AUSTRALIAN JOURNAL OF LABOUR ECONOMICS
Volume 18 • Number 2 • 2015 • pp 169 - 186

Temporary Versus Permanent Employment: Does Health Matter?

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Abstract

Poor health may inhibit active participation in the labour market and restrict the types of employment available to an individual. This paper uses recent survey data from New Zealand and employs a bivariate probit approach (to address sample selection issues) for investigating the relationship between health status and employment type. We find that health issues (and in particular mental health) are negatively related to the likelihood of being employed; and entering full-time and / or permanent employment. The picture with respect to temporary work is a little more fuzzy, with mixed results, and only minimal evidence is found that poor health is positively related to being in temporary employment.

Keywords: Employment, Mental health, Physical health

JEL classification: I1, J24, J29

1. Introduction

There is growing interest in the relationship between employment type and health, with foci on the increasingly precarious nature of work and the impacts of eroding employment security. While there are numerous definitions of temporary employment, as Hardy and Walker (2003) review, temporary work tends to encompass any job that deviates from the definition of permanent employment, in that it is not continuing and it does not necessarily go on for the full year (Campbell, 1994). Temporary work may cover seasonal, contract, casual, fixed-term, etc., and all of these can, in a variety of ways, be described as precarious. On the other hand, permanent work is generally defined as 'Workers who work all year and have an expectation of continuing employment' (Allan *et al*. 1998).

Although a multitude of factors have been linked with the likelihood of being in permanent versus temporary employment, one set of determinants that has not featured prominently in the literature is health. This is surprising considering that several studies

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have focussed on the impact of a change in employment type on health. The nature of the relationship between health and employment type is crucial to understand, because if people with poorer health have a higher propensity to find themselves in less-secure employment then the consequences may mean their overall well-being is affected, and possibly their mental health. To date, the predominant conceptualisations of these insecure employment roles have been either as an opportunity for disabled workers to gain entry to permanent, secure employment, or as a choice whereby such employment offers the flexibility that disabled workers are perceived to require when balancing employment alongside their own health requirements (Seebohm and Secker, 2005). Yet this assertion requires empirical investigation.

This study evaluates the relationship between various physical and mental health issues and participation in the labour market in a range of different types of employment arrangements. Data is sourced from the New Zealand General Social Survey (NZGSS), where we make use of six self-assessed health variables that encompass both physical and mental health. The role that health issues play with regard to temporary employment is investigated here in a more disaggregate fashion by analysing separately five sub-groups of temporary work: fixed term; contract; seasonal; casual; and other temp. The last on this list encompasses temp agency work and any other non-permanent circumstance that doesn't fit neatly into the first four categories. Such finer analysis is an important contribution as a large amount of extant literature focuses only on permanent employment versus the aggregate group of temporary workers (see, for example, Morris and Vekker, 2001) or concentrates on just one category of employment type (see, Güell and Petrongolo, 2007, who investigated determinants of converting fixed term into permanent contracts).

An important consideration in this research vein is sample selection bias. Some factors may determine only whether a person is active in the labour market (employment propensity) or only the employment type when actively in work (full time, seasonal, etc.) while other factors may influence both these issues. In our empirical exercise we employ bivariate probit regression and conditional marginal effects estimation processes to control for those variables that impact on employment propensity before we identify the marginal effects of the covariates on employment type.

The remainder of this paper is consequently organized as follows: Section 2 reviews the literature regarding the nature of the relationship between employment and health. Section 3 outlines the data source and provides details on the six key health identifiers used in this study (three physical health and three mental health variables), and explains the empirical approach adopted in this study. Section 4 reports key results, while section 5 concludes.

2. Literature

Underemployment: Causes and Consequences

While there are important debates over the extent of and reasons behind the increasing amount of non-permanent employment, there is growing evidence that a non-trivial proportion of the workforce can now be described as occupying non-permanent employment (Burgess and de Ruyter, 2000; Vosko, 2007). Although there has been documentation of the phenomenal changes in the labour market towards

either part-time or non-permanent employment types over the last two decades (Segal and Sullivan, 1997; Alba-Ramírez, 1998; Tan and Tan, 2002; De Jong *et al*., 2009), there is a contemporaneous dearth of recognition of the role of health with regard to employment type.

New Zealand (NZ) has a growing profile of temporary workers. Figures from the Department of Labour (2009) reveal that in March 2008, approximately one in 10 (9.4 per cent) employees were working in temporary jobs. Additionally, the Survey for Working Life (conducted by Statistics NZ in March 2008) found that 40 per cent of temporary workers indicated that they would prefer a permanent job, which is an indication that a substantial number of these workers were not satisfied with their current employment type. Underemployment has become a major social issue during the past 20 years. Scheid (1999) highlighted that when workers lose full employment they may accept partial employment, by for example involuntarily working part-time or at lower wages. Inadequate work has been termed 'disguised unemployment' (Robinson, 1936), and is often not reflected well in the standard unemployment statistics.

Much medical and psychological research on un/underemployment has concentrated on both the possible damage to mental health or psychological well-being caused by unemployment and whether health restricts an individual's capability to work; it often overlooks the issue of disadvantaged groups being found in disadvantaged employment (Hammarström and Janlert, 1997). That is, given the common observation that employed individuals are less depressed and show higher self-esteem than their unemployed counterparts, can we attribute this difference to employment type or does a pre-existing difference in mental health influence whether one will obtain and retain employment?

