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Underutilised workers in New Zealand

Characteristics, transience and earnings trajectories

AUTHORS

Lisa Meehan, Gail Pacheco and Alexandra Turcu

ACKNOWLEDGEMENTS

We would like to acknowledge the funding received from the Ministry of Business, Innovation and Employment (MBIE), which made this research possible. We also must thank Sharon Cox for her help throughout the research process, Gerald Minnee for engaging discussions and feedback on conceptualizing different aspects of labour market capacity, and a large number of staff from the Workforce and Workplace team and Skills and Employment policy within MBIE who provided feedback on draft versions of this research. Our appreciation also extends to attendees at the New Zealand Association of Economists 2022 conference who provided constructive comments and questions.

PUBLISHED

New Zealand Work Research Institute, Auckland, New Zealand

ISBN (PDF): 978-1-99-101107-7

2022

Suggested citation: Meehan, L., Pacheco, G. & Turcu, A. (2022). *Underutilised workers in New Zealand: Characteristics, transience and earnings trajectories*. New Zealand Work Research Institute, Auckland.

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All counts are rounded in accordance with Stats NZ requirements. Component counts may not add to totals due to rounding.

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EXECUTIVE SUMMARY

This study aims to better understand the various labour market groups in New Zealand who want jobs or more hours of work, known as the underutilised workforce. The underutilised comprise three sub-groups: the underemployed, the unemployed and the potential labour force. The underemployed are further disaggregated into full-time and part-time workers. The former of these sub-groups are not traditionally included in official underutilisation statistics, but this research separates out this group to understand its characteristics and prevalence.

This study analyses the composition and characteristics of the underutilised workforce, the likelihood of movement in and out of this group and the reasons for underemployment. It also presents findings on the earnings trajectories of underemployed workers relative to fully-utilised workers over the time period affected by COVID-19 compared to before the pandemic. Key findings are summarised below.

Q1 Who are the underutilised?

Research question 1 analyses the demographic, economic and work-related characteristics of underutilised workers in New Zealand, as well as whether these characteristics changed during the COVID-19 pandemic. We find:

- Underutilised workers have different characteristics to fully-utilised workers across a range of dimensions: For example, underutilised individuals are generally more likely to be female, younger, born in New Zealand and live in larger households than fully-utilised individuals. The underutilised are less likely to have a bachelor's or higher degree and, those who are working, are less likely to be on a permanent contract than fully-utilised workers.
- Income and hours: There are significant differences in income across labour market groups. Both personal and equivalised household income is significantly lower for all underutilised groups relative to the fully-utilised. Underemployed full-time workers make $429 less a week, on average, than those who are fully-utilised full-time, while underemployed part-time workers make $160 less compared to fully-utilised part-time workers. This is despite the fact that both full- and part-time underemployed groups work only one hour less a week than their fully-utilised counterparts.
- Ethnicity: Relative to the fully-utilised, all other labour market groups have a smaller proportion of individuals identifying as NZ European. Māori are over-represented among the underutilised. For example, Māori account for less than 13% of fully-utilised full-time workers but 29% of the unemployed and 22% of the potential labour force. Pacific Peoples are over-represented in the underemployed full-time group and the unemployed.
- Gender: Regardless of utilisation status, women are more likely to work part-time. For example, while only 43% of fully-utilised full-time workers are women, 72% of fully-utilised part-time workers are women. Women are also over-represented in three of the four underutilised groups, all of which have a larger proportion of women relative to the fully-utilised full-time group. The only underutilisation category where women are under-represented is the underemployed full-time category, with women accounting for 39% of this group.

- Age: Underutilised workers tend to have a higher proportion of those aged 15 to 24 relative to fully-utilised workers. Additionally, fully-utilised full-time workers have a higher proportion of those aged over 35 to 64 compared to all underutilised groups.

Q2 What are the probabilities of transitioning into and out of underutilisation?

Research question 2 focuses on movement into and out of underutilisation over time. By analysing the quarterly and yearly changes in labour market status, we explore persistence of underutilisation over time. We find:

- Underemployed full and part-time workers are more likely to move into other labour market groups over time relative to their fully-utilised counterparts. Over 50% of those who are underemployed full-time become fully-utilised full-time workers, and 30% of those who are underemployed part-time become fully-utilised part-time workers after one quarter.
- There are indications that some workers become discouraged, with 41% of those in the potential labour force exiting the labour force after one quarter, while only 12% become fully-utilised. Similarly with the unemployed, over 25% left the labour force after one quarter, and only 15% became fully-utilised.
- Yearly transitions showed much larger movements for the underutilised, with 26-28% of the underemployed and unemployed remaining in their respective categories after one year.

Q3 What are the reasons for underemployment?

Research question 3 focuses on the reasons for underemployment and the heterogeneity in the reasons by demographic characteristics. We find:

- The most cited reason for underemployment was “not enough work available” with more than half of respondents in each sub-group indicating that this is their reason for being underemployed.
- Underemployed part-time workers were more likely to cite “studying or training” as their reason for underemployment compared to underemployed full-time workers. For example, almost a third of underemployed part-time workers aged 15-24 cite this reason, compared with only 3% of underemployed full-time workers aged 15-24.
- Both full and part-time underemployed women were over four times more likely than men to cite “difficulty finding sutable childcare“ as their reason for underemployment.

Q4 How does earnings progression differ for the underemployed relative to the fully-utilised?

Research question 4 focusses on those who were underemployed versus fully utilised in the pre-COVID period of 2016 to 2019 and examines their employment and earnings trajectory. Key findings are:

- Those underemployed prior are more likely to experience future spells out of employment, relative to fully-utilised.
- Earnings progression for both underemployed and fully-utilised workers dipped during the COVID-affected period and then rebounded in the second year of the pandemic. This finding

aligns with macroeconomic labour market trends whereby COVID initially led to labour market slack, but later in the pandemic, the labour market was buoyant.

- Part-time workers, whether fully utilised or underemployed, experienced earnings increases in both pandemic-affected years. In the first COVID-affected year, earnings growth increased by approximately 8-9%, followed by a 15-16% increase in the second year, relative to the pre-COVID period. We note that earnings increases can come via an increase in hours or an increase in hourly earnings, and we cannot differentiate between the two sources of earnings increases due to data limitations. However, both mechanisms are likely at play for this population of interest.
- The gap in earnings growth between the underemployed and fully-utilised decreased during the pandemic years.

1. Introduction

This study aims to provide a detailed understanding of the underutilised workforce in New Zealand. This work builds on previous research by Erwin, Dasgupta and Pacheco (2019), which provided a detailed descriptive portrait of New Zealand's underutilised workforce over the period 2016 to 2018. This study updates and extends this previous work. It focusses on comparing underutilised workers (relative to other labour market groups) in the pre-COVID-19 pandemic time period versus during the pandemic. Our key research questions are:

Question 1: *Who are the underutilised?* This question analyses the social, economic, demographic, and work-related characteristics of underutilised workers in New Zealand.

Question 2: *What are the probabilities of transitioning into and out of underutilisation?* Here we aim to uncover the persistence of underutilisation over time, and to analyse dynamic movement between labour market groups.

Question 3: *What are the reasons for underemployment?* This question aims to uncover why those who are underemployed are unable to get more hours of work.

Question 4: *How does earnings progression differ for the underemployed relative to the fully utilised?* For this question we employ a difference-in-differences empirical strategy and examine the earnings trajectory of underemployed individuals relative to those who were fully-utilised over the pre-COVID versus the COVID-affected period.

The remainder of the report is set out as follows: Section 2 describes the labour market groups of interest and details the key data source of the Household Labour Force Survey (HLFS). Sections 3-6 present the results for each of the research questions outlined above in consecutive order.

2. Data

This study uses data from the Household Labour Force Survey (HLFS), which measures a variety of employment statistics and documents a range of individual, household and work characteristics of a representative sample of New Zealand's working-age population (aged 15 years and over). The survey, administered by Stats NZ, has been conducted quarterly since December 1985. We focus on the period spanning June 2016 to June 2021, as new questions were introduced in June 2016 to identify the underutilised workforce.

2.1 Defining labour market groups

We focus on five sub-groups of interest: the fully-utilised, underemployed, unemployed, potential labour force, and those not in the labour force (NILF) – which are defined below and illustrated in Figure 1. In order to analyse how these groups fared during the COVID-19 pandemic relative to prior to the pandemic, we split the data into two time periods. The pre-COVID period spans 15 quarters from 2016Q2 to 2019Q4, while the COVID-affected period spans six quarters from 2020Q1 to 2021Q2.

Fully-utilised

The fully-utilised are those who are employed (working more than zero hours) and do not want more hours. This group is split into two sub-groups, those working at least 30 hours per week, who we refer to as **fully-utilised full-time** workers, while those working fewer than 30 hours are **fully-utilised part-time** workers.

Underemployed

The underemployed are those who are employed (working more than zero hours) but would prefer to work more hours. This group is also split into two sub-groups: **underemployed full-time** and **underemployed part-time**. Note that the inclusion of 'underemployed full-time' in the underemployed category is a departure from Stats NZ's official definitions, which categorises those who are 'underemployed full-time' as 'fully utilised'. We make this departure as an exploratory exercise to understand the nature and prevalence of this labour market group.

Unemployed

The unemployed are individuals who are not employed, but who are available to work and are actively seeking employment.

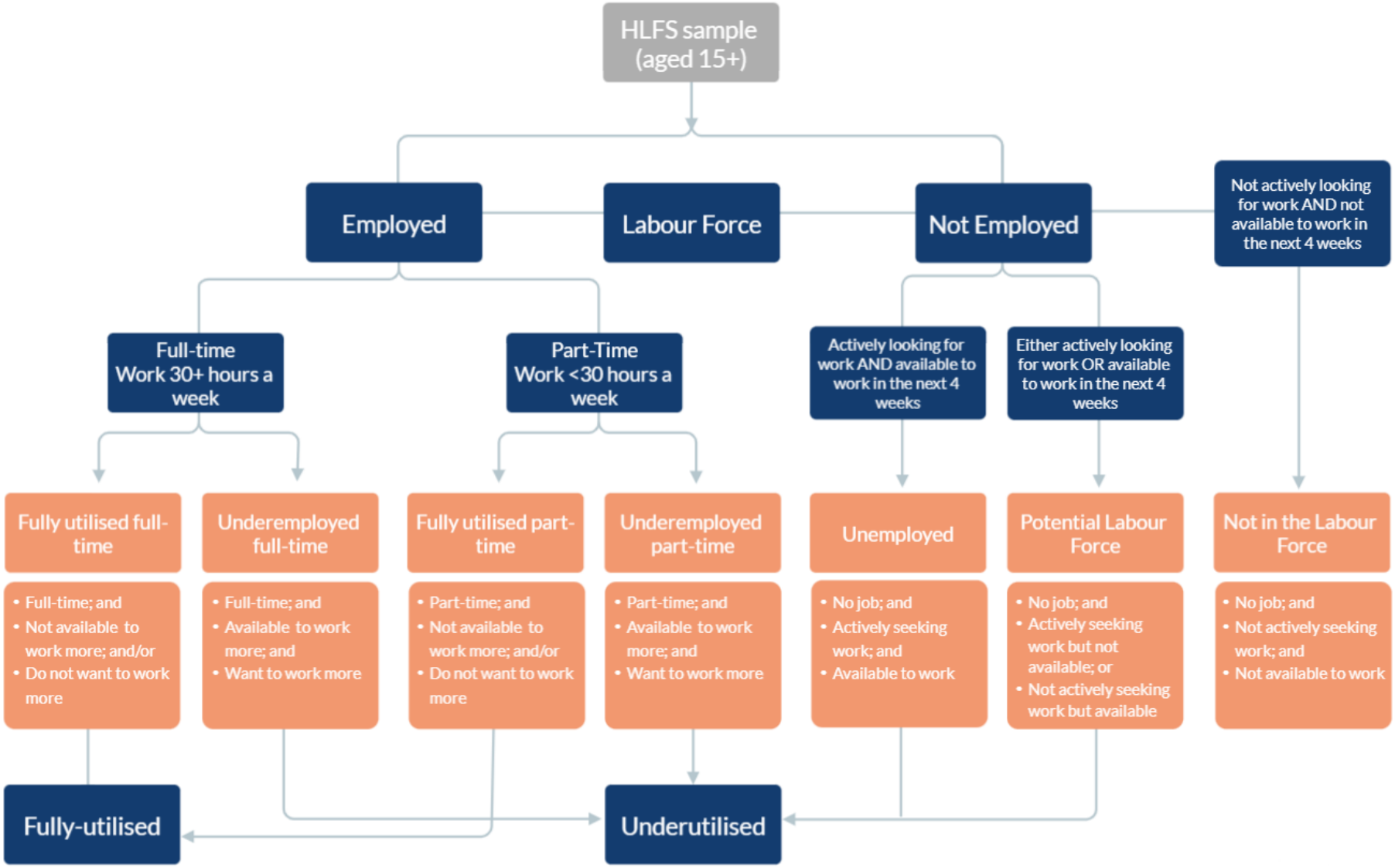
Potential labour force

The potential labour force are individuals who are actively seeking work but are not yet available to start working (i.e. will become available to work within a short time) and those who are available to work but were not actively seeking employment in the survey week.

Not in the labour force

The not in the labour force (NILF) group are those who are not employed, not available to work and are not actively seeking work.

Figure 1. Flowchart of labour market groups and sub-groups

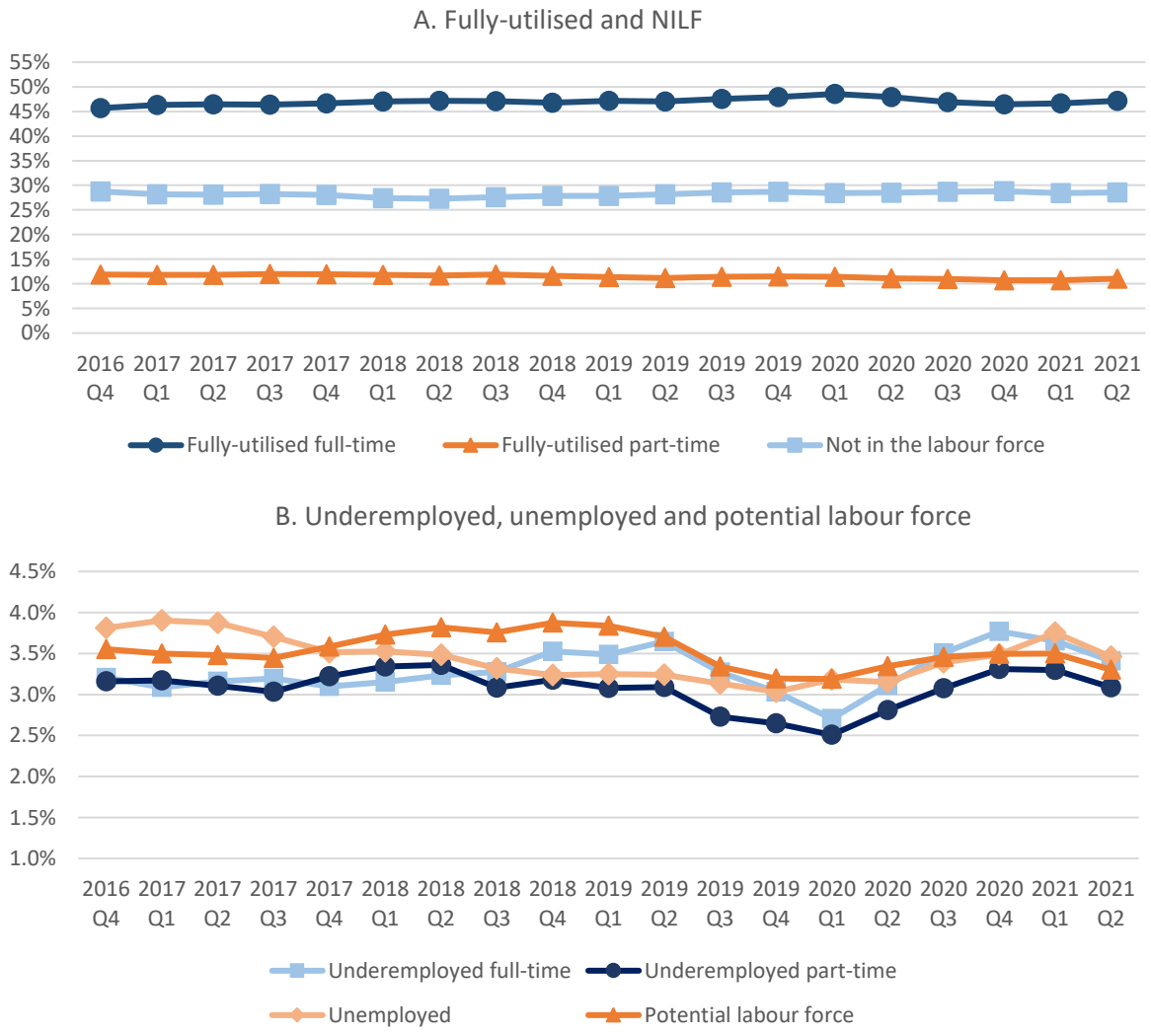


2.2 Labour market groups over time

Figure 2 presents each labour market group of interest as a proportion of the working-age population over time. The fully-utilised full- and part-time along with those who are NILF are the largest groups and, as such, are presented together in Panel A of Figure 2. The remaining groups are presented together in Panel B, such that the scale of the graph allows for an easier visual inspection of trends.

The three groups in Panel A show very stable trends over time, with the share of fully-utilised full-time workers in the working-age population decreasing slightly in the first two quarters of 2020. In Panel B, we note again fairly static trends for the share of the working-age population who are underemployed, unemployed and in the potential labour force. There is a slight increase in the underemployed (both full-time and part-time) share during 2020, before decreasing again in 2021. This increase coincides with a slight decrease in those not in the labour force and the underutilised illustrated in panel B of Figure 2., which appears more prominent due to the smaller scale of the y-axis.

Figure 2. Labour market groups as a share of the working-age population: 3-period moving average



Source: HLFS, Stats NZ. Authors' compilation.

2.3 Additional labour market groups of consideration

As explained earlier, our analysis uses the Stats NZ definition of underutilisation and expands it to include underemployed full-time workers. We undertake this extension to explore the nature and prevalence of this additional group and to understand why these individuals want more hours.

