive services, seen already for the whole population sample as well as for the younger cohort, is again evident from the increase in the size of the coefficients between the model estimated on the pre-pandemic and 2021 recovery samples. Of particular interest however, is the reversal in sign of the relative contribution of occupation by skill level to the probability that an economically inactive woman will move into employment in the subsequent quarter. The medium term trend in employment by occupational skill level is flat overall. However, in the 2021 recovery period, women aged over 35 who are in medium or high skilled occupations are significantly more likely to gain employment compared to those in lower skilled occupations, even when controlling for sector of employment and all other baseline observable characteristics. This confirms descriptive evidence in Section 3 (Figure 14).

We take 2015Q1-2019Q4 as the base period for our logit model to capture the relationships between observable characteristics and the probability that an individual participates in the labour market before the pandemic. Using the explanatory variables described above and the estimated coefficients from our logit model, we can predict the likelihood of an individual transitioning from inactivity to employment during the period under examination. If the explanatory variables predicting transitions to employment remain constant over time, the base period coefficients should predict employment transitions as accurately in the post Covid-19 recovery period (2021 Q2-Q4) as they do in prior to Covid-19 at a similar point in the economic cycle.

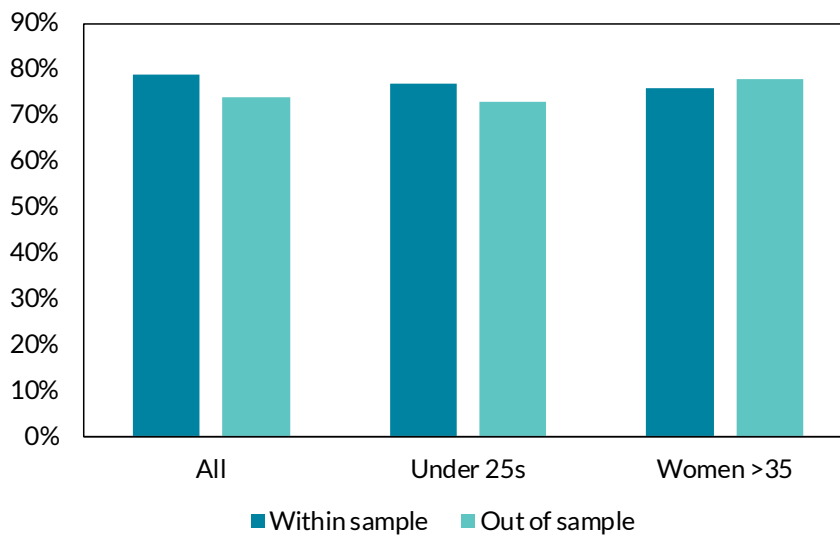
In the base period, two per cent of the sample transition from inactivity to employment. The average predicted probability of transitioning, generated from our model, is also two per cent. When we examine the observed transition outcomes of those whose predicted probability of transitioning is higher than the model average, we find that the model captures almost four-fifths of actual transitions.²⁹

We use the base period logit coefficients to predict probabilities of transitioning to employment in the post-Covid-19 LFS data and examine the actual transition outcomes compared to the predicted transition probabilities to assess how the model performs out of sample. From those whose predicted probabilities of transitioning are higher than the average transition rate in this period (three per cent), the model captures 74 per cent of all workers who actually transitioned, down marginally from 79 per cent in the pre-Covid-19 base period (Figure 15). The remaining 26 per cent have less than the average predicted probability in the model, suggesting that factors other than those captured in the model are driving the transitions for this group.

²⁹ Following the methodology in Paciorek, A. (2015) "Where are the construction workers?", FEDS Notes, Board of Governors of the Federal Reserve System and Conefrey T and McIndoe-Calder T (2017) "Where are Ireland's construction workers?", Quarterly Bulletin Signed Article, Quarterly Bulletin 4, Central Bank of Ireland.

Model describing transitions to employment performs well in and out of sample

Figure 15: Share of actual transitions predicted by model



Source: CSO and authors' calculations

Summing up, this regression analysis indicates that the increased transitions of workers from inactivity to employment observed during the Covid-19 recovery period in 2021 was largely in line with what would have been expected given the changes in the characteristics of workers and jobs over this period. Other potential explanations for the increased movement of workers from inactivity into the labour force, such as changes to working practices during the pandemic, appear not to have played a significant role to date. If this had been the case, we would expect to see meaningfully different coefficients between the pre-pandemic and 2021 recovery periods used for the model estimation, further we would expect to see the model's out of sample performance deteriorate markedly compared to its within sample performance, neither of which occur. This lends further evidence to our hypotheses above, suggesting that the combination of the strength of the economic growth in 2021 and long running cohort effects are the predominant factors driving increased labour force participation.

