DISCUSSION PAPER SERIES

No. 8904

ASPIRATIONS, WELL-BEING, RISK-AVERSION AND LOSS-AVERSION

Kees Koedijk, Rachel A J Pownall
and Meir Statman

FINANCIAL ECONOMICS

Centre for Economic Policy Research

www.cepr.org

Available online at: **www.cepr.org/pubs/dps/DP8904.asp**

ISSN 0265-8003

ASPIRATIONS, WELL-BEING, RISK-AVERSION AND LOSS-AVERSION

Kees Koedijk, Tilburg University and CEPR
Rachel A J Pownall, Tilburg University and Maastrict University
Meir Statman, Santa Clara University

Discussion Paper No. 8904
March 2012

Centre for Economic Policy Research
77 Bastwick Street, London EC1V 3PZ, UK
Tel: (44 20) 7183 8801, Fax: (44 20) 7183 8820
Email: cepr@cepr.org, Website: www.cepr.org

CEPR Discussion Paper No. 8904

March 2012

ABSTRACT

Aspirations, Well-being, Risk-Aversion and Loss-Aversion*

Financial well-being is distinct from income. Some people with high incomes suffer low financial well-being, as their incomes fall short of their aspirations. Such people feel propelled to reach their aspirations by taking risk and willing to bear losses. Conversely, some people with low incomes enjoy high financial well-being, as their incomes exceed their aspirations. We find that people whose aspirations exceed their income are less risk-averse and less loss-averse than people whose incomes exceed their aspirations. We also find that competitive and status-seeking people are less risk-averse than people who are less competitive and status-seeking, and that status-seeking people are less loss-averse than people who are not as status-seeking.

JEL Classification: D81 and G11
Keywords: behavioural portfolio theory, loss-aversion, prospect theory, risk-taking and subjective well-being

Kees Koedijk
Faculty of Economics and Business Adminstration
Tilburg University
P.O. Box 90153
5000 LE Tilburg
THE NETHERLANDS

Email: c.koedijk@uvt.nl

For further Discussion Papers by this author see:
www.cepr.org/pubs/new-dps/dplist.asp?authorid=115278

Rachel A J Pownall
Finance Department
Tilburg Sustainability Centre
Tilburg University
Room T408
PO Box 90153, 5000 LE Tilburg
THE NETHERLANDS

Email: r.a.j.pownall@uvt.nl

For further Discussion Papers by this author see:
www.cepr.org/pubs/new-dps/dplist.asp?authorid=175118

Meir Statman
Santa Clara University
500 El Camino Real
Santa Clara, CA 95053
USA

Email: m.statman@scu.edu

Submitted 5 March 2012

'Men will and do take great risks to distinguish themselves even when they know what the risks are,' wrote Friedman and Savage (1948, p. 299). We start new businesses and buy lottery tickets for a chance to reach our aspirations. We do not seek risk. Rather, risk is payment for a chance to reach our aspirations.

Some who aspire to be rich can reasonably expect to reach their aspirations through steady savings invested in safe bonds. But risky investment in stocks, enterprises, or even lottery tickets, offer many of us the only hope to reach our aspirations, whether millions in bank accounts, ample retirement incomes, or the means to help our children and grandchildren. The Consumer Federation of America (2006) reported that when asked about the most practical way to accumulate several hundred thousand dollars, more than half of surveyed Americans said: save something each month for many years. But more than one in five said win the lottery, and most of these were poor.

Many who bought houses in the boom years of 2006 and 2007 lost them to foreclosures in the years that followed. It is easy to characterize such home buyers as risk-seekers, but aspirations for better lives in homes of their own drove them, and risk was payment for a chance to reach their aspirations. These homeowners might well be the unskilled workers that Friedman and Savage (1948) described as willing to accept gambles that offer a small chance of lifting them into the 'middle' or 'upper' classes, even though such gambles are far more likely to make them poor even relative to others in the unskilled workers class. Members of the upper class often join members of the unskilled workers class in aspirations to distinguish themselves. Rajat Gupta is a member of the hundred-of-millions class who ran McKinsey from 1994 to 2003 and later served as a member of Goldman Sachs' board. Now he stands accused of disclosing inside information to Raj Rajaratnam of the Galleon hedge fund, risking his

millions and freedom for a chance to reach the billions class. Rajaratnam understood Gupta's motives in joining the private equity firm of Kohlberg, Kravis, and Roberts. 'My analysis of the situation is he's enamoured with Kravis, and I think he wants to be in that circle,' said Rajaratnam in a telephone conversation played at his trial. 'That's a billionaire circle, right? Goldman is like the hundreds of millions circle, right?'

