

**An Analysis of the Relationship between Subjective Well-Being and Employment
Status in Ireland
By Edel Walsh**

1: Introduction

The aim of this paper is to estimate the relationship between subjective well-being and employment status in Ireland while controlling for the potential endogeneity of these two variables. Past research shows that unemployment negatively affects a person's well-being and employment positively affects well-being (Cole *et al.*, 2009). However, many studies have failed to control for the potential endogenous relationship between these two variables, that is, while employment may affect well-being, well-being is also likely to have an impact on the individual's employment status (Hamilton *et al.*, 1997). This paper uses a simultaneous probit-ordered probit model to jointly estimate the determinants of an individual's well-being and employment status. This estimation uses cross-sectional data compiled from three rounds of the European Social Survey 2002 – 2006 which contains information on over 6000 Irish individuals. Well-being is a multidimensional concept which incorporates an individual's physical, social and mental state (NESC, 2009). Subjective well-being refers to all of the various types of evaluations, both positive and negative, that people make of their own well-being and can include evaluations of life satisfaction, work satisfaction, interest and engagement with others, and emotions such as happiness, joy and sadness (Diener, 2006). Employment status is also captured in the survey and individuals indicate if they are employed (in paid work) or unemployed.

The potential endogeneity of well-being and employment status is addressed by estimating the well-being equation and the employment status equation simultaneously. Simultaneous equations model combining the probit and ordered probit techniques provides a useful approach to modelling the two-way relationship between well-being and employment status. Failure to account for the simultaneous relationship between well-being and employment status will lead to biased estimates if either relationship is estimated alone (Hamilton *et al.*, 1997).

The results of this paper, after controlling for endogeneity, support a simultaneous relationship between well-being and employment status. The results indicate that individuals with poor well-being are at greater risk of being unemployed. As for the feedback effect, it is found that employment has a positive, albeit insignificant impact on well-being in Ireland when the simultaneous model is estimated.

The remainder of this paper is organised as follows. The rationale for this paper is discussed in Section 2. Section 3 provides a literature review on all aspects of this paper. Section 4 presents the data used in this analysis. The empirical techniques are presented in Section 5. Section 6 presents the results and a discussion thereof. Section 7 concludes.

2: Rationale

The rationale for this paper arises from *Well Being Matters: A Social Report for Ireland*, which was published by the Irish National Economic and Social Council (NESC) in 2009. The purpose of the report is to analyse and interpret key social trends to inform social policy and well-being in Ireland. According to the NESC there are a number of reasons countries should focus on well-being. These are presented in Table 1. Economists measure the economic output of a society using indicators such as gross domestic product (GDP) or gross national product (GNP). While it is widely recognized that GDP and GNP are good economic indicators, it is also accepted that these are not adequate overall measures of the well-being of a society or of individuals within a society. These indicators focus heavily on the purchase and sale of goods and services both at home and abroad, investment and government spending, and while these are important economic indicators, they omit much of what individual's in a society really value (Diener and Seligman, 2004).

Even though measures such as GDP do not quantify human well-being, both economists and policy makers often assume that an increase in GDP corresponds to an increase in welfare (McGillivray and Clarke 2006). Considerable research highlights that in spite of rapid economic growth in several developed countries over the last number of decades

Table 1: NESC reasons for adopting a well-being approach

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- | |
|---|
| <ul style="list-style-type: none">• there is a need for something more than GDP to measure progress• people play a central role in economic and social progress• people care about their well-being and are increasingly reflecting on what contributes to it• to assist in monitoring the impact of policy actions on policy outcomes |
|---|
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(Source: NESC 2009)

the average rates of well-being have remained stable (Easterlin, 2001). Easterlin (1974) used survey data to show that aggregate levels of subjective life satisfaction in the US had not risen in line with post-war economic growth. This finding is known as the Easterlin Paradox.

Limitations of using indicators such as GDP to measure overall societal well-being are well documented in the literature (Hicks and Streeten, 1979; Sen, 1985). According to these economists GDP is regarded as a one-dimensional indicator that does not include many of the dimensions that are regarded as essential for individual well-being such as social capital, financial satisfaction and employability.

