

**UNIVERSITY OF WAIKATO**

**Hamilton  
New Zealand**

**Labour Force Participation, Human Capital  
and Wellbeing among Older New Zealanders**

Michael P. Cameron  
*University of Waikato*

Peggy Koopman-Boyden  
*University of Waikato*

Matthew Roskrige  
*University of Waikato*

**Department of Economics**

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*Corresponding Author*

**Michael P. Cameron**  
Economics Department  
University of Waikato,  
Private Bag 3105,  
Hamilton 3240, New Zealand

Email: [mcam@waikato.ac.nz](mailto:mcam@waikato.ac.nz)  
Tel: +64 (0)7 858 5082

## **Abstract**

Along with many other countries, New Zealand is experiencing a rapid rise in the population of older people, both in absolute terms and also as a percentage of the overall population. Older people are increasingly likely to participate in formal employment beyond the age of pension eligibility (65 years in New Zealand). Earlier research has showed that working full-time reduces life satisfaction among New Zealanders 65 years and older, and that this relationship is robust to the inclusion of measures of job satisfaction or the desire to work more or fewer hours. In this paper we investigate the relationship between labour force participation and life satisfaction among older New Zealanders, with specific focus on the mediating role of human capital in the relationship. We utilise data from several waves of the New Zealand General Social Survey ( $n=5856$ ), and account for the bias due to selection effects and endogeneity using instrumental variables analysis, and control for mental and physical health. Our identification strategy is to use gender, regional-level employment rates, and migration rates as instruments for labour force status. Our results suggest that, should improving wellbeing for older people become an explicit government priority, investing in reducing the push factors for older people to remain in the full-time employment may improve wellbeing.

## **Keywords**

labour force participation  
retirement  
subjective wellbeing  
life satisfaction  
human capital  
New Zealand

## **JEL Codes**

I31, J14, J21, J24

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## 1. Introduction

Throughout the world, the number of older people as a proportion of the population is growing. Globally, the number of persons aged 60 years or over is projected to increase from 841 million in 2013 to 2 billion in 2050 (United Nations 2013). This ageing trend is unprecedented, and is most significant in China and in many developed countries such as New Zealand. The number of New Zealanders aged 65 years and over is projected to increase from 650,000 in 2014 to 1.17 million in 2033 and to nearly 1.7 million in 2068 (Statistics New Zealand, 2014). Importantly, the ratio of those aged 15-64 years to those aged 65 years and over is projected to decrease from 4.5 (younger people per person aged 65 years and over) in 2014 to 2.7 in 2033 and to 2.1 in 2068. Structural ageing represents a dramatic demographic shift that will also result in a substantial ageing of the labour force (Cochrane and Cameron 2014). The ageing of the labour force is further reinforced by the fact that New Zealanders are living longer and doing so in a healthier physical and mental state. Many older people continue working at older ages rather than retiring at the age of entitlement for universal New Zealand Superannuation (NZS), currently 65 years.<sup>1</sup>

Labour force participation rates among older people have increased substantially over the period from 1991 to 2013 (see Figure 1), both in total (from 5.8% to 22.5% among those aged 65 years and over; and from 21.5% to 46.3% among those aged 55 years and over) and within every five-year age cohort for those aged 55 years and over. These trends are not unique to New Zealand, with Australia and its states following similar trajectories to New Zealand over time (Temple, 2014).

