Economics of Happiness: A Review of Literature and Applications

Nattavudh Powdthavee[1]

Institute of Education, University of London

13th March, 2007

Abstract

This paper presents a review of literature, validation, methods, and applications of subjective well-being data in economic analysis. The idea is to provide researchers and policy makers a comprehensive guideline to what need to be considered before embarking on a research in the economics of happiness such as data collection and the validation of happiness scales.

JEL: I30

Keywords: Happiness, Life Satisfaction, Review, Policy Implications

[1] Bedford Group for Life-course and Statistical Studies, Institute of Education, University of London, 55-59 Gordon Square, London, WC1H 0AL, UK. Tel: +44(0)7990 815924. Email: N.Powdthavee@ioe.ac.uk

I. Introduction

The conventional view of utility in standard microeconomic textbooks is that it employs an objective position, based on observable choices made by individuals (see Pindyck & Rubinfeld, 1997; Frank, 2002; Varian, 2002). In this analysis, utility only depends on tangible goods and services and leisure. An individual is then observed to prefer one bundle of goods to another. Given that all the choices made between alternatives satisfy a certain criteria of reasonableness, a utility function that will explain an individual's preferences between different bundles of goods can be inferred from behaviour. Utility has thus become merely a number that denotes preferences without any further substantive meaning whatsoever.

The neoclassical concept of 'decision' utility has been influenced by the rise of positivism and behaviourism in the early 20th century. The utilitarian view of measurable cardinal utility (i.e., the idea that utility scales can be measured and, in particular, are comparable between individuals[2]) is rejected as being *unscientific*, because it is not objectively observable. The basic difficulty seems to be that there is no obvious way of comparing utility scales between individuals and, in particular, no way of showing that two individuals with similar income levels will get the same level of additional satisfaction from a given increase in income (Robbins, 1938). Most importantly, the ordinal concepts of utility (or revealed preference) have been demonstrated by numerous neoclassical economists - such as Hicks (1934) and Allen (1934) - to be sufficient for all the ordinary purposes of demand theory and could be used to derive welfare theory independent of cardinal utility assumptions. It has

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[2] See Bentham, 1789; Mill, 1863.

become evident that the analysis of consumer demand can be undertaken using only statements about preferences. Thus, modern economic theory has completely given up the substantive and empirically measurable idea of utility in terms of satisfaction and pleasure in order to explain individual choices in favour of the preference index of ordinal utility.

Over the last few decades, however, there has been a movement within economics that claims that utility should be considered in terms of happiness, and that it can, and should, be measured. This development is fuelled by the growing concerns over accumulated evidence - both from real life observation and inference from laboratory experiments - that individuals may not always act rationally when making decisions about consumption. It is often the case that people are not as well informed about their choices as is axiomatically assumed in revealed preference theory, or that they discount the future in an excessive, inconsistent manner.

Economists have also come to the agreement that people are not always able to choose the greatest amount of utility for themselves. It has been demonstrated by numerous scholars that contextual influences, such as the comparison of one's own income to that of friends or colleagues, can affect individual's utility of outcomes in a great way (e.g., Duesenberry, 1948; Hirsch, 1976; Clark & Oswald, 1998). An example comes from Robert Frank's (1985) illustration of two miners choosing whether to work in a clean or dusty mine. In order to compensate the miners working in relatively worse conditions, wages in the dusty mine at $250 a week are higher than those in the clean mine by $50. However, the adverse effect of working in the dusty mine is that life expectancy is shortened by fifteen years. See Figure 1. In the absence

of concerns about the relative standing of income hierarchy, each miner would find it worthwhile to sacrifice $50 a week in order to escape from working in the dusty mine. But neither is willing to make that same exchange if relative standing of income hierarchy matters. The two miners are then left with a standard case of Prisoner's dilemma, whereby the dominant strategy for each is to choose the dusty mine. Yet by doing so an outcome results in each working in a distasteful environment in comparison with the alternative of both working in the clean mine.