4.1 Robustness checks

The analysis in Section 4 illustrates that the individual-level transitions into employment seen in the 2021 recovery period can be explained to a high degree using historical relationships between observable characteristics and the probability of transitioning from inactivity into employment. This analysis showed the importance of age, gender, skill level and shifting social norms as reflected in the cohort effect.

This should imply that the aggregate labour force participation rate (LFPR) during 2021 should be able to be explained using a standard model of the aggregate labour force participation rate incorporating cyclical effects. To test this, we specify an autoregressive distributed lag (ARDL) model similar to that contained in Byrne and O'Brien (2017):

$$\ln LFPR_t = \alpha + \beta X_t + \lambda Z_t + \delta Y_t + \epsilon_t$$

Where $LFPR$ is the aggregate labour force participation rate in time t , X is a measure of the returns to labour (measured by the average weekly compensation per employee), Z is a measure of the average weekly unemployment benefit and Y is the unemployment rate in time t reflecting cyclical developments. The monetary variables are deflated using the personal consumption deflator and two lags of each variable are included.

The model is estimated over the period 1998Q1 to 2019Q4 to capture historical relationships. Using the estimated coefficients (β, λ, δ) and plugging in the realised values for the explanatory variables in 2021 yields values of the labour force participation of approximately 64.3 per cent in 2021Q3, just below the actual outturn of 65.1 but significantly above the 62 per cent in 2019 (the last data point in the model). This reflects the labour participation boost arising from a tightening labour market (lower unemployment rate), a decrease in the average weekly unemployment benefit available (as entry into the PUP schemes became more restricted), and increases in average weekly compensation per employee.

Earnings Developments

Employment is not the only aspect of the labour market to be affected by the pandemic and ongoing recovery. However, analysis of wage developments over 2020 and 2021 is complicated by compositional changes within sectors as evidenced in the Earnings, Hours and Employment Costs Survey (EHECS). Decomposition of weekly earnings growth into hourly earnings and hours worked components can typically identify underlying trends at a sectoral level; but the substantial employment changes at the onset of the pandemic saw large earnings increases for contact-intensive sectors. This was caused by a disproportionately greater number of lower-earning or part-time workers moving off firm payrolls (some to PUP supports) with *average* firm payrolls then increasing, as full-time or managerial staff constituted a greater share of remaining employment. As this and other changes complicate existing wage data releases, it is important to look to other data sources to analyse earnings developments for those with and without pandemic income supports in order to understand how this changes at both sectoral and demographic levels. These issues are outlined further in Box B.

Policy responses introduced to mitigate the negative financial impact of the pandemic, such as the TWSS, EWSS and PUP, were successful in supporting income levels. Without income supports being implemented in 2020 (and assuming no other out-of-work supports); median gross household income would have fallen annually by 20 per cent by Q2 2020 and 6 per cent by Q3 2020.³⁰ The EWSS provided flat-rate payments to eligible businesses that acted to subsidise wages and enabled a continuation of the link between employer and worker. A cumulative 769,814 workers across all economic sectors availed of the EWSS.

The relative success of the schemes has contributed to a strong recovery in consumption and enabled the unemployment rate to quickly return to pre-pandemic levels, aided by labour

³⁰ Cahill and Lydon (2021) - [“The Impact of COVID-19 on the incomes and debt sustainability of Irish households”](#)

demand increasing significantly across all economic sectors. The results of the 2021 SILC Household Survey show that median household disposable income for 2021 (€46,471) rose by 5.8 per cent from 2020 levels.³¹ Without Covid-19 income supports there would have been a 6.2 per cent decrease in year-on-year median household disposable income. The income supports affected households across the income distribution. Apart from the 1st decile, all others would have experienced negative income growth without the supports, with the income protection provided being relatively greater for the lower income deciles (Figure 16).

SILC data show that income supports accounted for between 6.3 and 10.8 per cent of total net household disposable income between the 2nd and 9th income deciles in 2021 (Figure 17). If a household received any Covid-19 income supports, PUP constituted the greater proportion amongst the lowest seven deciles, reflecting the relatively greater impact of the pandemic and health restrictions on the lower-earning and consumer-facing sectors.