Well-being is increasingly important in society where people want to live fulfilling lives as evaluated by themselves and not simply judged by governments, policy makers and ‘experts’ around the world (Grey *et al*, 2003). According to NESC (2009) people are becoming increasingly aware of well-being and the importance of it on both a personal and societal level. Furthermore, people care not only about their own well-being, but also about the well-being of their families, their communities and wider society (NESC, 2009). Internationally, there is increasing interest in, and analysis of, well-being and the economic, social, environmental and psychological factors that contribute to it (CMEPSP, 2008). The aim of the Commission on the Measurement of Economic Performance and Social Progress (CMEPSP) is to identify the limits of GDP as an indicator of economic performance and social progress. Current thinking suggests that measures of individuals’

well-being should be *combined* with Gross Domestic Product (GDP) to provide a more comprehensive analysis of a social progress and national well-being (New Economics Foundation, 2009).

Well Being Matters: A Social Report for Ireland calls for a broader understanding of social progress while taking into account the values of employment, social capital, and income inequality, elements which are omitted from frequently used measures of economic output such as GDP. The main objective of the report is to highlight social problems in the hope that more informed judgements about national priorities can be made. The report further emphasises the need to focus on outputs and outcomes and to align these better to high level societal goals and social indicators such as well-being can inform and support this process (NESC, 2009).

Kahneman *et al.*, (2004) and Diener and Seligman (2004), believe that periodic, systematic assessments of well-being offer policymakers a much stronger set of findings to use in policy making decisions. To assist policy-makers in making well-being a central objective in Ireland it is important to establish what contributes to individual well-being. This paper establishes the factors that affect subjective well-being in Ireland while controlling for the endogeneity of employment status.

3: Literature Review

There are a number of theories both economic and psychological relating well-being and employment status (Korpi, 1997). Early research by social psychologists provides evidence that unemployment leads to a reduction in well-being (Jahoda, 1988; Warr and Jackson, 1988; Liem and Liem, 1988). The link between subjective measures of well-being and unemployment has also received increasing attention from economists in recent years, most of who agree that unemployment is associated with lower levels of well-being (Blanchflower, 1996; Clark and Oswald, 1994; Di Tella *et al.*, 2001; Frey and Stutzer, 1999; Helliwell, 2003; Winkleman and Winkleman, 1995). A number of these studies have presented economic and psychological theories in an attempt to explain the relationship between well-being and employment status. Table 2 contains a list of both

economic and psychology theories and an explanation of each theory is presented thereafter.

Table 2: Theories of Unemployment and Well-Being

| Theories of Unemployment and Well-Being | |
|--|-------------------------------|
| <i>Economic Theories</i> | <i>Psychological Theories</i> |
| Social-Psychological Theory | Theory of Social Custom |
| Skills Atrophy Model | Latent Deprivation Model |
| Reverse Causation or Selection Hypothesis | Vitamin Model |
| Financial Deprivation Model | |

Source: Authors Own

Social-Psychological Theory of Unemployment

Research into the effects of unemployment on well-being began during the economic depression of the 1930s (see for example; Eisenberg and Lazarsfeld, 1938 and Jahoda *et al.*, 1971). Eisenberg and Lazarsfeld (1938) propose a Social-Psychological Theory of Unemployment in an analysis of the effects of unemployment on the individual and the family. The theory suggests that men and women reacted differently to unemployment and go through ‘stages’ which range from optimism to resignation and despair and these stages are accompanied by a deterioration in the individual’s social and intellectual well-being (McKibbin, 1990).

Most researchers agree on a number of points which correspond to the stages of unemployment first outlined by Eisenberg and Lazarsfeld (1938) and later by Harrison (1976) and Hill (1977). Individuals’ initial reaction to unemployment is that of shock, followed by an active search for a job during which time the individual is relatively optimistic (Winefield, 1995). The second stage an individual goes through, when efforts to secure employment fail is one of pessimism, anxiousness and distress (Eisenberg and Lazarsfeld, 1938). In the final stage the individual becomes ‘fatalistic’ and adapts to being unemployed (Darity and Goldsmith, 1996). In this state the individual has a

narrower scope and a broken attitude (Eisenberg and Lazarsfeld, 1938). Darity and Goldsmith (1996) propose that these stages may develop faster in an individual who is laid off by their employer than the individual who quits voluntarily. Either way these stages are predictable consequences of prolonged unemployment (Darity and Goldsmith, 1996). Among the working-age population, one of the most damaging individual experiences is unemployment (Ahn *et al.*, 2004).

The Social-Psychological Theory of Unemployment had been used in a number of studies over time (Darity and Goldsmith, 1993). In their study Darity and Goldsmith (1993) state that the theory is based on the adverse social psychological consequences of exposure to a long period of unemployment. Distressed feelings such as strain, finding life a struggle, loss of sleep through worry, feeling that life is not worth living, and feeling depressed, hopeless and worthless are found to be rife among unemployed individuals (Warr, 2007). The impact of unemployment on an individual's well-being, and especially their mental health, is likely to be manifest in a number of forms including denigration of self-worth or self-esteem (Goldsmith *et al.*, 1997). All of these feelings reduce a person's motivation to search for employment because they believe that their actions will have little or no effect on their circumstances (Cole *et al.*, 2009). The result is a period of persistent unemployment for the individual.