It is widely acknowledged that there are multiple potential channels by which workers find themselves in temporary employment (De Jong *et al*. 2009). The first mechanism involves free choice reasons, i.e. workers choosing temporary placements due to their intrinsic qualities, such as greater levels of freedom and flexibility. A second group of workers are forced into temporary positions due to constraints/obstacles including discriminatory practices that can be faced in finding permanent work. In these cases individuals may choose temporary jobs with the specific aim of attaining a permanent job at a later stage. Using data from the USA's Current Population Survey, Morris and Vekker (2001) found that the majority of temporary workers would have preferred a permanent position (67 per cent); close to a third of the temporary workers (32 per cent) stated that it was the only type of job they could find, and another 8 per cent hoped it would lead to a permanent job. Almost 20 per cent of temporary workers in their study chose this employment pathway due to the constraints faced with working and being in school/training simultaneously. This is clear evidence of underemployment.

Socio-economic Variables

Many studies have found that younger workers are over-represented in temporary jobs (Christensen, 1987; Corsini and Guerrazzi, 2007; Morris and Vekker, 2001; Nollen, 1996). Within the 16-64 age band it is likely that age is an important determinant as it is often correlated with experience and, thus, likely to be positively correlated

with gaining permanent employment. For example, Corsini and Guerrazzi (2007) found the probability of Italian workers moving from temporary to permanent jobs increased with age until the age bracket of 35-44 years, after which it began to decline. They suggest this finding may reflect the higher cost to firms of investing in younger and older workers. Morris and Vekker (2001) further indicate that the trend of younger workers in temporary jobs is also likely, and in the least part, attributable to young people being in school and desiring flexibility in their employment arrangement (see, also Howe, 1986). They also find that even young people not in school are disproportionately in temporary jobs (81 per cent) when they would prefer a permanent one.

Gender is also a crucial factor in determining employment type with women tending to make up the majority of temporary employment (De Cuyper *et al*. 2009; Howe, 1986; Lenz, 1996; Liard and Williams, 1996; Morris and Vekker, 2001; Nollen, 1996; Segal and Sullivan, 1997). Gregory and Connelly (2008) argue that as women reorganise their working lives around the presence of children, their reported job satisfaction is highest when in part time work. Their research also indicates that while part time employment is rapidly expanding amongst men in Britain, it still remains a predominantly female phenomenon with women making up 81 per cent of all part time workers in 2006. It is likely that women find it more difficult to transition into permanent jobs (Alba-Ramírez, 1998; Corsini and Guerrazzi, 2007). For instance, Güell and Petrongolo (2007) found that the likelihood of transitioning from temporary to permanent is increasing for men but decreasing for women.

Explanations for such patterns are the subject of significant debate. Firstly, Polachek (1976) suggests that women in general have different expectations from men and therefore, women make different investment decisions. Since women are often assumed to plan to abstain themselves from work for child bearing they are expected to choose the low occupations and hence in most cases they accumulate less human capital and have lower lifetime earnings as a result. Such explanations continue to be presented by Hakim (2000) in her preference theory, which is heavily influenced by human capital theories. Yet the concept of choice has been challenged (see, Durbin, 2002; Acker, 2006; Walby, 1997); the claim that women choose precarious employment in an attempt to balance work and home life is seen as highly problematic, not least because such choices are constrained by gendered social structures.

Other significant determinants of being in temporary versus permanent employment include education, marital type, and ethnicity. Morris and Vekker (2001) found temporary workers tend to have lower education levels than permanent workers. This result is supported by Bover and Gómez (2004) who showed that having a university degree increases the likelihood of getting into a permanent position, while simultaneously decreasing the probability of attaining a temporary one. In contrast, however, Corsini and Guerrazzi (2007) found that while workers with only compulsory education struggle to find employment, in particular that of permanent employment, workers with a high degree of education are also less likely than their moderately educated counterparts to hold a permanent job. The authors suggest this finding is explained by considering optimal firm/employee behaviour; firms preferring to pay high worth employees on a contract basis, while highly educated employees,

recognising the potential career opportunities that exist for them, also prefer contract work to ensure ease of mobility. Corsini and Guerrazzi (2007) also found that investment in further education with regard to increasing the chance of getting work (secure or otherwise) is significantly greater for young workers, suggesting that firms look for other factors in older workers such as experience. Evidence regarding the role of marital status in determining job type is inconclusive. For instance, while Alba-Ramirez (1998) finds that marriage increases the probability of both men and women obtaining an indefinite contract in Spain, Liard and Williams (1996) argue that married females may prefer temporary work due to their juggling of family and work activities. In terms of ethnicity, there is growing research on this complex issue, such as Morris and Vekker (2001) who found that Blacks had a lower likelihood of being in permanent employment, possibly due to a negative 'minority status' effect on a person's permanent job opportunities.

Health

One set of covariates that has not featured prominently in the employment type literature is health. This is surprising, considering that several studies have focussed on the opposite relationship; i.e. the impact on health as a result of a change in employment type. For example, research by Isaksson and Bellagh (2002), Ferrie *et al*. (1998), Virtanen *et al*. (2003) and Silla *et al*. (2005) investigated health as an outcome variable. Silla *et al*. (2005) found evidence that traditional temporary workers (those low in volition and employability) experienced the lowest health outcomes (in particular, low levels of well-being). Ferrie *et al*. (1998) found that organisational change in jobs and job insecurity triggered longstanding illnesses and minor psychiatric morbidity in both men and women, with men being more susceptible to these conditions than women. Virtanen *et al*. (2003) studied whether changing from a fixed-term to a permanent employment situation was followed by changes in health or health-related behaviours (such as sickness absence). Further research by Virtanen *et al*. (2005) emphasised the need for future work to investigate health status as an antecedent, since many dual labour market theorists argue that those who are healthy are selected for core jobs, while those who are not, are selected for periphery jobs. This approach maintains that the allocation of jobs and resources in a free labour market economy is determined by supply and demand, with the implication that discrimination based on prejudice and stereotypes against certain social groups is irrational and has no place within the functioning of a rational and efficient market as it would be non-competitive. According to this theory, any irrational discrimination against workers is naturally addressed by competitive mechanisms since employers evaluate workers in terms of their individual characteristics as they seek to maximize profit (Reich *et al*. 1972).