People whose incomes fall short of their aspirations feel that they have less money than they need. Such people are burdened by low financial well-being. Yet other people with identical incomes enjoy high financial well-being, feeling that they have more money than they need. Friedman and Savages analysis implies the hypothesis that people burdened by low financial well-being are driven to take risks in attempts to reach their aspired financial well-being, whereas people enjoying high financial well-being are less willing to take such risks. Low financial well-being may propel people not only to be relatively less risk-averse than people with high financial well-being, but also to be less loss-averse. People who are relatively less loss-averse care relatively less about avoiding financial losses than about reaping financial gains. Such people might act as hopeful and optimistic people, motivated to perceive higher probabilities of gains and lower probabilities of losses than objective probabilities. Friedman and Savage (1948 p. 284) quote Adam Smith about 'The presumptuous hope of success that entices so many adventurers into...hazardous trades...' Conversely, people who are relatively loss-averse care relatively more about avoiding financial losses than about reaping financial gains. Such people might act as fearful and pessimistic people, motivated to perceive higher probabilities of losses and lower probabilities of gains than objective probabilities. This implies a second hypothesis, that people with relatively low financial well-being are relatively less loss-averse than people with relatively high financial well-being.

Not all people in the unskilled workers class seek to distinguish themselves by rising into the middle or upper class, and not all people in the hundreds-of-millions class seek to distinguish themselves by rising into the billions class. People who seek to distinguish themselves are competitive and status-seeking people. This implies a third hypothesis, that relatively competitive and status-seeking people are less risk-averse and less loss-averse than people who are less competitive and status-seeking. We find support for these three hypotheses in data from a subsection of the DNB Household Survey conducted in 2010, and a survey sponsored by the Dutch National Bank and administered by CentERdata at Tilburg University. In addition, we have a sample of 1,842 Dutch households from a survey sponsored by the Dutch Central Bank and administered by CentERdata at Tilburg University. The survey provides information about the economic and psychological determinants of households' decision making. CentERdata includes data about income, marital status, number of children, and education.

1 Hypotheses and Measures

Hypothesis 1: People with relatively low financial well-being have relatively low risk-aversion

We measure the financial well-being of people by 'subjective cash flow,' a psychological construct developed by Johnson and Krueger (2006). We refer to it as 'subjective income.' People rated their current financial situation on a scale ranging from 1 to 7, where 1 indicates the worst possible situation. They also indicated on the same scale the degree to which they felt they had less or more money than they need, the degree to which they found it difficult to pay their bills, and the degree to which they felt they were financially better off than their parents were at the same age. Income is

'objective income,' distinct from subjective income. The aspired income of people with low financial well-being exceeds their objective income. We measure risk-aversion by level of agreement with the statement I think that it is more important to have safe investments and guaranteed returns than to take a risk for a chance to have the highest possible returns. Alessie et al. (2004) have used this measure of risk-aversion in an earlier wave of the CentREdata panel data.

Hypothesis 2: People with relatively low financial well-being have relatively low loss-aversion

We measure the loss-aversion of people by their responses to the statement: 'I invest to reap financial gains or to avoid financial losses.' The scale ranges from 1 to 10, where 1 indicates leaning toward reaping financial gains and 10 indicates leaning toward avoiding financial losses.

Hypothesis 3: Competitive and status-seeking people are less risk-averse and less loss-averse than people who are less competitive and less status-seeking

We measure competitiveness by levels of agreement, on a scale from 1 to 5, with statements derived from the Achievement Motivations Scale of Cassidy and Lynn (1989): 'I try harder when I'm in competition with other people.' 'It annoys me when other people perform better than I do.' 'I judge my performance on whether I do better than others rather than on just getting good results.' 'I would never allow others to get credit for what I have done.' 'It is important to me to perform better than others on a

task.' 'If I get good results, it doesn't matter if others do better.' (The last statement is assessed on a reverse scale).