Other literature finds evidence of a negative psychological impact of past unemployment on current well-being and current labour force participation choices, even for those in current employment (Heckman and Borjas, 1980; Clark *et al.*, 2001). In an early study Schweitzer and Smith (1974) find that past unemployment has a significant and negative effect on current labour market participation decisions. Other research finds that both past unemployment and past inactivity can reduce current self-esteem thereby hindering chances or re-employment (Goldsmith *et al.*, 1996).

One of the best coping mechanisms for the unemployed in terms of being re-employed is to be actively seeking a new job (Kaul and Kvande, 1991). It is argued that those individuals who spend their time while unemployed trying to find new work have the best

prospects of being re-employed (Hammer, 1993). The act of job seeking may help the individual to retain their work identity and thereby cope better with unemployment in such a way that increases their chances of re-employment (Kaul and Kvande, 1991).

Recent economic research has confirmed the long-standing conclusion of psychologists that unemployment has an adverse effect on individual well-being (Flatau *et al.*, 2000). In a British study, Clark and Oswald (1994) find that unemployment has a statistically negative effect on individual well-being. However loss of income is not found to be associated with a reduction in well-being in their study (Clark and Oswald, 1994). Theodossiou (1998) finds that unemployment has an adverse effect on mental health and well-being of individuals, especially males in the British panel data set. Agerbo *et al* (1998) Korpi (1997) and Winkleman and Winkleman (1998) find similar results with respect to the negative effect of unemployment on well-being.

In general, existing economic evidence finds the relationship between unemployment and some measure of well-being to be consistent and strong while the impact of well-being on unemployment is less clear.

Skills Atrophy Model

The skills atrophy model is an economic theory of hysteresis which attempts to explain periods of unemployment (Cole *et al.*, 2009). The model argues that during prolonged periods of unemployment the work skills, or human capital, of the unemployed become outdated and redundant and they become less attractive to firms (Pissarides, 1992). This in turn makes them less employable even when work becomes available (Cole *et al.*, 2009). Furthermore, when the unemployed lose some of their skills the effects of a temporary shock to aggregate employment can continue for a long time (Pissarides, 1992).

During the period of unemployment the individual can also lose attributes such as self-confidence, self-esteem and the self-discipline needed to get a job (Theodossiou, 1998). Seligman and Maier (1967) believe that experiences such as unemployment leave the

individual with a sense of 'helplessness'. The helpless individual believes that their current and future situations will not be affected significantly by any decisions they take (Seligman and Maier, 1967; Darity and Goldsmith, 1993). Helplessness may also reduce the motivation to acquire new skills (Darity and Goldsmith, 1993). The loss of skills, accompanied by a rise in demoralisation and a feeling of helplessness during unemployment increases the probability that the unemployed will remain without jobs over a significant period of time (Quiggin, 1995; Theodossiou, 1998; Cole *et al.*, 2009). Employers, aware of the loss of skills during long periods of unemployment, may discriminate against the long term unemployed, preferring instead to hire a short-term unemployed worker (Pissarides, 1992).

The skills atrophy model offers some explanation as to why the long term unemployed remain jobless and marginalised from the labour market (Quiggin, 1995; Cole *et al.*, 2009).

Theory of Social Customs

Labour market participation is considered as an important means of social integration. Conversely, unemployment implies a loss of social status associated with the previous employment and deprives the individual of a socially accepted role. Unemployment also implies a status that is often seen as deviant and shameful by the social environment (Kuhn *et al.*, 2007). Akerlof (1980) introduces a theory of social customs, also known as a model of social norms (Clark, 2003). Akerlof (1980) constructs a model where there is a code of behaviour as to how a person should behave in the labour market and how that person may lose reputation with other members of the community if they do not behave in accordance with those social norms (Akerlof, 1980). In the model a negative variable for reputation is included in the utility function if an individual breaks a social custom. If being unemployed involves breaking a social norm or custom then unemployment may result in loss of reputation according to Akerlof's model and the loss of reputation leads to a drop in an individual's utility (Carroll, 2007).