The nonsubstantive concept of utility has also been challenged from different angles by various enterprising economists. There are countless examples of non-objectivist theoretical analyses in economics. They incorporate, for instance, an individual's emotional state (Hermalin & Isen, 1999), mastery and meaning (Loewenstein, 1999), self-confidence (Benabou & Tirole, 1999), altruism (Altonji et al., 1997), and fairness (Rabin, 1997). The exclusive reliance on an objective approach by the standard economic theory is thus open to doubt, both theoretically and empirically. It seems that human happiness cannot be understood without, in part, listening to what human beings have to say.

The subjective approach to utility offers economists a fruitful complementary path to study an individual's well-being. This is because subjective well-being is a much broader concept than decision utility. It also includes 'experienced' utility, which is based on an individual's experiences of consumption or life events in the past, as well as 'procedural' utility or the utility derived from the mere act of engaging in an activity preferred by the individual. It is also considered by many as the ultimate goal of human life. We do not want other things that we may want, such as money, job

security, and status, simply for themselves, but rather to give us the possibility of making us happier. Finally, the concept of subjective well-being allows us to gain a better insight into human well-being. This creates a basis for explicitly testing fundamental assumptions and propositions in economic theory.

The aim of this paper is to provide a comprehensive – though by no mean exhaustive – review of literature, validation, statistical models, and applications of subjective well-being data in economic analysis. I start by discussing how happiness index is usually measured and constructed. Section III presents some validations for the use of such data. Section IV reports statistical modelling of happiness. Section V provides some applications of happiness data. Section VI concludes.

II. Measuring Happiness

Psychologists have been spending a considerable amount of time analyzing the sources of human satisfaction in detail for decades[3]. In their view, happiness, or subjective well-being, is conceived to be the degree of how one views one's life as a whole, or some particular domain of one's life, as favorable. As an attitude that is not accessible to public observation, psychologists believe that a concept such as subjective well-being can be studied, in part, by asking people how they feel.

How, then, can subjective well-being be captured? One way to measure an individual's subjective well-being is through surveys, which may include single-item or multiple-item questions on how one view one's state of well-being. An example of

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[3] Recent work includes Argyle (1989), Fox and Kahneman (1992), Myers (1992) and Diener and Suh (2000). For a comprehensive review on the research progress in the last three decades of subjective well-being, see Diener et al. (1999).

a single-item question comes from the standard happiness question in the World Values Survey, which asks people, "Taken all together, how happy would you say you are: very happy, quite happy, not very happy, not at all happy?" Each response then scores one to four points so that one has a numerical scale, running from the lowest well-being level (1. Not at all happy) to the highest well-being level (4. Very happy). This is very similar to the three-point scale of one of the General Social Surveys of the United States, which asks, "Taken all together, how would you say things are these days - would you say that you are very happy, pretty happy, or not too happy?" Another one of the most commonly used, single-item scales is the life satisfaction scale. The standard life satisfaction question, which can be found in the Eurobarometer Survey, asks individuals, "On the whole are you very satisfied, fairly satisfied, not very satisfied, or not satisfied with the life you lead?"

While single-item scales enjoy the benefit of brevity, many psychologists have considered them to be less reliable and to have less validity when compared to multi-item scales. This is because random measurement errors tend to be smaller on average in multi-item scales than single-item scales. Among multi-item scales, one of the most prominent measures of an individual's subjective well-being is the General Health Questionnaire (GHQ) in the British Household Panel Survey. The GHQ assesses positive and negative affect according to the responses to the following twelve questions: "Have you recently, a) been able to concentrate on whatever you're doing, b) felt that you were playing a useful part in things, c) felt capable of making decisions about things, d) been able to enjoy your normal day-to-day activities, e) been able to face up to problems, f) been feeling reasonably happy, all things considered, for positive affect, and g) lost much sleep over worry, h) felt constantly

under strain, i) felt you could not overcome your difficulties, j) been feeling unhappy or depressed, k) been losing confidence in yourself, l) been thinking of yourself as a worthless person?", for negative affect. The optional responses for the GHQ-12 questions are rated on a four-point Likert scale, with possible answers ranging from "1. More so than usual" to "4. Much less than usual" for positive affect and from "1. Not at all" to "4. Much more than usual". The unweighted scores are then summed up to form a single index, with higher scores indicating lower psychological well-being.