We measure status-seeking by levels of agreement, on a scale from 1 to 5, with statements derived from the same scale: 'I would really like an important job where people look up to me.' 'I like talking to people who are important.' 'I want to be an important person in the community.' 'I like to be admired for my achievements.' 'I dislike being the centre of attention.' (This statement is assessed on a reverse scale). 'I like to have people come to me for advice.' 'I find satisfaction in having influence over others.'

2 Aspirations, risk-aversion, and loss-aversion

Friedman and Savage were prompted into their analysis by the puzzling observation that many people who buy insurance policies also buy lottery tickets. People indicate that they are risk-averse by buying insurance policies, yet they indicate that they are risk-seeking by buying lottery tickets. Friedman and Savage offered a solution to the puzzle in a utility function where utility is a function of wealth. The function is concave everywhere except for a particular region of wealth where it is convex. People display risk-averse behavior in gambles where wealth outcomes are in the concave regions of the utility function but they display risk-seeking behavior in gambles where wealth outcomes are in the convex region of the utility function. This depiction was modified by Markowitz (1952) who argued that the convex portion of the utility function is not centered at a particular level of wealth common to all people but at a 'customary

wealth' specific to each person. Kahneman and Tversky (1979) built on the insights of Friedman and Savage and Markowitz in prospect theory where utility is determined not by wealth but by wealth relative to reference wealth. That reference wealth might be the current level of a person's wealth but it might also be an expected or aspired level of wealth. Indeed, Koszegi and Rabin (2006) developed a model of reference dependent preferences, where the reference level corresponds to expectations or aspirations of wealth rather than to current or status-quo levels of wealth. They noted, for example, that an employee with a $50,000 salary who expected a $60,000 salary would regard a $50,000 salary as $10,000 loss relative to his expected salary, rather than as a zero loss relative to his $50,000 status-quo salary. They further noted that their model is consistent with the finding that some workers set a daily aspired income, such that they stop working once they have reached their aspiration. Camerer et al (1997) found that taxi drivers are less likely to work in the afternoon if they have reached their aspired income in the morning. Larrick, Heath, and Wu (2009) found, in experiments, that aspirations to meet goals increase risk-taking. In one set of experiments they presented to participants the following hypothetical scenario:

John works in sales. With two days left, he has completed 26 sales. He is considering two strategies:

(A) He knows that if he concentrates his remaining two days on the 4 clients most ready to buy, he can close those deals.

(B) He can spend his time spot-calling his entire remaining base of 20 clients. On average, this strategy in the past has produced anywhere from 2 to 8 sales.

Which strategy will John prefer?

In this scenario John has no particular goal and participants thought he would be mildly

risk-averse: 54% said John would prefer the certain strategy, 46% said John would prefer the risky one.

Another group of participants was given a version in which the first sentence was changed to: John works in sales and has set a goal of making 30 sales this month. Here, John can reach his goal, with certainty, by using strategy A. Larrick et al found that the goal makes John much more risk-averse, as predicted by the concavity of prospect theorys value function in the domain of gains. Of participants, 96% believed John would be risk-averse and would prefer the certain Strategy A.

Finally, another group of participants was given a version where Johns safe strategy would leave him below his goal. In this version, John had a goal of making 30 sales and had completed only 21. Larrick et al found that 77% of participants believed John would prefer the risky Strategy B, as predicted by the convexity of the value function in the domain of losses. Larrick et al wrote: 'Overall, the value function makes a strong prediction that if people treat goals as reference points they will typically behave in a risk-seeking manner when they are deciding among outcomes that fall short of their goal.'

Shefrin and Statman (2000) built behavioral portfolio theory (BPT) on the insights of Friedman and Savage, Markowitz, Kahneman and Tversky, and Lopes (1987). In the two-mental-accounts version of BPT people begin by allocating their wealth into two mental accounts, one devoted to upside potential and the other to downside protection. Loss-aversion is particularly high in choices affecting wealth in downside-protection mental accounts. People who care relatively more about downside-protections than upside-potential allocate relatively more of their wealth to the downside-protection mental account.