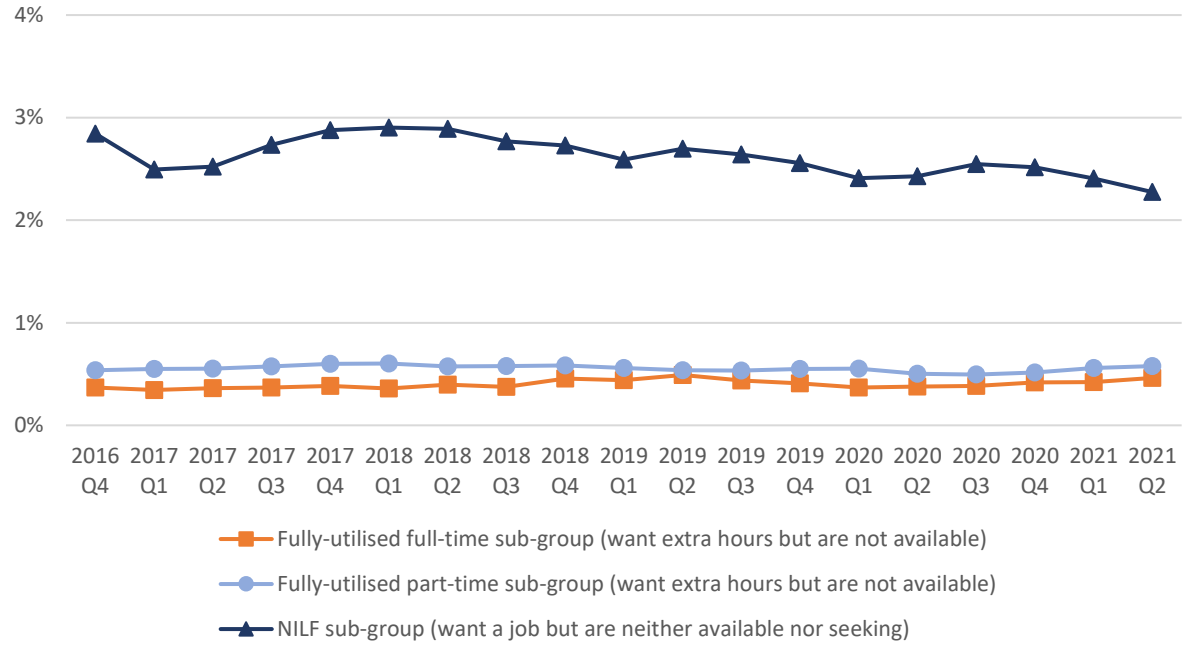
In this section we briefly explore other labour market groups to understand if they could provide additional sources of capacity in the labour market. We examine the fully-utilised full-time and part-time who would like more hours but are currently not available to increase their hours, and those who are not in the labour force because they are not employed and neither actively seeking work nor available to work, but indicate that they want a job.

First, we look at those who are fully-utilised full- or part-time and who would like more hours but are not available to increase their current hours. These individuals are not included in the definition of underutilised workers, but as shown in Figure 3, make up a very small share of the total working-age population. Hence, they are unlikely to be a source of capacity that can be tapped when the labour market is tight. In addition, these shares remain stable over time, including during the COVID-affected period.

In an additional descriptive analysis for the pre-COVID period, not shown here for the sake of brevity, we note that the sub-group of the fully-utilised who are employed full-time and would like more hours but are unavailable to increase their current hours are more likely to be male (over 56%), while the equivalent part-time sub-group is predominantly female (72%). Of note for the full-time sub-group is the large proportion who are of Asian ethnicity, at over 30%, compared to only 18% of the part-time group. The full-time group also had a higher proportion of workers of Pacific ethnicity at over 10%, compared with under 5% for the part-time sub-group. Finally, of note are the proportions of those born in New Zealand in each sub-group. For the full-time sub-group, less than half (about 45%) were born in New Zealand, while for the part-time group this proportion was much larger, at 67%.

One final sub-group of interest, also shown in Figure 3, are those who are not in the labour force because they are not employed and neither actively seeking work nor available to work, but do indicate that they want a paid job. This population sub-group made up approximately 3.5% of the working-age population in 2016Q2 and has been on a general decline to just over 2% of the working age-population by 2021Q2. Individuals in this sub-group are more likely to be female (60%). Just under a quarter of this sub-group are aged 15 to 19 years old, and nearly three-quarters of this sub-group were born in New Zealand. While these individuals indicate that they would like a paid job, approximately 30% say they are not looking for a job because they are studying, a further 25% due to a disability, sickness or illness, 20% due to childcare responsibilities, and 6% indicate that they are retired. As such, we cannot discern when or if these individuals will become available to work. Therefore, they are unlikely to represent a source of capacity that can be tapped when the labour market is tight.

Figure 3. Additional labour market sub-groups as a share of the working-age population: 3-period moving average



Source: HLFS, Stats NZ. Authors' compilation.

2.4 Individual, household and work-related characteristics

Table 1 provides a summary of the individual and household, as well as work-related variables we use in the empirical analysis that follows. These variables are used to give a comprehensive portrait of the populations of interest shown in Figure 1.

Table 1. Variable definitions

Characteristic	Definition
Individual and household	
Age	Continuous variable in years. In descriptive statistics age is broken into categories.
Regional council area	Set of 12 dummy variables equal to one if the respondent reported living in the council area, [1] zero otherwise.
Born in NZ	Dummy variable equal to one if reported being born in New Zealand, zero otherwise.
Female	Dummy variable equal to one if identified as female, zero otherwise.
Household income	Gross weekly household income taken from the NZ Income Survey (NZIS), conducted annually as a supplement to the June quarter of the HLFS. The OECD-modified equivalence scale is applied to adjust for household size. Figures are adjusted for inflation using 2019 Q1 as the base period.
Personal income	Gross weekly personal income from all sources taken from the NZIS, conducted annually as a supplement to the June quarter of the HLFS. Figures are adjusted for inflation using 2019 Q1 as the base period.
Poverty indicator	Dummy variable equal to one if equivalised household income is below 60 percent of the sample median equivalised household income, zero otherwise.
Household size	Count of total number of people in the household.
Parenthood	Dummy variable equal to one if respondent identified as being in a parenting role, zero otherwise.
Number of Children	Count of the total number of children, defined as those under the age of 18, in the household.
Prioritised ethnicity	Set of dummy variables equal to one if prioritised ethnicity was identified as being one of the following ethnicities, and zero otherwise: Māori, Pacific Peoples, Asian, MELAA, NZ European, other. Respondents are allocated a single ethnicity where the order of priority is in accordance with the list above.
Highest educational attainment	Set of dummy variables indicating the highest educational attainment of the respondent.
Deprivation decile	Based on NZDep2013 deprivation deciles published by the University of Otago (see Atkinson, Salmon & Crampton, 2014). A decile of 1 represents the least deprived areas.
Urban / rural	Set of dummy variables equal to one if the respondent lived in a main, secondary, or minor urban area, rural center or rural area, zero otherwise.
Years in NZ	Number of years the respondent has lived in New Zealand if born overseas.

[1] Note that several smaller council areas are combined, as shown in Table 2.

Region of birth	Set of nine dummy variables equal to one if the respondent was born in the following regions, and zero otherwise: Oceania and Antarctica, Northwest Europe, Southern and Eastern Europe, North Africa and the Middle East, Southeast Asia, Northeast Asia, Southern and Central Asia, the Americas, Sub-Saharan Africa.
Work-related characteristics	
Holds multiple jobs	Dummy variable equal to one if respondent had more than one job in the week prior to the survey, zero otherwise.
Number of jobs	Count of the number of jobs the respondent held in the week preceding the survey.
Employment status in main job	Employment status in main job (if employed): paid employee, employer, self-employed with no employees, unpaid family worker.
Main occupation	Set of dummy variables equal to one if respondent's main job was in one of the nine 2013 level-1 ANZSCO occupation categories, and zero otherwise.
Main industry	Set of dummy variables equal to one if respondent's main job was in one of the 20 2006 level-1 ANZSIC industry categories, and zero otherwise.
Usual hours per week in all jobs	Hours usually worked each week in all jobs.
Actual hours per week in all jobs	Hours worked in the week preceding the survey in all jobs.
Total number of hours wanted per week	Number of hours of work per week wanted for those who would prefer to work more hours.
Increase in usual hours wanted	[(total number of hours wanted per week – usual hours per week in all jobs) / usual hours per week in all jobs] x 100
Increase in actual hours wanted	[(total number of hours wanted per week – actual hours per week in all jobs) / actual hours per week in all jobs] x 100
Union membership	Dummy variable equal to one if respondent belongs to a union in their main job, and zero otherwise.
Contract type in main job	Set of dummy variables equal to one if respondent's main job had the following contract types, and zero otherwise: permanent, fixed term, project-based, temp agency, casual, seasonal.
Underemployment job seeking	Set of dummy variables indicating whether underemployed workers were actively seeking another job, not actively seeking another job, or did not specify, zero otherwise.
Reason for underemployment	Set of dummy variables indicating the main reason the respondent felt they were underemployed.
Available to work more hours	Dummy variable equal to one if underemployed respondents indicated they are available to work more hours, zero otherwise.

3. Who are the underutilised workforce?

In this section we analyse the characteristics of the underutilised workforce, relative to those who are fully-utilised. This builds on the descriptive work conducted in Erwin, Dasgupta & Pacheco (2019), which focussed on a 2016Q2 - 2018Q2 timeframe. We add to this analysis by extending this timeframe to 2021Q2 and by comparing the pre-COVID time period with the COVID-affected period.

3.1 Individual and household characteristics

Table 2 presents a range of individual and household characteristics for seven mutually exclusive labour market groups before the COVID-19 pandemic (2016Q2 – 2019Q4). A comparison with characteristics during the pandemic (2020Q1 – 2021Q2) is undertaken in Section 3.3. The groups include two categories of fully-utilised workers: fully-utilised full-time and fully-utilised part-time workers (columns 1 and 2 of Table 2). In addition, there are four groups that make up the underutilised workforce: the underemployed full-time, underemployed part-time, unemployed, and the potential labour force (columns 3 - 6 of Table 2). Finally, characteristics of those who are NILF are in column 7 of Table 2.

The underemployed are defined by official New Zealand statistics as those working part-time and wanting more hours (Stats NZ, 2018). Therefore, the group we refer to as underemployed part-time are those officially regarded as underemployed, while the group we refer to as the underemployed full-time are a new category of the labour market created for exploratory purposes in this study. These individuals would usually be reported in the fully-utilised category in official statistics.

Table 2 presents the shares of individuals that fall into demographic groups (so the columns for each demographic characteristic, such as age groups, sum to 100%).[2] In examining whether the differences across labour market groups are statistically significant, each labour market group is compared to the fully-utilised full-time group.

Underutilised workers tend to be younger than fully-utilised full-time workers

Underutilised workers tend to be younger than fully-utilised full-time workers. These age differences are consistent with previous analyses of the underutilised workforce in New Zealand (Erwin, Dasgupta & Pacheco, 2019). For example, 20% of underemployed part-time workers are aged 15-19, while only 2% of the fully-utilised full-time workers fall in this age category. The difference is less pronounced but still statistically significant between fully-utilised full-time and underemployed full-time workers of whom 5.3% are aged 15-19. The difference is largest when comparing the unemployed and potential labour force groups to those who are fully-utilised full-time, with 23% of unemployed and 24% of those in the potential labour force being aged 15-19. This equates to a 21 and 22 percentage point difference, respectively. Young people are also over-represented in the fully-utilised part-time and the not in the labour force group which may reflect factors such as a desire to work part-time or not at all while studying. Older individuals are also over-represented among those not in the labour market, with close

[2] The same results are also presented so the rows sum to 100% (i.e. each demographic group sums to 100% across labour market states) in Appendix Table A 1.

to half of this group being aged 65 and over, which is unsurprising given many in this age group would be retired.

Underutilised workers tend to have lower education levels

The age differences across labour market categories could also be driven by factors related to experience levels of younger workers and lower qualifications. We note, for example, that underutilised workers tend to have lower education levels. Fully-utilised full-time workers have the highest proportion of bachelor's degrees and post-graduate qualifications among all groups. For example, 24% of fully-utilised full-time workers have a bachelor's degree, while only 17% (16%) of underemployed full-time (part-time) workers have the same level of educational attainment. These proportions decrease further when we look at the unemployed, potential labour force and not in the labour force with only 12%, 11% and 9% respectively having a bachelor's degree.

Average incomes are significantly lower among the underutilised

There are also significant differences across labour market groups in socio-economic status measures. Equivalised household income is significantly lower for all underutilised groups by as much as $720 per week in the case of the unemployed, compared to the fully-utilised full-time group. Even for underemployed full-time workers, equivalised household income is just over $350 lower than that of fully-utilised full-time workers, a gap which is larger than that of the fully-utilised part-time workers who, on average, have a household income just over $300 less than fully-utilised full-time workers.

We see a similar trend when it comes to personal income, with the potential labour force and unemployed groups having the lowest weekly incomes ($158 and $138 per week respectively). Underemployed full-time workers make $429 less, on average, than those who are fully-utilised full-time. A gap is also evident between fully-utilised part-time and underemployed part-time workers, with the latter earning an average of $160 less per week.

Underemployed full-time workers have the lowest poverty rate of all underutilised groups, with 14% living in poverty – even so, this is more than double the 6.8% poverty rate of fully-utilised full-time workers. The proportion of those not in the labour force living in poverty is the highest of all groups, with over 58% living in poverty.

The results in Table 2 also indicate that those who are underemployed full-time are less likely to be born in New Zealand (60%) relative to those who are fully-utilised full-time (69%). All other groups are more likely to be born in New Zealand. Of foreign-born workers, we also find that those who are fully-utilised full-time (part-time) have spent an average of 16.8 (19.9) years in New Zealand, while only those in the potential labour force (20.6 years) and not in the labour force (26.5 years) have been in New Zealand longer.

Māori are over-represented in all underutilised groups

Ethnic differences are also apparent in Table 2. When looking at prioritised ethnicity, all other groups have a smaller proportion of individuals identifying as NZ European relative to fully-utilised full-time workers except for fully-utilised part-time workers. Māori are over-represented among all underutilised groups. For example, Māori account for less than 13% of fully-utilised full-time workers but 29% of the

unemployed and 22% of the potential labour force. Pacific Peoples are over-represented in the underutilised full-time group (12%) and the unemployed (10%) compared to fully-utilised full-time workers (5%). In the results in Appendix Table A 1 where the descriptives are presented with the rows summing to 1, the ethnic differences are clear in this perspective as well. Only 2.5% of NZ Europeans are unemployed, whereas this figure is just over 7% for Māori and 3.5% for Pacific Peoples. To further understand ethnic differences, Appendix Table A 3 also presents the individual, household and work-related characteristics of fully-utilised and underutilised NZ Europeans, Māori and Pacific Peoples.

Those of Asian ethnicity are strongly over-represented in the underemployed full-time category, accounting for 23% of this category versus 14% of the fully-utilised full-time group. This is also reflected in the region of birth statistics, with those born in southeast, northeast, south and central Asia accounting for a higher share of underemployed full-time, while those born in all other regions (except North Africa/Middle East, which is a small group) account for a higher share of the fully-utilised full-time group than of underemployed full-time workers.

Almost three-quarters of fully-utilised part-time workers are women

With respect to gender differences, the largest difference is between fully-utilised full-time and fully-utilised part-time workers. While only 43% of fully-utilised full-time workers are female, 72% of fully-utilised part-time workers are women. The over-representation of women is evident in three of the four underutilised groups, all of which have a larger proportion of women relative to the fully-utilised full-time group. It is also worth noting that regardless of utilisation status, the proportion of women is higher for part-time rather than full-time workers. Women are under-represented in the underemployed full-time category, accounting for 39% of this group.

