



# Rain or shine: Happiness and risk-taking<sup>☆</sup>



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## ABSTRACT

In this paper, we focus on the effects of weather, such as sunshine, as an exogenous shifter of happiness using happiness data at the individual level, and estimate sunshine as a predictor of happiness. Then we relate the predicted happiness to risk-taking. By doing so, we estimate a relationship, stronger than a simple correlation, between happiness and risky behavior. Weather changes, and sunshine in particular, have substantial influences on personal happiness. However, unexpected weather changes appear to be more important than expected changes for happiness. We include several risk measures such as subjective risk-taking and financial assets in our analysis. Happier people appear to be more risk-averse in general and more specifically in financial decisions, and choose accordingly safer investments. This might be explained by the fact that happy people take more time for making decisions and have more self-control. In addition, predicted happiness affects expectations about longevity and inflation. Happy people expect to live longer and accordingly seem more concerned about the future than the present, and expect less inflation.

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## 1. Introduction

The empirical research to date has mixed evidence on the relationship between the optimism of people in positive affective states and risk-taking. Therefore, the first contribution of this paper is to examine the causal effect of self-reported happiness (life satisfaction) on risky behavior using survey data. The stated objective is therefore to establish a relationship stronger than a simple correlation, which is always a difficult task, given the usual omitted variables and reverse causality problems which applied researchers face.

The literature focusing on the influence of weather on financial variables is providing mixed results.<sup>1</sup> As a second contribution, we focus on the effects of weather, sunshine, as an exogenous shifter

of happiness using happiness data at the person level, and estimate sunshine as a predictor of happiness. We then relate predicted happiness to risk-taking. Establishing this relationship could explain the correlation between weather and financial variables found in the finance literature, and could also help to determine the extent to which the findings from this research should be incorporated into policy analysis.

Further to this mixed evidence discussed above, the channels through which weather might affect financial variables are also unknown. Therefore, we examine the potential channels to explain our findings such as discount rates and self-control which is the third contribution of this paper. Using an instrumental variables approach, we establish a relationship going from happiness to risk-taking behavior. In order to establish this relationship, we use exogenous regional sunshine as an instrument for current personal happiness. Measures of sunshine are accessed through the European Climate Assessment Dataset (ECAD). Our personal survey data come from the Dutch Household Survey (DHS), which is a panel of 4500 persons covering the period 1993–2006, and the German Socio-Economic Panel (GSOEP), which is a panel of 21,000 persons surveyed from 1984 to 2006. The surveys provide self-reported

<sup>☆</sup> STATA is used for regressions.

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<sup>1</sup> For a detailed review on these studies, refer to [Subrahmanyam \(2007\)](#).

measures of well-being, such as responses to questions about how happy and satisfied individual respondents are with their lives, as well as, very detailed information on wealth and different measures of risky behavior.

Our empirical findings suggest that weather changes, and sunshine in particular, have substantial influences on personal happiness. However, unexpected weather changes appear to be more important than expected changes of weather for happiness. The paper considers risk measures such as subjective risk-taking and financial assets. Happier people appear to be more risk-averse both in financial decisions and in general life decisions, and choose accordingly safer investments. Happy people are more likely to have life insurance, savings accounts, and operating assets, but are less likely to own stocks and bonds. Happy people prefer investing less in shares, because they find them too risky.

Happy people take more time to make decisions and have more self-control. In addition, happiness affects subjective expectations about longevity and inflation. Happy people expect to live longer and accordingly seem more concerned about the future than the present, and expect less inflation. Happier people are more forward looking than less happy people. Therefore, one could expect that people who expect to live longer presumably have stronger incentives to save, which is confirmed by our results for the savings accounts.

The remainder of the paper is organized as follows. Section 2 provides an overview of the related economic literature on correlates of well-being and the impact of well-being on risk-taking behavior. Section 3 summarizes the data, and Section 4 provides the details about the empirical framework and the identification strategy. Section 5 presents the empirical results and Section 6 concludes.

## 2. Related literature

Happiness has been studied extensively in psychology for a long time. However, it was not until 1974 that it was considered by economists as a research concept (Easterlin, 1974), since when there has been a proliferation of studies on the relationships between various personal characteristics and happiness.<sup>2</sup> Happiness has been found to be positively related to good health (Dolan, Peasgood, & White, 2008). Life satisfaction is negatively related to hypertension (Oswald & Blanchflower, 2008), and may protect against ill health and the risk of disease. In their survey of the literature, Pressman and Cohen (2005) find that a higher level of life satisfaction was associated with a decreased mortality rate and increased longevity in four out of six studies, as well as with a decreased likelihood of hospital readmittance for patients with heart disease.