SP/A is a theory of choice under uncertainty developed by Lopes (1987). S stands for security, P for potential, and A for aspirations. Security is about a desire to avoid losses, potential is about a desire to reap gains, and aspiration is about reaching goals. Hope and fear are prominent in SP/A. Fear turns people pessimistic, pressing probabilities of losses lower than true probabilities, whereas hope turns people optimistic, pushing probabilities of gains higher than true probabilities. Hope and optimism animate people who buy lottery tickets, pushing probabilities of gains higher than true probabilities and overcoming the aversion to the loss of the dollars paid for lottery tickets. People with low financial well-being act as if they are animated by hope and optimism; they perceive probabilities of gains higher than true probabilities. This perception reduces risk-aversion and loss-aversion. Conversely, people with high financial well-being act as if they are animated by fear and pessimism; they perceive probabilities of losses higher than true probabilities and magnifying loss-aversion. This perception increases risk-aversion and loss-aversion.

Friedman and Savage quoted Adam Smith on the role of hope in reducing risk-aversion and the inclination of 'adventurers' toward taking risks. 'Adventurers' are competitive and status-seeking people. Moreover, Smith noted that adventurers might not be compensated for their risk-taking by higher returns. Smith wrote: 'The ordinary rate of profits always rises more or less with the risk. It does not, however, seem to rise in proportion to it, or as to compensate it completely. . . The presumptuous hope of success seems to act here as upon all other occasions, and to entice so many adventurers into those hazardous trades, that their competition reduces the profit below what is sufficient to compensate the risk.' (p. 284) Indeed, Moskowitz and Vissing-Jorgensen (2002) found that entrepreneurs earn returns on their concentrated private equity in-

vestments that are no higher than returns on public equities. They wrote: 'Given the large public equity premium, it is puzzling why households willingly invest substantial amounts in a single privately held firm with a seemingly far worse risk-return trade-off.' One answer to the puzzle, echoing Smith, is that entrepreneurs overestimate the returns they are likely to earn from their investments.

We present our three hypotheses within expected utility theory and prospect theory, depicted in Figures 1 and 2. Hypothesis 1 states the people with relatively low financial well-being have relatively low risk-aversion. People with relatively low risk-aversion are more likely than people with relatively high risk-aversion to forgo a sure amount for a chance for a higher amount, and their relatively low risk-aversion is reflected in disagreement with the statement: 'I think that it is more important to have safe investments and guaranteed returns than to take a risk for a chance to have the highest possible returns.' This hypothesis is depicted in Figure 3, where relatively low financial well-being is associated with relatively low risk-aversion, reflected in low concavity in the expected utility function. Relatively low concavity can turn into convexity, reflecting risk-seeking, as in the utility function offered by Friedman and Savage.

Hypothesis 2 states that people with relatively low financial well-being have relatively low loss-aversion. People with relatively low loss-aversion are likely to lean toward reaping financial gains in the statement 'I invest to reap financial gains or to avoid financial losses,' whereas people with relatively high loss-aversion are likely to lean toward avoiding financial loss. This hypothesis takes two forms. In the first form, presented in Figure 4, higher loss-aversion is depicted in a steeper declining curve in the loss region of the prospect theory function. For example, people with no loss-aversion are willing to accept a 50-50 bet for doubling their wealth or losing all of it. People

with moderate loss-aversion might be willing to accept a 50-50 bet for doubling their wealth or losing 30% of it. People with high loss-aversion might be willing to accept a 50-50 bet for doubling their wealth or losing 10% of it.

In the second form, presented in Figures 5a, 5b, and 5c, levels of loss-aversion are depicted in shifts in the reference point. Consider three people, each with a $60,000 objective income. The first person, presented in Figure 5a, has middling well-being, as his objective income equals his aspired income. His prospect theory reference point is $60,000, equal to his aspired income. The second person, depicted in Figure 5b, has relatively low well-being; his $60,000 objective income is lower than the aspired $80,000 income which serves as his prospect theory reference point. That person sees himself in the domain of losses of the prospect theory function, motivating him to focus on reaping gains more than on avoiding losses, and willing to accept the possibility of losses as he reaches for his aspired income. The third person, depicted in Figure 5c, has relatively high well-being; his $60,000 objective income is higher than his aspired $40,000 income which serves as his prospect theory reference point. That person sees himself in the domain of gains of the prospect theory function, motivating him to focus on avoiding losses more than on reaping gains, and unwilling to accept the possibility of losses for the possibility of gains.