Table 2. Individual and household characteristics pre-COVID

Characteristic	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time	Unemployed	Potential labour force	Not in the labour force
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age group							
15 – 19	1.86%	12.99%***	5.30%***	20.01%***	23.11%***	24.46%***	13.70%***
20 – 24	8.75%	10.28%***	17.55%***	15.34%***	17.99%***	10.80%***	5.80%***
25 – 34	23.95%	13.02%***	30.01%***	16.52%***	20.20%***	11.11%***	8.39%***
35 – 44	20.84%	15.43%***	18.14%***	14.84%***	13.33%***	8.96%***	6.41%***
45 – 54	22.59%	15.77%***	17.43%***	16.88%***	13.20%***	10.28%***	6.07%***
55 – 64	17.44%	16.43%***	10.54%***	12.96%***	10.27%***	12.77%***	10.17%***
65 and over	4.58%	16.09%***	1.08%***	3.46%***	1.85%***	21.61%***	49.47%***
Born in NZ	68.85%	73.74%***	59.64%***	73.26%***	72.93%***	74.45%***	69.55%***
Years in NZ	16.82 (14.00)	19.87*** (16.62)	12.15*** (11.05)	15.02*** (13.35)	14.49*** (13.30)	20.55*** (18.44)	26.54*** (22.03)
Female	43.38%	71.85%***	38.58%***	68.21%***	50.58%***	56.56%***	60.15%***
Personal Income	1313.02 (1017.31)	567.43*** (788.79)	883.68*** (495.99)	406.94*** (440.06)	138.00*** (208.06)	158.12*** (218.75)	243.21*** (224.34)
Household Income	1346.09 (901.45)	1038.89*** (962.58)	993.16*** (971.80)	870.46*** (699.37)	624.94*** (647.89)	689.57*** (679.61)	631.05*** (654.00)
Poverty Indicator	6.81%	21.92%***	14.19%***	27.76%***	49.76%***	48.98%***	58.34%***
Deprivation decile	5.08 (2.97)	4.82*** (2.90)	6.24*** (3.01)	5.59*** (3.04)	6.35*** (3.20)	5.72*** (3.19)	5.66*** (3.20)
Household size	3.19 (1.56)	3.30*** (1.57)	3.43*** (1.72)	3.47*** (1.60)	3.56*** (1.83)	3.29*** (1.78)	2.88*** (1.83)
Parenthood	45.59%	40.80%***	39.07%***	38.53%***	30.98%***	26.93%***	22.51%***
Female	19.81%	35.63%***	15.56%***	32.08%***	20.80%**	21.16%***	17.62%***
Male	25.78%	5.17%***	23.51%***	6.45%***	10.21%***	5.79%***	4.89%***
Number of children	0.99 (1.24)	1.16*** (1.34)	1.06*** (1.34)	1.33*** (1.35)	1.39*** (1.50)	1.16*** (1.44)	0.80*** (1.38)
Prioritised ethnicity							
NZ European	65.32%	71.83%***	42.88%***	60.08%***	44.10%***	58.28%***	64.08%***
Māori	12.79%	11.20%***	19.89%***	19.14%***	29.17%***	22.17%***	13.90%***
Pacific peoples	5.29%	3.01%***	11.66%***	5.00%	9.72%***	5.79%**	6.57%***
Asian	14.17%	11.08%***	22.72%***	12.48%***	13.67%	10.78%***	12.57%***
MELAA	1.07%	1.18%*	1.57%***	1.56%***	1.87%***	1.19%	1.08%
Other	1.36%	1.72%***	1.24%	1.71%***	1.47%	1.76%***	1.81%***
Highest educational attainment							
Post-graduate	11.52%	8.27%***	6.12%***	6.85%***	5.28%***	4.88%***	3.95%***
Bachelor's	24.17%	18.79%***	16.91%***	15.66%***	12.20%***	10.63%***	9.33%***
Post-school	26.42%	22.22%***	28.55%***	22.04%***	19.29%***	19.88%***	19.56%***
School	26.49%	36.56%***	33.53%***	40.90%***	40.48%***	37.94%***	30.38%***
No qualification	10.84%	13.76%***	14.43%***	14.21%***	22.09%***	26.04%***	36.17%***
Urban/rural							
Main urban areas	76.75%	70.69%***	78.31%***	72.05%***	77.46%*	73.90%***	72.46%***
Secondary urban areas	5.99%	6.00%	6.33%	7.07%***	5.38%***	6.21%	7.47%***
Minor urban areas	6.78%	7.99%***	7.95%***	9.64%***	8.63%***	9.39%***	10.40%***
Rural centres	0.85%	0.98%**	0.98%	1.20%***	1.30%***	1.07%**	0.95%***
Rural areas	9.63%	14.33%***	6.40%***	10.05%	7.23%***	9.43%	8.72%***

Regional council area							
Northland	3.00%	3.57%***	3.04%	3.87%***	5.06%***	4.69%***	4.51%***
Auckland	35.81%	29.89%***	34.31%***	26.48%***	33.23%***	30.41%***	33.96%***
Waikato	9.20%	10.08%***	9.51%	9.91%**	9.19%	9.53%	9.23%
Bay of Plenty	5.88%	7.00%***	7.17%***	7.65%***	7.04%***	7.69%***	6.58%***
Gisborne / Hawke's Bay	4.06%	4.43%***	5.23%***	4.43%*	5.57%***	5.54%***	4.59%***
Taranaki	2.32%	2.36%	2.45%	3.01%***	2.98%***	2.27%	2.34%
Manawatū / Whanganui	4.49%	4.61%	5.73%***	6.88%***	5.76%***	6.57%***	5.46%***
Wellington	12.23%	10.61%***	9.11%***	11.78%	11.14%***	10.30%***	9.55%***
Nelson / Tasman / Marlborough / West Coast	3.58%	4.68%***	3.72%	4.79%***	3.13%***	4.41%***	4.07%***
Canterbury	12.80%	14.92%***	12.83%	13.06%	10.72%***	12.20%**	12.83%
Otago	4.72%	5.64%***	4.93%	5.68%***	4.25%**	4.73%	5.02%***
Southland	1.91%	2.22%***	1.92%	2.45%***	1.98%	1.64%**	1.87%
Region of birth							
Oceania and Antarctica	74.60%	77.37%***	70.76%***	77.87%***	78.82%***	79.49%***	76.06%***
Northwest Europe	7.72%	8.68%***	4.02%***	6.06%***	4.27%***	7.44%	9.82%***
Southern & Eastern Europe	0.94%	0.75%***	0.70%***	0.89%	0.87%	0.57%***	0.66%***
North Africa/Middle East	0.35%	0.45%***	0.61%***	0.48%*	1.02%***	0.63%***	0.65%***
Southeast Asia	3.17%	2.22%***	6.29%***	2.74%***	3.15%	2.53%***	2.20%***
Northeast Asia	4.02%	3.57%***	4.37%*	3.85%	4.00%	3.76%	5.45%***
Southern & Central Asia	4.62%	3.15%***	9.35%***	3.90%***	4.10%***	2.31%***	2.68%***
The Americas	1.60%	1.54%	1.36%**	1.68%	1.36%**	1.13%***	0.96%***
Sub-Saharan Africa	2.99%	2.24%***	2.48%***	2.55%***	2.38%***	2.14%***	1.51%***
Observations	**187,305**	**47,217**	**12,837**	**12,474**	**14,109**	**14,829**	**123,468**
Population Estimates	**25,189,500**	**6,277,300**	**1,738,900**	**1,641,900**	**1,853,200**	**1,919,600**	**15,138,300**

Source: HLFS (2016Q2 - 2019Q4), Stats NZ. Authors' compilation.

Notes: *, **, and *** denote statistically significant differences between variable means compared with the fully-utilised full-time (column 1) at the 10, 5, and 1 percent-levels, respectively. Standard deviations in brackets.

3.2 Work-related characteristics

Table 3 presents the work-related characteristics of both the full- and part-time fully-utilised and underemployed workers in the pre-COVID period. We do not include the unemployed, potential labour force or those not in the labour force as they, by definition, do not hold jobs at the time of the survey. The inclusion of the underemployed full-time group, which has not been analysed in previous research, allows for comparisons between fully-utilised full-time and underemployed full-time workers and, as will be discussed, provides some interesting insights into differences between these groups. As such, we present statistical significance based on the differences between fully-utilised full-time and two of the three other groups, represented by "*" symbols, as well as between fully-utilised part-time and underemployed part-time workers, represented by "+" symbols.

Underemployed full-time workers are more likely to hold multiple jobs and be labourers

Several key differences across the population groups emerge in Table 3. Both fully-utilised part-time workers and underemployed full-time workers are up to 3 percentage points more likely to hold multiple jobs relative to fully-utilised full-time workers.

Fully-utilised full-time workers are also more likely to be managers (professionals) relative to their part-time counterparts and the underemployed full-time by 7.8 (9.2) and 5.9 (12.5) percentage points respectively. Underemployed part-time workers are also less likely to be managers or professionals relative to their fully-utilised counterparts by 5.9 and 11.7 percentage points respectively.

Underemployed full-time workers are 5.9 percentage points more likely to be machinery operators and drivers and 9.3 percentage points more likely to be labourers relative to fully-utilised full-time workers. Underemployed part-time workers are also more likely to be labourers (6.4 percentage points) relative to their fully-utilised counterparts, and they are more likely to be community and personal service workers (5.6 percentage points) and are 13.6 percentage points more likely to fall into that occupation compared to those who are underemployed full-time.

When considering industry characteristics, those who are underemployed full-time are 5.4 and 3.6 percentage points, respectively, more likely to be in manufacturing and accommodation & food services relative to those who are fully-utilised full-time. Additionally, fully-utilised full-time workers are approximately twice as likely to be in financial & insurance services (2 percentage points), professional, scientific, & technical services (4.8 percentage points), and education & training (4.2 percentage points) compared to the underemployed full-time. A similar story emerges when comparing the full-time underemployed to the part-time underemployed, who are more than twice as likely to be in accommodation & food services (10.3% compared to 3.9%). However those who are underemployed part-time are also more likely to be in education & training than the underemployed full-time, by 4.2 percentage points.

The underemployed only work an hour less per week than their fully-utilised counterparts

Another crucial aspect of the underemployed is in the number of hours worked and the number of hours wanted. The HLFS survey asks respondents how many hours they *usually* work per week as well

as how many hours they *actually* worked in the last week. We find that underemployed full-time individuals worked an average of 4.2 hours less in the survey week relative to their *usual* hours. This is similar to fully-utilised full-time workers whose actual hours were 4.6 hours less than their usual hours, on average. Indeed, it is in line with expectations that actual hours would be less than usual hours on average due to some workers being on annual or sick leave, for example, in any given week. Interestingly, as a proportion of *usual* hours, the underemployed full-time want to work over 21% more hours (a total of more than 48 hours per week, compared to their current 40), while compared to *actual* hours worked in the last week, they want to work over 37% more hours. On average, underutilised part-time workers want to work just over 30 hours per week, which would change their labour market status from part-time to full-time worker. This translates to the underutilised part-time wanting 108% more hours than their *usual* and 117% more than their *actual* hours.

It is interesting to note, when comparing the hours worked for the underemployed with the fully-utilised, that the underemployed only work approximately an hour less per week than their fully-utilised counterparts (in both *usual* and *actual* hours). This is the case regardless of whether comparing the full-time or part-time populations of underemployed and fully-utilised. Given the personal and household income differences between these two groups shown in Table 2, it is therefore likely that a key reason for wanting more hours is related to wage differences between the groups. This also aligns with the industry and occupation comparisons discussed above, with the fully-utilised more likely to work in occuptions (such as managers and professionals) and industries (such as finance & insurance and professional, scientific & technical services) which are generally higher paying.

Almost all fully-utilised full-time workers are on permanent contracts

Contract types are also relevant, with 94% of fully-utilised full-time workers employed on permanent contracts, compared to 64% of underemployed part-time workers. Underemployed part-time workers also have the highest likelihood of being a casual or seasonal worker.

More than half of underemployed part-time workers are actively seeking work

HLFS also collects information on whether underemployed workers are actively seeking work. This is only collected for the underemployed part-time, as the underemployed full-time group are part of the fully-utilised group rather than the underutilised workforce in official statistics. More than half (57%) of those who are underemployed part-time indicate that they were actively seeking work at the time of the survey.

While data on actively seeking work is not collected for the underemployed full-time, it is important to note that the HLFS does collect a lot of information on this group, which enabled our exploratory analysis in this study. Furthermore, even though the underemployed full-time group do represent some spare capacity in the labour market, this research does not necessarily advocate for inclusion of this group in Stats NZ's definition of the underemployed. This is especially because the characteristics of this group indicate they work very similar hours to those fully-utilised full-time but have lower earnings, which is likely the driving factor for wanting additional hours despite already having a full-time load. Nonetheless, this group is worth monitoring over time via the HLFS.

Table 3. Work-related characteristics pre-COVID

Characteristic	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time
	(1)	(2)	(3)	(4)
Holds multiple jobs	4.65%	7.75%***	5.94%***	7.61%
Number of jobs	1.05 (0.255)	1.09*** (0.335)	1.06*** (0.279)	1.08 (0.309)
Employment status in main job				
Paid employee	85.49%	73.23%***	91.79%***	82.31%+++
Employer	5.30%	5.37%	1.47%***	1.23%+++
Self-employed with no employees	8.96%	18.16%***	6.50%***	14.83%+++
Unpaid family worker	0.21%	3.17%***	0.17%	1.64%+++
Main occupation				
Manager	21.03%	13.26%***	11.79%***	7.39%+++
Professional	26.40%	20.51%***	13.75%***	14.71%+++
Technicians and trades workers	13.29%	6.08%***	18.65%***	6.96%+++
Community and personal service workers	6.74%	14.66%***	10.32%***	20.29%+++
Clerical and administrative workers	11.82%	15.28%***	8.09%***	9.99%+++
Sales workers	6.78%	13.55%***	8.21%***	17.38%+++
Machinery operators and drivers	5.33%	2.85%***	11.25%***	3.30%++
Labourers	7.83%	12.85%***	17.13%***	19.25%+++
Residual categories	0.79%	0.96%***	0.81%	0.70%+++
Main industry				
Agriculture, forestry, and fishing	4.50%	6.74%***	5.02%**	3.39%+++
Mining	0.17%	S	S	S
Manufacturing	10.90%	4.11%***	16.30%***	4.31%
Electricity, gas, water, and waste services	1.11%	S	S	S
Construction	10.46%	4.50%***	13.38%***	2.86%+++
Wholesale trade	4.98%	2.19%***	4.29%***	2.09%
Retail trade	8.18%	12.82%***	10.17%***	15.21%+++
Accommodation and food services	3.85%	10.25%***	7.48%***	15.07%+++
Transport, postal, and warehousing	4.09%	2.82%***	5.49%***	3.06%
Information media and telco	1.79%	1.20%***	1.37%***	1.49%++
Financial and insurance services	3.59%	1.91%***	1.59%***	0.82%+++
Rental, hiring, and real estate services	1.90%	2.84%***	1.20%***	1.32%+++
Professional, scientific, and technical services	10.22%	7.15%***	5.34%***	5.54%+++
Administrative and support services	2.88%	5.04%***	4.29%***	7.48%+++
Public administration and safety	7.28%	2.27%***	3.80%***	2.21%
Education and training	7.75%	11.92%***	3.58%***	12.39%
Health care and social assistance	9.92%	14.44%***	9.58%	12.54%+++
Arts and recreation services	1.45%	3.18%***	1.47%	3.61%++
Other services	3.88%	4.84%***	3.41%**	5.08%
Not classified elsewhere	1.11%	1.46%***	1.15%	1.42%
Hours				
Usual number of hours	41.02 (5.22)	16.17*** (7.46)	40.07*** (4.77)	15.27 (7.48)
Actual hours per week in all jobs (last week)	36.87 (13.18)	14.76*** (9.93)	35.45*** (12.98)	14.03 (9.67)
Total number of hours wanted per week	-	-	48.40 (8.90)	30.41 (10.67)
Increase in actual hours wanted (percent)	-	-	20.79%	107.91%
Increase in usual hours wanted (percent)	-	-	36.53%	116.75%
Union membership	17.12%	10.61%***	16.37%**	8.57%+++

Contract type in main job				
Permanent	94.21%	76.43%***	83.45%***	63.83%+++
Fixed term	2.42%	5.52%***	4.04%***	6.66%+++
Project-based	0.33%	1.43%***	1.68%***	3.04%
Temp agency	0.11%	0.94%	0.43%	1.29%
Casual	1.57%	13.08%***	6.20%***	20.4%+++
Seasonal	1.36%	2.6%***	4.19%***	4.78%+++
Underemployment job seeking				
Actively seeking	-	-	-	57.02%
Not actively seeking	-	-	-	42.24%
Seeking not specified	-	-	-	0.75%
Observations	**185,700**	**44,967**	**12,240**	**12,465**
Population Estimates	**25,189,500**	**6,277,300**	**1,738,900**	**1,641,900**

Source: HLFS (2016Q2 - 2019Q4), Stats NZ. Authors' compilation.

Notes: *(+), **(++), and ***(+++) denote statistically significant differences between variable means compared with the fully-utilised full-time (fully-utilised part-time) at the 10, 5, and 1 percent-levels, respectively. S denotes suppression due to Stats NZ rules for small counts.

3.3 Change in workforce characteristics during COVID

Table 4 presents the absolute difference between the pre-COVID (2016Q2 – 219Q4) means presented in Tables 2 and 3 and the COVID-affected period (2020Q1 – 2021Q2).[3] We use the pre-COVID-19 period as the reference group for each labour force state, with significance stars indicating which sample means are statistically different from zero at the 1, 5 or 10% (***, **, *) significance levels. Note that while most variables are statistically significantly different in the COVID period compared to prior to the pandemic, many differences are small in magnitude.

There were some changes in the age profiles during COVID but there is no clear pattern evident

The first notable pattern is changes in the age profile of the different population groups. Compared to pre-COVID, the fully-utilised are less likely to be aged 45-54 years during COVID; while the underemployed were more likely to contain 25-34 and 65+ year olds. The share of the fully-utilised part-time who are aged 65+ also increased by over 2 percentage points.

[3] The means for the COVID-affected period are presented in the Appendix Tables A 4 (individual and household characteristics) and A 5 (work-related characteristics). The results for the former are also presented so the rows sum to 100% in Appendix Table A 2.