MacKay (1998) highlights the concept of unemployment and underemployment as a 'choice'; unemployable through being unduly inflexible. This places the emphasis on the individual, their willingness to accept lower wages, poorer working conditions, or by physically moving location. From this perspective, it is inflexibility on the part of the individual that results in unemployment or unemployability, depoliticising organisational decision-making and exclusionary processes. In addition, for those who are underemployed, such an approach justifies their position in the labour market as a matter of choice or opportunity.

This attitude to exclusion is influenced by medical approaches to health. Here exclusion or propensity for non-permanent employment is an issue of individual deficit. Disability, and specifically mental health, in this context, has been used here to indicate inability or limitations in performing social roles and activities such as in relation to work, or family (Nagi, 1976). From such a perspective, any relationship between health and economic exclusion has been explained as causal; mental health impairs performance at the individual level, and in social performance (Nagi, 1976). Yet empirical evidence regarding the relationship between health status and employment type is scant. Research by Grzywacz and Dooley (2003) creates a continuum of 'good' and 'bad' jobs based on information regarding the psychological, social and economic resources of a worker; and their analysis revealed a consistent association between less than optimal jobs and poorer physical and mental health amongst adults.

3. Data and Method

Given the lack of empirical investigation into the relationship between mental and physical health status and temporary versus permanent employment, this research aims to fill this gap in the NZ literature. Data is sourced from the two most recent waves of the NZGSS (2010 and 2012). These cross sectional surveys are pooled, and provide information on a range of social and demographic characteristics of New Zealanders aged 15 and over. We limit our sample to those within the working age population (15-64) who are employed. This provides a final sample of 9,046. This is fairly evenly divided along the gender line (49 per cent male), and there are three distinct ethnic minorities (relative to the control group of NZ European) of Asian, Maori, and Pacific peoples (8.1, 11.6, and 4.1 per cent, respectively).

For the purpose of this research, the dependent variables of interest are the different categories of employment type. Specifically, understanding the determinants of being in full-time versus part-time work, conditional on being employed; and being in permanent versus temporary (further subdivided into fixed term, contract, seasonal, casual, and other temp) work, again conditional on being employed. These variables, along with the six disaggregated health status indicators, and other covariates used in the upcoming empirical analysis are described in table 1. Roughly 79 per cent of individuals in the sample are employed full-time (30+ hours per week), and 78 per cent are employed by way of permanent contract as opposed to on a temporary basis.

Under each of the health domains (physical and mental), there are aggregate summary scores, and disaggregated distinct health aspects. The aggregate measures are provided for purely informational purposes, as the following analysis focusses on the disaggregate indicators, to ensure attention is paid to which specific aspects of health are most strongly related to employment type. For instance, there are three physical health variables (Health Limiting, Pain and Energy) and three mental health indicators (Depression, Health social, and Health accomplishing). All variables have been coded in a similar fashion (categorical and ordered from one to five) such that the higher the value of the variable, the more detrimental the health of the individual. For instance, a value of five for the Pain variable signifies that during the past four weeks pain played a role of extreme interference with the individual's normal work, including work both within and outside the home. Conversely, a value of one is indicative of

pain having no impact on an individual's normal work. In a similar manner, a value of five for the depressed variable (one of the mental health indicators) signifies that the individual has felt depressed and downhearted all of the time during the past four weeks; whereas a value of one corresponds to them feeling depressed none of the time. A priori we expect a negative relationship between poor health and both full-time and permanent employment.

Table 1 - Descriptive Statistics

Variable	*Definition*	
Job characteristics		
Employed	Dummy variable: 1 for employed; 0 otherwise.	0.739 (0.439)
Full time	= 1 for employed full time (minimum 30 hours per week on average); 0 for part time	0.785 (0.411)
Permanent	= 1 for permanent employment agreement; 0 otherwise	0.781 (0.414)
Fixed term	= 1 for fixed term employment agreement; 0 otherwise	0.034 (0.182)
Contract	= 1 for contract employment agreement; 0 otherwise	0.067 (0.249)
Seasonal	= 1 for seasonal employment agreement; 0 otherwise	0.013 (0.115)
Casual	= 1 for casual employment agreement; 0 otherwise	0.058 (0.234)
Other temp	= 1 for other temporary employment agreements (other than fixed term, contract, seasonal, or casual); 0 otherwise	0.046 (0.210)
Physical health		
Summary physical health	Summary measure of physical health – continuous variable ranging from 0 to 100, standardized against NZ norms. A score above the norm (>50) indicates better physical health than the overall NZ population, and a score below 50 indicates worse physical health.	52.772 (7.139)
Health limiting	Question: During the past four weeks, how much of the time were you limited in the kind of work or other regular daily activities you do as a result of your physical health? Categorical variable: 1 = none of the time; 2 = a little of the time; 3 = some of the time; 4 = most of the time; and 5 = all of the time.	1.409 (0.843)
Pain	Question: During the past four weeks, how much did pain interfere with your normal work including both work outside the home and housework? Categorical variable: 1 = not at all; 2 = a little bit; 3 = moderately; 4 = quite a bit; 5 = extremely.	1.644 (1.050)
Energy	Question: How much of the time during the past four weeks did you have a lot of energy? Categorical variable: 1 = all of the time; ….; 5 = none of the time.	2.331 (0.854)
Mental health		
Summary mental health	Summary measure of mental health – continuous variable ranging from 0 to 100, standardised against NZ norms. A score above the norm (>50) indicates better mental health than the overall NZ population, and a score below 50 indicates worse mental health.	50.771 (8.960)
Health social	Question: During the past four weeks, how much time has your physical health or emotional problems interfered with your social activities, such as visiting friends, relatives, etc. Categorical variable: 1 = none of the time; ...; 5 = all of the time.	1.396 (0.810)
Depressed	Question: How much of the time during the past four weeks have you felt downhearted and depressed? Categorical variable: 1 = none of the time; ...; 5 = all of the time.	1.580 (0.820)