Hypothesis 3 states that competitive and status-seeking people are less risk-averse and less loss-averse than people who are not as competitive or status-seeking. We can depict the risk-aversion portion of the hypothesis in Figure 6, analogous to Figure 3, where high competitiveness and status-seeking is associated with low risk-aversion. We can depict the loss-aversion portion of the hypothesis in Figure 7, analogous to Figure 5, where levels of loss-aversion are depicted in shifts in the reference point. The aspired

incomes of competitive and status-seeking people exceed their objective income, placing them in the domain of losses, as in Figure 7a, inducing them to accept further losses as they attempt to reach their aspirations. Conversely, the objective incomes of people who are not competitive or status-seeking exceed their aspired incomes, as in Figure 7b, inducing them to forego gains as they shy away from losses.

3 Well-being, risk-aversion, and loss-aversion

Well-being varies from person to person, but there are patterns to the variation. These patterns matter as we analyze the relation between well-being, risk-aversion and loss-aversion. Men vary in from women in well-being, risk- aversion, and loss-aversion, and so do young from old, educated from less educated.

In 'Well-being: The Foundations of Hedonic Psychology,' a book edited by Kahneman, Diener, and Schwartz (1999), they wrote: 'Subjective well-being...involves a component of judgment and comparison with ideals, aspirations, other people, and one's own past.' They went on to note that a robust finding of research is a low correlation between judgments of quality of life and objective living conditions.

Well-being is often discussed in the language of happiness. In one chapter of the book, 'Causes and Correlates of Happiness,' Argyle (1999) noted that higher incomes are associated with greater happiness, although the relation between income and happiness is stronger in relatively low-income countries such as Tanzania and Jordan than in relatively high-income countries such as the United States. The relation between income and happiness might be weak at relatively high levels of income because happiness is affected not only by income but also by gaps between actual income and aspired

income. People with relatively high income who feel that they have less money than they need are likely to be less happy as people with lower income who feel that they have more money than they need.

Older people are generally happier than younger people. This might seem odd, as the objective situation of older people generally places them at a worse spot than that of younger people. Older people are likely to be in worse health than younger people, and their incomes are generally lower in retirement. Yet older people have had time to adapt to their situations. Older people are likely to be happier because their aspirations are lower, narrowing the gap between their objective situations and their aspirations. Older people, unlike younger ones, expect to be out of a job and possibly widowed.

Relatively high levels of education are associated with relatively high happiness even after adjustment for the relation between education and income. That might be due to the association between education and status, both occupational and social. Education might detract from happiness if it increases aspirations by more than it increases income, but the evidence indicates that the net effect of education on happiness is positive.

We know from many studies that the risk-aversion of women exceeds that of men. Charness and Gneezy (2007) assembled data from 10 sets of experiments conducted by different experimenters who did not set out to look for gender differences in risk-aversion, yet found that women more risk-averse than men. Beckmann and Menkhoff (2008) found that not even expertise eliminates gender differences in risk-aversion. Women are more risk-averse than men even among professional fund managers.

Risk-aversion is likely rooted in our biology. Sapienza, Zingales, and Maestripieri (2009) found that higher levels of circulating testosterone were associated with lower

risk-aversion among women, but not among men. At comparably low concentrations of salivary testosterone, however, the gender difference in risk-aversion disappeared, suggesting that testosterone has nonlinear effects on risk-aversion regardless of gender.

Cesarini, Johannnson, Lichtenstein, Sandewall, and Wallance (2010) found in a study of fraternal and identical twin that approximately 25% of individual variation in portfolio risk is due to genetic variation, and Kuhnen and Chiao (2008) found that variants of two genes that regulate dopamine and serotonin neurotransmission are significant determinants of risk-aversion in investment decisions.

