What do happiness and health satisfaction data tell us about relative risk aversion? ☆

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Néstor Gandelman [a,*], Rubén Hernández-Murillo [b]

[a] Néstor Gandelman, Department of Economics, Universidad ORT Uruguay, PC 11.300, Montevideo, Uruguay
[b] Research Division, Federal Reserve Bank of St. Louis, St. Louis, P.O. Box 442, St. Louis, MO 63166-0442, United States

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ABSTRACT

In this paper we provide estimates of the coefficient of relative risk aversion using information on self-reports of subjective personal well-being from multiple datasets, including three cross-sectional surveys and two panel surveys, namely the Gallup World Poll, the European Social Survey, the World Values Survey, the British Household Panel Survey for the United Kingdom, and the General Social Survey for the United States. We additionally consider the implications of allowing for health-state dependence in the utility function on the estimates of risk aversion and examine how the marginal utility of income changes in poor health states. Our estimates of relative risk aversion with cross-section data vary closely around 1, which corresponds to logarithmic utility, while the estimates with panel data are slightly larger. We find that controlling for health dependence generally reduces these estimates. In contrast with other studies in the literature, our results also suggest that the marginal utility of income *increases* when satisfaction with health deteriorates, and this effect is robust across the various datasets analyzed.

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1. Introduction

Attitudes toward risk are a central issue in almost every economic problem involving decision making. Surprisingly, there is not yet a commonly accepted estimate of the coefficient of relative risk aversion. Many economists think that the coefficient of relative risk aversion probably lies between 1 and 3, but estimates vary widely in the literature, from as low as 0.2 to 10 or higher, particularly in the literature that uses inferences from behavioral choices to elicit risk aversion.[1]

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[1] Among the studies based on behavioral choices, Friend and Blume (1975), studying the demand for risky assets, estimate that the coefficient of relative risk aversion generally exceeds 1. Weber (1975), using expenditure data, and Szpiro (1986), using data on property insurance, estimate relative risk aversion in the range of 1.3 and 1.8. Using consumption data, Hansen and Singleton (1983) report lower estimates: between 0.68 and 0.97. Also using data on consumption, Mankiw (1985) finds much larger estimates in the range of 2.44–5.26. More recent studies continue to show a great disparity of estimates. Using a consumption-based capital asset pricing model with state-dependent risk aversion, Gordon and St-Amour (2004) find estimates in the range of 0–10. Garcia, Luger, and Renault (2003) using a generalization of a Black-Scholes option pricing model to S&P 500 call option prices report estimates of relative risk aversion in the range of 0.83–3.28. Chetty (2006), studying the links among labor supply, risk aversion, and the curvature of the utility over consumption, finds a mean estimate of relative risk aversion of 0.71 with a range of 0.15–1.78. Campo, Guerre, Perrigne, and Vuong (2011) estimate a first-price auction model semiparametrically and report an estimate of relative risk aversion of 0.61. Kapteyn and Teppa (2011) estimate different measures of risk aversion based on subjective indicators.

In this paper, we use data on subjective self-reports of personal well-being to estimate the coefficient of relative risk aversion. Additionally, using data on subjective self-reports of satisfaction with personal health, we examine how the estimates of risk aversion and the curvature of the utility function are affected by considering health-state dependence.

The literature on the application of happiness or subjective well-being data to address economic issues originated with Easterlin's (1974) seminal paper, and since the late 1990s the amount of research that uses happiness and satisfaction databases has increased considerably; Frey and Stutzer (2002) and Di Tella and MacCulloch (2006) are two examples of reviews of the use of such data in economics.