Clark (2003) tests the theory of social norms and social comparisons in relation to employment status and presents some empirical evidence of the utility effects of the adherence to an employment norm. The results find that others' unemployment is negatively correlated with the well-being of those in paid employment but positively correlated with the well-being of the unemployed (Clark, 2003). Flatau *et al.*, (2000) and Clark and Oswald (1994) note that unemployed individuals living in regions suffering from high unemployment are less affected than those living in areas of low unemployment.

Akerlof (1980), Clark (2003) and Carroll (2007) suggest that unemployment would be associated with lower life satisfaction among the employed according to the theory of social customs.

Latent Deprivation Model

Jahoda (1979, 1981, 1982) suggests that paid employment has several latent functions in an individual's life aside from meeting economic needs. A job provides the following five latent functions of employment which correspond to important psychological needs;

- imposes time structure on the individual's day
- allows for regularly shared experiences and contact with others outside of the immediate family
- links an individual to goals and purposes outside of their own
- gives an individual personal status and identity (social status)
- engages the individual in meaningful activity

Unemployment does not provide these latent functions and therefore reduces an individual's capacity to meet the psychological needs. This may in turn lead to higher levels of distress and lower levels of life satisfaction and overall well-being (Cole *et al.*, 2009). Only employment can provide these latent functions to a sufficient degree in modern societies, while unemployment leads to a state of deprivation and ultimately distress (Paul and Moser, 2009). Muller *et al* (2000) developed a scale called the Latent

and Manifest Benefits Scale to measure the five latent benefits proposed by Jahoda (1982).

Based on Jahoda's Latent Deprivation Theory, Warr (1987, 2007) proposed a model known as the Vitamin Model.

Vitamin Model

Warr (1987, 1994, 2007) introduces a model including nine environmental factors called 'vitamins'. This model was later extended to include twelve factors. These factors or 'vitamins' include opportunity for control, opportunity for skill use, externally generated goals, variety, environmental quality, availability of money, physical security, opportunity for interpersonal contact and valued social position (Warr, 1994; Flatau *et al.*, 2000). These factors are essential to sustain good mental health and well-being. However, they are not available for unemployed people in a sufficient amount and therefore their well-being suffers (Paul and Moser, 2009).

In contrast to Jahoda's (1979, 1981, 1982) Latent Deprivation Model and Warr's (1994) Vitamin Model, Fryer (1997) and Fryer and Payne (1986) propose a Financial Deprivation Model to incorporate to the role of poverty as a cause for unemployment distress.

Financial Deprivation Model

The manifest benefit of employment is income and therefore in becoming unemployed an individual loses this benefit. The financial deprivation model, also known as the agency restriction model (Fryer, 1986), argues that financial deprivation is the main negative consequence of unemployment. Unemployment reduces income which in turn may reduce well-being (Winkleman and Winkleman, 1998). According to Fryer (1986) the loss of income restricts personal control and reduces the individual's capacity to make plans for the future and achieve a meaningful and satisfying life (Cole *et al.*, 2009; Creed *et al.*, 2009). Furthermore, due to their loss of income the unemployed are a group of

people who typically are more in danger of absolute poverty than other groups in most societies (Paul and Moser, 2009).

While the negative impact of unemployment on well-being is well documented in the literature, the simultaneous effect of poor well-being on employment status has been less well explored (Cole *et al.*, 2009). One theory put forward to explain this relationship is the Reverse Causation Theory or Selection Hypothesis.

Reverse Causation Theory

Kasl's (1982) reverse causation theory posits that poor well-being negatively influences employment outcomes (Crossley and Stanton, 2005). Being unemployed has a negative effect on an individual's well-being, in particular their self-esteem. This poor well-being in turn interferes with the individual's ability and desire to find employment (Cole *et al.*, 2009). Kanfer *et al.*, (2001), find negative effects of low self-esteem on search intensity in their analysis on factors influencing job search. If the period of unemployment is substantial the individual's self-esteem continues to suffer creating a negative cyclical effect between well-being and job search activity (Cole *et al.*, 2009). As a consequence the individual continues to remain unemployed for a long period of time.

The reverse causation hypothesis also assumes that the association between unemployment and reduced well-being arises because people with low levels of well-being, poor life satisfaction levels and poor mental health have a higher probability of losing their jobs and furthermore, when unemployed, exhibit negative traits which hinders their chances of finding new employment (Toppen, 1971; Winefield, 1995; Mastekaasa, 1996).