Csikszentmihalyi (1990) recommends that well-being should also be measured in real time as well as in survey forms. The Experience Sampling Method (ESM) requires participants to carry a handheld computer that prompts them several times during the course of the day (or days) to answer a set of questions immediately. This may contain questions about the participant's current state of happiness, as well as the activities in which they were engaged just before they were prompted and the people with whom they were interacting. However, even though the ESM reduces the extent of cognitive biases in the reported well-being (e.g., memory bias about past well-being) normally obtained in surveys it is an extremely costly method to be applied on a large population sample. An alternative method to ESM is the Day Reconstruction Method (DRM), which asks participants to fill out a diary summarising episodes of the preceding day and to report the intensity of their feelings during each of those episodes (Kahneman et al., 2004). For a more comprehensive review on ESM and DRM and other measurements of subjective well-being, the interested readers are encouraged to refer to Kahneman and Krueger (2006).

For a long time, such happiness measures have been used by psychologists to analyse the composition of individual's well-being. Yet only recently has it become the subject of economic analysis. One of the main reasons why economists have traditionally shied away from using such subjective information is because of the justifiable concerns that subjective well-being responses are subject to nonsampling bias. For instance, people may overstate their happiness level in order to maintain their self-esteem over the interviewer, whilst situational factors such as mood and weather may affect their responses at the time of the survey (Bertrand and Mullainathan, 2001). Thus, traditional economists prefer to focus their analyses on actual behaviour, such as revealed preferences in consumption, savings, and labour market participation, in the assumption that individuals rationally process all the information at their disposal before making their choices accordingly to maximise utility.

In recent years, there seems to be growing concerns among numerous scholars as to whether utility can generally be derived by observable choices. The introduction of bounded rationality concept, in which individuals are assumed to have access only to a limited or local information and make decision according to heuristic rules rather than optimization calculations, suggests that preferences may not, in some cases, be recovered through observations of human behaviour alone even if they can be observed directly (Simon, 1978; Conlisk, 1996; Kahneman, 2003). In addition, norms or rules may lead to seemingly irrational behaviour that is guided not so much by utilitarian calculus but by the principles of, or the fear of social sanctions (Akerlof, 1980; Thaler, 1992). Frey and Stutzer (2002, p.405) conclude from a review of relevant literature that: "The exclusive reliance on an objectivist approach by standard

economic theory is thus open to doubt, both theoretically and empirically. In any case, it restricts the possibility of understanding and influencing human well-being." Thus the above argument suggests that given observable choices are not enough to provide all the information required to infer the utility of outcomes, a subjective approach, which allows us to capture well-being directly, should also be studied in part by economists.

III. Validation

Researchers remain sceptical as to whether self-rated well-being data, in its terminology, is valid and reliable. A first argument in defence of using happiness data comes from evidence that it has often been shown to correlate substantially with other subjective data. These include, for instance, how self-rated happiness can be shown to be correlated well with assessments of the person's happiness by friends and family (Diener, 1984; Pavot and Diener, 1993; Sandvik et al., 1993), reports by spouses (Costa and McCrae, 1988), reports from clinical experts (Goldings, 1954), and with memory measures, in which people must remember good versus bad events from their lives (Balatsky and Diener, 1993). A second argument is based on findings within psychology literature, of a well-defined correlation between happiness data and various physical measures. For example, reported subjective well-being has been shown to be positively associated with the duration of genuine or the so-called "Duchenne" smile (Eckman et al., 1990), and measures of responses to stress such as heart rate and blood pressure (Shedler et al., 1993). Subjective well-being measures have also been used to predict the length of the person's life (Palmore, 1969) as well as the risk of getting a coronary heart disease (Sales & House, 1971).