Covid-19 income supports (EWSS/PUP) prevented negative income growth across the distribution

Figure 16: Year-on-year per cent change in net equivalised disposable income, 2020 to 2021

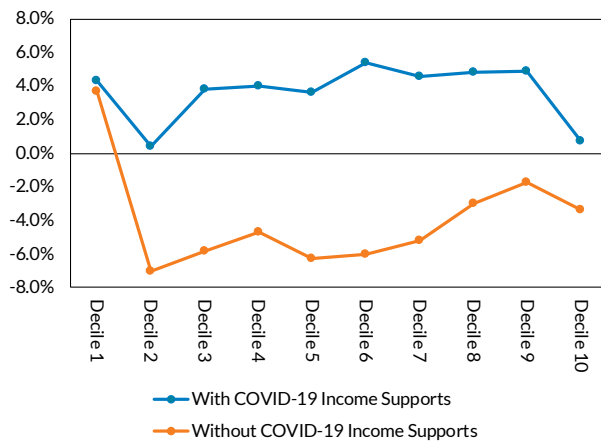
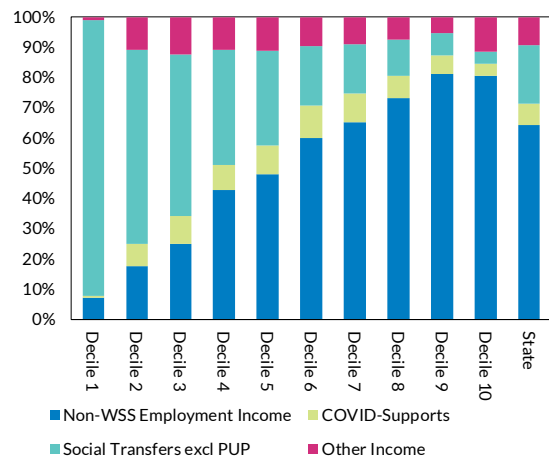


Figure 17: Composition of net household disposable income in 2021, by income decile



Source: CSO and authors' calculations

A CSO Frontier Series analysis using real-time administrative sources offers further insight into earnings developments between Q3 2019 and Q3 2021. The findings show that wage increases have been concentrated among younger workers, those in jobs that were not supported by either the EWSS or PUP schemes and among those who changed employer during 2020 and 2021. The group with the highest median weekly income were workers who had no income supports in either Q3 2021 or Q3 2020. They experienced a 13 per cent increase over the two-year period. There were relatively greater increases for females (13.5 per cent) and persons aged under 25 years (39.3 per cent) (Figure 18). Earnings increases for

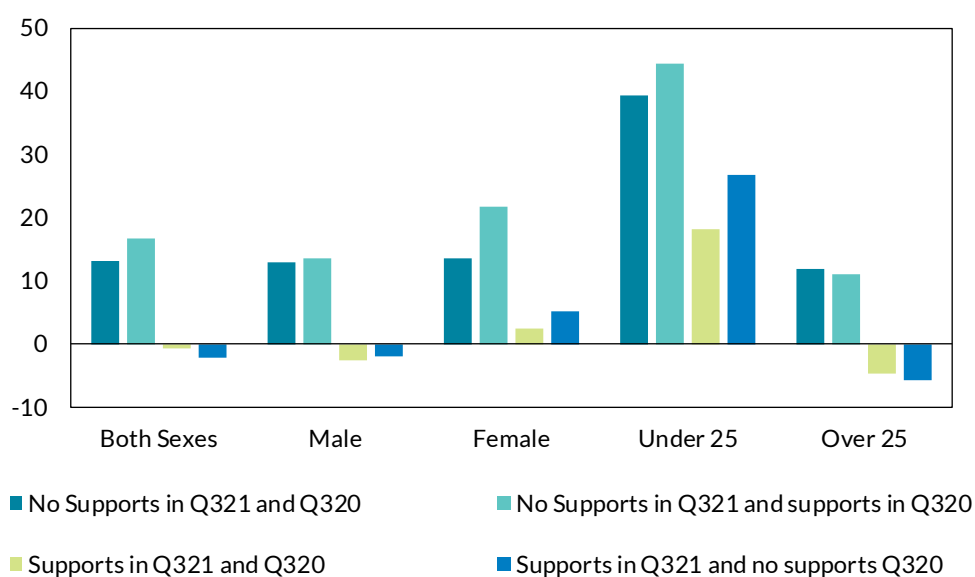
³¹ Income estimates from SILC 2021 are calculated using 2020 calendar year income. In 2021, a [new regulation](#) established a common framework for European statistics relating to persons and households. In order to meet the new regulation requirements, the CSO introduced changes to many SILC business processes, which resulted in a break in the SILC time series for the 2021 release.

these two cohorts were evident regardless of whether they had received pandemic income supports.

It is important to note that both females and those aged under 25 had a relatively lower base level of median earnings in 2019, while the literature on earnings profiles across the age distribution identifies that the highest rate of earnings increases typically occur in the early stages of the working career ([Casanova, 2010](#)).