Yet the direction of causality between risk-aversion, competitiveness, status-seeking, and financial well-being is unclear. Moreover, circumstances affect risk-tolerance, beyond genetics, leading some to take high risks to escape these circumstances. In that, they are similar to the Dubins and Savage (1976) investors a casino with $1,000 and desperately need $10,000 by morning. The optimal betting strategy for such people consists of a single risky bet, one that offers a chance of winning $10,000. People who make many less risky bets are likely to do worse than those who concentrate them in one risky bet because the probability of reaching the aspired $10,000, however small, is smaller with many less risky bets than with an single risky bet.

4 Findings

Table 1 presents the association between financial well-being and income, education, age, gender, competitiveness and status-seeking. People with relatively high incomes are more likely to perceive themselves as enjoying high financial well-being than people with relatively low incomes. The coefficient of income is positive and statistically sig-

nificant. Yet Figure 8 shows the wide variation of well-being at similar levels of income. Indeed, some people at the highest levels of income perceive themselves as having lower financial well-being than people at the lowest levels of income.

We also find that financial well-being increases with education, and age. The two coefficients are positive and statistically significant. But there is no statistically significant relation between financial well-being and gender, competitiveness, or status-seeking. We place competitiveness and status-seeking in two separate regressions because the 0.54 correlation between them is relatively high.

Table 2 presents the association between risk-aversion and financial wellbeing, income, education, age, gender, competitiveness, and status-seeking. We find, consistent with our first hypothesis that people who enjoy relatively high financial well-being tend to be relatively risk-averse. The coefficient of financial well-being is positive and statistically significant.

We also find, consistent with the third hypothesis, that competitive and status-seeking people are likely to be relatively less risk-averse than people who are not as competitive or status-seeking. The coefficients of both competitiveness and status-seeking are both negative and statistically significant. Relatively old people are more likely to be risk-averse than relatively young people, and women tend to be more risk-averse than men. Yet there is no statistically significant relation between risk-aversion and income or education.

Loss-aversion is positively correlated with risk-aversion, but the 0.23 correlation between them is not very high. Table 3 examines the relation between loss-aversion and financial wellbeing, income, education, age, gender, competitiveness, and status-seeking. We find, consistent with our second hypothesis, a positive and statistically

significant relation between loss-aversion and financial wellbeing. We find negative and statistically significant relations between loss-aversion and status-seeking, consistent with our third hypothesis, but the relation between loss-aversion and competitiveness is positive, inconsistent with our third hypothesis, even if not statistically significant.

There is a positive and statistically significant relation between loss-aversion and age, and women are more loss-averse than men at a statistically significant level. Yet there is no statistically significant relation between loss-aversion and income or education.

5 Conclusion

People suffer low financial well-being when their incomes fall short of their aspirations. We find that such people are less risk-averse and less loss-averse than people who enjoy high financial well-being. We also find that competitive and status-seeking people are less risk-averse than people who are not as competitive and status-seeking, and that status-seeking people are less loss-averse than people who are not as status-seeking.

People with relatively low income can enjoy financial well-being as high as people with high incomes as long as their aspirations do not exceed their incomes. A crisis, such as one in 2008, is likely to tamp aspirations along with incomes, mitigating its effect on financial well-being. Conversely, economic liberalization, as in China, might decrease financial well-being if aspirations rise faster than incomes.

References

[1] Alessie, Rob, Stefan Hochguertel & Arthur van Soest (2004) "Ownership of Stocks and Mutual Funds: A Panel Data Anlaysis." Review of Economics and Statistics, 86(3), 783-796

[2] Argyle, Michael (1999) "Causes and Correlates of Happiness" in The Foundations of Hedonic Psychology, 353-373

[3] Beckmann, Daniela & Menkhoff, Lukas (2008) "Will Women Be Women? Analyzing the Gender Difference among Financial Experts." Discussion Paper No. 391. ISSN 0949-9962

[4] Cassidy, Tony & Lynn, Richard (1989) "A Multifactorial Approach to Achievement Motivation: The Development of a Comprehensive Measure." Journal of Occupational Psychology, 62, 301- 12

[5] Cesarini, David, Christopher J. Dawes, Magnus Johannesson, Paul Lichtenstein & Bjrn Wallace, (2010) "Genetic Variation in Preferences for Giving and Risk Taking." Quarterly Journal of Economics, 124 (2) 809-842

[6] Charness Gary, & Uri Gneezy (2007) "Strong Evidence for Gender Differences in Investment." Working Paper available at SSRN: http//ssrn.com/abstract=648735

[7] Consumer Federation of America, (January 9, 2006) "How Americans View Personal Wealth vs. How Financial Planners View This Wealth," press release http://www.americasaves.org/downloads/www.americasaves.org/01.09.2006.pdf.