Paul and Moser (2009) propose that an individual's unemployment is a consequence of poor well-being, and in particular mental health problems. They find that the effect could be the result of several processes. Firstly, mental health problems might reduce an employee's performance at work or might increase absenteeism. Issues such as these might in turn increase the likelihood of dismissal (Mastekaasa, 1996; Paul and Moser,

2009). Hesselius (2007) find that an increase in the number of sick days in addition to an increase in the duration of sick spells are associated with a higher risk of unemployment. Secondly, distress may play a role with regard to the job search process. An employer's hiring decision is likely to be influenced by the applicant's impression on management, a variable that may be influenced by mental health (Paul and Moser, 2009). Thirdly, as previously stated, psychological problems may be expected to reduce the effort and the efficiency of an individual's job search which in turn reduces the probability of reemployment (Paul and Moser, 2009; Cole *et al.*, 2009). A common hypothesis in the literature holds that unemployment leads to emotional distress which may be due either to the financial strain associated with the loss in income, or the emotional damage to self-esteem (Kuhn *et al.*, 2007). Crossley and Stanton (2005) suggest that this distress resulting from unemployment has a negative relationship with both interview and job-search success.

Waters and Moore (2002) investigate Kasl's (1982) reverse causation hypothesis by examining the impact of self-esteem, cognitive appraisals and coping efforts on re-employment of a sample of Australians. The findings support the reverse causation hypothesis and confirm that it was these aspects of well-being rather than demographic characteristics or labour market experience that predicted re-employment (Waters and Moore, 2002). Similarly, Winefield and Tiggemann (1985) and Caplan *et al* (1989) find that high levels of self-esteem are associated with re-employment.

4: Data Description

In order to estimate the relationship between subjective well-being and employment status in Ireland the empirical analysis is carried out using the European Social Survey (2002-2007). The European Social Survey is a biennial cross sectional survey which covers over 30 nations and monitors Europe's changing social attitudes, social beliefs and values. Combining three rounds of the European Social Survey dataset (2002/2003, 2004/2005 and 2006/2007), a random sample of about 6132 Irish respondents is obtained. The European Social Survey contains information on individuals' subjective well-being,

on a discrete scale from 0 to 10, as well as a number of personal characteristics and socio-economic variables, including employment status.

From the European Social Survey 2002 - 2006 a number of key variables are identified as important for use in the regression estimation. The endogenous variables used in this paper are subjective well-being and employment status. A host of personal and socio-economic characteristics are used as exogenous variables in estimating the relationship between well-being and employment status.

Dependent and Independent Variables

Life satisfaction questions have been posed into questionnaires for over three decades (Bradburn, 1969; Cantril, 1965; Likert, 1932). Through single-item (single) questions or multi-item (several) questions within global surveys, such as the European Social Survey, it is possible to ascertain the level of subjective well-being among respondents in a given country.

In this paper the dependent variable, life satisfaction, is obtained from the response to the following question;

All things considered, how satisfied are you with your life as a whole nowadays?

Respondents are asked to rank their answer on an eleven-point scale ranging from 0 “extremely dissatisfied” to 10 “extremely satisfied”. This has been referred to as subjective well-being (SWB), general satisfaction, and self-reported life satisfaction (Ferrer-i-Carbonell, 2005). As with other economic studies on well-being, it is assumed that the answers to the life satisfaction question are ordinally comparable and that it is unknown what the relative difference between the satisfaction answers. However it is assumed that all respondents have the same interpretation of the possible answers (Ferrer-i-Carbonell and Frijters, 2004). Ordinal variables do not establish the numeric difference between data points. They indicate only that one data point is ranked higher or lower than another (Runyon and Haber, 1976). The dependent variable Employment Status (*ES*)

equals 1 if the individual is employed (in paid work [or away temporarily] [employee, self-employed, working for the family business]); and 0 otherwise.

Table 3 includes a detailed description of the dependent and independent variables from the combined European Social Survey 2002 – 2006 dataset, where the summary statistics of variables was calculated using the statistical computing software package STATA, Version 11 (STATA Corporation, 2010). Due to the qualitative nature of most of the variables it was necessary to create dummy variables, where a value of 1 or 0 indicates the presence or absence of an attribute.

A condition for estimating simultaneous equation models is that a different set of exogenous variables be included in the two equations, that is each equation contains some variables that do not appear in the other equation (Cai and Kalb, 2006). To that end the following variables are included in the well-being equation; education, age, gender, marital status, having children, hours spend watching television daily, and social capital variables such as trust, having someone to discuss personal matters with, having regular social contact and regular church attendance. Research on social capital indicates that social contact with others as well as feelings of trust provide people with resources that allow them to be more resilient in the event of shocks and ultimately enhance their well-being (Commission of the European Communities, 2009). Therefore it was deemed important to include measures of social capital in the determinants of well-being.