Table 1 - Descriptive Statistics (continued)

Variable	*Definition*	
Health accomplishing	Question: During the past four weeks, how much of the time have you accomplished less than you would like as a result of any emotional problems, such as feeling depressed or anxious? Categorical variable: 1 = none of the time; …; 5 = all of the time.	1.433 (0.786)
Demographic characteristics		
Asian	Dummy variable: 1 = Asian; 0 otherwise	0.081 (0.273)
Maori	Dummy variable: 1 = Maori; 0 otherwise	0.116 (0.320)
Pacific peoples	Dummy variable: 1 = Pacific peoples; 0 otherwise	0.041 (0.197)
Male	Dummy variable: 1 = Male; 0 = Female	0.490 (0.500)
Partnered	Dummy variable: 1 = partnered; 0 = non-partnered	0.637 (0.481)
Children	Dummy variable: 1 = presence of children in household; 0 otherwise	0.491 (0.500)
Educational qualifications		
Qual school	Dummy variable: 1 = highest educational qualification is a school certificate; 0 otherwise	0.455 (0.498)
Qual tertiary	Dummy variable: 1 = highest educational qualification is a post-school diploma or tertiary degree; 0 otherwise	0.293 (0.455)
Qual post grad	Dummy variable: 1 = highest educational qualification is a post graduate qualification; 0 otherwise	0.114 (0.318)
Age categories		
15-19	Dummy variable:1 = aged 15-19 years; 0 otherwise	0.039 (0.193)
20-24	Dummy variable:1 = aged 20-24 years; 0 otherwise	0.063 (0.243)
25-29	Dummy variable:1 = aged 25-29 years; 0 otherwise	0.082 (0.274)
30-34	Dummy variable:1 = aged 30-34 years; 0 otherwise	0.101 (0.302)
35-39	Dummy variable:1 = aged 35-39 years; 0 otherwise	0.122 (0.328)
40-44	Dummy variable:1 = aged 40-44 years; 0 otherwise	0.135 (0.342)
45-49	Dummy variable:1 = aged 45-49 years; 0 otherwise	0.130 (0.337)
50-54	Dummy variable:1 = aged 50-54 years; 0 otherwise	0.125 (0.330)
55-59	Dummy variable:1 = aged 55-59 years; 0 otherwise	0.110 (0.313)
60-64	Dummy variable:1 = aged 60-64 years; 0 otherwise	0.092 (0.289

Note: apart from the mean and standard deviation provided for the 1st variable of *employed*, all other descriptive statistics are provided for the employed group. $N = 9{,}057$.

While we have three disaggregated variables under each of the physical and mental health headings, these categories are by no means mutually exclusive and there may be some overlap. For instance, a respondent could mistake the motive for the question relating to the pain variable as either physical or emotional pain. While all correlations across the health variables are not presented here, we do find that the highest correlation is between health accomplishing and depression at 0.6; both of these indicators being mental health variables. In terms of the descriptive statistics provided in table 1, most New Zealanders rate their health status relatively well. This is shown by the means for the six health indicators being closer to one, rather than five. Assuming we can directly compare the health indicators with each other, the Energy variable has the poorest rating for individuals in this sample, with a mean of 2.33.

Table 2 provides a glimpse into the health status of workers versus non-

workers; full-time versus part-time, and permanent versus a range of temporary contracts. Several patterns are evident within this table. Firstly, across all physical and mental health aspects, individuals not employed have poorer health, relative to those employed. While these means do not in themselves establish a causal link between health and employment type; along with past international literature investigating the general link between health status and employment (see, Ojeda *et al*. 2010; Cai and Kalb, 2006; Pelkowski and Berger, 2004); these statistics add weight to the argument that healthy individuals are selected for employment, and they are also more likely to choose employment whereas people with health issues may choose to focus on dealing with their health issues.

Another clear pattern in table 2 is that part-time workers have inferior health status relative to those in full-time employment. However, without further empirical investigation it is difficult to know which direction causation runs, or if it runs in both directions in a significant manner.

Finally, when comparing permanent workers to the sub-categories of temporary jobs, casual employees appear to have particularly poor health – with the highest means for three out of the six disaggregated health indicators. The lowest means (and therefore best self-assessed health status) were experienced by permanent workers. T-tests were conducted to explore whether the means were significantly different across sub-samples of different employment types. Comparing permanent employment with various temporary categories, it is clear that casual workers stand out as most markedly different to their permanent counterparts, whereas fixed-term workers and contractors have the least significant differences with permanent workers, with respect to individual characteristics. These findings show the importance of disaggregating analysis of different temporary employment types where possible.