Table 4. Descriptive comparisons between pre-COVID and during COVID

Characteristic	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time	Unemployed	Potential labour force	Not in the labour force
Individual and household characteristics							
Age group							
15 – 19	0.03%***	-0.40%	-0.73%***	-1.81%	-2.48%	-2.14%	-0.66%***
20 – 24	-0.44%***	-0.25%	-1.57%	-0.76%**	0.22%	0.66%***	-0.77%
25 – 34	0.97%	0.07%***	0.41%***	1.62%**	0.94%*	1.61%	-0.04%
35 – 44	0.14%***	-0.86%***	2.32%**	1.27%	0.93%	0.74%	0.14%
45 – 54	-1.16%	-1.05%	-1.09%	-0.04%**	-0.46%	-0.27%	0.02%
55 – 64	0.19%***	0.45%***	0.30%*	-1.20%***	0.15%***	-0.05%	0.19%***
65 and over	0.28%***	2.02%***	0.36%***	0.89%***	0.63%***	-0.54%	1.12%*
Born in NZ	-2.21%**	-1.28%***	-3.52%**	-3.39%	-2.62%	-0.24%	0.48%**
Years in NZ	-0.02***	0.86	0.33	0.05	0.15***	0.87	1.50
Female	0.57%***	-1.55%***	-2.46%***	-0.77%***	-0.21%***	-0.51%***	-0.47%***
Personal income	159.74***	126.97***	184.44***	83.19***	32.34***	33.43***	47.01***
Household income	177.63***	158.06	225.09	135.39	114.58*	121.00	90.20***
Poverty indicator	0.69%***	0.07%	-1.06%	-1.60%	-2.71%	-3.13%	-2.07%***
Household size	0.02***	-0.01***	-0.03	3.58%*	0.03**	0.05	0.03
Parenthood	-0.84%	-1.64%***	-1.92%	1.49%	-1.59%***	-0.37%	-0.03%
Female	-0.20%***	-2.03%*	-1.38%	0.53%**	-2.03%	-0.35%	-0.30%**
Male	-0.64%	0.36%***	-0.54%***	0.96%	0.42%**	-0.10%	0.26%*
Number of children	-0.01***	-0.04***	-0.06	-0.01	-0.06	0.00	0.01***

Primary ethnicity							
NZ European	-2.72%***	-3.31%**	0.08%***	-0.33%***	1.27%***	0.64%	-1.94%***
Māori	0.47%***	0.57%**	-2.21%***	-2.02%	-3.58%	0.10%	0.89%***
Pacific Peoples	0.40%***	0.39%***	-2.10%***	-0.08%***	-0.31%***	-0.66%	0.40%***
Asian	1.81%***	2.34%	4.52%	2.50%	2.97%*	0.33%	0.49%
MELAA	0.28%***	0.11%	0.13%***	0.30%*	0.35%***	-0.09%	0.10%
Other	-0.24%***	-0.11%***	-0.42%	-0.35%	-0.71%	-0.30%**	0.05%***
Highest educational attainment							
Post-graduate	1.12%**	1.80%***	1.06%	1.98%***	1.34%***	0.45%**	0.45%***
Bachelor's	0.49%	1.04%	1.43%	1.88%	2.76%	1.48%**	0.93%
Post-school	-0.07%***	-0.67%**	0.20%*	0.29%***	0.63%**	1.26%	0.22%
School	-1.30%	-1.04%***	-1.71%**	-3.22%*	-1.77%***	-0.28%***	-0.22%***
No qualification	-0.13%***	-0.97%	-1.22%***	-0.99%***	-3.19%***	-2.85%**	-1.27%*
Deprivation decile	0.05***	-0.01**	-0.34	-0.18***	-0.19	-0.05	0.03
Urban / rural							
Main urban areas	-0.53%***	-0.82%***	1.24%	2.62%***	0.49%*	0.05%	-0.10%***
Secondary urban areas	-0.42%***	-0.93%***	-1.04%**	-1.19%***	0.84%***	-0.53%	-0.75%***
Minor urban areas	0.40%	0.94%**	-0.70%**	-1.50%	-1.40%	0.32%**	0.48%***
Rural centres	0.00%***	0.24%*	0.51%	0.21%	0.07%	0.18%	0.30%
Rural areas	0.55%	0.55%***	0.07%	-0.16%	0.00%	0.07%	0.08%***
Regional council area							
Northland	0.32%*	0.16%	0.20%	-0.48%**	-1.52%***	-0.47%	-0.05%
Auckland	-0.35%	0.48%	-0.34%***	1.84%*	2.93%	-1.25%	0.24%***
Waikato	0.02%**	-0.10%	0.87%***	-0.81%	0.02%	0.48%	0.43%**
Bay of Plenty	0.24%	-0.01%*	-1.11%	-0.53%	0.09%*	-0.45%	0.43%
Gisborne / Hawke's Bay	0.05%	0.39%	-0.40%	-0.30%	-0.61%*	0.19%	-0.20%
Taranaki	-0.04%	0.24%***	-0.19%***	-0.29%***	-0.45%***	0.40%**	-0.08%***
Manawatū / Whanganui	0.09%***	0.52%*	-1.46%***	-1.28%	-1.01%	-0.69%	-0.41%

Wellington	-0.46%	-0.46%**	1.68%	0.76%	-0.06%	0.16%	0.04%***
Nelson / Tasman / Marlborough / West Coast	0.00%	0.42%**	0.50%	0.30%	-0.44%**	0.27%	-0.41%
Canterbury	-0.05%	-0.80%***	0.43%	0.85%	1.12%	0.82%	-0.06%
Otago	0.14%	-0.64%*	0.10%	0.03%	0.30%**	0.39%**	0.13%
Southland	0.04%***	-0.19%***	-0.22%***	-0.02%***	-0.46%***	0.22%	-0.05%***
Region of birth							
Oceania and Antarctica	-2.11%	-1.24%***	-5.09%	-3.71%	-2.60%	-0.50%	0.62%***
Northwest Europe	-0.09%	-0.76%	0.09%	0.55%	0.33%	-0.15%	-1.19%**
Southern & Eastern Europe	-0.05%***	0.01%	0.22%	0.01%	-0.06%	-0.06%	-0.08%
North Africa / the Middle East	0.09%***	-0.01%***	0.01%***	0.03%**	-0.21%	0.03%	0.02%***
Southeast Asia	0.54%***	0.51%***	2.14%	0.71%	0.04%*	-0.37%	0.33%
Northeast Asia	0.55%***	0.81%***	0.56%**	0.28%***	0.66%**	0.31%	0.00%
Southern & Central Asia	0.52%***	0.41%**	1.65%	1.30%**	0.70%**	0.06%*	0.00%***
The Americas	0.24%***	0.28%	-0.07%***	0.58%	0.51%**	0.12%***	0.20%
Sub-Saharan Africa	0.31%	0.03%*	0.50%***	0.16%***	0.70%***	0.57%***	0.09%
Work-related characteristics							
Holds multiple jobs	0.06%	0.47%*	1.26%***	-0.19%	-	-	-
Number of jobs	0.00	0.01	0.02***	-0.01	-	-	-
Union membership	0.04%	0.83%	-1.45%***	0.76%*	-	-	-
Employment status in main job							
Paid employee	-0.74%***	-2.71%***	-2.55%***	-4.31%***	-	-	-
Employer	0.12%	0.60%***	S	-0.27%	-	-	-
Self-employed with no employees	0.58%***	1.99%***	2.27%***	4.35%***	-	-	-
Unpaid family worker	-0.02%	0.10%	S	0.17%	-	-	-
Main occupation							
Manager	1.78%***	3.27%	2.98%	3.02%	-	-	-
Professional	0.04%***	0.16%***	-0.72%***	0.68%***	-	-	-
Technicians and trades workers	-0.90%	-0.36%	1.79%	-1.81%	-	-	-

Community and personal service workers	0.15%***	-0.11%	-0.75%**	-0.89%***	-	-	-
Clerical and administrative workers	-1.13%	-1.68%	-0.08%	0.08%	-	-	-
Sales workers	-0.30%***	-0.97%***	-0.31%	-1.09%	-	-	-
Machinery operators and drivers	0.06%***	0.20%***	-0.54%	0.10%	-	-	-
Labourers	-0.16%	-1.02%	-2.26%	-0.76%	-	-	-
Residual categories	0.46%	0.52%***	0.00%***	0.55%	-	-	-
Main industry							
Agriculture, forestry, and fishing	0.15%***	0.28%***	-0.27%	-0.11%***	-	-	-
Mining	-0.01%	S	S	S	-	-	-
Manufacturing	-0.39%	-0.26%	-1.32%*	-0.91%	-	-	-
Electricity, gas, water, and waste services	0.09%***	S	S	S	-	-	-
Construction	0.48%*	0.26%	1.22%	0.70%**	-	-	-
Wholesale trade	-0.86%***	0.07%	-0.07%**	-0.34%**	-	-	-
Retail trade	0.05%***	-0.48%	-0.17%	-0.05%	-	-	-
Accommodation and food services	-0.34%	-0.03%	-0.82%	-1.10%	-	-	-
Transport, postal, and warehousing	0.16%***	-0.10%	0.30%*	0.56%*	-	-	-
Information media and telco	-0.27%*	-0.22%	-0.34%	-0.08%*	-	-	-
Financial and insurance services	0.24%***	-0.12%**	-0.02%*	0.48%	-	-	-
Rental, hiring, and real estate services	0.02%***	0.08%	-0.23%	0.32%**	-	-	-
Professional, scientific, and technical services	-0.58%	0.00%	1.15%	0.69%	-	-	-
Administrative and support services	0.01%***	-0.27%	0.31%***	0.55%*	-	-	-
Public administration and safety	0.43%	0.40%	0.15%	-0.01%	-	-	-
Education and training	-0.71%***	-0.22%***	-0.60%	-1.03%	-	-	-
Health care and social assistance	0.68%***	0.82%	-0.55%**	-0.44%*	-	-	-
Arts and recreation services	0.22%***	-0.58%**	0.31%	0.58%	-	-	-
Other services	0.32%***	0.23%***	0.87%	-0.27%	-	-	-
Not classified elsewhere	0.31%***	0.09%	-0.18%**	-0.01%	-	-	-

Hours							
Actual hours per week in all jobs (last week)	-0.19***	0.32	-0.08	0.00	-	-	-
Usual number of hours	-0.72***	-0.44***	-0.99	-0.50	-	-	-
Total number of hours wanted per week	-	-	-0.12***	-0.20***	-	-	-
Contract type in main job							
Permanent	-0.09%	-0.6%***	2.53%**	-0.52%	-	-	-
Fixed term	0.00%	0.04%	-0.12%**	-0.04%	-	-	-
Project-based	-0.01%	0.07%	-0.41%	-0.24%	-	-	-
Temp agency	0.03%	0.29%	-0.14%	0.04%	-	-	-
Casual	-0.01%*	-0.25%***	-0.49%	0.44%	-	-	-
Seasonal	0.09%	0.45%**	-1.30%	0.32%	-	-	-
Underemployment job seeking							
Actively seeking	-	-	-	-4.24%	-	-	-
Not actively seeking	-	-	-	3.97%***	-	-	-
Seeking not specified	-	-	-	0.27%	-	-	-

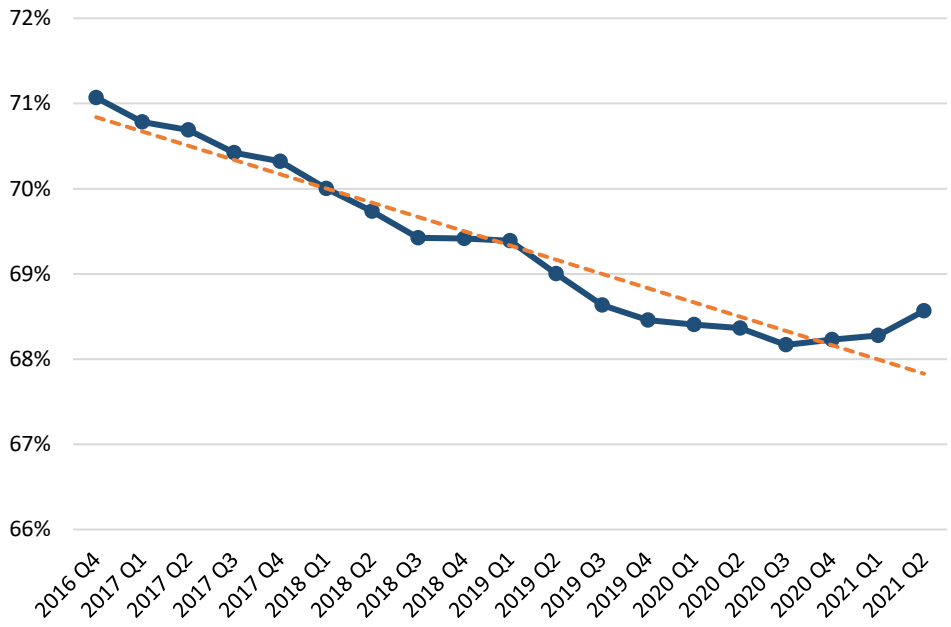
Source: HLFS (2016Q2 - 2021Q2), Stats NZ. Authors' compilation.

Notes: Figures represent a percentage point drop between means shown in Tables 2 and 3 of the the COVID period (2020 Q1 – 2021 Q2) and pre-COVID period (2016 Q2 – 2019 Q4). *, **, and *** denote statistically significant differences between variable means in COVID compared with the pre-COVID period at the 10, 5, and 1 percent-levels, respectively. S denotes suppression due to Stats NZ rules for small counts.

There was a decrease in the proportion of those born in New Zealand, reflecting a longer-term trend

Some labour market groups experienced a decrease in the proportions of those born in New Zealand, including the fully-utilised full-time and part-time as well as the underemployed full-time. The remaining groups showed either no statistically significant change, or a slight increase as was the case for those not in the labour force. This is surprising given the border was closed for much of the COVID timeframe in our analysis, which severely limited new migrants to the country. Indeed, there was net inward migration among New Zealand citizens in the COVID period, while there was net outward migration of non- New Zealand-citizens (Stats NZ, 2020). Assuming that New Zealand citizenship roughly equates to being born in New Zealand, this would have resulted in an increase in the share of New Zealand-born individuals in the HLFS target population rather than a decrease. However, as Figure 4 illustrates, the proportion of those born in New Zealand was showing a steady decline prior to the start of the pandemic, and thus the resulting decrease in those born in New Zealand in the COVD-affected period appears to be a continuation of this trend rather than a consequence of COVID. Indeed, there was a slight increase in the share of the working-age population who were born in New Zealand from late 2020, reflecting the migration pattern described above during the COVID period.

Figure 4. Share of the working-age population that are New Zealand born

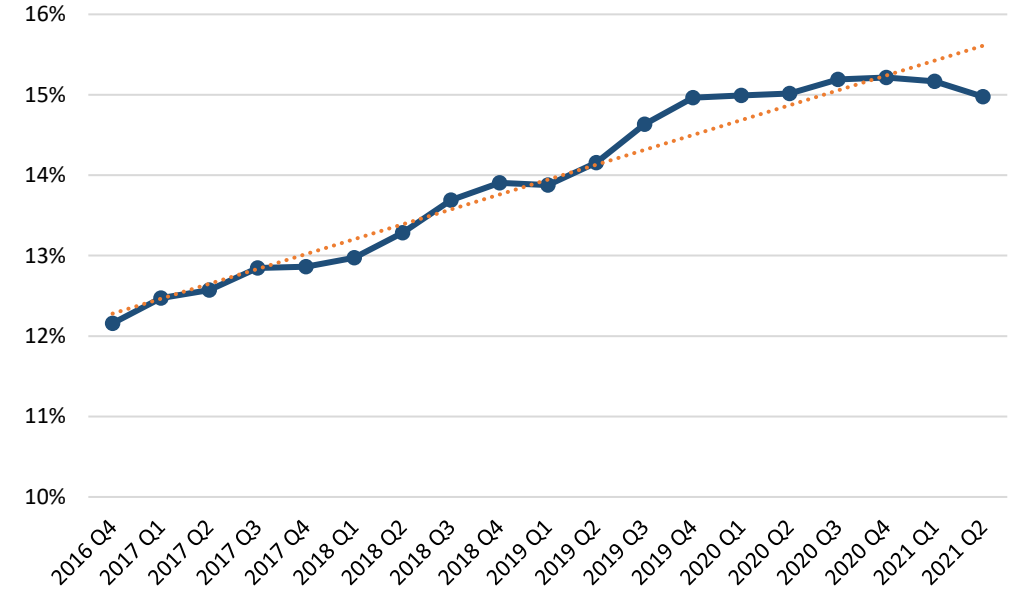


Source: HLFS, Stats NZ. Authors' compilation.
Notes: The figure graphs a 3-period weighted average proportion of HLFS respondents who indicate that they were born in New Zealand, with a linear trend depicted by the dashed line.

The share of ethnic minorities in the underutilised groups generally decreased during COVID

The share of non-NZ Europeans among the fully-utilised and not in the labour force population groups generally increased during the COVID-affected period. While this was matched with a corresponding drop in representation of Māori and Pacific Peoples in the underemployed, the proportion of underemployed of Asian ethnicity actually increased. This could reflect that the proportion of people of Asian ethnicity in the working-age population increased overall, as shown in Figure 5.

Figure 5. Share of the working-age population that are Asian



Source: HLFS, Stats NZ. Authors' compilation.
Notes: The figure graphs a 3-period weighted average proportion of HLFS respondents whose prioritised ethnicity is Asian, with a linear trend depicted by the dashed line.

Similarly, while the proportion of those with a bachelor's degree or higher increased a little across all groups relative to the pre-COVID-19 time period, this likely reflects a general trend of increasing education levels over time. Consistent with this, the share of those with no or school qualifications also fell for all groups.

Income levels increased for all groups during COVID regardless of labour force status

Both personal and household income levels increased for all groups regardless of labour force status. Those in the underemployed full-time category saw the largest household income increase between the pre-COVID and COVID time periods, and the second largest increase in personal income. This is consistent with a drop in the proportion of those living in poverty for the majority of population groups in Table 4 (particularly underemployed part-time). Mechanisms behind these shifts in household income and poverty status are unknown. Several factors may have increased the income of lower-income households, who are also more likely to fall into the underemployed category, compared with the income of other groups of workers, particularly fully-utilised full-time workers. The legislated minimum wage increased twice during the COVID period – in April 2020 from $17.70 to $18.90, and again in April 2021 to $20 an hour. In addition, government assistance such as increases in benefit payments and working-for-families likely disproportionately benefited this group (noting that many on a main benefit also work part-time). Furthermore, COVID-specific assistance such as the wage subsidy would have represented a higher income replacement rate for those on lower earnings since the payment was capped.

All groups experienced an increase in self-employment and professionals, and the underemployed part-time were less likely to be actively seeking work

Next, in terms of work-related characteristics of the different labour market groups, the first notable difference between the time periods is in regard to employment status. All groups illustrated in Table

4 saw a decrease in the proportion of paid employees and increase in those self-employed with no employees. By far the largest difference was experienced by the underemployed part-time, with a 4.3 percentage point drop in paid employees and a 4.4 percentage point increase in those self-employed with no employees. This growth in self-employment is consistent with recent data from Stats NZ which reveals that the proportion of women becoming self-employed grew by 14% year-on-year between 2020 and 2021 (Stats NZ, 2021a). Therefore, if women are most likely to move into self-employment, groups with the highest proportion of women are most likely to see compositional changes. Therefore, this change in employment status for the underemployed part-time could be a function of the high proportion of women (72%) in this group in the pre-COVID period.

Looking at occupations, COVID-19 also seems to have had a significant impact on the proportion of professionals for all groups. All three groups saw an increase in the proportion of the respective population group that were classed as professionals. It may be a compositional effect whereby professionals were less likely than other occupation groups to exit the labour force during the COVID period.

Notably, only the fully-utilised full-time experienced a statistically significant change in the actual hours worked per week. For the underemployed part-time, there was a 4.2 percentage point decrease in those that reported that they were actively seeking work, which appears to coincide with the 4 percentage point increase in those not actively seeking work.

4. Transitions into and out of underutilisation

In this section we explore how permanent or transient labour market status is. We examine this since policy considerations are likely to be different in a situation where some workers remain persistently underutilised for long periods of time versus one where people who are predominantly fully-utilised spend a short period of time underemployed or unemployed before returning to being fully-utilised.

The analysis for this research question builds on previous research, particularly Erwin et al (2019). We disaggregate the labour market groups further than the previous study (in a similar fashion to the population groups studied in Sections 2 and 3), and we also compare results between the pre-COVID period and the pandemic time period.

Specifically, we examine the following questions:

1. How likely are fully-utilised (underutilised) workers to still be fully-utilised (underutilised) a quarter later? A year later?

2. Are these patterns different before and after COVID?

To examine these questions, we use transition probability matrices. These show workers' labour force status in one period and compare it to their status in a later period. We use quarterly and annual transition matrices to gain both a short-term and longer-term perspective.