In our analysis, we build primarily on Layard, Mayraz, and Nickell (2008) by applying their analysis to various cross-sectional and panel datasets not considered in their study. These authors use happiness data to estimate how fast the marginal utility of income declines as income increases, an elasticity that corresponds to the parameter of relative risk aversion under a constant relative risk aversion utility function. The authors stress the importance of this interpretation of the parameter of interest for analyzing normative public economic issues, such as optimal taxation. The estimation of the association between survey based measures of personal well-being and income has been analyzed extensively in the literature. Clark, Frijters, and Shields (2008) provide a survey of recent results on the estimation of the relationship specifically between happiness scores and personal income.[2]

Our paper also extends the framework of Layard et al. (2008) by considering health-state dependence in the utility function, as in Finkelstein et al. (2013), who stress the interpretation of the parameter of interest as a measure of risk aversion for analyzing financial problems, such as determining the optimal amount of health insurance.

While the interpretation of the parameter of interest as either the elasticity of the marginal utility of income or as the coefficient of relative risk aversion may conceptually rely on whether one assumes that happiness scores are ordinal or cardinal in nature, Ferrer-i-Carbonell and Frijters (2004) argue that one can practically assume that happiness scores are both cardinally and ordinally interpersonally comparable, as findings suggest that individuals, especially in the same language community, have a common understanding of happiness and of how to translate subjective notions of well-being into a numerical scale (van Praag, 1991). In this paper, we follow the literature and explicitly assume that happiness scores are cardinally comparable to provide estimates based on linear least squares regressions and we interpret the estimated coefficient as relative risk aversion.

First, we consider data sets that provide only cross-sectional observations for various countries in one or more time periods. In other words, these surveys do not follow individual respondents over time, but they may provide information for the same country in different years. The cross-section estimates use data from the Gallup World Poll (GWP), the European Social Survey (ESS), and the World Values Survey (WVS). The Gallup dataset only recently became available for applied research and covers a larger set of people than most subjective well-being surveys: about 70,000 individuals in more than 140 countries.[3] The largest dataset used by Layard et al. (2008), for example, includes only about 50 countries. We also use data from the ESS covering 27 countries and from the WVS covering 41 countries. We classify the various individual countries in these surveys using five groups of countries categorized by the World Bank in terms of income per capita, and provide estimates for these categories. We also provide estimates for the United States with data from the GWP and the WVS. For each of these surveys, we provide overall estimates that use pooled observations from all countries.

Second, we consider panel data sets that follow individuals over multiple time periods. We use data from the British Household Panel Survey (BPHS) for the United Kingdom and data from the General Social Survey (GSS) for the United States. In the samples we consider, the BPHS provides data for about 6000 individuals in up to 7 waves, while the GSS provides data for about 940 individuals in up to 3 waves. The panel studies allow for the inclusion of time-invariant individual effects, which has been shown to be relevant for analyzing the effect of income on reported happiness (see Clark et al., 2008).

The estimates of relative risk aversion using the cross-sectional or panel surveys are largely similar in magnitude. In the cross-sectional surveys, the estimates with the GWP data are slightly lower than 1, whereas the estimates with the ESS and the WVS were slightly larger than 1. When we analyze the effect of controlling for health-state dependence on the estimates of relative risk aversion, we find that the estimated relative risk aversion coefficients generally decline. We also find in contrast to Finkelstein et al. (2013) that the marginal utility of income *increases* when health deteriorates. These patterns are robust across all the different datasets we analyzed.

In the Section 2 we describe the datasets used in the analysis. In Section 3 we present the estimated equations. We discuss the results in Section 4 and provide concluding comments in Section 5.

2. Data

2.1. Cross-sectional surveys

We use data from the 2006 GWP, the 2002 to 2006 waves of the ESS and the 1981 to 2008 waves of WVS. The main variables of interest are self-reports of happiness or satisfaction with life, self-reports on the assessment of personal health, and

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[2] In a related approach, Plug, van Praag, and Hartog (1999) use survey-based measures of *welfare from income* in an analysis of optimal taxation.
[3] Deaton (2008), Gandelman and Hernández-Murillo (2009), and Rojas (2011) are among the first published papers using this data.