Regarding the nonsampling issue, it is believed that such a deterministic bias from an individual's desire to maintain a high degree of happiness depends on the respective culture the respondent is from. Hence, for a given set of subjective well-being distribution within a population of the same culture, there will also be a bias distribution. Given that the average pressure to overstate one's true well-being decreases with average true well-being for populations of the same culture, it seems plausible to assume that higher reported well-being reflects higher true well-being, provided that an increase in true well-being does not reduce the bias by the same extent, or more. Therefore, provided the cultural differences of the populations compared are not too large, reported subjective well-being can be used as a sufficiently valid ordinal measure of true average well-being (Diener & Suh, 2000; Hollander, 2001). In addition, a review of studies carried on countries in which more than one language is spoken show that happiness scores across language groups are similar (Ouweenel & Veenhoven, 1991). A further argument in favour of happiness data is that psychologists have been able to identify a number of subjective well-being correlations that are not only highly plausible, but have also turned out to be stable across populations and over time (Argyle, 1989; Diener & Suh, 2000). As Hollander (2001, p.243) pointed out in his assessment of the subject: "The fact that subjective well-being data enabled psychologists to identify circumstances that, on average, make a life satisfying and happy for those who live it, should convince economists that it is worth the while to try the same for economic circumstances[4].

IV. Happiness Function

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[4] For a more comprehensive review of the reliability and validity of happiness measures, see also Diener (1984), Myers (1992) and Konow and Earley (1999).

The general perception, as postulated in psychology, is that there is a reported well-being function for each individual in question. Each respondent, when asked to rate his or her own personal happiness or subjective well-being onto a numerical scale is thought to base his or her answer on a whole extensive set of personal and household characteristics, as well as social circumstances and background. Hence, the happiness measures based on surveys do not claim to be objective, but rather, attempt to make a global assessment of the whole sphere of life.

An example of a reported well-being function comes from Blanchflower and Oswald (2004). The idea is that there exists a reported well-being function of the following form:

$$r = h(u(y, z, t) + e), \quad\quad\quad\quad\quad (1)$$

where r is some self-reported number of level (perhaps the integer 4 on a life satisfaction scale, or "very happy" on an ordinal happiness scale), $u(\ldots)$ is thought to capture the individual's true well-being or utility, $h(.)$ is a non-differentiable function relating actual well-being to reported well-being, y is real income, z is a set of demographic status, t is a time trend. The error term, e, is thought to subsume among other factors the inability of human beings to communicate accurately their happiness level (your "two" may be my "three"). It is assumed that $u(\ldots)$ is a function that is only observable to the individual, and cannot be conveyed unambiguously to the interviewer.

The structure of equation (1) makes it suitable for estimation as an ordered probit or ordered logit. However, qualitatively similar results can still be obtained using ordinary least squares (Ferrer-i-Carbonell & Frijters, 2004). Nevertheless, there are limitations to econometric inferences at the cross-section. One issue is the identification problem involved in the modelling of happiness regression equations such as that of equation (1). For example, are people more satisfied with their life because of their economic conditions, or do happy people assess their economic conditions more favourably? The problem of reversed causality may also exist at the individual level in the relationship between marriage and happiness: does marriage make people happy, or are intrinsically happier people more likely to find a partner and get married? In addition, with respect to the influence of average characteristics of relevant others in the community, there may be a Manski-type reflection issue if, say, others' unemployment or crime affect the reported life satisfaction at the household level directly, rather than indirectly as we have portrayed them throughout our analysis (Manski, 1993). More importantly, cross-sectional studies on happiness may be unreliable if individuals' subjective responses are dominated by personal latent psychological differences (i.e., inborn genetic predispositions). The idea is that cross-section equations will be biased whenever unobserved personality traits (such as neuroticism or self-esteem) are correlated with observable socio-economic factors (unemployment or education) and subjective well-being responses. As a result, we should always treat interpretation of cross-sectional estimates with care.