In the employment status equation the exogenous explanatory variables are; education, age, gender, marital status, having children, being an Irish citizen and belonging to a group that is discriminated against in Ireland. There are some variables in the employment status equation which are not included in the well-being equation. One of these is whether an individual is an Irish citizen or not. Being a non-citizen (immigrant) especially from a non-English speaking background may affect employment status through language or cultural problems (Cai and Kalb, 2006).

Table 3: Descriptive Statistics

| Variables | Description | Mean | Std.Dev | Min | Max |
|---------------------------|--|-------|---------|-------|-------|
| Life Satisfaction | Individual's satisfaction with life on a scale between 0 -10 (0 = extremely dissatisfied, 10 = extremely satisfied) | 7.552 | 1.951 | 0 | 10 |
| I_lifesatis | Fitted value of lifesatis estimated from the reduced form ordered probit model in the first stage | 7.584 | 0.629 | 4.211 | 9.045 |
| Employment Status | 1 if the individual is employed, 0 otherwise | 0.492 | 0.500 | 0 | 1 |
| I_emplstatus | Fitted value of emplstatus estimated from the reduced form probit model in the first stage | 0.497 | 0.277 | 0.003 | 0.970 |
| Primary Education | 1 if the highest level of education the individual has achieved is primary education, 0 otherwise | 0.213 | 0.410 | 0 | 1 |
| Secondary Education | 1 if the highest level of education the individual has achieved is secondary education, 0 otherwise | 0.459 | 0.498 | 0 | 1 |
| Post Secondary* | 1 if the highest level of education the individual has achieved is post-secondary (non-tertiary) education, 0 otherwise | 0.168 | 0.374 | 0 | 1 |
| Tertiary Education | 1 if the highest level of education the individual has achieved is tertiary education, 0 otherwise | 0.155 | 0.362 | 0 | 1 |
| Age 24 | 1 if the individual is under 24 years old, 0 otherwise | 0.120 | 0.324 | 0 | 1 |
| Age 25-34 | 1 if the individual is aged between 25 and 34, 0 otherwise | 0.165 | 0.371 | 0 | 1 |
| Age 35-44 | 1 if the individual is aged between 35 and 44, 0 otherwise | 0.184 | 0.387 | 0 | 1 |
| Age 45-54* | 1 if the individual is aged between 45 and 54, 0 otherwise | 0.164 | 0.370 | 0 | 1 |
| Age 55-64 | 1 if the individual is aged between 55 and 64, 0 otherwise | 0.163 | 0.369 | 0 | 1 |
| Age 65 & over | 1 if the individual is over 65 years old, 0 otherwise | 0.205 | 0.404 | 0 | 1 |
| Male | 1 if male. 0 if female | 0.448 | 0.497 | 0 | 1 |
| Divorce* | 1 if the individual is divorced, 0 otherwise | 0.012 | 0.110 | 0 | 1 |
| Widow | 1 if the individual is widowed, 0 otherwise | 0.084 | 0.278 | 0 | 1 |
| Single | 1 if the individual is single, 0 otherwise | 0.326 | 0.469 | 0 | 1 |
| Separated | 1 if the individual is separated, 0 otherwise | 0.033 | 0.179 | 0 | 1 |
| Married | 1 if the individual is married, 0 otherwise | 0.539 | 0.498 | 0 | 1 |
| Children | 1 if the individual has children, 0 otherwise | 0.658 | 0.474 | 0 | 1 |
| TV Hours | 1 if individual watches more than 2.5hours of television per weekday, 0 otherwise | 0.377 | 0.485 | 0 | 1 |
| Trust | Individual's level of trust with other people on a scale between 0 -10 (0 = cannot be too careful, 10 = most people can be trusted), 0 otherwise | 5.585 | 2.459 | 0 | 10 |
| Discuss | 1 if the individual has someone with whom they can discuss intimate and personal matters, 0 otherwise | 0.913 | 0.282 | 0 | 1 |
| Regular Social Contact | 1 if the individual regularly meets socially with friends, relatives or work colleagues, 0 otherwise | 0.800 | 0.400 | 0 | 1 |
| Regular Church Attendance | 1 if the individual attends religious services more than once a week, 0 otherwise | 0.535 | 0.499 | 0 | 1 |
| Irish Citizen | 1 if the individual is an Irish citizen, 0 otherwise | 0.957 | 0.202 | 0 | 1 |
| Group Discrimination | 1 if the individual believes they are a member of a group which is being discriminated against, 0 o/wise | 0.045 | 0.207 | 0 | 1 |

* indicates base category

In estimating similar simultaneous equation probit models to the one in this paper, Hamilton *et al* (1997), Cai and Kalb (2006) and Duarte *et al* (2007) included all of the above exogenous variables and therefore it was deemed important to include the above variables in the estimation of the simultaneous system in this research.