Tables 5 and 6 present quarterly transition matrices for the pre-COVID (2016 Q2 - 2019 Q4) and COVID-affected (2020Q1 - 2021Q2) time periods respectively. These tables present the proportions of individuals in each of the labour market states in quarter QTR_{t+1}, given the individuals' labour market state the previous quarter, QTR_t. The diagonal elements show the likelihood of remaining in a particular labour market state in the successive time period.

All underutilised groups had lower levels of persistence compared to the fully-utilised

Table 5 shows that most workers remain in the same labour market state from one quarter to the next in the pre-COVID period. This persistence is particularly strong for fully-utilised full-time workers, with about 90% of those who were in this category remaining in it a quarter later. Of the fully-utilised full-time workers who changed categories, 4.6% became part-time workers, with most remaining fully-utilised. About 3% become underemployed full-time and 1% left the labour force. The degree of persistence is also high for NILF. Just under 90% were still NILF one quarter later, while just over 3% moved into part-time employment and 2% became employed full-time. This NILF group includes, among others, those who have retired, students and those with family care responsibilities, and it would be expected that only a small share of these individuals move into employment from one quarter to the next. This is illustrated in the potential labour force group, who would otherwise be considered a sub-set of NILF. Of this group, over 20% moved into one of the employed categories.

The degree of persistence for fully-utilised part-time workers is somewhat lower but still high at about 66%. Most of these workers who moved categories became fully-utilised full-time workers (14%), while about 7% left the labour force and almost 8% became underemployed part-time workers.

All underutilised groups had lower levels of persistence. About 38% of those who were unemployed in one quarter remain unemployed in the next, while over 15% become fully-utilised full- or part-time workers. About 16% became part of the potential labour force, and 25% dropped out of the labour force, which may indicate that at least some of these individuals became discouraged workers. In fact, most of the movement out of the potential labour force group was out of the labour force, with over 40% moving into the NILF category.

As for the underemployed, both full and part-time workers had lower levels of persistence relative to their fully-utilised counterparts. Notably, over 51% of underemployed full-time workers became fully-utilised full-time after one quarter, while 30% of the underemployed part-time workers moved into the fully-utilised part-time category.

There was more movement towards being fully-utilised or out of the labour force in the COVID period

As shown in Table 6, the COVID period is largely similar to the pre-COVID period. However, there are a few slight differences. For example, those who were underemployed full-time workers were more likely to be fully-utilised full-time workers in the next quarter in the COVID period (59% versus 51%). Overall, there was more movement towards being fully-utilised or out of the labour force in the COVID period than pre-COVID. This may be due to a combination of factors including buoyant labour market conditions during the COVID period, with government support helping retain some jobs in negatively impacted industries and the impact of the pandemic on career decisions, also known as “the great resignation“.

When we take a longer-term perspective by looking at the one-year transitions, the general story for fully-utilised full-time workers remains the same as with the quarterly transitions. The vast majority (86%) remaining fully-utilised full-time. Looking at the pre-COVID period in Table 7, movement out of the labour force seems to have increased for most groups. This is most evident for fully-utilised part-time and underemployed part-time workers.

For the underutilised workforce, there were much higher levels of mobility out of underutilisation and into full utilisation over a year versus a quarter, with only 26-27% of underutilised workers remaining in the same labour market group after one year. The majority of the movement for the underemployed is into the fully-utilised groups, with over 52% of underemployed full-time workers becoming fully-utilised full-time after one year.

It is harder to make comment on the one-year transitions over the COVID-period as the data available in this timeframe only covers six quarters, and therefore there are often too few observations for particular transitions. This is evident in Table 8, given the number of transition values that are suppressed. In general, from the limited information available, similar to the comparison of quarterly transitions between the pre-COVID and COVID periods, there appears to be more a of a mixed likelihood of underutilised categories moving to fully-utilised full-time status during the pandemic time period, relative to pre-COVID.

Table 5. Quarter-to-quarter transitions pre-COVID

		QTR_{t+1}						
	State	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time	Unemployed	Potential labour force	Not in the labour force
QTR_t	Fully-utilised full-time	**89.53%**	3.63%	3.39%	0.94%	1.02%	0.46%	1.03%
	Fully -utilised part-time	14.13%	**66.25%**	0.71%	7.80%	2.14%	1.72%	7.24%
	Underemployed full-time	51.21%	3.07%	**35.73%**	4.03%	3.24%	0.92%	1.80%
	Underemployed part-time	9.87%	29.89%	2.53%	**40.66%**	7.06%	3.47%	6.53%
	Unemployed	10.98%	4.24%	1.70%	3.46%	**38.44%**	15.74%	25.43%
	Potential labour force	6.72%	5.54%	0.87%	2.97%	16.53%	**26.43%**	40.95%
	Not in the labour force	2.06%	2.95%	0.13%	0.42%	1.80%	3.51%	**89.13%**

Source: NZ HLFS (2016Q2 - 2019Q4), Stats NZ. Authors' compilation.

Notes: 264,720 observations based on respondents who were observed in HLFS at both time t and t+1. Within-cell observation counts are presented in parentheses.

Table 6. Quarter-to-quarter transitions during COVID

		QTR_{t+1}						
	State	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time	Unemployed	Potential labour force	Not in the labour force
QTR_t	Fully-utilised full-time	**88.98%**	3.47%	3.76%	1.13%	1.15%	0.43%	1.08%
	Fully-utilised part-time	15.80%	**64.53%**	0.68%	7.64%	2.07%	1.58%	7.69%
	Underemployed full-time	58.33%	2.41%	**31.12%**	3.41%	3.01%	0.40%	1.31%
	Underemployed part-time	12.31%	27.82%	3.52%	**37.33%**	7.76%	3.52%	7.76%
	Unemployed	13.35%	4.55%	2.13%	4.74%	**33.95%**	15.67%	25.63%
	Potential labour force	8.77%	5.09%	0.83%	2.61%	17.06%	**23.34%**	42.30%
	Not in the labour force	2.63%	3.15%	0.15%	0.63%	2.15%	3.46%	**87.83%**

Source: HLFS (2020Q1 - 2021Q2), Stats NZ. Authors' compilation.

Notes: 100,884 observations based on respondents who were observed in HLFS at both time t and t+1. Within-cell observation counts are presented in parentheses. S denotes suppression due to Stats NZ confidentiality rules.

Table 7. Year-to-year transitions pre-COVID

		YR_{t+1}						
YR_t	State	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time	Unemployed	Potential labour force	Not in the labour force
	Fully-utilised full-time	**85.80%**	4.83%	3.56%	1.52%	1.42%	0.71%	2.17%
	Fully -utilised part-time	18.15%	**56.80%**	0.77%	7.13%	2.53%	2.36%	12.26%
	Underemployed full-time	52.72%	5.16%	**27.06%**	5.72%	3.77%	1.53%	4.04%
	Underemployed part-time	14.21%	27.08%	3.11%	**27.64%**	8.66%	5.44%	13.87%
	Unemployed	16.32%	5.94%	1.98%	4.78%	**26.11%**	15.15%	29.72%
	Potential labour force	10.93%	7.42%	1.35%	3.64%	14.17%	**19.16%**	43.32%
	Not in the labour force	3.94%	4.98%	0.19%	0.71%	1.93%	3.50%	**84.76%**

Source: HLFS (2016Q2 - 2019Q4), Stats NZ. Authors' compilation.
Notes: 99,354 observations based on respondents who were observed in HLFS at both time t and t+1. Within-cell observation counts are presented in parentheses.

Table 8. Year-to-year transitions during COVID

		YR_{t+1}						
YR_t	State	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time	Unemployed	Potential labour force	Not in the labour force
	Fully-utilised full-time	**85.75%**	4.46%	3.73%	1.43%	1.64%	0.95%	2.05%
	Fully-utilised part-time	19.80%	**53.80%**	0.72%	8.18%	2.58%	2.44%	12.48%
	Underemployed full-time	57.55%	5.04%	**25.90%**	S	S	S	S
	Underemployed part-time	17.31%	26.92%	3.85%	**24.36%**	7.05%	6.41%	14.10%
	Unemployed	19.02%	5.52%	2.45%	4.91%	**19.63%**	15.34%	33.13%
	Potential labour force	15.79%	6.77%	S	S	10.53%	**19.55%**	43.61%
	Not in the labour force	4.87%	4.62%	0.10%	0.90%	1.66%	3.36%	**84.50%**

Source: HLFS (2020Q1 - 2021Q2), Stats NZ. Authors' compilation.
Notes: 17,937 observations based on respondents who were observed in HLFS at both time t and t+1. Within-cell observation counts are presented in parentheses. S denotes suppression due to Stats NZ confidentiality rules.

5. Reasons for underemployment

Tables 9 – 11 of this section focus on reasons for underemployment (before and during COVID) and the heterogeneity in the reasons in terms of sub-population groups demarcated by age, gender and ethnicity (as well as splitting results between full-time and part-time workers). A number of international studies already show the differential market impacts experienced by females in the early stage of the COVID-19 pandemic (see Anderson, Hu & Rajan, 2021; Heggness, 2020; Landivar et al., 2020), and available analysis for New Zealand is also consistent with this (Stats NZ, 2021b). Further, in terms of ethnicity, we focus on Māori and Pacific Peoples, compared to NZ Europeans, as analysis in Table 2 illustrate that these groups are over-represented in the underemployed categories.

The most common reason cited for underemployment is 'not enough work available'

The HLFS allows underemployed respondents to choose one of seven reasons for their underemployment. The most dominant response for all categories as presented in Table 9, is *not enough work available*, ranging from 53% of responses for part-time underemployed aged 15-24, to 71% for part-time underemployed aged 65 and over. Note that an income-related response option is not provided in the HLFS. However, this may be a pertinent response option given findings in Section 3 that many underemployed individuals work similar hours to those who are fully-utilised, but have lower household income.

Table 9 illustrates clear gender differences for the underemployed. Underemployed part-time women are four times more likely to cite *difficulty finding suitable childcare* compared to their male counterparts. Women were also three times more likely to cite *other family responsibilities* as their reason for being underemployed compared to men. However, they are 6 percentage points less likely to cite *studying or training* as a reason.

Age differences are also apparent in Table 9. For instance, of the underemployed part-time, those aged 25-44 are more likely to cite *difficulty finding suitable childcare* and *other family responsibilities* than other age groups. This finding is not surprising as those aged 25-44 are more likely than other age groups to have young children in the household. It is interesting to note that for those aged 45-64, while finding suitable childcare is not a significant concern, *other family responsibilities* comes more to the fore.

Drawing some comparisons between Tables 9 and 10 we notice that *not enough work available* is cited slightly less in the COVID-affected period compared to before. This difference is most pronounced when looking at all full-time respondents and full-time female workers. Note that sample sizes for the COVID-affected period in Table 10 become quite small as we disaggregate the data by more groups. This is evident in Table 10, given the number of values that are suppressed.

The Pacific ethnic group was more likely to cite 'other family responsibilities'

Table 11 examines reasons for underemployment by ethnicity. *Not enough work available* is the dominant response among NZ Europeans, Māori and Pacific workers, with about two-thirds of underemployed full-time workers in each of these ethnic groups citing this as the main reason for being underemployed before COVID. The numbers for the part-time underemployed are again similar, with 57.6% of NZ Europeans citing *not enough work available*, as their main reason and 59.9% and 58.4% respectively, for Māori and Pacific workers.

The Pacific ethnic group is also more likely to cite other family responsibilities, with 8.2% of full-time pre-COVID Pacific respondents citing this reason, while only 4.7% of Māori and 4.8% NZ European selecting this reason.

In relation to the COVID affected period however, both part-time and full-time underemployed Māori cite not *enough work available* less in the COVID-affected period compared to before. This is similar for full-time Pacific respondents, but part-time Pacific workers cite this reason 7 percentage points more during COVID than before.

Table 9. Reasons for underemployment by gender and age pre-COVID

Reason for underemployment	All		Women		Men		15-24		25-44		45-64		65+	
Full-time (FT) or Part-time (PT)	FT (1)	PT (2)	FT (3)	PT (4)	FT (5)	PT (6)	FT (7)	PT (8)	FT (9)	PT (10)	FT (11)	PT (12)	FT (13)	PT (14)
Difficulty finding suitable childcare	1.52%	3.47%	2.91%	4.64%	0.71%	1.03%	S	1.04%	2.23%	8.10%	1.00%	1.85%	S	S
Other family responsibilities	6.13%	7.34%	6.86%	9.34%	5.72%	3.09%	2.24%	1.19%	8.27%	14.03%	5.52%	8.04%	S	S
Own sickness/ illness/ disability	1.40%	3.37%	1.42%	3.04%	1.38%	4.11%	S	1.19%	0.76%	4.32%	2.45%	5.17%	S	S
Studying or training	1.27%	13.29%	1.55%	11.35%	1.07%	17.48%	2.77%	31.54%	0.96%	5.17%	0.61%	1.62%	S	S
Not enough work available	65.37%	58.29%	64.53%	57.85%	65.84%	59.26%	67.98%	52.87%	63.52%	55.67%	66.79%	66.05%	57.45%	70.99%
Weather conditions	3.19%	0.84%	0.91%	0.45%	4.42%	1.58%	3.82%	0.60%	2.94%	0.77%	3.07%	1.11%	S	S
Other reason	19.12%	12.83%	20.19%	12.77%	18.54%	12.97%	19.24%	10.96%	19.28%	11.41%	18.63%	15.65%	25.53%	20.37%
Observations	**12,240**	**12,465**	**4,635**	**8,670**	**7,605**	**3,792**	**2,277**	**4,023**	**5,913**	**3,891**	**3,912**	**4,065**	**141**	**486**

Source: HLFS (2016Q2 - 2019Q4), Stats NZ. Authors' compilation.
Notes: S denotes suppression due to Stats NZ confidentiality rules.

Table 10. Reasons for underemployment by gender and age during COVID

Reason for underemployment	All		Women		Men		15-24		25-44		45-64		65+	
Full-time (FT) or Part-time (PT)	FT (1)	PT (2)	FT (3)	PT (4)	FT (5)	PT (6)	FT (7)	PT (8)	FT (9)	PT (10)	FT (11)	PT (12)	FT (13)	PT (14)
Difficulty finding suitable childcare	1.46%	3.62%	2.70%	5.05%	0.76%	S	S	S	2.11%	8.81%	S	1.65%	S	S
Other family responsibilities	6.27%	7.18%	8.26%	9.52%	5.33%	2.32%	S	S	8.66%	13.05%	4.76%	8.27%	S	S
Own sickness/ illness/ disability	1.51%	2.94%	S	S	1.44%	3.75%	S	1.47%	1.06%	S	2.29%	4.41%	S	S
Studying or training	1.35%	11.65%	1.80%	10.35%	1.10%	14.29%	4.26%	29.67%	0.84%	4.41%	S	S	S	S
Not enough work available	62.92%	57.58%	59.46%	57.04%	64.67%	58.57%	66.56%	53.48%	61.14%	54.58%	64.20%	63.97%	53.33%	70.11%
Weather conditions	2.16%	0.51%	S	S	2.70%	S	3.61%	S	1.69%	S	1.94%	S	S	S
Other reason	17.35%	11.20%	17.87%	10.51%	17.08%	12.50%	16.07%	9.52%	17.95%	10.00%	16.93%	13.79%	S	14.94%
Observations	**5,550**	**5,304**	**1,998**	**3,624**	**3,549**	**1,680**	**915**	**1,638**	**2,841**	**1,770**	**1,701**	**1,632**	**90**	**261**

Source: HLFS (2020Q1 - 2021Q2), Stats NZ. Authors' compilation.
Notes: S denotes suppression due to Stats NZ confidentiality rules.

Table 11. Reasons for underemployment by ethnicity

Reason for underemployment	NZ European				Māori				Pasifika			
	Pre-COVID		COVID		Pre-COVID		COVID		Pre-COVID		COVID	
Full-time (FT) or Part-time (PT)	FT (1)	PT (2)	FT (3)	PT (4)	FT (5)	PT (6)	FT (7)	PT (8)	FT (9)	PT (10)	FT (11)	PT (12)
Difficulty finding suitable childcare	1.60%	3.34%	1.41%	3.53%	1.44%	4.40%	S	3.58%	1.20%	3.43%	S	S
Other family responsibilities	4.87%	7.42%	4.99%	6.88%	4.74%	6.81%	4.64%	7.53%	8.21%	7.73%	8.41%	7.14%
Own sickness/ illness/ disability	1.54%	3.85%	1.92%	S	1.72%	2.84%	S	S	S	S	S	S
Studying or training	1.36%	12.67%	1.41%	10.70%	1.01%	13.05%	S	12.19%	S	15.45%	S	11.22%
Not enough work available	65.88%	57.60%	61.25%	57.30%	65.80%	59.86%	63.93%	55.56%	68.03%	58.37%	64.95%	65.31%
Weather conditions	3.50%	0.78%	2.05%	S	5.03%	1.13%	3.21%	S	1.71%	S	S	S
Other reason	19.70%	13.87%	18.16%	11.35%	18.53%	11.06%	18.57%	12.19%	15.73%	10.73%	14.49%	7.14%
Observations	**5,055**	**7,719**	**2,346**	**3,225**	**2,088**	**2,115**	**840**	**837**	**1,755**	**699**	**642**	**294**

Source: HLFS (2016 Q2 - 2021 Q2), Stats NZ. Authors' compilation.

Notes: Pre-COVID relates to the period 2016 Q2 – 2019 Q4 and COVID relates to the period 2020 Q1 – 2021 Q2. S denotes suppression due to Stats NZ confidentiality rules.

6. Earnings progression and underemployment

In this section, we analyse the impact of the COVID-19 pandemic on the earnings progression of those who are underemployed (relative to fully-utilised) using a difference-in-differences approach. To do this, we link HLFS data to a number of administrative data sources within Stats NZ's Integrated Data Infrastructure (IDI). The IDI holds anonymised data from multiple government and non-government entities and also links individuals across data sources via unique identifiers.

6.1 Data

Defining the population of interest

The spine of our population of interest is individuals from the HLFS during the pre-COVID period of 2016Q2 to 2019Q4 who were aged 16-64 years. Our focus is on comparing the earnings progression of those who are underemployed relative to those who are fully-utilised. We use a broad definition to capture individuals that have experienced some underemployment. Specifically, an individual is classified as underemployed if they were underemployed in any of the pre-COVID quarters in which they appeared in the HLFS. In comparison, we consider individuals as fully-utilised if they were fully-utilised in every quarter of the pre-COVID period in which they appeared in the HLFS. Individuals who did not fit into either of these categories (i.e. unemployed, the potential labour force and those NILF) are excluded from the analysis.