Table 2 - Descriptive Statistics by Employment Type

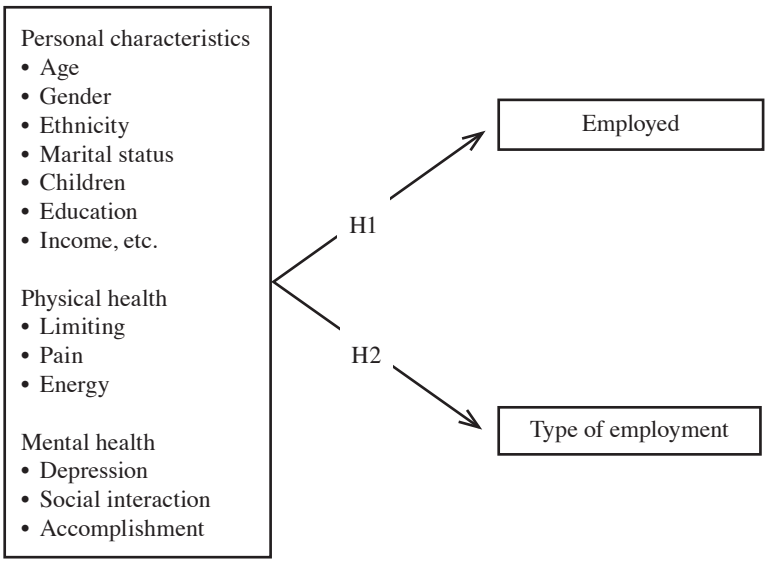
Variable	*Employed*	*Not Employed*	*Full Time*	*Part Time*	*Permanent*	*Fixed Term*	*Contractor*	*Seasonal*	*Casual*	*Other Temp*
Physical health										
Health limiting	1.409	1.827***	1.372	1.543***	1.395	1.432	1.384	1.426	1.560***	1.474*
Pain	1.644	1.924***	1.622	1.726***	1.627	1.642	1.717**	1.795*	1.732**	1.667
Energy	2.331	2.611***	2.296	2.458***	2.317	2.374	2.353	2.221	2.410**	2.438***
Mental health										
Health social	1.396	1.824***	1.365	1.507***	1.374	1.565	1.402	1.328	1.554***	1.445*
Depressed	1.580	1.923***	1.549	1.692***	1.553	1.632*	1.674***	1.475	1.767***	1.655**
Health accomplishing	1.433	1.824***	1.397	1.563***	1.402	1.535	1.487***	1.426	1.641***	1.526***
Demographic characteristics										
Asian	0.081	0.101***	0.082	0.078	0.079	0.074	0.071	0.115	0.101*	0.098
Maori	0.116	0.218***	0.114	0.122	0.115	0.126	0.091*	0.205***	0.154***	0.088*
Pacific peoples	0.041	0.077***	0.042	0.033*	0.041	0.058	0.023**	0.066	0.047	0.033
Male	0.490	0.337***	0.562	0.226***	0.484	0.387***	0.692***	0.549	0.378***	0.500
Partnered	0.637	0.388***	0.655	0.572***	0.648	0.613	0.674	0.557**	0.446***	0.686
Children	0.491	0.606***	0.457	0.615***	0.483	0.535*	0.467	0.410	0.603***	0.507
Educational qualifications										
Qual school	0.455	0.476**	0.449	0.481**	0.456	0.319***	0.469	0.508	0.518***	0.436
Qual tertiary	0.293	0.178***	0.295	0.285	0.295	0.403***	0.281	0.107***	0.218***	0.336*
Qual post grad	0.114	0.048***	0.122	0.086***	0.115	0.197***	0.126	0.025***	0.063***	0.119
Age categories										
15-19	0.039	0.171***	0.017	0.116***	0.027	0.048**	0.017	0.115***	0.195***	0.045**
20-24	0.063	0.096***	0.061	0.070	0.060	0.077	0.012***	0.090	0.142***	0.060
25-29	0.082	0.091*	0.088	0.058***	0.086	0.119**	0.051***	0.066	0.074	0.040***
30-34	0.101	0.088**	0.104	0.093	0.103	0.129	0.094	0.090	0.076**	0.098
35-39	0.122	0.102***	0.122	0.125	0.123	0.132	0.147*	0.148	0.097*	0.086**
40-44	0.135	0.085***	0.139	0.121**	0.137	0.132	0.152	0.098	0.099**	0.133
45-49	0.130	0.081***	0.136	0.111***	0.134	0.116	0.149	0.074**	0.076***	0.138
50-54	0.125	0.074***	0.131	0.102***	0.127	0.110	0.146	0.115	0.080***	0.136
55-59	0.110	0.087***	0.116	0.091***	0.113	0.058***	0.124	0.123	0.063***	0.148**
60-64	0.092	0.125***	0.087	0.113***	0.090	0.077	0.108	0.082	0.099	0.117*
Sample size	9,057	3,196	7,108	1,949	7,074	310	604	122	527	420

Note: ***, **, and * indicate significance levels for t-tests comparing employed with not employed, full-time with part-time, and each type of temporary employment type with permanent.

4. Method

The core focus of this paper is to address sample selection issues. Therefore, contrary to the majority of approaches adopted elsewhere, this paper examines (simultaneously) whether there are associations between a range of personal and health-related factors on employment *and* employment type. We assume that data take the format shown in figure 1, and a distinctive feature of this study is that it models the hypotheses of H1 and H2 simultaneously.

Figure 1 - Summary of Associations Investigated in this Paper



Past studies have modelled the determinants of employment status (yes/no) and employment type (permanent/temporary) separately. However, if there is an overlap in the unobserved characteristics that determine both the propensity to be employed and the type of employment (e.g. personal traits), then the errors from the regression models will be related. This will bias the coefficients on our health indicators. To deal with this modelling obstacle, we employ a bivariate probit, which also allows construction of marginal effects for covariates, conditional on whether an individual is employed or not.

5. Results

Table 3 presents the results of the bivariate probit regressions where the first regression of each pair examines the probability that the individual is employed and the second regression examines the propensity that the individual is in a particular type of employment[1]. There is consistency in the results across the table and many of the covariates yield expected findings.

[1] All regressions have been weighted using the sample weight provided by Statistics NZ.