5: Empirical Techniques

This paper estimates the relationship between subjective well-being and employment status using a two stage simultaneous probit-ordered probit model (TWOPOP) (Doucouliagos *et al.*, 2008). Similar to Hamilton *et al.* (1997), Duarte *et al.* (2007) and Doucouliagos *et al.* (2008) the two stage probit-ordered probit regression technique is used to estimate the following simultaneous structural equations for well-being (SWB) and employment status (ES);

$$SWB_i = \gamma_0 + \gamma_1 ES_i + \sum_{k=2}^K \gamma_k Z_k + w_i \quad (\text{Eqn. 5.1})$$

$$ES_i = \beta_0 + \beta_1 SWB_i + \sum_{l=2}^L \beta_l Y_l + \varepsilon_i \quad (\text{Eqn. 5.2})$$

where:

SWB measures Subjective Well-Being

ES represents Employment Status

Z and *Y* are exogenous variables

$k = 2, 3, \dots, K$

$l = 2, 3, \dots, L$ are parameter indices

$w_i \varepsilon_i$ are the error terms

The binary variable, *ES*, is observed as follows:

$$ES = 1 \text{ if } ES^* > 0$$

$$ES = 0 \text{ otherwise}$$

Equation 5.1 and Equation 5.2 are expressed in reduced form by solving the system for SWB and ES:

$$SWB_i = \phi_0 + \sum_{m=1}^M \phi_p Y_i + \sum_{n=1}^N \phi_r Z_i + \zeta_i \quad (\text{Eqn. 5.3})$$

$$ES_i = \mathcal{G}_0 + \sum_{p=1}^P \mathcal{G}_m Y_i + \sum_{r=1}^R \mathcal{G}_n Z_i + \xi_i \quad (\text{Eqn. 5.4})$$

where:

m, n, p and r are parameter indices as above

The well-being equation is estimated by ordered probit technique and the employment status equation is estimated via maximum likelihood probit.

The second stage structural equations of the system are estimated by inserting the fitted values of the endogenous variables from Equations 5.3 and 5.4 into Equations 5.1 and 5.2 and then Equation 5.1 is estimated with an ordered probit and Equation 5.2 is estimated using a probit technique.

6: Results

The results are presented in Table 4 and Table 5. In both tables Column 1 presents the single-equation estimates, ignoring simultaneity. Table 4 presents the results for the well-being equation which was estimated using the ordered probit technique. Table 5 gives the results for the employment status equation which was estimated via probit estimation technique. Column 2 in both tables presents the results from the two stage probit ordered probit estimates.

This paper is primarily interested in the coefficients on life satisfaction and employment status. The endogeneity of well-being to employment status implies that in the well-being equation the coefficient on employment status would be positive (Cai and Kalb, 2006). The employment status coefficient in the well-being equation reported in Table 6 is positive and statistically significant at the 1% level. The positive sign indicates that,

ceterus paribus, being employed has a positive and significant effect on well-being. This result is similar to the result in Hamilton *et al* (1997) who find the coefficient on employment status in their mental health equation to be precisely estimated establishing that employment leads to higher levels of mental health. Column 2 presents the results after accounting for simultaneity. Using the single equation the effect of employment on an individual's well-being may be underestimated. A number of other variables are also significant after the two stage estimation, namely primary and secondary education, 55-64 age group and having children.