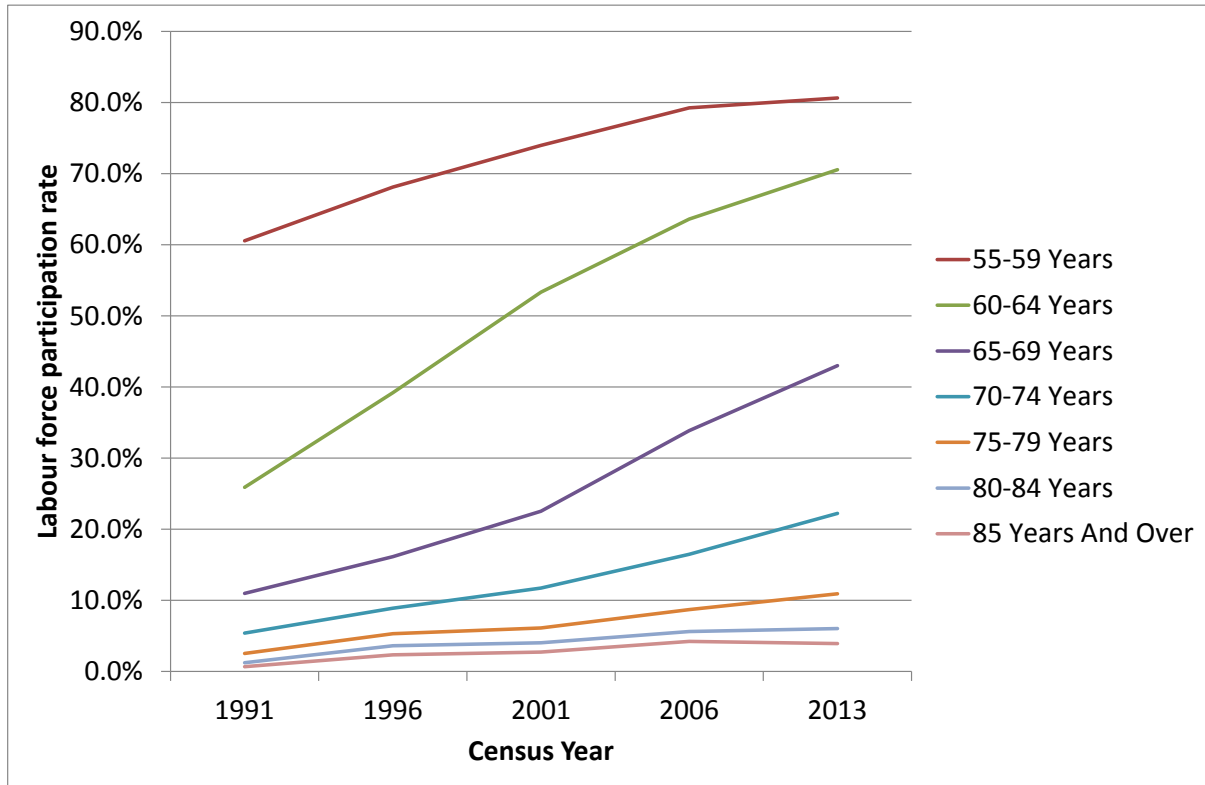
Cameron (2014) explores the characteristics of and trends in labour force participation among older New Zealanders in more detail. His paper shows that there has been a substantial increase in the size of the older labour force, and that older people are increasingly choosing part-time rather than full-time employment, presumably because more older people choose to delay full retirement or engage in bridge employment (Cahill, Giandrea and Quinn 2005, Statistics New Zealand 2008). Cameron (2014) also shows that the trend of increasing labour force participation over time is predominantly a cohort effect – more recent cohorts have reached older ages with higher levels of labour force participation than previous cohorts. However, changes in part-time/full-time employment status are not predominantly cohort effects.

The trend of increasing workforce participation among older people is often presented in a positive light, due to the potential for older workers to help offset some of the labour force impact occurring as a result of structural ageing. However, while there may be a benefit at the societal level, there is a small but growing body of evidence as to the impact of working or retirement on the wellbeing of older individuals (Van Solinge 2012).

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<sup>1</sup> There is no official 'retirement age' in New Zealand, although many older workers are likely to take the opportunity to retire presented by their entitlement to NZS at age 65.

**Figure 1: Labour Force Participation Rate by Age, 1991-2013**



A strict neoclassical economic argument would suggest that older people would not choose to work, given that NZS provides an adequate income and retirement is not compulsory in New Zealand, unless the benefits outweigh the costs. The costs include foregone leisure time, foregone opportunities to volunteer or participate in activities, and physical and/or mental exertion (although, as Hotopp (2007) notes, this latter cost is no more so for older workers than younger workers). Benefits of working longer include a higher level of income available for consumption, as well as enjoyment from work and from the social aspects of work, active engagement, and building and maintaining of social capital (Longino and Kart 1982, Helliwell 2006).

Despite the neoclassical argument that people who retire will do so only if it makes them better off (if that retirement is largely voluntary), evidence on the effect of retirement on life satisfaction is somewhat mixed. Retirement itself has been shown to be positively associated with life satisfaction among older people (Reitzes, Mutran and Fernandez 1996, Latif 2011, Bechetti, Ricca and Pelloni 2012), especially among the well-off (Pinquart and Schindler, 2007). Retirement may only exert a temporary positive influence on life satisfaction (Horner, 2014), although Gorry, Gorry and Slavov (2015) demonstrate a lasting effect that increases over time in some measures. Voluntary retirement has been shown not to be significantly related to life satisfaction (Bonsang and Klein 2012), whereas involuntary retirement has been shown to be associated with lower life satisfaction (Herzog, House and Morgan 1991, Van Solinge and Henkens 2008, Calvo, Haverstick and Sass 2009, Cameron and Waldegrave 2009, Bonsang and Klein 2012, Hershey and Henkens 2013). In contrast, participation in paid

or volunteer work has also been shown to be associated with higher life satisfaction among older people (Aquino, Russell, Cutrona and Altmaier 1996). However, these studies have usually concentrated on the extensive margin (that is, the difference between the ‘retired’ and ‘not retired’), which is a largely arbitrary distinction. Retirement has long been recognised as being characterised by more subtle and long-run transitions from full-time employed to fully retired (for example, Honig and Hanoch 1985).