Underemployed and fully-utilised are defined based on the pre-COVID period of 2016-2019

For our population of interest of underemployed and fully-utilised workers in the pre-COVID period (who are defined above) we then follow their employment status and wage and salary earnings between January 2018 and June 2021 (explained below). We exclude those who died before the end of this time period (based on Department of Internal Affairs data within the IDI) and individuals who left for 90 days or more (based on Ministry of Business, Innovation and Employment border movements data).[4] Due to data limitations (discussed below), we exclude those with self-employed income.

Outcome variables

We use Inland Revenue data to obtain information on individual wage and salary earnings on a monthly level to construct our outcomes of interest. We consider only wage and salary earnings as these are available on a monthly basis, whereas self-employed income is generally only available on an annual basis.

We construct two main outcome variables. First, whether or not an individual is employed in a given month, where employed is defined as having positive wage or salary earnings. Second, earnings progression, which is based on an individual's total wage and salary earnings in a given month. Earnings

[4] This exclusion is made because IR earnings data would be misleading for those who were living overseas for a substantial part of the time period, and presuming many of these people are working overseas, so they may have very different earnings trajectories.

progression is defined on an annual basis as the difference between the log of earnings in the reference month relative to 12 months prior, for each individual-month observation. Hours information is not available in IR data for the entirety of our sample timeframe, and we therefore examine total earnings progression rather than hourly earnings progression. Therefore, our constructed dataset from the IDI consists of a balanced panel of 42 monthly employment and earnings observations for each individual in our population of interest from January 2018 to June 2021.

Covariates

We include a number of individual and household characteristics for the employment regression (see Equation 1 below), and individual, household and work-related characteristics for the earnings progression regression in (see Equation 2 below). The majority of these are sourced from the HLFS. These variables are taken at one point in time, when the individual first appears in the HLFS in the pre-COVID period. The individual and household characteristics include age as a continuous variable as well as age squared, a gender variable coded as 1 if the individual identifies as female and zero otherwise, dummy variables for regional council area, prioritised ethnicity, highest educational attainment and deprivation decile (all of which were defined earlier in Table 1).

A small number of further work-related variables are obtained from Inland Revenue (IR) and linked employee-employer data (LEED) and included in the earnings regression in Equation 2. This includes whether an individual changed primary employers. It is important to capture movement between employers as the literature consistently finds that movement between employers is associated with an increase in wages (see for example Johnston & Lee, 2012 and Chadi & Hetschko, 2020). For individuals with multiple employers, we used data on the primary employer from whom the individual was earning the highest level of wages and salaries per month. An individual is deemed to have changed employers when the primary employer changed relative to 12 months prior. We also derive information on the industry and occupation of the individual in their role with their primary empoyer. The final work-related variable that is included is an individual's earnings 12 months prior to the reference month.

6.2 Method

We employ a difference-in-differences empirical strategy to capture the effects of COVID-19 on earnings progression for different labour market groups. However, we first examine employment effects by estimating the following model using a probit regression:

$$y_{i,t} = \alpha + \beta Under_i + \sum_{year} \delta year_{i,t} + \sum_{year} \theta year_{i,t} \times Under_i + \eta X_i + u_{it} \quad (1)$$

where $y_{i,t}$ is 1 if individual *i* is employed at time *t* and 0 otherwise. If an individual is underemployed in the pre-COVID period then $Under_i$=1, and 0 if the individual is fully-utilised (see Section 6.1 for detailed definitions). We also control for year-specific effects and interact the underemployment variable with year, which helps us identify differences in the impact of the COVID-19 pandemic across the two labour market utilisation states. We also control for a range of individual and household characteristics

indicated by X_i (as detailed in Section 6.1), including month fixed effects. We cluster all our standard errors at the individual level, and u_{it} is an idiosyncratic error term.

For our main regressions on earnings progression, we limit focus to those who are 'continuously' employed – defined as individuals who were employed in the reference month as well as 12 months prior. We estimate the following model:

$$\Delta y_{i,t} = \alpha + \beta Under_i + \sum_{year} \delta year_{i,t} + \sum_{year} \theta year_{i,t} \times Under_i + \eta X_i + u_{it} \quad (2)$$

where $\Delta y_{i,t}$, is the change in earnings for individual *i* at month *t*. More specifically, it is the change in log earnings between time *t-12* and *t*. We include the same explanatory variables as in Equation 1 and cluster standard errors at the individual level.

For employment, we examine two pre-COVID years (2018/2019 and 2019/2020) and one COVID-affected period (2020/2021). For earnings progression, since we are examining the change in earnings rather than the level (as with employment), we examine one pre-COVID year (2018/2019) and two COVID-affected periods (2019/2020 and 2020/2021). For both employment and earnings progression, 2018/2019 is the base year. Thus, the labour-market-group specific differences in employment (earnings progression) compared to the base year (2018/19) for 2019/2020 and 2020/2021 is δ for the fully-utilised and $\beta + \delta_{year} + \theta_{year}$ for the underemployed. Further, we calculate the marginal difference between the underemployed and fully-utilised as β in the base year and $\beta + \theta_{year}$ in subsequent years.

6.3 Results

This section presents our main results. We first consider employment as our outcome of interest and then limit attention to only those who are employed in both time *t* and *t-12* and examine earnings progression.

Those underemployed pre-COVID are more likely to experience future spells out of employment, relative to fully-utilised

Our outcome of interest is a dummy variable that is equal to one if employed at time *t* and zero otherwise, as outlined in Equation 1. The regressions include a set of covariates as outlined in Equation 1. As a first step, we first consider the impact on an individual's employment status in the COVID-affected period relative to the pre-COVID period. Recall that for the employment regression we include two pre-COVID periods (2018/2019 and 2019/2020) and one COVID-affected period (2020/2021), with 2018/2019 being the base reference year. Results in Table 12 compare the impact for fully-utilised and underemployed individuals separately. Recall that these two groups are defined based on their labour market status in the HLFS over the pre-COVID period of 2016Q2 to 2019Q4.

Table 12 shows that fully-utilised workers were 3 percentage points less likely to be employed in 2019/20 relative to 2018/19. This negative employment trend continued during COVID increasing to 5 percentage points, relative to the reference period of 2018/19. The underemployed were close to 4 percentage points less likely to be employed in 2019/20 relative to 2018/19. This negative trend did not widen further in 2020/21, remaining as a 4 percentage point decrease relative to the reference period of 2018/19.

Table 12. Marginal employment effects: Relative to base year

Year	Marginal employment effects	
	Fully-utilised (1)	Underemployed (2)
2018/19	reference	
2019/20	-0.0298*** (0.00145)	-0.0367*** (0.00449)
2020/21	-0.0491*** (0.00237)	-0.0400*** (0.00631)
Individual and household characteristics	Yes	
Weighted observation counts	670,131	

Notes: *, **, and *** denote statistically significance at the 10, 5, and 1 percent-levels, respectively. Employment status relative to the base year is $\delta_{year} + \theta_{year}$ from Equation 1.

Table 13 shows the marginal difference between the underemployed and fully-utilised in each year. The underemployed experienced lower likelihood of being employed in general, relative to the fully-utilised. This difference widened marginally during 2019/20 compared to 2018/19, increasing from just over 6 percentage points to closer to 7 percentage points. However, it is notable that during the COVID-affected period of 2020/21, the employment gap closes, dropping to just over 5 percentage points.

Table 13. Marginal employment effects: Underemployed relative to fully-utilised

Year	Marginal employment effects
2018/19	-0.0615*** (0.00664)
2019/20	-0.0684*** (0.00699)
2020/21	-0.0524*** (0.00722)

Notes: *, **, and *** denote statistically significance at the 10, 5, and 1 percent-levels, respectively. Employment status of the underemployed relative to the fully-utilised is β in 2018/19 base year and $\beta + \theta_{year}$ in subsequent years from Equation 1 .

Earnings progression initially dipped during the pandemic before rebounding

We next limit focus to those who are 'continuously' employed – defined as individuals who were employed in the reference month as well as 12 months prior, and estimate Equation 2. As mentioned earlier, in the earnings regression, because we are considering the change in earnings over a 12month time frame, we now have two COVID-affected periods of 2019/20 and 2020/21.

The results for the change in earnings regressions are shown in Tables 14 and 15 and are provided for the full sample, as well as the sub-samples of full-time and part-time.[5] First, in Table 14, we see that relative to the pre-COVID period, the earnings of the fully-utilised dropped by 1.4% initially, but then increased by 2.8% relative to the base year. The figures are similar when we focus on fully-utilised full-time workers - their earnings trajectory drops by 1.8% in the first COVID-affected period and then bounces up to be an increase by 2.3% in the second COVID-affected period, relative to the base year. These patterns align with macroeconomic labour market trends whereby COVID initially led to labour market slack, but later in the COVID-affected period, the labour market was buoyant.

For the fully-utilised working part-time however, there is an increase in both years following the beginning of the COVID pandemic. Initially earnings growth increased by 7.8%, followed by a 16% increase relative to the pre-COVID period. Note that earnings increases can come via an increase in hours or an increase in hourly earnings, and unfortunately we cannot differentiate between the two sources of earnings increases due to data limitations. In fact it is fairly plausible that both mechanisms are at play for this population of interest. As we found in Table 3, part-time workers, whether fully-utilised or underemployed, are more likely to be in lower-skilled roles and thus they likely experienced two rises in the minimum wage (in April 2020 and April 2021). Further, demand for hours of work for lower-skilled roles may have been more abundant during the pandemic due to an increase in demand for essential workers such as supermarket and security workers. While the regression includes controls for industry, occupation and qualification which should account for at least some of this effect, there may be residual effects.

For the underemployed, as shown in Table 14, in aggregate they experienced no earnings growth in the first COVID-affected time period of 2019/20 and a 5% increase later in the pandemic in 2020/21, relative to the reference year of 2018/19. The patterns are quite different for underemployed full-time versus part-time workers. For the former, they actually experience a dip in their earnings trajectory at

[5] Full regression results for the full sample, full-time workers and part-time workers are provided in Appendix Table A 6.

the start of the pandemic (just like their fully-utilised counterparts), then an earnings upswing of 4% relative to the reference year. For the latter (i.e. underemployed workers who are part-time) they had an increase in their earnings progression in both COVID years, equating to nearly 9% in 2019/20 and close to 15% in 2020/21, relative to the reference year. As indicated earlier, this could be driven by both an increase in hours and an increase in their hourly earnings rate.

Table 14. Marginal earnings progression: Relative to base year

Δ_{year}	Full sample		Full-time		Part-time	
	Fully-utilised (1)	Underemployed (2)	Fully-utilised (3)	Underemployed (4)	Fully-utilised (5)	Underemployed (6)
2018/19	reference					
2019/20	-0.0136*** (0.00244)	0.00392 (0.00921)	-0.0176*** (0.00224)	-0.0204** (0.00874)	0.0778*** (0.0136)	0.0857*** (0.0197)
2020/21	0.0276*** (0.00354)	0.0525*** (0.0107)	0.0231*** (0.00330)	0.0419*** (0.0102)	0.159*** (0.0192)	0.146*** (0.0250)
Individual and household characteristics	Yes		Yes		Yes	
Work-related characteristics	Yes		Yes		Yes	
Weighted observation counts	562,458		493,416		69,042	

Notes: *, **, and *** denote statistically significance at the 10, 5, and 1 percent-levels, respectively. Earnings progression relative to the base year is $\delta_{year} + \theta_{year}$ from Equation 2.

The gap in earnings growth between the underemployed and fully-utilised narrows during COVID

Table 15 provides the marginal difference between the underemployed and fully-utilised in each year. For the full sample, earnings growth in the pre-COVID reference year was about 6.4% lower for the underemployed relative to the fully-utilised. Across the pandemic years, the gap in earnings growth between the two groups got smaller, decreasing to a 4.7% difference in 2019/20 and to just under 4% in 2020/21.

Restricting attention to the full-time underemployed, earnings progression was 3.9% lower than their fully-utilised counterparts in the pre-COVID period, remained similar at 4.2% lower in the first COVID-affected period, and decreased to 2% lower in the second COVID-affected period.

Finally, for the part-time sub-group of underemployed – their earnings trajectory is quite different and in fact is significantly no different to their fully-utilised counterparts in the pre-COVID period of 2018/19. They experienced greater earnings growth (3.9%) in the first year of the pandemic relative to fully-utilised part-time workers. In the second pandemic year, they appear to return to the pre-COVID setting of no significant difference in earnings progression relative to fully-utilised part-time workers.

Table 15. Marginal earnings progression: Underemployed relative to fully-utilised

Δ_{year}	Full sample	Full-time	Part-time
	(1)	(2)	(3)
2018/19	-0.0644***	-0.0388***	0.0311
	(0.00796)	(0.00753)	(0.0198)
2019/20	-0.0469***	-0.0416***	0.0392**
	(0.00688)	(0.00681)	(0.0177)
2020/21	-0.0395***	-0.0199**	0.0184
	(0.00828)	(0.00841)	(0.0206)

Notes: *, **, and *** denote statistically significance at the 10, 5, and 1 percent-levels, respectively. Earnings progression of the underemployed relative to the fully-utilised is β in 2018/19 base year and $\beta + \theta_{year}$ in subsequent years from Equation 2.

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Appendix

Table A 1. Individual and household characteristics rows sum to 100% (pre-COVID)

Characteristic	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time	Unemployed	Potential labour force	Not in the labour force
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Born in NZ	45.00%	11.70%	3.19%	2.42%	3.60%	3.00%	31.09%
Poverty indicator	10.43%	8.66%	3.07%	1.48%	6.09%	4.55%	65.73%
Age group							
15 – 19	9.55%	16.46%	7.13%	1.65%	9.59%	10.00%	45.61%
20 – 24	44.73%	12.72%	5.58%	6.02%	7.47%	4.84%	18.65%
25 – 34	62.61%	8.16%	3.02%	5.39%	4.22%	2.56%	14.05%
35 – 44	64.05%	11.03%	3.16%	4.01%	3.20%	2.19%	12.37%
45 – 54	65.60%	10.78%	3.34%	3.60%	3.06%	2.00%	11.62%
55 – 64	56.28%	12.40%	2.81%	2.31%	2.62%	2.21%	21.37%
65 and over	10.89%	9.62%	0.55%	0.16%	0.34%	1.23%	77.22%
Regional council area							
Northland	37.88%	10.75%	3.17%	2.45%	4.39%	3.50%	37.86%
Auckland	48.47%	9.57%	2.34%	3.23%	3.40%	2.67%	30.32%
Waikato	44.74%	11.79%	3.21%	2.97%	3.42%	2.95%	30.91%
Bay of Plenty	42.10%	11.81%	3.58%	2.99%	3.73%	2.92%	32.87%
Gisborne / Hawke's Bay	41.29%	11.19%	3.15%	3.55%	4.30%	3.50%	33.03%
Taranaki	43.69%	11.07%	3.72%	2.80%	4.10%	2.97%	31.64%
Manawatū / Whanganui	40.22%	10.18%	4.03%	3.29%	3.96%	3.70%	34.62%
Wellington	50.72%	10.37%	3.19%	2.51%	3.52%	2.63%	27.06%
Nelson / Tasman / Marlborough / West Coast	41.50%	13.52%	3.79%	2.55%	2.71%	2.67%	33.25%
Canterbury	44.80%	12.75%	3.07%	3.07%	2.92%	2.61%	30.78%
Otago	43.34%	12.74%	3.50%	2.86%	3.05%	2.88%	31.63%
Southland	44.22%	12.12%	3.84%	2.55%	3.70%	2.55%	31.02%
Parenthood	57.36%	12.12%	3.32%	3.47%	2.99%	2.33%	18.41%
Female	43.53%	18.21%	4.75%	2.24%	3.51%	3.13%	24.62%
Male	76.69%	3.61%	1.34%	5.18%	2.26%	1.20%	9.71%

Prioritised ethnicity							
NZ European	46.39%	12.43%	2.89%	1.90%	2.46%	2.27%	31.67%
Māori	41.32%	8.58%	4.08%	4.03%	7.12%	5.25%	29.62%
Pacific Peoples	48.43%	8.93%	2.93%	5.81%	3.56%	2.81%	27.53%
Asian	41.66%	5.60%	2.67%	6.68%	5.81%	3.90%	33.68%
MELAA	40.12%	11.62%	3.26%	2.55%	3.30%	2.72%	36.44%
Other	42.63%	10.87%	4.19%	4.19%	5.89%	3.73%	28.49%
Highest educational attainment							
Doctorate	64.64%	10.93%	1.59%	1.32%	1.76%	1.32%	18.43%
Master's	64.39%	10.27%	3.01%	2.66%	2.62%	1.85%	15.21%
Bachelor's	63.00%	12.05%	2.61%	2.75%	2.30%	1.67%	15.62%
Post-school	47.14%	12.00%	3.68%	3.64%	3.83%	2.89%	26.82%
School	36.34%	12.12%	3.14%	2.21%	3.95%	3.99%	38.24%
No qualification	25.14%	7.84%	2.14%	2.21%	3.71%	3.64%	55.32%
Urban / rural							
Main urban areas	46.75%	10.49%	2.98%	3.17%	3.58%	2.90%	30.14%
Secondary urban areas	41.61%	10.36%	3.46%	2.83%	2.96%	2.67%	36.11%
Minor urban areas	36.60%	11.00%	3.55%	2.67%	3.53%	2.94%	39.71%
Rural centres	41.08%	12.24%	3.91%	2.65%	4.42%	2.88%	32.82%
Rural areas	45.39%	17.06%	3.01%	1.72%	2.40%	2.27%	28.16%
Region of birth							
Oceania and Antarctica	44.95%	11.28%	3.13%	2.76%	3.60%	2.98%	31.31%
Northwest Europe	42.86%	11.62%	2.28%	1.30%	1.81%	1.83%	38.30%
Southern & Eastern Europe	51.91%	9.95%	3.26%	3.07%	3.44%	1.95%	26.42%
North Africa / Middle East	32.08%	10.09%	3.01%	3.46%	7.38%	4.52%	39.46%
Southeast Asia	50.99%	8.49%	3.00%	7.81%	3.79%	2.82%	23.09%
Northeast Asia	42.40%	9.32%	2.74%	3.29%	3.16%	2.81%	36.28%
Southern & Central Asia	53.60%	8.38%	3.13%	7.91%	3.70%	2.36%	20.92%
The Americas	53.52%	12.58%	4.16%	2.88%	3.43%	2.38%	21.05%
Sub-Saharan Africa	57.18%	10.41%	3.25%	3.09%	3.54%	2.96%	19.56%

Source: NZ HLFS (2016 Q2 - 2019 Q4), Stats NZ. Authors' compilation.