Female employees and those aged under 25 experienced overall increases in median weekly earnings irrespective of receiving income supports or not

Figure 18: Change in median weekly earnings, by gender and age (Q3 2019 – Q3 2021)



Source: CSO

Workers who did not receive income supports and changed employer between Q3 2019 and Q3 2021 experienced a greater increase in median weekly earnings relative to the non-income support workers who stayed with the same employer (19.5 per cent compared to 12.2 per cent). This trend is evident across gender and age categories, with women and those aged under 25 years again exhibiting the highest relative increase in median weekly earnings.³² However, the earnings increase for non-income support recipients aged over 25 years who either remained with the same employer or changed employer was also strong over the period (11.1 per cent and 15.3 per cent).

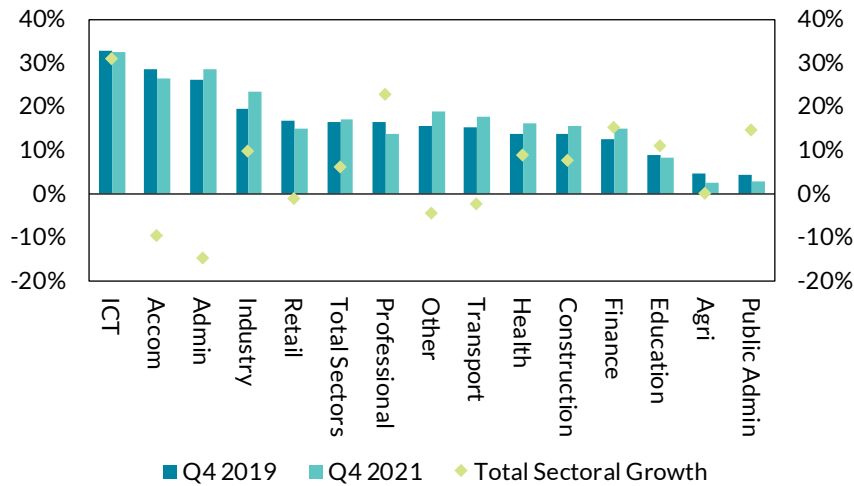
As workers aged over 25 years were less likely to receive income supports, their relative increase in earnings may suggest strong wage gains in sectors less adversely affected by pandemic-related compositional issues. Wage developments for non-income support recipients during the pandemic and the subsequent recovery period have been stronger than

³² The data show that across all gender and age splits, the median weekly income level was lower for those who changed employer compared to those who stayed.

previous periods of labour market tightness. This may reflect labour shortages in expanding sectors.

Slight increase in overall share of non-Irish sectoral employment with more notable increases in essential and non-contact sectors

Figure 19: Share of non-Irish employment by sector (Q4 2019 – Q4 2021)



Source: CSO and authors' calculations

Sectors such as ICT, Finance and Professional services contributed strongly to the recent expansion in employment growth whilst at the same time continuing to exhibit high job vacancy rates, perhaps reflecting a shrinking pool of available labour supply (Figures 10 and 11). Given the lower levels of net inward migration, wage developments in these sectors may continue to outpace other sectors as labour demand persists across firms.

The share of non-Irish employment increased in a number of essential and non-contact intensive sectors, including health, construction, finance and industry, between Q4 2019 and Q4 2021 (See Figure 19). Non-Irish workers accounted for 48 per cent of the increase in employment in these sectors compared to 25 per cent across all economic sectors. Overall, strong earnings growth may have acted as an incentivising factor for existing workers to change jobs in addition to serving as a pull factor for firms to attract new workers who were originally outside of the labour force, such as younger workers identified in previous sections, as well as migrants.³³ The ability of firms to retain labour during periods of closure through the EWSS may have facilitated younger workers to both remain in part-time employment for longer periods relative to the pre-pandemic period and contribute a higher number of hours when available in response to the increased labour demand in contact-intensive sectors.

Whilst sectoral detail was not available in the granular earnings data at the time of writing, National Accounts data shows that non-contact intensive sectors experienced a strong

³³ [Karahana et al \(2017\)](#) find that job-to-job transitions are an important indicator related to wage growth particularly at low levels of unemployment, while [Lydon and Lozei \(2018\)](#) identified that job switching in a tight labour market tends to increase earnings by in excess of 10 per cent.

increase in earnings throughout the pandemic and comprise a much lower share of EWSS supports compared to contact-intensive sectors (Figure 21).³⁴

Non-contact intensive sectors saw strong employment gains throughout the pandemic, coupled with relatively larger increases in earnings and low EWSS take-up