To avoid the arbitrary distinction between work and retirement, the relationship between work and life satisfaction must be evaluated also at the intensive margin, such as comparing whether the effects differ between those who work part-time and those who work full-time. Chang and Yen (2011) showed that older people in part-time work have higher life satisfaction, while full-time work is associated with lower life satisfaction. Similarly, Kim and Feldman (2000) found that bridge employment is associated with higher life satisfaction than full-time employment.

However, few of these previous studies have adequately accounted for selection bias – older workers typically choose whether or not to work, and will be more likely to work if they expect benefits to outweigh costs, that is, if they expect higher life satisfaction as a result of working. Those studies that have accounted for selection bias have typically not considered differences between full-time and part-time work – for instance, Gorry et al. (2015) combine full-time and part-time work into a single category, and fully and partially retired into a second category. A recent study using pooled cross-sectional data for New Zealand, and using instrumental variables regression to account for selection bias, strongly suggests that labour force participation is associated with lower life satisfaction among older people (Cameron and Roskruege 2014a). The negative relationship is largest and most significant for full-time work, but part-time work is also associated with lower life satisfaction. Moreover, the relationship is robust to the inclusion of job satisfaction, type of occupation, and desire to work more or fewer hours (Cameron and Roskruege 2014b).

Human capital has been shown to be closely related to life satisfaction. Health in particular has a critical relationship with both labour force participation (Currie and Madrian, 1999) and life satisfaction (Pool, Amey, Cameron and van der Pas 2009), and has also seldom been accounted for in previous studies. Within a large sample of New Zealanders aged 65 to 84 years, poor health was the second-most cited reason (after family responsibilities) for periods of more than one year spent outside the workforce, and the third-most cited reason (after wanting to do other things, and reaching the official retirement age) for retirement (Cameron and Waldegrave 2009). Educational achievement has also been shown to be positively related to life satisfaction (Callister 2006, Meara, Richards and Cutler 2008). The mechanism through which higher levels of education positively affects life satisfaction is suggested to be through increased engagement in paid work, and increased access to economic resources (Ross and van Willigen 1997).

This paper aims to further explore the relationship between labour force participation and life satisfaction among older people, accounting for selection bias and the important role of human capital. Following Cameron and Roskrug (2014a, 2014b), we use data from a pooled cross-section of older people in New Zealand, and investigate the mediating role of human capital in the relationship. Specifically, we answer the question: does the negative relationship between labour force participation and life satisfaction depend on human capital? This question has important policy implications. With structural ageing, it is almost inevitable that there will be increasing demand for older people's labour in developed economies. In the case of New Zealand, as the ratio of the number of older people receiving NZS to full-time income earners and taxpayers increases, the affordability of universal superannuation becomes increasingly questionable. Delaying the eligibility for superannuation to older ages, or reducing the real value of superannuation, both increase the incentives for older people to work to older ages. However, it is not clear *a priori* the effect that these changes will have on older people themselves. Will increasing labour force participation among older people make them better or worse off, and will younger (and better educated) cohorts be better placed to negotiate this changing environment?

The paper proceeds as follows. The following section outlines our identification strategy for investigating the links between labour force participation, human capital and wellbeing. We then discuss the data and methods employed, and present the results of our analysis using data from three waves of the New Zealand General Social Survey (NZGSS). The final section discusses the results and concludes.

## **2. Identification Strategy**

There are two critical methodological issues that must be overcome in investigating the effects of labour force participation on life satisfaction or wellbeing. First is the role of selection bias. Older people choose whether or not to participate in the labour market, and it is likely that those who believe that their wellbeing is likely to be increased as a result of working will work, while those who believe that their wellbeing will be likely to be reduced will choose not to work. Thus, simply comparing the wellbeing of older people who are working with those who are not working will not reveal the 'true' difference in wellbeing between an individual working and *that same individual* not working.

Second, any analysis of the relationship between labour force participation and wellbeing must take account of the critical role of health. Health affects labour force participation, as healthier workers are more able to work. However, health has been shown to have a separate direct effect on life satisfaction, especially among older people (Coe and Zamarro 2011, Atalay and Barrett 2014). This creates a problem of endogeneity. If we simply investigate the effect of labour force participation on life satisfaction while controlling for health, we would be ignoring the fact that health also directly affects labour force participation.