Table A 2. Individual and household characteristics rows sum to 100% (during COVID)

Characteristic	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time	Unemployed	Potential labour force	Not in the labour force
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Born in NZ	44.69%	11.00%	3.14%	2.51%	3.51%	2.86%	32.29%
Poverty indicator	12.06%	8.37%	2.81%	1.59%	5.02%	4.24%	65.91%
Age group							
15 – 19	10.53%	15.63%	7.01%	1.62%	9.20%	8.87%	47.15%
20 – 24	45.16%	12.63%	5.72%	5.74%	7.85%	4.68%	18.22%
25 – 34	63.06%	7.40%	3.19%	5.80%	4.14%	2.62%	13.78%
35 – 44	63.55%	9.81%	3.31%	4.61%	3.40%	2.20%	13.12%
45 – 54	65.84%	9.81%	3.44%	3.75%	2.98%	2.00%	12.18%
55 – 64	56.32%	11.92%	2.54%	2.46%	2.52%	2.21%	22.03%
65 and over	11.34%	9.71%	0.68%	0.23%	0.45%	1.07%	76.52%
Regional council area							
Northland	40.66%	10.39%	2.66%	2.76%	3.21%	3.01%	37.30%
Auckland	47.81%	9.11%	2.52%	3.25%	3.68%	2.40%	31.22%
Waikato	44.25%	10.69%	3.01%	3.66%	3.43%	2.91%	32.05%
Bay of Plenty	42.47%	11.08%	3.26%	2.56%	3.78%	2.79%	34.06%
Gisborne / Hawke's Bay	42.76%	11.68%	2.95%	3.56%	3.70%	3.20%	32.15%
Taranaki	43.64%	11.44%	3.27%	3.03%	3.51%	3.21%	31.90%
Manawatū / Whanganui	43.00%	11.10%	3.53%	2.81%	3.12%	3.22%	33.22%
Wellington	50.10%	9.50%	3.42%	3.14%	3.49%	2.55%	27.81%
Nelson / Tasman / Marlborough / West Coast	43.13%	13.52%	3.86%	3.10%	2.30%	2.53%	31.56%
Canterbury	44.34%	11.39%	3.41%	3.42%	3.17%	2.53%	31.75%
Otago	44.31%	10.92%	3.59%	3.10%	3.17%	2.81%	32.09%
Southland	46.12%	10.67%	3.35%	2.73%	2.73%	3.17%	31.22%
Parenthood	57.34%	11.18%	3.49%	3.70%	2.89%	2.25%	19.14%
Female	44.32%	16.62%	4.90%	2.41%	3.29%	3.02%	25.45%
Male	75.33%	3.66%	1.54%	5.49%	2.35%	1.19%	10.44%
Prioritised ethnicity							
NZ European	46.29%	11.55%	2.97%	2.16%	2.51%	2.25%	32.27%
Māori	41.67%	8.47%	3.62%	3.63%	6.25%	4.82%	31.54%
Pacific Peoples	48.57%	9.14%	3.08%	6.42%	3.79%	2.33%	26.66%
Asian	43.28%	5.78%	2.52%	5.47%	5.32%	3.16%	34.46%
MELAA	38.21%	11.68%	2.95%	1.59%	2.04%	2.04%	41.50%
Other	46.13%	9.63%	4.56%	3.93%	6.08%	3.30%	26.36%

Highest educational attainment							
Doctorate	60.51%	12.80%	3.66%	1.28%	2.74%	1.28%	17.73%
Master's	62.33%	10.20%	3.42%	2.93%	2.80%	1.82%	16.50%
Bachelor's	61.97%	11.58%	2.81%	2.98%	2.53%	1.61%	16.53%
Post-school	46.64%	11.15%	3.53%	3.89%	3.82%	2.94%	28.03%
School	34.27%	11.06%	3.32%	2.34%	4.35%	3.37%	41.29%
No qualification	26.22%	7.17%	2.09%	2.25%	3.26%	3.19%	55.81%
Urban / rural							
Main urban areas	46.81%	9.80%	3.06%	3.40%	3.56%	2.72%	30.65%
Secondary urban areas	42.00%	8.93%	3.28%	3.07%	3.66%	2.72%	36.34%
Minor urban areas	37.64%	11.04%	2.92%	2.48%	2.90%	2.63%	40.39%
Rural centres	36.13%	12.36%	4.12%	3.49%	3.80%	3.49%	36.61%
Rural areas	45.84%	16.33%	2.96%	1.93%	2.31%	2.13%	28.49%
Region of birth							
Oceania and Antarctica	44.74%	10.61%	3.06%	2.77%	3.51%	2.82%	32.50%
Northwest Europe	44.40%	11.01%	2.64%	1.53%	2.04%	1.68%	36.71%
Southern & Eastern Europe	52.65%	10.62%	3.32%	3.54%	3.10%	1.77%	25.00%
North Africa / Middle East	35.98%	9.15%	3.05%	3.66%	5.49%	4.57%	38.11%
Southeast Asia	50.59%	7.90%	3.26%	9.37%	3.31%	2.19%	23.38%
Northeast Asia	43.10%	9.80%	2.72%	3.54%	3.17%	2.68%	34.99%
Southern & Central Asia	53.93%	8.33%	3.59%	8.45%	3.89%	1.90%	19.91%
The Americas	52.53%	11.67%	4.30%	2.42%	3.85%	2.53%	22.69%
Sub-Saharan Africa	57.55%	8.88%	3.22%	4.13%	4.27%	3.29%	18.67%

Source: NZ HLFS (2020 Q1 - 2021 Q2), Stats NZ. Authors' compilation.

Table A 3. Individual and work-related characteristics by ethnicity pre-COVID

Characteristic	Fully-utilised			Underutilised		
Ethnicity	**NZ European (1)**	**Māori (2)**	**Pacific (3)**	**NZ European (4)**	**Māori (5)**	**Pacific (6)**
	57.84%	50.14%	57.71%	9.89%	18.32%	15.63%
Individual and household characteristics						
Age group						
15 – 19	3.84%	7.07%	4.70%	18.85%	24.84%	16.77%
20 – 24	8.20%	12.09%	13.38%	13.95%	17.15%	19.87%
25 – 34	18.53%	22.57%	25.21%	14.42%	20.53%	23.15%
35 – 44	18.68%	19.51%	20.39%	11.53%	13.23%	14.22%
45 – 54	22.46%	19.45%	20.49%	14.85%	13.09%	15.31%
55 – 64	19.81%	14.17%	12.13%	14.59%	8.10%	8.38%
65 and over	8.49%	5.13%	3.75%	11.82%	3.05%	2.31%
Born in NZ	79.34%	98.00%	45.03%	80.30%	98.20%	46.17%
Years in NZ	21.02	24.86	22.51	20.84	19.23	18.58
Female	49.65%	49.39%	47.96%	54.89%	54.65%	50.36%
Personal income	1225.16	1004.61	973.20	373.97	363.17	447.16
Household income	1369.08	1086.10	1012.98	860.79	678.22	679.25
Poverty indicator	8.49%	13.20%	12.44%	33.02%	43.40%	36.98%
Household size	3.01	3.48	4.51	3.08	3.73	4.61
Deprivation decile	4.52	6.48	7.52	5.14	7.31	8.05
Parenthood	42.39%	47.79%	54.97%	28.18%	38.01%	44.53%
Female	21.95%	25.65%	26.69%	20.30%	26.56%	24.61%
Male	20.44%	22.14%	28.25%	7.89%	11.40%	19.93%
Number of children	0.93	1.25	1.73	1.02	1.53	2.04
Highest educational attainment						
Post-graduate	11.02%	5.67%	2.99%	5.75%	1.17%	1.25%
Bachelor's	21.78%	13.80%	13.39%	13.07%	5.13%	7.11%
Post-school	27.67%	26.69%	21.39%	23.76%	22.19%	21.38%
School	28.48%	32.55%	40.81%	39.11%	39.66%	45.32%
No qualification	10.52%	20.64%	20.86%	17.88%	31.00%	24.38%
Urban / rural						
Main urban areas	72.20%	68.28%	92.68%	71.79%	66.76%	90.77%
Secondary urban areas	6.67%	7.05%	2.71%	7.14%	7.31%	4.62%
Minor urban areas	7.51%	11.63%	2.64%	9.23%	14.59%	2.61%
Rural centres	0.86%	1.88%	0.42%	1.04%	2.15%	0.36%
Rural areas	12.76%	11.17%	1.49%	10.79%	9.16%	1.34%
Regional council area						
Northland	3.04%	6.88%	0.92%	3.68%	9.08%	1.28%
Auckland	29.00%	22.49%	68.73%	23.30%	19.28%	65.31%
Waikato	9.57%	12.99%	3.97%	8.98%	13.64%	5.29%
Bay of Plenty	6.31%	9.96%	1.98%	7.26%	11.43%	2.73%
Gisborne / Hawke's Bay	3.81%	9.52%	1.49%	4.22%	10.80%	1.58%
Taranaki	2.21%	3.04%	0.47%	2.58%	3.71%	0.30%
Manawatū / Whanganui	4.52%	8.37%	2.17%	6.51%	8.86%	3.10%
Wellington	12.69%	10.50%	12.06%	11.97%	8.75%	10.69%
Nelson / Tasman / Marlborough / West Coast	4.68%	3.29%	1.27%	5.69%	2.86%	1.76%
Canterbury	15.86%	8.16%	4.60%	16.40%	7.09%	4.25%
Otago	6.00%	2.74%	1.75%	6.98%	2.40%	2.25%
Southland	2.32%	2.01%	0.59%	2.38%	2.10%	1.03%
Work-related characteristics						
Holds multiple jobs	6.23%	3.86%	2.24%	8.31%	4.66%	2.35%
Number of jobs	1.07	1.04	1.02	1.09	1.05	1.02
Union membership	14.70%	21.72%	23.70%	10.35%	14.40%	21.58%
Employment status in main job						
Paid employee	80.33%	89.92%	94.69%	82.29%	91.43%	94.94%
Employer	6.26%	2.54%	1.23%	1.31%	0.82%	0.74%
Self-employed with no employees	12.52%	6.69%	3.66%	15.42%	6.31%	4.19%
Unpaid family worker	0.84%	0.81%	0.38%	0.99%	1.37%	S
Main occupation						
Manager	21.51%	14.36%	9.84%	9.63%	7.27%	5.92%

Professional	26.38%	18.78%	15.25%	15.87%	8.57%	8.26%
Technicians and trades workers	11.94%	11.58%	11.61%	12.18%	10.70%	12.33%
Community and personal service workers	7.69%	10.90%	12.23%	16.75%	16.53%	17.26%
Clerical and administrative workers	13.05%	10.89%	12.79%	10.31%	7.61%	7.64%
Sales workers	7.85%	7.65%	7.93%	14.43%	12.14%	8.88%
Machinery operators and drivers	3.81%	8.46%	12.15%	5.06%	9.74%	13.93%
Labourers	7.08%	16.34%	16.73%	15.24%	26.54%	24.78%
Residual categories	0.69%	1.04%	1.42%	0.56%	0.96%	0.62%
Main industry						
Agriculture, forestry, and fishing	5.39%	5.72%	2.24%	3.92%	5.83%	3.45%
Mining	0.12%	S	S	0.05%	S	S
Manufacturing	8.79%	12.23%	15.72%	7.38%	12.07%	16.65%
Electricity, gas, water, and waste services	0.93%	1.19%	S	0.41%	0.55%	0.86%
Construction	9.82%	10.63%	9.65%	7.27%	8.71%	9.86%
Wholesale trade	4.51%	3.33%	4.22%	2.97%	3.09%	3.21%
Retail trade	8.76%	8.43%	8.57%	13.89%	12.21%	9.37%
Accommodation and food services	4.03%	5.15%	5.12%	10.89%	12.62%	8.63%
Transport, postal, and warehousing	3.28%	4.85%	7.93%	3.22%	4.87%	7.77%
Information media and telco	1.67%	1.33%	1.09%	1.64%	0.89%	0.25%
Financial and insurance services	3.20%	2.28%	3.54%	1.10%	0.62%	1.23%
Rental, hiring, and real estate services	2.29%	1.32%	1.37%	1.35%	1.10%	1.36%
Professional, scientific, and technical services	10.65%	4.68%	4.06%	6.41%	2.61%	1.60%
Administrative and support services	3.17%	3.37%	4.39%	5.40%	6.58%	7.64%
Public administration and safety	6.37%	7.41%	7.08%	2.63%	3.43%	4.81%
Education and training	9.15%	9.70%	6.25%	9.54%	7.27%	5.80%
Health care and social assistance	10.54%	10.65%	11.12%	11.77%	10.29%	10.23%
Arts and recreation services	1.98%	1.88%	1.23%	3.47%	2.40%	1.60%
Other services	4.28%	4.24%	3.33%	5.45%	3.29%	3.21%
Not classified elsewhere	1.08%	1.32%	1.98%	1.28%	1.58%	1.73%
Hours						
Actual hours per week in all jobs (last week)	31.93	32.52	34.81	21.89	24.29	29.87
Usual number of hours	35.71	36.49	37.71	24.64	27.22	32.84
Total number of hours wanted per week	34.33	39.20	42.19	36.08	40.04	45.12

Contract type in main job						
Permanent	91.62%	75.27%	88.13%	67.77%	89.94%	73.16%
Fixed term	3.02%	5.29%	2.80%	4.94%	2.62%	5.34%
Project-based	0.49%	2.06%	0.78%	3.56%	0.51%	2.38%
Temporary	0.25%	0.84%	0.30%	0.86%	0.32%	1.07%
Casual	3.37%	12.85%	4.47%	15.23%	4.53%	13.42%
Seasonal	1.25%	3.69%	3.51%	7.65%	2.08%	4.63%
Underemployment job seeking						
Actively seeking	-	-	-	54.08%	61.81%	67.09%
Not actively seeking	-	-	-	45.22%	37.20%	31.20%
Seeking not specified	-	-	-	0.66%	0.71%	1.71%
Observations	**158,853**	**26,421**	**12,711**	**28,833**	**11,001**	**4,938**

Source: HLFS (2016Q2 - 2019Q4), Stats NZ. Authors' compilation.

Table A 4. Individual and household characteristics during COVID

Characteristic	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time	Unemployed	Potential labour force	Not in the labour force
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age group							
15 – 19	1.89%	12.60%***	4.57%***	18.20%***	20.64%***	22.32%***	13.04%***
20 – 24	8.31%	10.03%***	15.98%***	14.58%***	18.21%***	11.46%***	5.02%***
25 – 34	24.92%	13.09%***	30.42%***	18.15%***	21.14%***	12.72%***	8.35%***
35 – 44	20.97%	14.56%***	20.45%***	16.11%	14.26%***	9.70%***	6.55%***
45 – 54	21.43%	14.72%***	16.34%***	16.85%***	12.75%***	10.01%***	6.09%***
55 – 64	17.63%	16.88%**	10.84%***	11.76%***	10.42%***	12.72%***	10.36%***
65 and over	4.86%	18.12%***	1.44%*	4.35%***	2.48%***	21.07%***	50.60%***
Born in NZ	66.64%	72.46%***	56.12%***	69.87%***	70.31%***	74.21%***	70.04%***
Years in NZ	16.79 (0.53)	20.74*** (17.17)	12.48*** (11.44)	15.07*** (13.58)	14.63*** (12.80)	21.42*** (18.70)	28.04*** (22.10)
Female	43.95%	70.30%***	36.13%***	67.44%***	50.38%***	56.06%***	59.69%***
Personal Income	1325.04 (1024.03)	625.89*** (873.96)	967.10*** (748.33)	443.69*** (438.61)	153.34*** (219.07)	173.70*** (244.26)	261.80*** (237.41)
Household Income	1371.50 (905.43)	1076.10*** (1007.66)	1105.26*** (687.35)	908.62*** (710.82)	667.09*** (565.29)	732.72*** (715.33)	649.55*** (631.35)
Poverty Indicator	7.51%	21.99%***	13.13%***	26.15%***	47.05%***	45.86%***	56.27%***
Deprivation decile	5.14 (0.49)	4.81*** (2.88)	5.90*** (3.02)	5.41*** (2.98)	6.16*** (3.17)	5.67*** (3.15)	5.69*** (3.19)
Household size	3.21 (0.53)	3.29*** (1.58)	3.40*** (1.68)	3.50*** (1.58)	3.59*** (1.78)	3.34*** (1.84)	2.90*** (1.87)
Parenthood	44.75%	39.15%***	37.15%***	40.02%***	29.39%***	26.56%***	22.47%***
Female	19.61%	33.60%***	14.18%***	32.62%***	18.77%	20.81%**	17.32%***
Male	25.14%	5.52%***	22.97%***	7.41%***	10.62%***	5.68%***	5.15%***
Number of dependent children	0.68 (1.27)	0.80*** (1.19)	0.63*** (1.04)	0.88*** (1.20)	0.82*** (1.24)	0.77*** (1.23)	0.53*** (1.16)
Number of children	0.99 (0.52)	1.13*** (1.32)	1.01*** (1.30)	1.31 (1.33)	1.33*** (1.46)	1.15*** (1.45)	0.81*** (1.40)
Prioritised ethnicity							
NZ European	62.59%	68.52%***	42.96%***	59.75%***	45.37%***	58.92%***	62.14%
Māori	13.26%	11.77%***	17.68%***	17.13%***	25.59%***	22.27%***	14.79%***
Pacific peoples	5.69%	3.40%***	9.56%**	4.92%***	9.41%***	5.13%*	6.97%***
Asian	15.98%	13.42%***	27.24%*	14.98%***	16.64%	11.11%***	13.06%***
MELAA	1.35%	1.29%	1.70%***	1.87%*	2.23%***	1.11%*	1.18%***
Other	1.12%	1.60%***	0.82%	1.36%**	0.76%***	1.46%*	1.86%***
Highest educational attainment							
Post-graduate	12.64%	10.07%***	7.19%***	8.83%***	6.63%***	5.34%***	4.40%***
Bachelor's	24.66%	19.84%***	18.34%***	17.54%***	14.96%***	12.11%***	10.26%***
Post-school	26.35%	21.55%***	28.75%***	22.33%***	19.93%***	21.14%***	19.78%***
School	25.19%	35.52%***	31.82%***	37.68%***	38.72%***	37.66%***	30.16%***
No qualification	10.72%	12.78%***	13.21%***	13.21%***	18.89%***	23.19%***	34.90%***
Urban / Rural							
Main urban areas	76.22%	69.87%***	79.55%**	74.67%***	77.95%***	73.96%***	72.36%***
Secondary urban areas	5.57%	5.08%**	5.29%	5.88%	6.22%*	5.68%	6.72%***
Minor urban areas	7.18%	8.93%***	7.25%**	8.14%	7.23%	9.70%***	10.88%***
Rural centres	0.85%	1.22%***	1.49%***	1.41%***	1.37%***	1.26%***	1.25%***
Rural areas	10.18%	14.88%***	6.47%	9.89%***	7.23%***	9.50%	8.80%***

