

## *Econometric Analysis of Happiness*

Dec, 2004

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### *What Creates Happiness?*

The economy and the economic policies of government are major concerns for people today. Upon reflection, however, many would agree that the ultimate goal in life should be happiness and satisfaction with life, rather than economic growth, high personal income or a colorful career itself. No doubt, income and consumption (which are what economists normally analyze as proxies of welfare) do contribute to human happiness, but there are probably additional factors. For example, it might be of interest to assess to what extent factors such as marital status, age, gender, educational background, unemployment and living in a big city could affect human happiness.

To answer these questions, some economists have recently developed a new approach to human welfare. They elicit subjective well-being assessments from people by having them respond to questionnaire surveys and then estimate the determinants using econometric techniques. Here is an example question from one survey: “All things considered, have you recently been feeling reasonably happy? Here is a 0 to 10 scale. Think of 10 as very happy and 0 as very unhappy. How would you say you feel these days, using this ten-point scale?” Ohtake and Tomioka (2004) analyze the reported happiness measure of Japanese and its determinants, using a survey in 2002. Figure 1 shows the distribution of reported happiness<sup>1</sup>.

Figure 1. Distribution of Reported Happiness

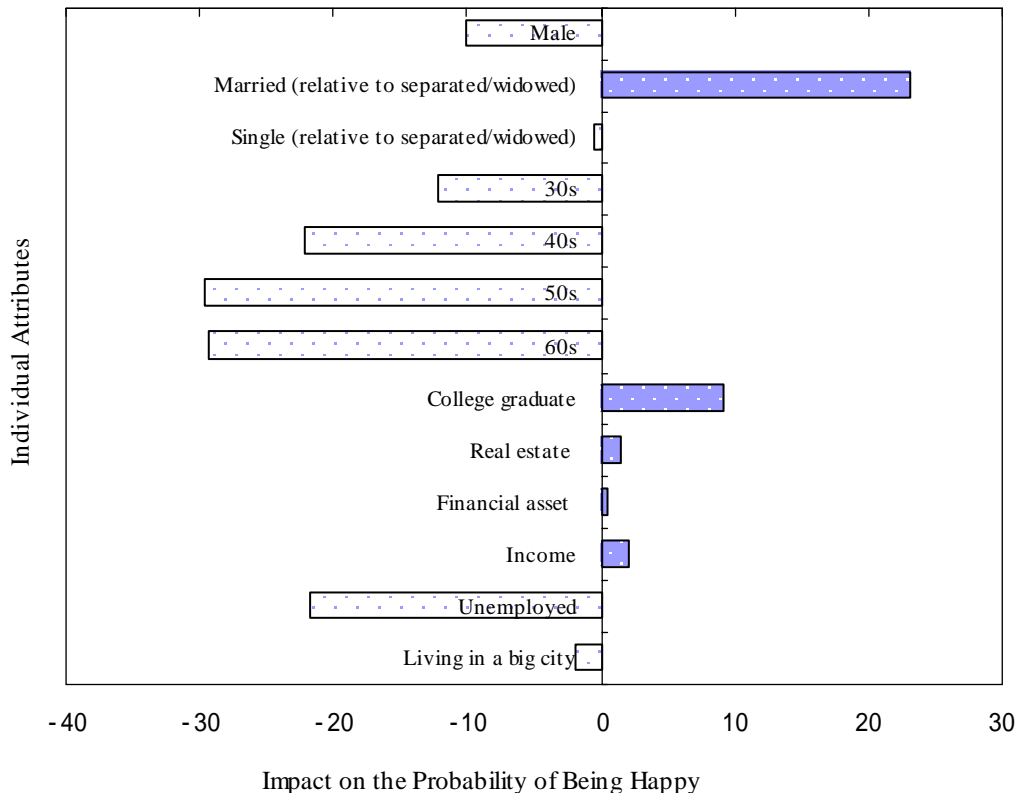


<sup>1</sup> Ohtake and Tomioka (2004) “Happiness and Income Inequality in Japan,” mimeo, Osaka University.