To overcome both of these issues, we use instrumental variables regression (Pearl 2000, Angrist and Krueger 2001). This approach requires at least one variable that affects labour force participation that does not separately affect life satisfaction. Moreover, as we are considering both full-time and part-time work separately, we require *two* instrumental variables. For an instrumental variable to be valid, it must plausibly be related to the endogenous variable (in this case full-time or part-time work), but not have a direct influence on the dependent variable (life satisfaction).

First, we argue that gender is one such variable. In terms of relationship to the endogenous variable, men have higher labour force participation than women, and there is no theoretical reason why life satisfaction should be higher among men than women, or vice versa. While past studies have demonstrated that life satisfaction does differ between men and women (see, for example, Bonsang and Klein 2002), past studies of life satisfaction among older people that demonstrate differences by gender have not controlled for labour force participation. While the reader might be sceptical of this approach, we demonstrate in our results that gender has no independent and statistically significant effect on life satisfaction, which enables its use as an instrument (see Results section).

Second, labour force participation among older people will depend on the availability and desirability of local employment opportunities. We use two variables defined at the regional level to capture this: (1) regional sex-specific employment rates (number of employed people of each sex as a proportion of the working age population, defined as those aged 15 and over); and (2) regional prime-age internal in-migration rate (defined as the number of people aged 20-49 who moved into the region from elsewhere in New Zealand over the period 2008-2013, divided by the regional population in 2008).

The regional employment rate of those not at retirement age captures the availability of jobs in the region, which will affect the difficulty for older people to obtain work, and affect their labour force participation. It is unlikely to have a direct effect on life satisfaction of older people, even though older people are included within the working age population, as they make up only a small proportion of those with employment in each region. The regional in-migration rate captures the desirability of the region, which partially depends on the availability of suitable employment opportunities, especially for those of working age. Again, it is unlikely to have a direct effect on life satisfaction of older people.

### 3. Data and Methods

Our data come from a Confidentialised Unit Record File (CURF) of the 2008, 2010 and 2012 waves of the New Zealand General Social Survey (NZGSS). The NZGSS is an official survey of wellbeing in New Zealand conducted biennially by Statistics New Zealand<sup>2</sup>. The NZGSS collects information at the household and at the individual level. Statistics New Zealand selects household participants by means of a sample selection method that selects 1,200 primary sampling units (PSU) from the Household Survey Frame, which is then narrowed down to eligible households from the selected PSUs. Eligible individuals (aged over 15 years) are randomly selected to complete the individual component of the NZGSS from each of the participating households. The 2008, 2010, and 2012 basic NZGSS CURFs include 8,721, 8,550 and 8,462 individual responses respectively. There are a total of 25,733 observations in the merged dataset. We restrict our analysis to those aged 65-79 years; a total of 5,856 observations across the three waves of the NZGSS. Of those, 5,851 respondents answered the life satisfaction question, and 4,224 provided data for all of the variables used in our analysis.

The NZGSS collects data on a variety of social indicators and demographics. Importantly, the dataset includes data on life satisfaction, self-reported health status and labour force status. Life satisfaction is measured as the response to the question: 'How do you feel about your life as a whole right now?'. Responses are measured on a five-point Likert scale:

- 1 = Very Satisfied
- 2 = Satisfied
- 3 = No feeling either way
- 4 = Dissatisfied
- 5 = Very dissatisfied.

This measure is very similar to those employed in other surveys in New Zealand and elsewhere (Koopman-Boyden and Waldegrave 2009).

We reduce the ordinal life satisfaction data to a binary variable, equal to one if the respondent was very satisfied and zero otherwise. The findings of this paper were robust to using an alternative cut-point, where the life satisfaction variable was set equal to one when the respondent was either satisfied or very satisfied and zero otherwise. Self-reported health status is measured using the SF-12 measures (Ware, Kosinski, Turner-Bowker and Gandek 2007). The SF-12 can be used to produce two scales, a Physical Component Summary (PCS) and a Mental Component Summary (MCS), which are taken to represent physical health and mental health respectively. Both scales are scored to have a mean of 50 and a standard deviation of 10. The SF-12 has been used in previous analyses of the relationship between overall wellbeing and health among older New Zealanders (Pool et al. 2009).

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<sup>2</sup> For more information see <http://www.stats.govt.nz/nzgss>



Education is measured as the highest qualification obtained, in four levels: (1) no secondary school qualification; (2) some secondary school qualification; (3) some post-secondary qualification; (4) degree-level or higher study. This categorisation follows earlier work among older people in New Zealand (Koopman-Boyden 2007). We then collapse this variable down to two levels: those with and without post-secondary education.