For instance, Maori and Pacific Islanders are less likely to be employed than Europeans, males are more likely to be employed than females, respondents who have partners are more likely to be employed than people without partners, and those with children may face constraints on their ability to work as indicated by the negative coefficients. Relative to people in the 30-34 year old age bracket, those in the 40-44, 45-49 and 50-54 age groups are more likely to be working, perhaps because these age groups may be past the average child bearing age for women and because of the need for extra income to maintain the same level of welfare in family units as opposed to a household singleton. The 60-64 year old age group are less likely to be employed, perhaps indicating the preference of employers to select and train younger workers in order to reap longer term returns from their investment in these workers or the choice of older workers to retire early. The results also corroborate existing knowledge that higher qualified individuals are more likely to be in employment.

Turning our attention to the health-related variables, four of the six variables have a negative association with being employed. With regard to the physical health domain, only health limiting has a statistically significant negative association with the likelihood of being employed, while the coefficients on pain and energy are statistically insignificant. In contrast, all three mental health variables appear to be consistently exhibiting a significant negative relationship with being employed.

The second of each pair of regressions correspond to H2 in figure 1, and in general indicate that physical and mental health issues tend to be associated with non-participation in particular employment types – such as full-time and permanent work. However, before delving much further into the direction and sign of coefficients in table 3, it is important to note that at this stage we haven't controlled for sample selection bias. For an individual to be formally included in the employment type specification, the individual must first be employed. Therefore, the results of the employment type regressions should not be biased by inclusion of individuals who are not employed, which is potentially the case in the second columns of these pair-wise regression results. Accordingly, table 4 presents the marginal effects corresponding to the second of the pair-wise regressions, and are estimated conditional on the individual being employed, e.g. P (Full time=1 | Employed=1) and similarly for other employment types (such as P(Seasonal=1| Employed=1); P(Casual=1| Employed=1), etc).

There are three key findings from these results. First, in general, results point to a significant relationship between health problems and a lower propensity to be in full time or permanent work. Interestingly, health issues also have a negative relationship with contract work (albeit marginally, and with respect to the health limiting variable) and seasonal employment (with respect to health social and depression). Second to this, it is worth noting that the magnitude of the marginal effects on full time and permanent employment are much larger than the corresponding marginal effects of health problems on being in temporary work. Third, there are only two situations where worse health is associated with increases in the probability of being in a particular employment type – health accomplishing for fixed term work, and lack of energy for other temp work. These results indicate that while poor health is potentially a significant inhibitor for an individual entering full time or permanent work, these findings do not translate into an equivalent upsurge in temporary employment.

Table 3 - Bivariate Probit Regression Results

Variable	*Employed*	*Full Time*	*Employed*	*Permanent*	*Employed*	*Fixed Term*	*Employed*	*Contract*	*Employed*	*Seasonal*	*Employed*	*Casual*	*Employed*	*Other Temp*
Physical health														
Health limiting	-0.115***	-0.115***	-0.101***	-0.067***	-0.112***	-0.060	-0.112***	-0.101***	-0.113***	0.031	-0.108***	0.012	-0.112***	0.007
	(0.022)	(0.023)	(0.021)	(0.022	(0.022)	(0.044)	(0.022)	(0.032)	(0.022)	(0.057)	(0.021	(0.029)	(0.022)	(0.040)
Pain	-0.012	-0.015	-0.015	-0.028*	-0.013	0.008	-0.012	0.034	-0.012	0.049	-0.012	0.013	-0.014	0.006
	(0.017)	(0.016)	(0.017)	(0.015)	(0.017)	(0.034)	(0.017)	(0.023)	(0.017)	(0.038)	(0.017)	(0.026)	(0.017)	(0.034)
Energy	-0.022	-0.030	-0.019	-0.028	-0.024	0.011	-0.023	-0.004	-0.023	0.009	-0.028	-0.038	-0.025	0.085**
	(0.022)	(0.021)	(0.021)	(0.020)	(0.022)	(0.039)	(0.022)	(0.033)	(0.022)	(0.054)	(0.021)	(0.030)	(0.022)	(0.040)
Mental health														
Health social	-0.061***	-0.041*	-0.070***	-0.042*	-0.067***	0.029	-0.069***	-0.028	-0.068***	-0.173***	-0.055**	-0.001	-0.069***	-0.036
	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)	(0.044)	(0.023)	(0.035)	(0.023)	(0.053)	(0.023)	(0.040)	(0.023)	(0.047)
Depressed	-0.091***	-0.086***	-0.086***	-0.073***	-0.089***	-0.072	-0.088***	0.034	-0.090***	-0.120*	-0.089***	0.018	-0.087***	0.019
	(0.024)	(0.023)	(0.023)	(0.022)	(0.024)	(0.045)	(0.024)	(0.033)	(0.024)	(0.064)	(0.024)	(0.032)	(0.024)	(0.045)
Health accomplishing	-0.068***	-0.074***	-0.079***	-0.090***	-0.069***	0.081*	-0.069***	0.035	-0.071***	0.038	-0.073***	0.013	-0.065***	-0.016
	(0.025)	(0.024)	(0.024)	(0.023)	(0.025)	(0.044)	(0.025)	(0.035)	(0.025)	(0.067)	(0.025)	(0.034)	(0.025)	(0.049)
Demographic characteristics														
Asian	-0.395***	-0.335***	-0.402***	-0.309***	-0.422***	-0.216**	-0.421***	-0.062	-0.421***	0.237*	-0.407***	0.029	-0.422***	-0.021
	(0.058)	(0.054)	(0.057)	(0.054)	(0.059)	(0.112)	(0.059)	(0.097)	(0.059)	(0.136)	(0.058)	(0.084)	(0.059)	(0.085)
Maori	-0.237***	-0.124***	-0.259***	-0.186***	-0.246***	0.001	-0.249***	-0.144	-0.254***	0.256**	-0.246***	-0.077	-0.251***	-0.047
	(0.046)	(0.045)	(0.046)	(0.045)	(0.047)	(0.092)	(0.047)	(0.093)	(0.047)	(0.106)	(0.047)	(0.073)	(0.047)	(0.098)
Pacific peoples	-0.228***	-0.047	-0.278***	-0.108	-0.254***	0.089	-0.257***	-0.347***	-0.253***	-0.114	-0.264***	-0.015	-0.254***	-0.201
	(0.071)	(0.072)	(0.070)	(0.067)	(0.071)	(0.122)	(0.072)	(0.129)	(0.072)	(0.163)	(0.070)	(0.116)	(0.072)	(0.134)
Male	0.428***	0.758***	0.387***	0.173***	0.404***	-0.126*	0.408***	0.511***	0.408***	0.177**	0.378***	-0.064	0.408***	0.106*
	(0.036)	(0.033)	(0.034)	(0.032)	(0.035)	(0.066)	(0.035)	(0.052)	(0.035)	(0.086)	(0.035)	(0.055)	(0.035)	(0.058)
Partnered	0.315***	0.294***	0.330***	0.249***	0.359***	0.045	0.361***	0.028	0.358***	0.040	0.360***	-0.085	0.358***	0.177***
	(0.037)	(0.035)	(0.037)	(0.034)	(0.037)	(0.075)	(0.037)	(0.057)	(0.038)	(0.097)	(0.037)	(0.066)	(0.037)	(0.069)
Children	-0.288***	-0.350***	-0.227***	-0.179***	-0.257***	-0.073	-0.256***	-0.134**	-0.256***	-0.297***	-0.255***	0.077	-0.255***	0.059
	(0.040)	(0.036)	(0.038)	(0.035)	(0.039)	(0.065)	(0.039)	(0.059)	(0.039)	(0.096)	(0.039)	(0.061)	(0.039)	(0.065)