To simplify, let us create a binary variable from the ten-point scale responses to the happiness question. Namely, the respondents are classified as being “happy” if they replied 10, 9, 8, or 7, and as being “unhappy or neither happy nor unhappy” if they replied with an integer between 6 and 0. Figure 2 shows a predicted change in the probability of being “happy” when a specific explanatory variable increases by one unit, and other variables remain constant.<sup>2</sup>

The probability that a typical male respondent is classified as “happy” is lower by 10% than that of a typical female respondent. A married person is predicted to be much happier (by 23%) than a divorced or widowed person. Aging is accompanied by a notable decrease in happiness, and this is most significant among people in their fifties, (the comparison group being people in their twenties). Holding other factors (including income) constant, a college graduate is 9% more likely to be “happy” than someone with no degree. Household income and wealth (in million yen) both have a positive correlation with happiness. If income rises from its mean level (7.5 million yen) by one million yen, the probability of being happy increases by 2.2%. Thus, for instance, the welfare loss incurred in the transition from one’s twenties to one’s forties (-22%) can be compensated by a rise in income of ten million yen, assuming that the effect of an incremental income on happiness is constant.

Figure 2. Individual Attributes and Reported Happiness



<sup>2</sup> We used a probit model. The sample size is 1372. Marginal effects are calculated at the mean values of explanatory variables. Apart from financial assets, real estate and income, all variables are binary (i.e., dummy variables, taking either one or zero), and apart from single and big city dummies, they are individually statistically significant at a 5% level.

### *Measuring the Cost of Unemployment*

Particularly interesting is the finding that being unemployed has a strong, negative association with reported happiness, even after adjusting for income and wealth. One interpretation is that this reflects the non-monetary costs of unemployment, such as damage to self-esteem and loss of discipline in life. Supposing such an interpretation is correct, it follows that the standard analysis of welfare costs of unemployment, which focuses on the loss of income or consumption, underestimates the “true” cost of being unemployed. It also implies that, as an instrument for the government to recover the welfare loss incurred by unemployment, monetary compensation for the unemployed is likely to be less effective than helping them find a job. These observations support the welfare-to-work policy pursued by the British labor government and others.<sup>3</sup>

We have found that, on average, people are happier if they are female, married, young, college graduates, rich, and not unemployed, than otherwise. This result is intuitively reasonable. It is also consistent with the well-known facts that suicides are more common among middle-aged males, and that the unemployment rate and the suicide rate move together closely. That an analysis of happiness implicitly produces an analysis of suicide is not altogether implausible, and may actually merit further exploration, given the historically high suicide rate in recent Japan.

Similar results have been obtained in other developed countries. Although questions like “Would you say you are very happy?” seem rather vague and unscientific at first sight, researchers have confirmed that responses to such questions have strong and reasonable correlations with a variety of important components of human life. It might prove interesting to examine other possible determinants of happiness, including addictive behavior (e.g., smoking and alcohol consumption), personal appearance, crime rate, working and commuting hours, personnel management policy at the workplace and business cycles.

### *Looking Ahead*

Happiness studies have produced some interesting insights. They have also indicated several issues to be tackled in the future. Firstly, the relationship between happiness studies and economic theory is elusive and needs to be clarified. Secondly, reliable causal inference is not as easy to make as it might appear. A typical analysis, like the one presented above, merely shows empirical associations between a reported happiness measure and individual characteristics. In general, one should be cautious about giving causal interpretations to such observed regularities. For example, it is difficult to determine whether it is really marriage that brings people constant happiness, or whether those who are happy by nature tend to get married (and not divorced). A similar consideration about the direction of causality applies to the relation between unemployment and happiness.

Thirdly, it could be that relative considerations such as rivalry and habit are more important than the absolute level of each explanatory variable. That is, a comparison with others or with one’s own past may be more relevant to a person’s subjective assessment of well-being. With richer data and appropriate econometric techniques, these possibilities could in principle be tested. Some progress has already been made in

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<sup>3</sup> Wage flexibility is also desirable to reduce employment adjustment. Although the traditional, textbook model of labor supply considers work simply as a cost to earn income, in our context it makes more sense to distinguish between working hours (yielding negative utility) and having a job (yielding positive utility).

the literature.

The optimal policies of government and firms depend on the way people's subjective welfare is determined in actuality. One instance is labor market policy, which we briefly discussed. Another is the pay evaluation and pay policy of firms (such as whether or how a worker's pay should depend on his/her performance relative to his/her coworkers'), to the extent that worker productivity is a function of morale and welfare. Thus, the research of subjective well-being is potentially of huge practical importance.<sup>4</sup>

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<sup>4</sup> For more on the recent development and practical implications of the happiness study, see, e.g., Gruber and Mullainathan, (2002) "Do Cigarette Taxes Make Smokers Happier?" NBER Working Paper 8872; Layard (2003) "Happiness: Has Social Science a Clue?" Lionel Robbins Memorial Lectures, London School of Economics; Frey and Stutzer (2002) "What Can Economists Learn from Happiness Research?" *Journal of Economic Literature*, 40.