The NZGSS does not contain sufficient economic information to confidently control for individual or household wealth. However, geographic measures of local social deprivation are available for small areas, and we use this data as proxy for wealth. NZDep2006 is the most commonly used measure of local area social deprivation in New Zealand (Salmond, Crampton, and Atkinson, 2007), and was constructed from 2006 Census data. It is a standardised scale with a mean of 1000 and a standard deviation of 100, with lower deprivation scores representing areas of higher socio-economic status. However, deprivation is typically measured in quintiles, and we use NZDep quintile as our proxy measure of wealth. Labour force status is defined in terms of part-time or full-time work, with full-time work defined as working thirty hours or more a week. For the purposes of this paper, we treat those who define themselves as unemployed (who comprise only 0.36 percent of the sample of those aged 65-79 years) as not employed, although technically they are part of the labour force. For most practical purposes in terms of wellbeing, there is likely to be little difference between an unemployed and a retired person, particularly given how few of them there are in the sample.

Partnership status is a dummy variable equal to one if the respondent was married or in a long-term relationship. Additional data for our instruments were obtained from the Household Labour Force Survey for regional employment rates, and from the 2013 Census of Population and Dwellings for regional internal in-migration rates.

Summary statistics for all the variables used in the analysis are presented in Table 1. Overall levels of life satisfaction in the sample are very high, with nearly 39 percent of respondents rating their life satisfaction as 'very satisfied' (90.5% of respondents rate their life satisfaction as 'satisfied' or 'very satisfied' (data not shown)). This is similar in magnitude to other surveys of life satisfaction among older people in New Zealand (Waldegrave and Koopman-Boyden 2009). Over 22 percent of the sample was in paid employment, with slightly more than half of those in full-time employment. Most (57.7%) of the sample was female, which is similar to the proportion of women in the older population as a whole, and the highest proportion (42.3%) of the sample were in the youngest (65-69 years) cohort. Slightly more than one-third of the sample had some post-secondary education. On average, physical health was below the standardised mean score which is not surprising given that this was a sample of older people, while mental health was slightly above the standardised mean score.

As noted in the previous section, we employ an instrumental variables estimation technique. Self-reported life satisfaction is the dependent variable, and explanatory variables include age (in five-year age groups), education, self-reported health status (physical and mental), and labour force status (full-time or part-time work, not working is the comparator category). We also include local deprivation as a proxy for wealth, and include survey wave fixed effects. Labour force status (full-time and part-time work) are likely to be endogenous variables, so we include in the first-stage regression all of the exogenous variables from the second stage, plus gender. To avoid the ‘forbidden regression problem’ (Angrist and Pischke 2009), our models are specified as linear even though the dependent variables are binary. The estimator that we employ is the GMM (Generalised Method of Moments) estimator, which is more robust to the presence of heteroskedasticity than alternatives such as two-stage least squares (Baum, Schaffer, and Stillman 2003). The second stage of the estimation is a linear probability model, so the coefficients can be interpreted as being the marginal probability of reporting being 'very satisfied'.

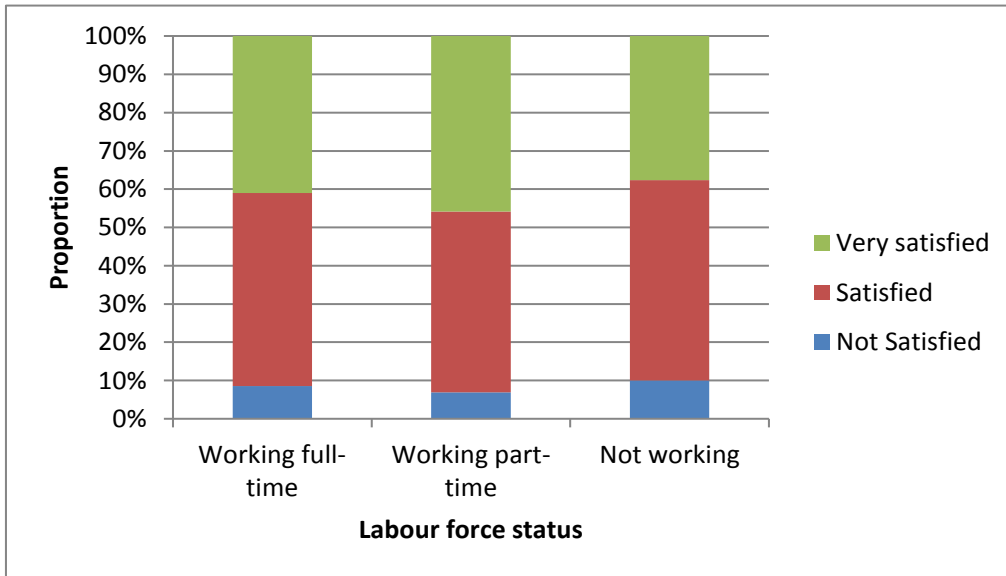
**Table 1: Summary statistics (n=4224)**