V. Applications

Recognising the limitations of such subjective scale, research in the economics of happiness over the recent years has established a systematic relationship between economic factors and reported well-being data. One of the appealing facts to contemporary economists about happiness data is that it contains not only decision utility but also experienced utility based on an individual's past experiences, as well as expected utility, which represents an individual's expectation of the future (Kahneman et al., 1997; Kahneman & Thaler, 1991; Harsanyi, 1997; and Rabin, 1998). These papers argue, in essence, that there are circumstances where measures of experienced and expected utility can be derived (such as happiness responses) that are reasonable substitutes for observing individual outcomes. In his pioneering work, Easterlin (1974) has shown for the US from 1946-1970 that, while happiness is associated positively with higher incomes in the cross-sectional analysis for each of the observed years, its average remains stagnant despite tremendous economic growth over that period. Later studies seem to have confirmed Easterlin's findings as to the stagnant long-run relationship between happiness and real GDP in America (Easterlin, 1995; Di Tella et al., 2003). This is different from what standard utility theory would predict: increasing incomes should increase utility, but they simply do not. The results, however, can be explained by introducing income aspirations into people's utility which capture their concerns for relative income, as well as their adaptation to their previous income level (Easterlin, 2001). In other words, increasing income for all leads to an increase in all aspiration levels, leaving individual utility unaffected. Easterlin's empirical contribution on relative utility theory is also supported by growing evidence that favorable comparison income levels, against which the individual compares himself, are strongly correlated with higher reported well-being

for people for different populations and time period, holding absolute income constant (see van de Stadt et al., 1985; Tomes, 1986; Clark & Oswald, 1996, among others).

Regarding other factors that affect happiness, Oswald (1997, p.1823) notes that "Reported happiness is high among those who are married, on high income, women, whites, the well-educated, the self-employed, the retired, and those looking after the home. Happiness is apparently U-shaped in age (minimizing around the 30s)." The results are not only consistent with the findings on the literature of psychology (for instance, see Wilson, 1967) but also seem to hold across different countries, different time periods and even different measures of well-being (see, for example, Frey & Stutzer, 2000, for Switzerland; Gerdtham & Johannesson, 2001, for Sweden; Frijters et al., 2004, for Germany).

Other than testing the relative income hypothesis, economists also use happiness data to test old hypotheses in a new way. Though by no mean exhaustive, economists have used subjective well-being data to measure the non-pecuniary effects of unemployment (Clark & Oswald, 1994; Darity & Goldsmith, 1996; Theodossiou, 1998; Winkelmann & Winkelmann, 1998), to study social norms in the labour market and past unemployment (Clark et al., 2001; Clark, 2003; Powdthavee, 2007a), to understand people's preferences between unemployment and inflation (Di Tella et al., 2001), to study the relationship between happiness and economic growth (Kenny, 1999), to measure the effects of political institution (Frey & Stutzer, 2000), to study the non-monetary effect of crime (Powdthavee, 2005), as well as to examine other intangible factors such as airport noise (Van Praag & Baarsma, 2005), on well-being.

The impression given by the existing literature on the economics of happiness is that it only focuses on wealthy nations. This is not very far from the truth. Subjective well-being research has focused largely on developed economies, simply because adequate data are more readily available from these countries. Yet developing economies offer more opportunities for economists to study poverty and inequality, as well as the volatility in various socio-economic and macroeconomic factors, and their implications for the happiness of people living there.

Two of the few people working on happiness data taken from developing economies are Carol Graham and Stefano Pettinato (2002). They compare happiness in Latin America and in Russia, using data from 1997 to 2000 from the Latinobarometer, and from 1995 to 1998 from the Russia Longitudinal Monitoring Survey. They find that favorable relative income differences and change in status - as measured by income mobility over the years - have strong positive effects on reported well-being for both sets of data. In addition, they find most of the socio-demographics of happiness in Latin America and in Russia similar to those of advanced industrialized economies. Using the same data set for Russia, Ravallion and Lokshin (2001, 2002) show how self-rated economic welfare, one of the domain satisfactions of global well-being, is determined not only by absolute income but also by changes in household income and health status, as well as relative income in the area of residence. For other countries, Namazie and Sanfey (2001) and Lelkes (2002) find that socioeconomic variables such as age, gender, income, education levels, employment and marital status have similar effects on self-reported happiness levels in Kyrgyzstan and Hungary, respectively, as in the more developed western economies. Powdthavee (2007b) shows using the South African data that the structure of happiness equation is similar in rich and in

poor countries. Nevertheless, there remains little research that draws upon happiness data from developing countries, compared to that of advanced industrialized nations.