Figure 20: Sectoral contribution to employment growth and job vacancy rates

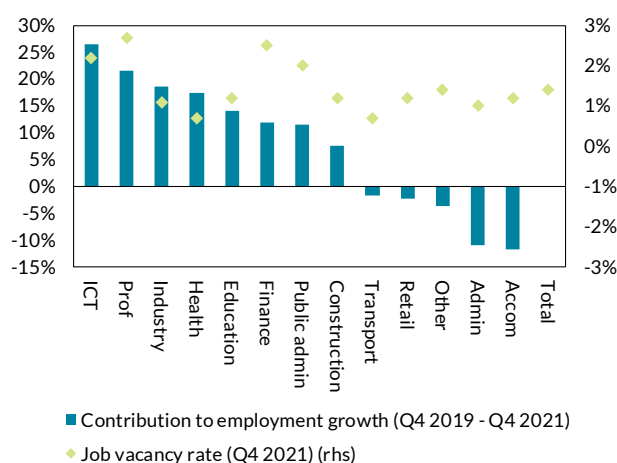
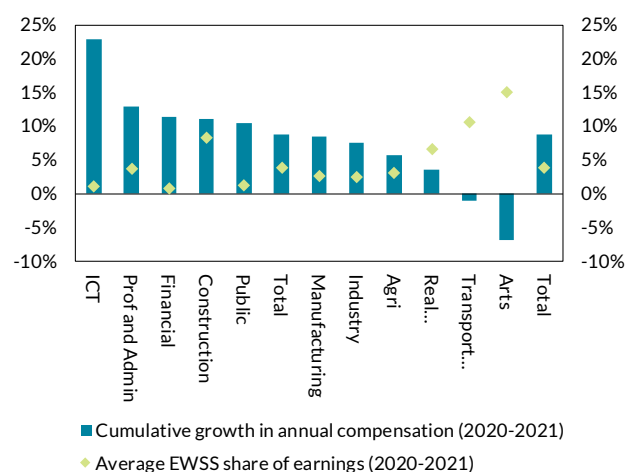


Figure 21: Cumulative change in annual compensation of employees (2020-2021)



Source: CSO and authors' calculations

Allowing for the relative compositional effects to employment, it appears that there was strong wage growth in the non-contact intensive sectors throughout 2020 and 2021, which coincides with the higher level of labour demand. Contact-intensive sectors that were more adversely-affected by the pandemic saw weaker wage growth, especially before the impact of the income-support schemes are factored in. As these contact-intensive sectors are now recovering, following the removal of health restrictions alongside increasing labour demand, this would suggest that overall economy-wide wage growth is likely to pick up as the labour market tightens in the 2021 recovery period. Indeed, upward pressure on wages may have been greater in the absence of the labour force participation gains observed over recent quarters.

³⁴ Similar compositional issues exist in the National Accounts data, but they are lessened here relative to other sectors due to the more limited impact of the pandemic on employment in non-contact sectors.

Box B: Data Challenges to Understanding Wage Developments

Monitoring developments in earnings is important for both understanding the status of the labour market as well as assessing the potential impact on prices. However, the nature of the data poses several challenges for analysing how wages have changed since 2019. In this *Box*, we summarise current challenges in interpreting wage data in Ireland and highlight some experimental sources seeking to address them.

Data challenges

A key issue relates to the impact on overall wages of changes in the composition of the labour market as a result of the pandemic. At one end of the spectrum, individuals working in disrupted sectors may have had their hours reduced or lost their jobs altogether, resulting in lower earnings. While at the other extreme, individuals working in resilient sectors who remained employed throughout may have experienced a wage increase. Some workers will also have changed jobs and certain sectors will have experienced greater job churn than others.

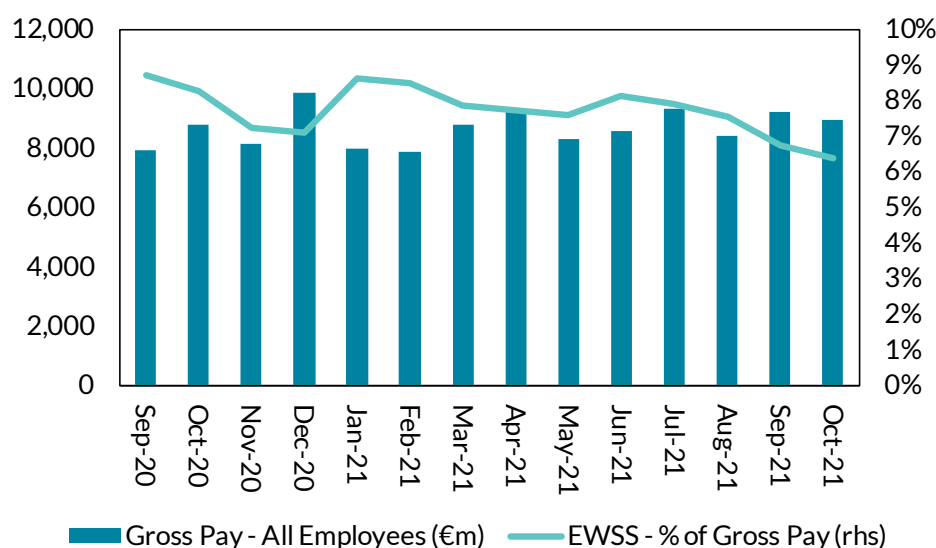
This diversity of pathways for employment means that the composition of the labour market now is different from what it was pre-pandemic. However, data in relation to sectoral shifts and changes in the composition of the workforce, particularly with respect to individual characteristics (such as age, education, experience, gender or type of employment contract) are not captured in core earnings statistics such as the quarterly Earnings, Hours and Employment Costs Survey (EHECS). As a result, it is not possible to confirm whether changes in earnings, as measured by EHECS, reflect genuine changes in wages or rather compositional effects.³⁵ For example, a firm completing the EHECS survey may report a decrease in overall average weekly earnings but this could be driven by a decreasing number of full-time workers or increasing the number of part-time or younger staff that typically command a lower wage.