Regional council area							
Northland	3.32%	3.73%**	3.24%	3.39%	3.54%	4.22%***	4.46%***
Auckland	35.46%	30.37%***	33.97%***	28.32%**	36.17%	29.16%***	34.20%***
Waikato	9.22%	9.98%***	10.38%	9.10%***	9.21%	10.01%*	9.66%**
Bay of Plenty	6.12%	7.00%***	6.06%**	7.12%	7.13%***	7.24%***	7.01%***
Gisborne / Hawke's Bay	4.11%	4.82%***	4.83%	4.13%**	4.96%***	5.73%***	4.39%**
Taranaki	2.28%	2.60%**	2.26%*	2.71%	2.53%	2.66%*	2.25%
Manawatū / Whanganui	4.58%	5.12%***	4.27%***	5.60%	4.75%	5.88%***	5.05%***
Wellington	11.77%	10.15%***	10.79%	12.55%**	11.08%	10.46%***	9.59%***
Nelson / Tasman / Marlborough / West Coast	3.58%	5.09%***	4.21%***	5.09%**	2.68%***	4.68%***	3.67%
Canterbury	12.75%	14.12%***	13.26%**	13.91%	11.84%*	13.02%	12.77%
Otago	4.86%	5.00%	5.04%**	5.71%	4.55%	5.13%	5.15%**
Southland	1.94%	2.03%	1.70%*	2.43%	1.52%**	1.86%	1.82%
Region of birth							
Oceania and Antarctica	72.49%	76.14%***	65.67%**	74.17%***	76.23%***	78.98%***	76.68%***
Northwest Europe	7.63%	7.92%	4.11%***	6.61%***	4.60%***	7.29%	8.63%***
Southern & Eastern Europe	0.89%	0.76%	0.92%	0.90%	0.81%	0.50%***	0.58%***
North Africa/Middle East	0.44%	0.44%	0.62%	0.51%	0.81%***	0.65%**	0.67%***
Southeast Asia	3.71%	2.73%***	8.43%	3.45%***	3.19%**	2.16%***	2.53%***
Northeast Asia	4.57%	4.38%	4.93%	4.13%	4.65%	4.07%	5.45%***
Southern & Central Asia	5.15%	3.55%***	11.00%	5.20%***	4.81%	2.36%***	2.69%***
The Americas	1.83%	1.82%	1.28%*	2.26%***	1.87%	1.26%***	1.16%***
Sub-Saharan Africa	3.30%	2.27%***	2.98%**	2.71%	3.09%	2.71%**	1.60%***
Observations	**79,827**	**79,827**	**18,909**	**5,838**	**5,931**	**5,967**	**53,394**
Population	**10,704,300**	**10,704,300**	**2,508,600**	**783,300**	**779,700**	**779,700**	**6,508,600**

Source: NZ HLFS (2020 Q1 - 2021 Q2), Stats NZ. Authors' compilation.

Notes: *, **, and *** denote statistically significant differences between variable means compared with the fully-utilised full-time (column 1) at the 10, 5, and 1 percent-levels, respectively.

Table A 5. Work-related characteristics during COVID

Characteristic	Fully-utilised full-time	Fully-utilised part-time	Underemployed full-time	Underemployed part-time
	(1)	(2)	(3)	(4)
Holds multiple jobs	4.71%	8.21%***	7.20%***	7.41%+
Number of jobs	1.05 (0.255)	1.09*** (0.335)	1.08*** (0.279)	1.08 (0.309)
Union membership	17.16%	11.44%***	14.93%***	9.33%+++
Employment status in main job				
Paid employee	84.76%	70.52%***	89.24%***	78.00%+++
Employer	5.42%	5.97%***	S***	0.96%+++
Self-employed with no employees	9.54%	20.15%***	8.76%*	19.17%
Unpaid family worker	0.19%	3.27%***	S	1.81%+++
Main occupation				
Manager	22.81%	16.53%***	14.76%***	10.41%+++
Professional	26.44%	20.67%***	13.03%***	15.38%+++
Technicians and trade workers	12.39%	5.72%***	20.44%***	5.15%
Community and personal service workers	6.88%	14.55%***	9.57%***	19.40%+++
Clerical and administrative workers	10.69%	13.60%***	8.00%***	10.07%+++
Sales workers	6.48%	12.58%***	7.90%***	16.29%+++
Machinery operators and drivers	5.38%	3.05%***	10.71%***	3.39%
Labourers	7.67%	11.83%***	14.87%***	18.50%+++
Residual categories	1.25%	1.48%**	0.81%***	1.24%
Main industry				
Agriculture, forestry & fishing	4.65%	7.02%***	4.76%	3.28%+++
Mining	0.17%	S	S	S
Manufacturing	10.51%	3.85%***	14.98%***	3.39%
Electricity, gas, water & waste services	1.19%	S	S	S
Construction	10.94%	4.75%***	14.60%***	3.56%+++
Wholesale trade	4.12%	2.27%***	4.22%	1.75%++
Retail trade	8.23%	12.35%***	10.01%***	15.16%+++
Accommodation & food services	3.50%	10.23%***	6.65%***	13.97%+++
Transport, postal & food services	4.24%	2.72%***	5.79%***	3.62%+++
Information media & telecommunications	1.52%	0.98%***	1.03%***	1.41%++
Financial & insurance services	3.83%	1.79%***	1.57%***	1.30%++
Rental, hiring & real estate services	1.91%	2.92%***	0.97%***	1.64%+++
Professional, scientific & technical services	9.65%	7.14%***	6.49%***	6.22%++
Administrative & support services	2.89%	4.77%***	4.60%***	8.03%+++
Public administration & safety	7.71%	2.67%***	3.95%***	2.21%++
Education & training	7.04%	11.70%***	2.97%***	11.37%
Health care & social assistance	10.60%	15.27%***	9.03%***	12.10%+++
Arts & recreation services	1.67%	2.60%***	1.78%	4.19%+++
Other services	4.20%	5.07%***	4.27%	4.81%
Not classified elsewhere	1.43%	1.55%	0.97%***	1.41%
Hours				
Total number of hours	40.83 (5.22)	16.49*** (7.46)	39.99*** (4.77)	15.27 (7.48)
Actual hours last week in all jobs	36.15 (13.18)	14.32*** (9.93)	34.46*** (12.98)	13.53 (9.67)
Total number of hours wanted (week)	-	-	48.28 (8.90)	30.21 (10.67)
Increase in usual hours wanted	-	-	23.37%	163.92%
Increase in actual hours wanted	-	-	53.52%	192.07%
Contract type in main job				
Permament	94.21%	76.43%***	85.98%***	63.83%+++
Fixed term	2.42%	5.52%***	3.92%***	6.66%+++
Project-based	0.33%	1.43%***	1.27%	3.04%+++
Temp agency	0.11%	0.94%	0.29%	1.29%+
Casual	1.57%	13.08%***	5.71%***	20.40%++
Seasonal	1.36%	2.60%***	2.89%***	4.78%+++

Underemployment job seeking				
Actively seeking	-	-	-	52.77%
Not actively seeking	-	-	-	46.21%
Seeking not specified	-	-	-	1.02%
Observations	**79,092**	**17,982**	**5,547**	**5,304**
Population	**10,704,300**	**10,704,300**	**2,508,600**	**783,300**

Source: NZ HLFS (2020 Q1 - 2021 Q2), Stats NZ. Authors' compilation.

Notes: *(+), **(++), and ***(+++) denote statistically significant differences between variable means compared with the fully-utilised full-time (fully-utilised part-time) at the 10, 5, and 1 percent-levels, respectively. S denotes suppression due to Stats NZ rules for small counts.

Table A 6. Full regression results

Variable	Continuously employed	Full-time	Part-time
	(1)	(2)	(3)
Underemployed	-0.0644*** (0.00796)	-0.0388*** (0.00753)	0.0311 (0.0198)
2019/20	-0.0136*** (0.00244)	-0.0176*** (0.00224)	0.0778*** (0.0136)
2020/21	0.0276*** (0.00354)	0.0231*** (0.00330)	0.159*** (0.0192)
Underemployed*2019/20	0.0175* (0.00935)	-0.00280 (0.00890)	0.00806 (0.0225)
Underemployed*2020/21	0.0249** (0.0106)	0.0189* (0.0101)	-0.0127 (0.0260)
Lag of earnings	-0.383*** (0.00524)	-0.432*** (0.00571)	-0.460*** (0.0118)
Age	0.0184*** (0.00100)	0.0177*** (0.000964)	0.0195*** (0.00325)
Age squared	-0.000215*** (1.20e-05)	-0.000197*** (1.15e-05)	-0.000265*** (4.16e-05)
Female	-0.0950*** (0.00354)	-0.0829*** (0.00339)	-0.0562*** (0.0177)
Household size	0.00209 (0.00130)	-0.00227* (0.00127)	0.0236*** (0.00634)
Partner	0.00148 (0.00326)	0.00572* (0.00315)	-0.00451 (0.0147)
Number of dependent children	-0.00565*** (0.00201)	0.00938*** (0.00197)	-0.0390*** (0.00798)
Regional council area (reference catergory: Northland)			
Auckland	0.0319*** (0.0103)	0.0381*** (0.0103)	-0.00809 (0.0406)
Waikato	0.0197* (0.0110)	0.0219** (0.0108)	-0.0200 (0.0445)
Bay of Plenty	0.000404 (0.0118)	-0.00138 (0.0117)	0.0188 (0.0448)
Gisborne / Hawke's Bay	0.0158 (0.0117)	0.00715 (0.0116)	0.0162 (0.0471)
Taranaki	0.0261** (0.0131)	0.0226* (0.0130)	0.0282 (0.0514)
Manawatū / Whanganui	-0.00210 (0.0115)	-0.0159 (0.0116)	0.0344 (0.0436)
Wellington	0.0214** (0.0108)	0.0266** (0.0107)	-0. 0463 (0.0433)
Nelson / Tasman / Marlborough / West Coast	-0.0148 (0.0125)	-0.0161 (0.0125)	-0.0325 (0.0474)
Canterbury	-0.00246 (0.0107)	-0.00225 (0.0106)	-0.0255 (0.0410)
Otago	-0.00795 (0.0116)	-0.0118 (0.0114)	-0.0187 (0.0464)
Southland	0.00793 (0.0135)	0.00381 (0.0133)	0.0135 (0.0492)
Prioritised ethnicity (reference catergory: NZ European)			
Māori	-0.0150*** (0.00467)	-0.0269*** (0.00448)	-0. 00906 (0.0214)
Pacific Peoples	-0.0209*** (0.00622)	-0.0403*** (0.00623)	0.0204 (0.0318)
Asian	-0.0263*** (0.00441)	-0.0440*** (0.00435)	0.0438** (0.0218)
MELAA	-0.0342** (0.0150)	-0.0245* (0.0140)	-0.0678 (0.0543)
Other	-0.0288** (0.0126)	-0.0173* (0.0102)	-0.0756 (0.0480)

Highest educational attainment (reference catergory: No school)			
Post graduate	0.148*** (0.00730)	0.144*** (0.00724)	0.185*** (0.0342)
Bachelor's	0.109*** (0.00613)	0.100*** (0.00596)	0.192*** (0.0262)
Post-school	0.0431*** (0.00537)	0.0377*** (0.00512)	0.0697*** (0.0234)
School	0.0308*** (0.00534)	0.0252*** (0.00505)	0.0642*** (0.0207)
Deprivation Decile (reference catergory: Decile 1)			
Decile 2	-0.0124* (0.00674)	-0.0192*** (0.00663)	-0.0305 (0.0283)
Decile 3	-0.0305*** (0.00697)	-0.0413*** (0.00684)	-0.0114 (0.0303)
Decile 4	-0.0373*** (0.00669)	-0.0513*** (0.00653)	-0.0354 (0.0289)
Decile 5	-0.0315*** (0.00668)	-0.0424*** (0.00647)	-0.0240 (0.0282)
Decile 6	-0.0342*** (0.00649)	-0.0524*** (0.00641)	-0.00146 (0.0277)
Decile 7	-0.0376*** (0.00657)	-0.0548*** (0.00645)	-0.0176 (0.0280)
Decile 8	-0.0419*** (0.00644)	-0.0595*** (0.00627)	-0.0194 (0.0275)
Decile 9	-0.0423*** (0.00683)	-0.0646*** (0.00667)	-0.00593 (0.0302)
Decile 10	-0.0433*** (0.00711)	-0.0702*** (0.00705)	0.00365 (0.0299)
Month (reference catergory: January)			
February	0.00928*** (0.00213)	0.0108*** (0.00203)	-0.00184 (0.00949)
March	0.101*** (0.00245)	0.107*** (0.00235)	0.0768*** (0.0108)
April	0.0366*** (0.00228)	0.0377*** (0.00220)	0.0481*** (0.0101)
May	0.00580** (0.00232)	0.00937*** (0.00225)	0.0170* (0.0100)
June	0.0304*** (0.00269)	0.0282*** (0.00258)	0.0490*** (0.0117)
July	0.0746*** (0.00289)	0.0795*** (0.00281)	0.0925*** (0.0122)
August	-0.0129*** (0.00286)	-0.00794*** (0.00272)	-0.00679 (0.0127)
September	0.0707*** (0.00283)	0.0736*** (0.00269)	0.0720*** (0.0127)
October	0.0149*** (0.00307)	0.0248*** (0.00294)	0.0233* (0.0131)
November	0.0203*** (0.00282)	0.0191*** (0.00266)	0.0670*** (0.0129)
December	0.104*** (0.00322)	0.108*** (0.00316)	0.179*** (0.0136)
Work-related characteristics			
Changed employer	-0.0266*** (0.00410)	-0.0610*** (0.00409)	0.133*** (0.0133)
Main occupation (reference catergory: Manager)			
Professional	-0.0176*** (0.00495)	-0.0152*** (0.00501)	0.0685* (0.0366)
Technicians and trade workers	-0.0845*** (0.00527)	-0.0904*** (0.00527)	0.0566 (0.0420)
Community and personal service workers	-0.123*** (0.00735)	-0.113*** (0.00725)	-0.0200 (0.0359)
Clerical and administrative workers	-0.104*** (0.00588)	-0.0991*** (0.00567)	-0.0234 (0.0375)
Sales workers	-0.103*** (0.00721)	-0.101*** (0.00713)	0.0119 (0.0362)
Machinery operators and drivers	-0.110*** (0.00726)	-0.114*** (0.00728)	0.0231 (0.0458)

Labourers	**-0.126*** (0.00689)**	**-0.118*** (0.00673)**	**-0.0429 (0.0367)**
Residual categories	-0.0736*** (0.0167)	-0.0715*** (0.0159)	0.0467 (0.0788)
Main industry (reference catergory: Agriculture, forestry & fishing)			
Mining	0.155*** (0.0336)	0.163*** (0.0362)	-0.238*** (0.0628)
Manufacturing	0.0526*** (0.00922)	0.0493*** (0.00928)	0.101* (0.0532)
Electricity, gas, water & waste services	0.0948*** (0.0137)	0.0912*** (0.0146)	0.0448 (0.137)
Construction	0.0409*** (0.00929)	0.0402*** (0.00939)	0.115* (0.0630)
Wholesale trade	0.0413*** (0.0108)	0.0397*** (0.0107)	0.102 (0.0620)
Retail trade	-0.0220** (0.00992)	-0.0194* (0.00997)	0.0415 (0.0457)
Accommodation & food services	-0.0459*** (0.0112)	-0.0585*** (0.0112)	0.0455 (0.0445)
Transport, postal & food services	0.0433*** (0.0112)	0.0430*** (0.0112)	0.135** (0.0674)
Information media & telecommunications	0.0269* (0.0155)	0.0497*** (0.0145)	0.000491 (0.0800)
Financial & insurance services	0.115*** (0.0113)	0.117*** (0.0115)	0.229*** (0.0590)
Rental, hiring & real estate services	0.0385** (0.0159)	0.0463*** (0.0152)	0.0378 (0.0853)
Professional, scientific & technical services	0.0623*** (0.0102)	0.0755*** (0.0101)	0.0880 (0.0567)
Administrative & support services	-0.00121 (0.0126)	0.00617 (0.0129)	0.0437 (0.0505)
Public administration & safety	0.0995*** (0.00985)	0.0954*** (0.00991)	0.126** (0.0568)
Education & training	-0.0385*** (0.0104)	-0.0283*** (0.0103)	0.0302 (0.0467)
Health care & social assistance	0.0139 (0.0101)	0.0249** (0.0101)	0.102** (0.0451)
Arts & recreation services	-0.0433** (0.0168)	-0.00547 (0.0158)	-0.0977 (0.0607)
Other services	-0.00321 (0.0113)	-0.00183 (0.0111)	0.0516 (0.0542)
Not classified elsewhere	0.00876 (0.0170)	0.0395** (0.0154)	-0.0576 (0.0846)
Constant	2.981*** (0.0448)	3.436*** (0.0499)	3.036*** (0.110)
R squared	0.207	0.213	0.256
Observations	**562,458**	**493,416**	**69,042**

Notes: *, **, and *** denote statistical significance at the 10, 5, and 1 percent-levels, respectively. Robust standard errors on parentheses.

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@NZWorkResearch

NZ Work Research Institute

www.workresearch.aut.ac.nz

work.research@aut.ac.nz

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