Recent studies on happiness have also started to investigate whether or not adaptation to life events is complete. This question is of large applied importance to society because it is relevant to whether progress in societal happiness is doomed by what Brickman and Campbell (1971) called the hedonic treadmill—a process by which gains and setbacks in well-being are inevitably followed by adaptation back to baseline (Kahneman, 1999). According to set-point theories in psychology, people initially react to events, but then return to baseline levels of well-being that are determined by personality factors (Headey & Wearing, 1992). This is supported by an early cross-sectional study, which demonstrates that lottery winners are no happier than non-winners and paraplegics are as happy as able-bodied individuals (Brickman et al., 1978). However, more recent studies using longitudinal data have found that complete adaptation does not always occur for some of the more important predictors of happiness. For example, longitudinal studies have shown that unemployed individuals do not completely return to their former levels of life satisfaction after their initial reaction to the event, even after reemployment (Lucas et al., 2004). There is evidence of an incomplete adaptation for people with severe disability, even after more than six years of disablement, in the British longitudinal data (Oswald & Powdthavee, 2005). The adaptation of happiness is also incomplete after the so-called 'Honeymoon' effect among those in their first marriages (Zimmermann & Easterlin, 2006) and for those who had gone through a divorce (Lucas, 2005). Fujita and Diener (2005) find only a modest stability in LS over a period of 17 years and that some individuals did change significantly and substantially in their life satisfaction over

time. Furthermore, Easterlin (2005) shows that adaptation is generally incomplete for many different domains of life.

Findings in subjective well-being research have many important policy implications. For example, the findings that relative status matters to individual well-being have led to some scholars suggesting that corrective taxes should be collected (Frank, 1999; Layard, 2006). Given that social comparisons drive people to work longer hours than socially desirable, government should start raising taxes to reduce work effort to a level that where the fruitless incentive to raise your relative income has been fully offset. A similar type of corrective tax can also be applied to correct for the individuals' ability to adapt to both good and bad events. In terms of other types of externalities, the finding that being a victim of crime hurts but hurts less when our neighbours are also victims as well suggests that a support group in which victims are encouraged to meet one another is probably more effective in alleviating the stigmatising effects from crime than simply handing out monetary compensation (Powdthavee, 2005). For a more comprehensive review of policy implications derived from happiness research, see Layard (2005, 2006).

VI. Conclusion

Economists and policy makers around the world are becoming increasingly aware about the way individuals' *well-beings* are being insufficiently measured. A better well-being indicator should therefore incorporate both *objective* and *subjective* aspects of human satisfaction. This is because there are many dimensions to individual well-being in which objective (i.e. income, unemployment, education) or subjective (i.e.

surveys of reported well-being) alone can not adequately capture. Nevertheless, many caveats remain if one wishes to integrate happiness studies into the domain of public policy analyses. One of main cautions is that *correlation* does not necessarily mean *causation*. An econometric model that yields a positive coefficient between, say, income and happiness does not necessarily mean than income *causes* happiness but rather it may be that happiness could be the cause of higher incomes. Therefore, it is necessary for happiness data to be collected longitudinally rather than only at the cross-section in order to make more convincing causal analyses possible. This includes factoring out unobserved individual fixed effects from the happiness equations[5]. However, even if unobserved heterogeneity problem has been solved using longitudinal dataset, problems such as omitted time-varying variables may remain even with longitudinal data. Thus, a more causal analysis in well-being research requires not only rich longitudinal dataset but also a good use of instrumental variable (IV) or natural experiments method in order to deal with the omitted variables problem.

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[5] For examples of longitudinal studies of happiness, see Clark (2003), Oswald and Powdthavee (2005), Zimmerman and Easterlin (2005).

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Figure 1: Mine Safety Choice When Relative Income Matters

		B	
		Clean Mine	**Dirty Mine**
A	**Clean Mine**	Second best for A Second best for B	Best for B Worst for A
	Dirty Mine	Best for A Worst for B	Third best for A Third best for B

Note: Clean mine: $200 a week; Dirty mine: $250 a week.

Source: Frank (1985).