A further challenge is the impact of pandemic income supports. Revenue data on PAYE trends shows that wage subsidy schemes (WSS) worked to maintain earnings throughout the pandemic (Figure B1). The relatively higher take-up of supports in the contact-intensive sectors makes it difficult for firms in these sectors to accurately reflect developments when completing earnings surveys, as the presence of such income supports masks changes in underlying wages excluding the supports.

³⁵ [EHECS](#) measures “total earnings” as the sum of regular salary, overtime payments and bonuses.

The share of earnings attributed to EWSS varied throughout the pandemic

Figure B1: EWSS as a share of total earnings



Source: Revenue and authors' calculations

Moreover, these additional datasets are aggregate sources and, similar to EHECS, lack information on individual characteristics which obscures the underlying dynamics for particular demographic cohorts. The Survey of Income and Living Conditions (SILC) is Ireland's official source on household and individual income. While, it can provide granular data on individual characteristics, it follows an annual cycle which hinders regular, timely analysis.

Another annual source is the CSO's Earnings Analysis using Admin Data Sources (EAADS). It presents earnings statistics, which draw on administrative returns and is linked to the CSO's Business Register. This dataset provides a demographic breakdowns of employee earnings including by gender, age, sector, region, nationality and WSS status. The data show that median weekly earnings increased annually in 2020 by 5.2 per cent, but without WSS supports, they would have declined by 1.1 per cent. Data for 2021 are not yet available.

New sources

To overcome some of these issues, the CSO has released several Frontier publications throughout 2020 and 2021. This included an experimental SILC release in December 2021 that permitted the role of Covid-19 income supports to be analysed by various characteristics, including income deciles.³⁶ Similarly, a CSO Frontier Series Analysis using real-time administrative sources released in March 2022 provided insight into how availing of Covid-19 income support schemes and/or changing employer impacted a worker's weekly earnings.³⁷

These experimental sources help provide granular information which, while not complete, when pieced together with aggregate sources allow a starting point for wage analysis. However,

³⁶ CSO (2022) – [Poverty Insights - Income Reference Periods 2018 to 2020](#)

³⁷ CSO (2022) – [Impact of COVID-19 Income Supports on Employees, - Insights from Real Time Administrative Sources, Series 3](#)

policymakers are also interested in expected future wage growth. Strong wage demand can lead to faster rising consumer prices as firms may raise their prices to offset additional wage costs. Inflation in turn has implications for real income, as well as consumer confidence, which can impact consumption and investment decisions.

In light of this, there is a growing number of surveys seeking to collect information about what economic agents think will happen in future. For example, the European Commission's Economic Sentiment Indicator (ESI) provides a composite indicator combining judgements and attitudes of consumers and businesses about the general economic situation. Within this survey, there are explicit questions on prospective wage developments.³⁸ The ECB's Consumer Expectations Survey (CES) asks respondents about their financial situation and expectations for their own household income.³⁹ As CES data for Ireland only becomes available in the summer, the Central Bank has recently conducted a pilot collaboration with the polling agency Ireland Thinks. This process involved surveying a nationally representative sample on their wage expectations in relation to inflation and whether they had taken any labour market actions to seek higher wages.⁴⁰ Together, all of these various earnings sources through their use of backward and forward-looking components can help to understand wage developments in greater detail and identify areas where further data sources are needed.

Conclusion

We show that the growth in employment in recent quarters has been mainly driven by women aged over 35 years and young people aged 15-24 years. We find that the recent large increase in employment reflects underlying trend improvements in participation as well as the strength of the economic recovery, rather than structural changes due to the pandemic. Our empirical analysis shows the participation expansion supporting employment growth in 2021 is mostly explained by both the effect of the tighter labour market on participation and longer run trend increases in participation for some groups. In relation to the latter, the analysis suggests that the higher levels of participation for women could be sustained, providing a boost to overall labour supply and supporting economic growth. The participation gains for under 25s could also be maintained as these cohorts are contributing labour alongside educational attainment, however, this activity is more sensitive to the economic cycle. Structural changes in the labour market induced by the pandemic do not appear to have played a major role to date.