| <b>Variable</b>                      | <b>Proportion</b> | <b>Mean</b> | <b>Median</b> | <b>St. Dev.</b> | <b>Min.</b> | <b>Max.</b> |
|--------------------------------------|-------------------|-------------|---------------|-----------------|-------------|-------------|
| Life satisfaction (1=very satisfied) | 38.9%             |             |               |                 |             |             |
| Working full-time                    | 11.7%             |             |               |                 |             |             |
| Working part-time                    | 11.0%             |             |               |                 |             |             |
| Gender (1=male)                      | 42.3%             |             |               |                 |             |             |
| Age 65-69                            | 40.5%             |             |               |                 |             |             |
| Age 70-74                            | 32.8%             |             |               |                 |             |             |
| Age 75-79                            | 26.7%             |             |               |                 |             |             |
| Education (1=post-secondary)         | 34.3%             |             |               |                 |             |             |
| Partnered                            | 51.9%             |             |               |                 |             |             |
| SF-12 PCS                            |                   | 44.26       | 48            | 12.21           | 4           | 66          |
| SF-12 MCS                            |                   | 52.49       | 55            | 9.61            | 6           | 75          |
| Regional employment rate             |                   | 63.64       | 61.98         | 6.30            | 53.44       | 73.53       |
| Regional in-migration rate           |                   | 8.18        | 8.82          | 2.39            | 4.41        | 12.37       |

#### **4. Results**

Figure 2 shows the relationship between life satisfaction and labour force status in our sample of people aged 65-79 years, demonstrating the overall very high levels of life satisfaction in the sample. Satisfaction is highest among those working part-time (45.8% very satisfied, and 47.3% satisfied), followed by those working full-time (41.0% very satisfied, and 50.5% satisfied), and lowest among those not working (37.6% very satisfied, and 52.3% satisfied). However, the apparent differences in life satisfaction by labour force status in Figure 2 tell us little about whether there is any causal relationship between labour force status and life satisfaction, and importantly do not control for health status (healthier people work more, and have higher life satisfaction) or economic need.

**Figure 2: Life satisfaction, by labour force status (n=4224)**



Accounting for selection bias, health status and the endogeneity of labour force participation, our econometric results of the final model specifications are presented in Table 2. We report four models. The first (Model 1) includes education as a covariate in both the first and second stages of the regression, and includes gender as a covariate but not as an instrument. This model shows that gender is statistically insignificant as a direct predictor of life satisfaction, after controlling for other variables, and can therefore be excluded from the explanatory variables. Having been excluded from having a direct effect on life satisfaction, gender can then be included as an instrument, the results of which are shown in Model 2. The final two columns, Model 3A and Model 3B, disaggregate the sample into those with and without some post-secondary education respectively.

The results reiterate the earlier findings of Cameron and Roskrug (2014a, 2014b), in that working full-time is associated with lower life satisfaction, controlling for selection bias and endogeneity using gender as an instrument. In Model 1, only mental health score and partnered status are statistically significantly associated with life satisfaction. This reflects a relative weakness in the instruments for both full-time and part-time status; in both cases, the Cragg-Donald Wald F statistics do not meet the Stock-Yogo critical values (Stock and Yogo, 2005). Importantly, gender is not statistically significant. In Model 2, which includes gender as an instrument, the model exceeds the Stock-Yogo critical value for full-time work, but not for part-time work. In this model, when compared with not working, working full-time is associated with a statistically significant 80.4 percent lower probability of a respondent reporting themselves as 'very satisfied' with their life as a whole, while working part-time has no statistically significant effect on life satisfaction. The results for part-time work are likely to reflect a lack of power in identifying the relationship between life satisfaction and part-time work.