Table 4: Parameter Estimates of Well-Being

| Variables | Single Equation Estimates | 2 Stage Estimates |
|--|---------------------------|-------------------|
| <i>1. Well-Being Equation (Ordered Probit)</i> <i>Dependent Variable = Life Satisfaction 0-10</i> | | |
| Employment Status | 0.126 (0.033)*** | 1.027 (0.289)*** |
| Primary Education | 0.042 (0.049) | 0.191 (0.069)* |
| Secondary Education | 0.022 (0.039) | 0.099 (0.047)** |
| Tertiary Education | -0.031 (0.048) | -0.063 (0.049) |
| Age 24 | 0.283 (0.066)*** | 0.637 (0.129)*** |
| Age 25-34 | 0.088 (0.052) | 0.083 (0.053) |
| Age 35-44 | 0.044 (0.046) | 0.075 (0.047) |
| Age 55-64 | 0.090 (0.049) | 0.250 (0.069)*** |
| Age 65 & over | 0.298 (0.054)*** | 0.747 (0.154)*** |
| Male | -0.093 (0.030)** | -0.295 (0.072)*** |
| Widow | -0.020 (0.129) | -0.103 (0.132) |
| Single | -0.132 (0.123) | -0.196 (0.125) |
| Separated | -0.309 (0.139)** | -0.429 (0.144)* |
| Married | 0.170 (0.119) | 0.093 (0.121) |
| Children | 0.014 (0.042) | 0.101 (0.051)** |
| TV Hours | -0.055 (0.029) | 0.025 (0.039) |
| Trust | 0.057 (0.006)*** | 0.052 (0.006)*** |
| Discuss | 0.386 (0.050)*** | 0.293 (0.058)*** |
| Regular Social Contact | 0.243 (0.035)*** | 0.256 (0.036)*** |
| Regular Church Attendance | 0.247 (0.031)*** | 0.285 (0.033)*** |
| | | |
| <i>No. of Obs</i> | 5667 | 5620 |
| <i>Pseudo R²</i> | 0.024 | 0.024 |
| <i>LR Chi²</i> | 534.39*** | 527.21*** |

*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level

The results in Table 5 below show that there is a significant and positive effect of well-being on the probability of being employed. This corroborates findings from Hamilton *et al* (1997), Duarte *et al* (2007) and Cole *et al* (2009) who also find that higher levels of well-being (or some other self-assessed well-being/health variable) lead to an increased probability of participation in the labour force in Canada and Australia. The coefficient on well-being using the two stage technique is greater than from the single equation estimates; however the significance level reduces from the 1% level to the 5% significance level. The remaining results in both equations are broadly similar.

Table 5: Parameter Estimates of Employment Status

| Variables | Single Equation Estimates | 2 Stage Estimates |
|--|---------------------------|-------------------|
| <i>2. Employment Status Equation (Probit)</i> <i>Dependent Variable = Employment Status 0,1</i> | | |
| Life Satisfaction | 0.052 (0.010)*** | 0.130 (0.044)** |
| Primary Education | -0.641 (0.065)*** | -0.622 (0.067)*** |
| Secondary Education | -0.306 (0.052)*** | -0.298 (0.052)*** |
| Tertiary Education | 0.162 (0.066)** | 0.150 (0.067)** |
| Age 24 | -1.142 (0.083)*** | -1.178 (0.087)*** |
| Age 25-34 | 0.045 (0.070) | 0.045 (0.071) |
| Age 35-44 | -0.091 (0.061) | -0.091 (0.062) |
| Age 55-64 | -0.506 (0.062)*** | -0.508 (0.064)*** |
| Age 65 & over | -1.723 (0.073)*** | -1.759 (0.077)*** |
| Male | 0.766 (0.040)*** | 0.770 (0.040)*** |
| Widow | 0.040 (0.176) | -0.014 (0.181) |
| Single | 0.142 (0.161) | 0.110 (0.166) |
| Separated | 0.375 (0.180)** | 0.385 (0.187)** |
| Married | 0.183 (0.154) | 0.096 (0.160) |
| Children | -0.324 (0.057)*** | -0.315 (0.058)*** |
| Irish Citizen | 0.275 (0.094)** | 0.240 (0.097)** |
| Group Discrimination | -0.190 (0.091)** | -0.086 (0.105) |
| | | |
| <i>No. of Obs</i> | 5620 | 5620 |
| <i>Pseudo R²</i> | 0.24 | 0.24 |
| <i>LR Chi²</i> | 2003.90*** | 1921*** |

*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level

These results find support for a simultaneous relationship between well-being and employment status. The results indicate that employment leads to better well-being and better well-being increases the probability of employment, after controlling for the endogeneity of both variables using a two stage estimator in a simultaneous probit-ordered probit model.

7: Conclusions

This paper estimates the relationship between subjective well-being and employment status in Ireland while controlling for the potential endogeneity of these two variables. Using data obtained from the European Social Survey 2002 – 2006 the potential endogeneity of well-being and employment status is addressed by estimating the well-being equation and the employment status equation simultaneously using a Two-Stage Probit Ordered Probit Technique.

The results from this paper find support for a simultaneous relationship between well-being and employment status. After controlling for endogeneity this study finds that employment leads to improved well-being and higher levels of well-being increase the probability of being employed. The significant relationship between well-being and employment suggests that interventions to improve well-being may enhance work force productivity through increased employment rates. Therefore expansion of services aimed at increasing well-being may yield economic benefits as well as personal, in terms of well-being benefits. In particular programmes aimed at increasing the well-being of the unemployed may be justified.

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