Evaluating the role of income, state dependence and individual specific heterogeneity in the determination of subjective health assessments☆

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ARTICLE INFO

ABSTRACT

This paper investigates the role of various determinants of an individual's subjective self-assessment of own health. While the economics literature has focused primarily on the role of income on these assessments, we include an examination of the role of state dependence and unobserved individual specific time invariant heterogeneity. We employ a dynamic fixed effects ordered choice model to examine the responses of Australian residents. We find no statistically significant relationship between transitory income and health responses. We also find that while there is evidence of state dependence, this does not appear to be responsible for the distribution of responses. Our results suggest that the variation in the individual specific effects, comprising both observed and unobserved time invariant factors, is primarily responsible for the variation across individuals' responses.

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1. Introduction

The physical well being of an economy's members has substantial implications for its level of productivity and the allocation of its resources. For example, an economy comprising healthy individuals is likely to be more productive than one whose members are not in good health. Moreover, private and public expenditures on medical care for economies comprising healthy individuals are likely to be lower than those in which the individuals are in poor health. Healthy workers are also likely to have longer and more rewarding work lives thereby reducing the burden they impose on the economy's resources following retirement from the workplace. Given the importance of individual well being it is useful to understand its socioeconomic determinants. However, identifying these determinants and tracking how individual health evolves in response to changes in these socioeconomic factors can be challenging. One difficulty results directly from issues related to the measurement of health status. Objective health measures are expensive to collect and those available may be for a sample which is non-representative due to the non-random selection of individuals who seek medical evaluations (Etilé and Milcent, 2006). As a result, many researchers have used subjective self-assessed health measures. These subjective measures are frequently considered capable of capturing patterns in objective measures (see, for example, Idler and Benyamini, 1997; Mackenbach et al., 2002; Van Doorslaer

and Gerdtham, 2003). However, self-assessment is likely to reduce the level of objectivity reflected in the responses creating problems related to individual specific heterogeneity (see, for example, Etilé and Milcent, 2006; Jones and Wildman, 2008; Jones and Schurer, 2011; Carro and Traferri, 2014). That is, individuals may have different reference points due to social or cultural biases or individual perceptions and this may result in respondents with the identical objective health status providing very different self-assessments. This also potentially introduces an element of persistence, or state dependence, into the responses if an individual reports relatively little change in health status over time due to the subjective nature of their self evaluation. It is also possible that some of the potential determinants of well being may be correlated with the individual specific evaluation and this creates a difficulty for drawing inference in models examining the relationship between self reported health status and these factors.

The above discussion suggests that the examination of the determinants of an individual's self assessed health status might be contaminated by problems associated with unobserved individual heterogeneity. While one approach to capture subjectivity in self-assessment of health is the use of vignettes (see, for example, Salomon et al., 2004), we employ an econometric approach which captures unobserved individual specific time invariant heterogeneity while also incorporating the presence of state dependence. We also capture changes in an individual's socioeconomic background which possibly have implications for his/her health. One particular socioeconomic determinant of well being which has attracted substantial attention in the economics literature is the individual's level of income. The empirical relationship between income and health has been investigated through a variety of econometric techniques and in a number of settings (for example, cross-section studies – Lindahl (2005) for Sweden, Etilé and Milcent (2006) for France; panel studies – Contoyannis et al. (2004), Jones and Wildman (2008) and Carro and Traferri (2014) for the UK, Jones and Schurer (2011) and Frijters et al. (2005) for Germany). However, despite this substantial body of empirical work it appears, as first concluded by Deaton and Paxson (1998), that the relationship is poorly understood. Subsequent empirical work does not appear to have altered the appropriateness of their conclusion.

This paper employs recent advances in the fixed effects panel data literature to account for individual specific time invariant heterogeneity in a dynamic model of subjective health responses. Our focus is equally upon the role of income, state dependence and individual specific time invariant heterogeneity in determining the distribution of observed health responses. We employ an Australian set data which has been previously examined to investigate the impact of health status on poverty, wages, and labor force participation (see, for example, Buddelmeyer and Cai, 2009; Cai, 2009; Cai et al., 2008). The following section presents the empirical model and estimates a dynamic ordered response model with an explicit role for time invariant individual heterogeneity. It also comments on the role of income, state dependence and unobserved heterogeneity in explaining the observed distribution of

health responses. Section 3 provides some discussion and Section 4 concludes.

2. Empirical model and results

2.1. Data description

We analyze data from the 2001–2012 waves of the Household, Income and Labour Dynamics in Australia (HILDA) Survey. HILDA is a nationally representative household-based panel study comprising 7682 households (13,969 individuals) in the inception year. The survey began in 2001 and is conducted annually. It contains detailed demographic characteristics and information on family structure, employment history, education, income, health, wellbeing, attitudes and values. To construct a balanced panel we restrict the sample to individuals aged between 17 and 65 years in all periods.[1] This reduces our sample to 3150 individuals.[2] We acknowledge that selection rules determining inclusion in the sample may induce selection and attrition bias. To the extent such issues reflect time invariant unobserved heterogeneity our use of fixed effects in our modelling strategy will account for this bias (see, for example, Vella, 1998). However, in the instances where selection and attrition are related to unobservables correlated with the time varying unobservables which are included in our model the failure to account for these influences may bias our results.

The dependent variable of primary interest is the response to the question: "In general, would you say your health is?" and the responses take the values from 1 to 5 with 1 being poor, 2 – fair, 3 – good, 4 – very good, 5 – excellent.[3] Table 1 reports the distribution of these responses across the 12 time periods. The table indicates that very few report being in very poor health while relatively few report being in fair health or excellent health. The vast majority of the sample indicate that they are in good or very good health.

Around 92 percent of the sample reported some change in health status over the twelve year period. This reflects changes in the factors which determine an individual's health status. However, the remaining 8 percent provide the same response over the 12 waves. This might capture the role of state dependence in that individual's current health status is greatly influenced by the health dependence in the previous year. It may also suggest an element of subjectivity in the individual's response. That is, the individual reports the same response irrespective of his/her health. The relative lack of movement across responses

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[1] The age requirement imposes the individuals must be aged between 17 and 54 years in the first period.

[2] The survey covered 13,969 individuals in 2001. In creating a balanced panel we only keep individuals who appear in the 12 waves we consider. This reduced the sample to 6991. Restricting the sample to individuals aged 17–65 year over all 12 years reduced the number of observations 5043. Excluding observations with missing health and employment responses in any given year further reduced the sample to 3150.

[3] In the questionnaire the scale is in reverse order 5 being poor, 4 – fair, 3 – good, 2 – very good, 1 – excellent. We reversed the order to have "the more the better" interpretation of health status.