These employment gains have thus far supported economic growth without generating substantial wage pressures. With employment approaching levels consistent with full employment, policies to enhance potential employment growth over the medium term will be important to avoid wage developments decoupling from productivity. For example, the prime

³⁸ Latest ESI – [April 2022](#)

³⁹ ECB - [Further information on the CES](#)

⁴⁰ Cunningham, K., Garabedian G., and Zekaite, Z., (2022). [A snapshot into inflation and earnings expectations by Irish residents](#). Economic Letter No. 2, Central Bank of Ireland.

working age (20-64) participation rate in Ireland (~74 per cent) is below the best performing European countries such as the Netherlands (83.7 per cent) and Estonia (79.1 per cent). One reason for this is that the female participation rate in the prime working age population is still lower than the male participation rate (11.9 percentage points difference). Policies to increase the availability or reduce the relative cost of childcare have been shown to promote female participation, particularly for lower income households (Russell et al., 2018). Policies aimed at reducing the gender wage gap could be effective in increasing continuity in female employment (McGuinness et al., 2009), while active labour market policies could improve access to employment for those outside of the labour force for extended periods (Faubert, 2019). Moreover, Byrne and McIndoe Calder (2019) show that, when the economy is close to full capacity, net inward migration is the most important source of employment growth but that attracting migrants in the context of tight labour markets across Europe will be challenging.

References

- Abraham, K. G., & Spletzer, J. R. (2009). New evidence on the returns to job skills. *American Economic Review*, 99(2), 52-57.
- Arulampalam, W., Gregg, P., & Gregory, M., (2001). Introduction: unemployment scarring. *The Economic Journal*, 111(475), F577-F584.
- Bercholz, M., and Fitzgerald, J., (2016). Recent Trends in Female Labour Force Participation in Ireland. *Quarterly Economic Commentary: Special Articles*, Economic and Social Research Institute (ESRI).
- Byrne S., & O'Brien, M., (2017). Understanding Irish Labour Force Participation. *The Economic and Social Review*, Economic and Social Studies, vol. 48(1), pages 27-60.
- Byrne, S., and Conefrey, T., (2017). A Non-Employment Index for Ireland. *Economic Letter No. 9*, Central Bank of Ireland.
- Byrne, S., and McIndoe-Calder, T., (2019). Employment Growth: Where Do We Go From Here? *Quarterly Bulletin 3 – Signed Article*, Central Bank of Ireland.
- Byrne, S., Coates, D., and Keenan, E., and McIndoe-Calder, T., (2020). The Initial Labour Market Impact of COVID-19. *Economic Letter No. 4*, Central Bank of Ireland.
- Byrne, S., and Keenan E., (2020). Measuring and Forecasting the Unemployment Rate during Covid-19. *Quarterly Bulletin 4 – Box D*, Central Bank of Ireland.
- Cahill, B., & Lydon, R. (2021). The Impact of COVID-19 on the incomes and debt sustainability of Irish households. *Economic Letter No. 2*, Central Bank of Ireland.
- CSO, (2021). Information Note – Break in Time Series SILC 2020. CSO.
- CSO, (2022). Poverty Insights – Income Reference Periods 2018-2020. *Frontier Series Publication*. CSO.
- CSO, (2022). Impact of COVID-19 Income Supports on Employees, - Insights from Real Time Administrative Sources, Series 3. *Frontier Series Publication*. CSO.
- Cunningham, K., Garabedian G., and Zekaite, Z., (2022). A snapshot into inflation and earnings expectations by Irish residents. *Economic Letter No. 2*, Central Bank of Ireland.
- Dabla-Norris, E., Pizzinelli, C., & Rappaport, J. (2022). Are Low-Skill Women Being Left Behind? Labor Market Evidence from the UK. *Working Paper No. 2022/042*. IMF.
- Devins, D., Bickerstaffe, T., Nunn, A., Mitchell, B., McQuaid, R., Egdell, V., & Lindsay, C. (2011). The role of skills in the transition from worklessness into sustainable jobs with progression.
- Dwan-O'Reilly, J., and McNelis, M., (2022). Trends in Post-PUP Employment: Examining the Employment Transitions of Those Closing Their Pandemic Unemployment Payment Claims. *IGEEES/IGSS Working Paper*. Department of Social Protection.