**Table 2: IV Regression Results**

| Variable                 | Model 1             | Model 2              | Model 3A<br>(Post-secondary) | Model 3B<br>(No post-secondary) |
|--------------------------|---------------------|----------------------|------------------------------|---------------------------------|
| Working full-time        | 0.340<br>(1.737)    | -0.804***<br>(0.221) | -0.850**<br>(0.425)          | -0.654***<br>(0.190)            |
| Working part-time        | -0.349<br>(0.896)   | -0.001<br>(0.764)    | 0.509<br>(0.989)             | -0.225<br>(1.056)               |
| Gender                   | -0.125<br>(0.190)   |                      |                              |                                 |
| Post-secondary education | 0.003<br>(0.037)    | 0.020<br>(0.027)     |                              |                                 |
| Partnered                | 0.112***<br>(0.020) | 0.118***<br>(0.019)  | 0.090***<br>(0.033)          | 0.134***<br>(0.026)             |
| SF-12 PCS                | 0.004<br>(0.003)    | 0.006***<br>(0.002)  | 0.006*<br>(0.003)            | 0.005***<br>(0.002)             |
| SF-12 MCS                | 0.014***<br>(0.003) | 0.015***<br>(0.001)  | 0.019***<br>(0.003)          | 0.014***<br>(0.002)             |
| Age 70-74                | 0.014<br>(0.197)    | -0.106<br>(0.080)    | -0.088<br>(0.137)            | -0.104<br>(0.099)               |
| Age 75-79                | 0.067<br>(0.261)    | -0.090<br>(0.111)    | -0.090<br>(0.190)            | -0.066<br>(0.135)               |
| Deprivation Q1           | 0.066<br>(0.102)    | 0.125**<br>(0.052)   | 0.022<br>(0.083)             | 0.160**<br>(0.064)              |
| Deprivation Q2           | 0.047<br>(0.051)    | 0.070*<br>(0.039)    | -0.005<br>(0.088)            | 0.095*<br>(0.055)               |
| Deprivation Q3           | 0.013<br>(0.056)    | 0.047*<br>(0.027)    | -0.003<br>(0.055)            | 0.056*<br>(0.030)               |
| Deprivation Q4           | 0.010<br>(0.054)    | 0.041<br>(0.028)     | -0.035<br>(0.077)            | 0.060**<br>(0.028)              |
| <i>n</i>                 | 4,224               | 4,224                | 1,447                        | 2,777                           |

\*\*\* p<0.01; \*\* p<0.05; \* p<0.1

As expected, human capital is important but only for health and not for education. Self-reported health (both physical and mental) is highly significant in explaining life satisfaction. An additional standard deviation of self-reported physical health score is associated with a 5.8 percent higher probability of reporting being 'very satisfied', and an additional standard deviation of self-reported mental health score is associated with a 15.4 percent higher probability of reporting being 'very satisfied'. Post-secondary education has no statistically significant association with life satisfaction. Partnered people and those living in less deprived areas are significantly more likely to be very satisfied, while *ceteris paribus* there are no differences in life satisfaction by age.

When the analysis is disaggregated by education level (Models 3A and 3B), the mediating effect of education on the relationships between life satisfaction and other variables becomes clear. The negative effect of full-time work on life satisfaction is larger and more statistically significant for the higher educated group than for the lower educated group. While working full-time is associated with an 85.0 percent lower probability of

reporting as 'very satisfied' among the high education group, it is only associated with a 65.4 percent lower probability among the low education group. Part-time work is not associated with lower life satisfaction in either group (again reflecting a lack of power in identifying the relationship). The effects of health, particularly mental health, on life satisfaction are larger for those with high education than those with low education. Finally, the effect of partnered status is larger for those in the low education group, while the protective effect of living in less deprived areas is statistically significant only for those in the low education group.

## 5. Discussion and Conclusions

Our results provide further support for the contention that working is associated with lower life satisfaction among older New Zealanders. Overall, those working full-time have significantly lower life satisfaction than those not working, while we find no evidence that those working part-time have lower life satisfaction than those not working. Moreover, the negative relationship between life satisfaction and working full-time is larger for those with more education.

These results are somewhat surprising – our initial expectation was that older people with more education would be more likely to be working out of choice rather than necessity. As higher education is associated with higher income and consequently more economic resources, it is likely that older people with higher education do not *need* to work due to economic resources providing additional income, and would only do so if it increases their wellbeing. In contrast, older people with less education are likely to have accumulated less economic resources and may be more likely to work in order to meet costs of living or make luxury purchases, with lower wellbeing as a consequence of foregone leisure time. Our results suggest the opposite is true – better educated older people have larger negative life satisfaction consequences from working.

This unexpected result may arise through a number of mechanisms. First, the life satisfaction 'cost' of working will depend on the retirement aspirations of the older person. A disconnect between aspirations and lived reality may reduce life satisfaction. Older people with low educational attainment might aspire to retire at the age of eligibility for NZS, but they might be realistic and realise that working past age 65 is likely for them. So, when they find themselves 65 or over and still working part- or full-time, working doesn't reduce their life satisfaction. In contrast, older people with high educational attainment may aspire to retire at or around age 65 or aspire to be working on their own terms. When they find themselves 65 or over and still working, it reduces their life satisfaction - and more so if they are working full-time rather than part-time.

Secondly, the cost of maintaining lifestyle will likely be higher for those with more educational attainment (and higher pre-retirement income). While universal superannuation provides an unearned source of income, this level of income will not be sufficient to maintain pre-retirement lifestyle for most people, and more so for higher income (and higher education)

people. So in order to maintain something close to their lifestyle before age 65, older people with higher education are more likely than those with less education to feel that they have to work, and similarly more likely to feel that they have to work full-time rather than part-time, with a consequent reduction in their life satisfaction due to foregone leisure opportunities.