In addition, a recent body of literature examines the relationship between weather and happiness. For instance, Rehdanz and Maddison (2005) find that climate variables have a powerful effect on self reported levels of happiness in a panel of 67 countries, controlling for a range of other factors. Van Praag and Ferreri-Carbonell (2004) and Frijters and Van Praag (1998) show that climate variables such as rain, hours of sunshine, average temperature, and windiness are strongly correlated with household costs, financial satisfaction, and general satisfaction. Becchetti, Castriota, and Londoño Bedoya (2007) estimate the relative gains and losses (in terms of happiness) arising from the change in climate when individuals move from one city to another (e.g. from Paris to

Madrid) and provide evidence of significant links between happiness and several climatic factors.

Among many other studies, Johnson and Tversky (1983) show that affective states influence subjective probability evaluations. Happier people have different attitudes toward risk-taking than people who are less happy. They may prefer different markets and types of financial investments, also (Kleindorfer, Kunreuther, & Schoemaker, 1993). Moore and Chater (2003) observe a significant positive relationship between affect and risky behavior in the laboratory. People in a positive affective state report higher subjective probabilities for positive events and lower subjective probabilities for negative events. One explanation for this could be that people retrieve mood-congruent memories more easily, and focus their attention more on mood-congruent information when assessing subjective probabilities. On the other hand, rank-dependent utility theory of Quiggin and Schmeidler could also provide insights to understand the role of optimism and pessimism for decision-making under risk and uncertainty (Diecidue & Wakker, 2001). The authors in this paper described the intuition of rank-dependence in terms of decision weights and have argued that Rank Dependent Utility is not just a mathematical device but that it is based on intuition and has real-world merits. Fromme, Katz, and Rivet (1997) find that beliefs about potential benefits are more reliably associated with risk-taking than beliefs about potential negative consequences.

For example, Arkes, Terren, and Isen (1988) find that subjects in a positive affective state are willing to pay more for lottery tickets than the control subjects are. Valois, Zullig, Scott Huebner, and Wanzer Drane (2001) and Valois, Zullig, Scott Huebner, Kammermann, and Wanzer Drane (2002) find that risky behavior of students is associated with low levels of life satisfaction. A number of studies (e.g., Isen & Patrick, 1983) have found that people's responses to risk stimuli depend on the gamble's stakes: when faced with high stakes, people in a positive state are more risk-averse, with a view to avoiding large losses. In contrast, if the stakes are low, decision makers become risk-seeking in order to benefit from the gain without putting too much on the line (Mano, 1994). Emotions in uncertain or risky situations seem to be sensitive to the possibility rather than the probability of strong positive or negative consequences, causing an overweight of very small probabilities (Loewenstein, Weber, Hsee, & Welch, 2001).

Hirshleifer and Shumway (2003) show that morning sunshine in the city of a country's leading stock exchange has significant impacts on the daily market index and stock returns using data from 26 countries for the period 1982–1997. Moreover, sunshine influences the interest rates of bank bills, government bonds, and the returns of stock indices in New Zealand (Keef & Roush, 2005). Furthermore, sunshine and temperature are also significantly correlated with stock market returns in Australia (Keef & Roush, 2007) and in Europe (Floros, 2008). Gerlach (2007) argues that the relationship between weather and financial variables depends on market responses to macroeconomic news but does not depend on psychological or institutional factors. Jacobsen and Marquering (2008) argue that climate effects on stock returns through mood changes of investors are premature. They show that stock market returns tend to be significantly lower during summer and fall than during winter and spring. They also find that the anomalies in stock returns can be explained by a simple winter/summer dummy. On the contrary, Loughran and Schultz (2004) find little evidence that cloudy weather in the city in which a company is based, affects its returns.

Based on their findings, Goetzmann and Zhu (2005) claim that the behavior of market-makers, rather than individual investors, may be responsible for the relationship between returns and weather. In this respect, emotions, and specifically happiness,

<sup>2</sup> For a detailed discussion on these issues, refer to a survey of this literature by Frey and Stutzer (2002).

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