Table 3 - Bivariate Probit Regression Results (continued)

Variable	*Employed*	*Full Time*	*Employed*	*Permanent*	*Employed*	*Fixed Term*	*Employed*	*Contract*	*Employed*	*Seasonal*	*Employed*	*Casual*	*Employed*	*Other Temp*
Educational qualifications														
Qual school	0.368***	0.293***	0.359***	0.269***	0.379***	0.115	0.382***	0.204**	0.380***	-0.297***	0.375***	-0.033	0.383***	0.166*
	(0.044)	(0.044)	(0.043)	(0.043)	(0.044)	(0.107)	(0.044)	(0.081)	(0.044)	(0.094)	(0.044)	(0.070)	(0.044)	(0.097)
Qual tertiary	0.562***	0.429***	0.523***	0.319***	0.562***	0.446***	0.563***	0.232***	0.564***	-0.495***	0.558***	-0.065	0.565***	0.292***
	(0.052)	(0.050)	(0.051)	(0.049)	(0.053)	(0.119)	(0.053)	(0.090)	(0.053)	(0.131)	(0.052)	(0.087)	(0.053)	(0.103)
Qual postgrad	0.657***	0.563***	0.599***	0.372***	0.653***	0.558***	0.644***	0.243**	0.650***	-0.789***	0.651***	-0.246**	0.654***	0.280**
	(0.073)	(0.067)	(0.072)	(0.064)	(0.075)	(0.130)	(0.075)	(0.101)	(0.075)	(0.219)	(0.075)	(0.108)	(0.075)	(0.124)
Age categories														
15-19	-0.775***	-1.249***	-0.790***	-0.923***	-0.738***	-0.009	-0.745***	-0.544***	-0.748***	0.209	-0.709***	0.523***	-0.750***	-0.079
	(0.080)	(0.085)	(0.079)	(0.080)	(0.080)	(0.179)	(0.080)	(0.170)	(0.080)	(0.200)	(0.080)	(0.121)	(0.080)	(0.148)
20-24	-0.230***	-0.393***	-0.237***	-0.323***	-0.219***	-0.007	-0.228***	-0.737***	-0.228***	0.146	-0.210***	0.615***	-0.234***	0.095
	(0.080)	(0.076)	(0.078)	(0.073)	(0.079)	(0.155)	(0.080)	(0.183)	(0.080)	(0.186)	(0.079)	(0.115)	(0.079)	(0.146)
25-29	-0.069	-0.038	-0.062	0.034	-0.076	0.137	-0.078	-0.311**	-0.079	-0.015	-0.074	0.011	-0.083	-0.408***
	(0.074)	(0.070)	(0.074)	(0.068)	(0.075)	(0.145)	(0.075)	(0.125)	(0.075)	(0.199)	(0.075)	(0.112)	(0.075)	(0.139)
35-39	0.037	0.008	0.061	0.039	0.075	-0.132	0.077	0.186*	0.069	0.152	0.075	-0.001	0.067	-0.171
	(0.067)	(0.062)	(0.067)	(0.063)	(0.068)	(0.124)	(0.068)	(0.103)	(0.068)	(0.170)	(0.068)	(0.112)	(0.068)	(0.117)
40-44	0.180**	0.152**	0.176**	0.092	0.212***	-0.090	0.205***	0.141	0.210***	0.058	0.213***	-0.045	0.209***	0.120
	(0.071)	(0.065)	(0.072)	(0.063)	(0.073)	(0.130)	(0.073)	(0.102)	(0.073)	(0.192)	(0.073)	(0.108)	(0.073)	(0.116)
45-49	0.187***	0.145**	0.200***	0.192***	0.225***	-0.154	0.221***	0.078	0.220***	-0.232	0.219***	-0.061	0.220***	-0.047
	(0.065)	(0.073)	(0.073)	(0.064)	(0.074)	(0.128)	(0.075)	(0.102)	(0.075)	(0.185)	(0.074)	(0.116)	(0.075)	(0.108)
50-54	0.246***	0.144**	0.215***	0.145**	0.271***	-0.207	0.271***	0.091	0.266***	-0.083	0.272***	-0.059	0.270***	0.159
	(0.076)	(0.068)	(0.075)	(0.066)	(0.077)	(0.128)	(0.077)	(0.101)	(0.077)	(0.170)	(0.077)	(0.119)	(0.077)	(0.114)
55-59	0.070	0.020	0.055	0.038	0.097	-0.323**	0.093	0.042	0.096	0.050	0.099	-0.160	0.098	0.276**
	(0.073)	(0.069)	(0.072)	(0.069)	(0.074)	(0.154)	(0.075)	(0.109)	(0.075)	(0.173)	(0.074)	(0.116)	(0.075)	(0.117)
60-64	-0.424***	-0.446***	-0.413***	-0.324***	-0.393***	-0.235*	-0.392***	0.012	-0.398***	-0.275*	-0.391***	0.064	-0.392***	0.141
	(0.076	(0.070)	(0.075)	(0.070)	(0.077)	(0.145)	(0.078)	(0.117)	(0.077)	(0.203)	(0.077)	(0.117)	(0.078)	(0.122)
Constant	0.880***	0.379***	0.878***	0.501***	0.835***	-2.043***	0.831***	-1.967***	0.840***	-1.910***	0.830***	-1.746***	0.835***	-2.418***
	(0.096)	(0.090)	(0.092)	(0.087)	(0.095)	(0.206)	(0.096)	(0.155)	(0.096)	(0.241)	(0.094)	(0.135)	(0.096)	(0.166)
ρ (Rho)	0.998		0.996		0.999		0.876		0.996		0.999		0.999	
χ^2 for LR test of ρ=0	66.215***		44.858***		22.783***		75.435***		15.831***		0.419		5.918**	