Thirdly, older people with greater educational attainment may be more likely to be employed in occupations with more responsibility and broader job scope, both of which increase job-related stress and likely reduce job and life satisfaction. However, including job satisfaction into the models in the last section does not eliminate the difference in life satisfaction between part-time and full-time work (the difference between working and not working cannot be tested with job satisfaction in the model, as job satisfaction is not observed for those who are not working). Given this finding, it is possible that barriers to exiting the workforce are more prominent among those with higher education. As higher educated individuals often occupy more specialized or senior positions, it may be more difficult to attract suitable replacement labour to facilitate an individual retiring. This may be even more pronounced in New Zealand as structural ageing, a shallow labour market, and lack of competitiveness with other countries for specialized labour, all contribute to difficulties in sourcing appropriate replacement labour, particularly in regional New Zealand where populations may be stable or declining.

Fourthly, it could be that for some people to pursue higher education, and subsequent careers, they substitute away from investment in the family, social and cultural domains which contribute to later life satisfaction. However, in our results educational attainment did not have a direct effect on life satisfaction, so this explanation seems less likely to hold in our sample. Available data from the NZGSS are insufficient to explore these four plausible mechanisms relating labour force participation to lower life satisfaction. Further research using qualitative methodologies may therefore be important in better understanding the underlying reasons for this observed relationship.

Human capital has a further effect on life satisfaction among older people, directly through the relationship between health and life satisfaction. Both physical and mental health are associated with higher life satisfaction, but as with labour force participation this relationship is mediated by educational attainment – the positive relationship is larger for those with post-secondary education than for those with less education, particularly for mental health. This may possibly be due to greater economic resources accrued by those with advanced education, which allow them to capitalize on good health through travel or mentoring, while poor health restricts the opportunities greater wealth offers. In contrast, those with less education would not have these opportunities and therefore may face a lesser degree of negative consequences (in terms of life satisfaction) of poor health.

Educational attainment also appears to mediate the relationship between wealth and life satisfaction – the relationship is statistically significant only for those with less educational attainment. This may provide further support for the importance of maintaining lifestyle mentioned earlier. Although greater wealth is associated with higher life satisfaction, the marginal benefit of wealth on life satisfaction diminishes with greater wealth. Thus, it is plausible that the cost of maintaining a more expensive lifestyle (in terms of foregone leisure and other opportunities) may not fully offset the positive relationship between wealth and life satisfaction for those with low educational attainment, but may do so for those with higher education. Thus, there is a protective effect of wealth on life satisfaction for those with low educational attainment, but for the better educated this effect is not significant.

Our results have important implications for policy aimed at improving life satisfaction among older people. The New Zealand population is ageing, and older people are healthier and increasingly remaining in the labour force for longer. While improved health has a protective effect on life satisfaction among older people, our results demonstrate that working full-time reduces life satisfaction. Helping older people to avoid the necessity of full-time work would substantially improve their wellbeing. Full-time work among older people could be replaced by more part-time or bridge employment (Cahill et al., 2005), provided appropriate policies are put in place to support this (Cameron and Roskrue, 2014a). Managing the transition from full-time employed to full retirement will be especially important for more educated older people, so opportunities for mentoring, job sharing or phased retirement will be especially important for this group.

Finally, the results reported in this paper have a number of limitations and suggests a number of future avenues for further research. Our results are based on pooled cross-sectional data which doesn't fully take account of changes in retirement attitudes, aspirations, or experience between different cohorts. Longitudinal data that follows individuals over time as they make the transition from full-time employment to retirement at or around the age of eligibility for NZS would greatly improve our ability to understand whether labour force participation causes lower life satisfaction.

We have used gender as an instrument for labour force participation, which may be arguable. However as we have shown, gender has no *ceteris paribus* direct relationship with life satisfaction in our sample. Finally, our results were based on data from New Zealand and may not be generalizable to other contexts. Future research should take advantage of longitudinal or panel data such as the Australian HILDA survey, of data from the Health and Retirement Study family of surveys, and qualitative research on the transition from full-time work to retirement would help understand how this transition affects life satisfaction.

The populations of developed countries are ageing rapidly, and larger numbers of people are reaching older age. New Zealand has high labour force participation among older people, but many other developed countries are narrowing this gap. Understanding how life

satisfaction among older people is affected by labour force status is important, particularly if the trade-off between work and life satisfaction in this age group is apparent in other populations. Mitigating the impact of work on life satisfaction will be important in the future, and finding a suitable mechanism to assist in the transition from work to retirement is essential.

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