- Evans, R., Moore, A., and Rees, D., (2018). The Cyclical Behaviour of Labour Force Participation. Bulletin–September Quarter 2018. Reserve Bank of Australia.
- Fallick, B., & Pingle, J. F., (2007). A Cohort-Based Model of Labor Force Participation. FEDS Working Paper No. 2007-09.
- Faubert, V (2019). Why has Labour Market Participation not fully recovered in Ireland since the Recession? European Commission Economic Brief 051, November 2019
- Hampf, F., Wiederhold, S., & Woessmann, L. (2017). Skills, earnings, and employment: exploring causality in the estimation of returns to skills. *Large-scale Assessments in Education*, 5(1), 1-30.
- Karahan, F., Michaels, R., Pugsley, B., Şahin, A., & Schuh, R., (2017). Do Job-to-Job Transitions Drive Wage Fluctuations Over the Business Cycle? *The American Economic Review*, 107(5), 353–357.
- Kiiver, H., & Espelage, F., (2016). The Use of Regression Models in Labour Market Flow Statistics. European Conference on Quality in Official Statistics, Madrid.
- Lydon, R., & Lozej, M., (2018). Flexibility of New Hires' Earnings in Ireland. *Labour Economics*, 53, 112-127.
- Ma, C., Rogers, J., and Zhou, S., (2020). Modern Pandemics: Recession and Recovery, International Finance Discussion Papers No. 1295, Washington: Board of Governors of the Federal Reserve System.
- Macaluso, C., (2021). High Labor Market Churn During the 2020 Recession. Economic Brief, No. 21-06. Federal Reserve Bank of Richmond.
- McGuinness, S., Kelly, E., Callan, T. and P. J. O'Connell (2009). The Gender Wage Gap in Ireland: Evidence from the National Employment Survey 2003, ESRI, Dublin.
- Nientker, W., & Alessie, R., (2019). Female Labour Market Participation across Cohorts: Evidence from the Netherlands. *De Economist*, 167(4), 407-433.

Appendix

Table A1: Marginal effects, logit estimation of transition to employment from inactivity

	(1)	(2)	(3)	(4)	(5)	(6)
Time period	Pre-Covid Growth	2021 Recovery	Pre-Covid Growth	2021 Recovery	Pre-Covid Growth	2021 Recovery
Sample	All 15+	All 15+	15-25	15-25	Women, 35-65	Women, 35-65
Age	-0.00313*** (9.96e-05)	-0.00474*** (0.000383)	-0.0137*** (0.000538)	-0.0191*** (0.00207)	-0.000816*** (0.000268)	-0.0011 (0.00121)
Age squared	3.26e-05*** (1.03e-06)	4.99e-05*** (3.96e-06)			1.01e-05*** (2.40e-06)	8.22e-06 (1.04e-05)
Female	0.00326*** (0.000500)	0.00947*** (0.00212)	-0.00237 (0.00212)	0.0131 (0.00861)		
Skill level, low skilled=reference						
High skilled	-0.00386** (0.00178)	-0.0233** (0.0102)	0.00895 (0.00932)	0.0131 (0.0331)	-0.00525 (0.00455)	0.0258* (0.0138)
Medium skilled	-0.00417** (0.00174)	-0.0154* (0.00937)	-0.0167* (0.00882)	-0.00640 (0.0283)	-0.00196 (0.00456)	0.0266* (0.0147)
Sector of employment, private contact intensive services=reference						
Primary	0.0145*** (0.00150)	0.00871* (0.00515)	0.0134** (0.00589)	0.0134 (0.0207)	0.0388*** (0.00416)	0.0383*** (0.0133)
Industry	0.000215 (0.000874)	-0.0186*** (0.00340)	0.00397 (0.00506)	-0.0123 (0.0177)	-0.00124 (0.00137)	-0.0146** (0.00626)
Construction	0.00678*** (0.00124)	0.00862 (0.00560)	0.0111* (0.00596)	0.0222 (0.0209)	0.0101*** (0.00370)	-0.00174 (0.0121)
Private non-contact services	0.000523 (0.000836)	-0.0115*** (0.00378)	0.00985* (0.00540)	0.000953 (0.0204)	-0.000431 (0.00108)	-0.0168*** (0.00435)
Public services	-0.000619 (0.000655)	-0.0202*** (0.00268)	0.0151*** (0.00489)	-0.00937 (0.0161)	-0.00373*** (0.000671)	-0.0219*** (0.00329)
Observations	426,191	41,465	58,235	5,063	159,222	10,810
Additional controls included [^]	Y	Y	Y	Y	Y	Y

Source: CSO and authors' calculations

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

[^] migrant; marital; location; employment intensity and permanence; sector catch-all; skill-level catch-all
The time periods are Pre Covid Growth (Q1 2015 – Q4 2019) and 2021 Recovery (Q2 2021 – Q4 2021)

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