Notes: Standard errors are in parentheses; *, ** and *** indicate statistical significance at the 10, 5, and 1 percent levels, respectively. Omitted categories are females, non-partnered, European and other ethnicity, no school qualifications, and age 30-34 years.

Table 4 - Marginal Effects after Biprobit

	Full time	*Permanent*	*Fixed Term*	*Contractor*	*Seasonal*	*Casual*	*Other Temp*
Physical health							
Health limiting	-0.023***	-0.005	-0.003	-0.008**	0.001	0.003	0.002
Pain	-0.004	-0.010	0.001	0.004	0.001	0.002	0.001
Energy	-0.008	-0.009	0.001	-0.00001	0.0003	-0.004	0.008**
Mental health							
Health social	-0.002	-0.001	0.003	-0.002	-0.004***	0.001	-0.002
Depressed	-0.016**	-0.012	-0.004	0.005	-0.002*	0.004	0.003
Health accomplishing	-0.017**	-0.022***	0.006**	0.005	0.001	0.003	-0.0004

Note: *, ** and *** indicate statistical significance at the 10, 5, and 1 percent levels, respectively.

Limitations

The results presented within tables 3 and 4 implicitly assume that the direction of causality is from health status to employment type. However, causation may run in the reverse direction if employment reduces the probability or severity of mental and physical health issues or if being unemployed accentuates an individual's health status.

This issue results in the estimated coefficients being potentially unreliable, as variation in the explanatory variables is not only associated with variation in the employment (outcome variable), but also changes in the error term. Instrumental variables is the most common approach with regard to handling these endogeneity concerns. However, our search of the NZGSS netted no appropriate instrument. A valid instrument would need to be associated with changes in health status, but not lead to changes in employment type (except by the indirect route of health).

Given the possibility of endogeneity impacting our results in tables 3 and 4, we acknowledge this limitation and point out the importance of further NZ surveys that measure health and employment on a longitudinal basis, such that future studies can delve into disentangling the causal pattern at play here.

6. Conclusions

This paper presented an investigation of the relationship between mental and physical health issues and the propensity to be in employment per se and in particular employment types (e.g. full-time, casual, seasonal, etc.)[2]. Separating these two issues is key if appropriate policy is to be formulated to enhance employment rates and understand why there are differences in the likelihood of people with various health conditions being in particular employment contracts. However the vast majority of existing studies jumbled mental health and physical health conditions into one variable. By drawing data from the New Zealand General Social Survey we are able to distinguish between these two different health issues.

[2] There are no specific reasons as to why the results should not be generalizable beyond NZ. However, it should be noted that NZ has not gone down the same route as many European countries – such as Spain, which previously had high rates of employment protection for permanent workers, and have implemented policies in the last two decades to increase the prevalence of temporary contracts, in response to the detrimental effects of recessionary periods.

Our empirical analysis reveals that the majority of health conditions are negatively associated with the likelihood of an individual being in employment and in full time and permanent contracts. Mental health issues in particular stand out as having a significant negative relationship with an individual's propensity to be employed. An important result from the bivariate probit analysis is that while the role of poor health in terms of working full time or being in permanent employment was negative and significant; the role that poor health plays with respect to temporary work is mixed, and appears to usually be small in magnitude.

It is important to recognise that while our empirical analysis has been able to control for both mental and physical health factors, it is beyond the scope of this study to investigate the complicated inter-relationships between physical health and mental health; for instance, it could be the case that mental health influences physical health and then employment. Future analysis is recommended down this track.

Overall, this study signals that public policy employment initiatives need to be aware of the important part played by mental and physical health issues. Promoting the employment opportunities of people with mental health should be a political priority, however the risk is that this is translated into 'any old' work, with little or no thought placed on aspirations, skills and abilities, and potentially forcing people into inappropriate and dissatisfying employment. Dividing people in this way is underpinned yet again by a medicalised view of mental health, with no consideration of the circumstances of employment. As Waddell and Aylward (2005) point out, while work is generally good for physical and mental health, there are major provisos, namely that physical and psychosocial conditions are satisfactory and provide a decent 'human' quality of work, and that work provides adequate financial reward and security.

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