[8] Diener, Ed, Eynkook Suh, Richard Lucas, & Heidi Smith (1999) "Subjective Well-Being: Three Decades of Progress." Psychological Bulletin, Vol. 125 (2) 276-302

[9] Dubins, L.E., & Savage, L.J (1976) "Inequalities for Stochastic Processes." Dover, New York.

[10] Friedman, Milton & Leonard. J. Savage, (1948) "The Utility Analysis of Choices Involving Risk." Journal of Political Economy, LVI (August), 279-304

[11] Johnson, Wendy & Robert Krueger (2006) "How Money Buys Happiness: Genetic and Environmental Processes Linking Finances and Life Satisfaction." Journal of Personality and Social Psychology, Vol. 90 (4), 680-691

[12] Kahneman, Daniel., Ed Diener, & Norbert Schwartz (1999) "The Foundations of Hedonic Psychology."New York, Russel Sage Foundation.

[13] Kahneman, Daniel & Amos Tversky (1979) "An Analysis of Decision Under Risk." Econometrica, Vol. 47(2), 263-292

[14] Koszegi & Matthew Rabin (2006) "A Model of Reference Dependent Preferences." Quarterly Journal of Economics, Vol. 121, 4. 1133-1165.

[15] Kuhnen, Camelia M. & Joan Y. Chiao (2006) "Genetic Determinants of Financial Risk Taking." PLoS ONE 4, no. 2 (February 2009): e4362, http://www.plosone.org/article/info:doi%2F10.1371%2Fjournal.pone.0004362

[16] Larrick, Richard P., Chip Heath, & George Wu (2009) "Goal-Induced Risk Taking in Negotiation and Decision Making." Social Cognition 27, 342-364

[17] Lopes, Lola (1987) "Between Hope and Fear: The Psychology of Risk." Advances in Experimental Social Psychology. 20, 255-295.

[18] Lopes, Lola & Gregg C. Oden (1999) "The Role of Aspiration Level in Risk Choice: A Comparison of Cumulative Prospect Theory and SP/A Theory." The Journal of Mathematical Psychology, 43, 286-313.

[19] Markowitz, Harry (1952) "The Utility of Wealth." The Journal of Political Economy, LX(2), 151-158

[20] Moskowitz, Tobias J. & Annette Vissing-Jorgensen (2002) "The Returns to Entrepreneurial Investment: A Private Equity Premium Puzzle?" American Economic Review, 745-778

[21] Sapienza, Paolo, Luigi Zingales, & Dario Maestripieri (2009) "Gender differences in financial risk aversion and career choices are affected by testosterone." Proceedings of the National Academy of Sciences U.S.A., 106, 15268-15273.

[22] Shefrin, Hersh & Meir Statman (2000) "Behavioral Portfolio Theory." Journal of Financial & Quantitative Analysis, 35(2), 127-151

[23] Tversky, Amos, & Daniel Kahneman (1991) "Loss Aversion in Riskless Choice: A Reference-Dependent Model." Quarterly Journal of Economics, 106, 1039 1061.

Table 1: Explaining Financial Wellbeing

Variable	**(1)**	**(2)**
Competitiveness	-0.078	
	(0.080)	
Status Seeking		0.007
		(0.077)
Education	0.175***	0.175***
	(0.029)	(0.029)
Income	0.951***	0.948***
	(0.096)	(0.096)
Age	0.955***	0.971***
	(0.133)	(0.135)
Female	0.011	0.019
	(0.085)	(0.085)
Pseudo R2	0.0280	0.0279
Observations	1759	1759
* $p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$		

Note: Standard errors are in parentheses.

Table 2: Explaining Risk-Aversion

Variable	(1)	(2)
Financial Wellbeing	0.048***	0.049***
	(0.016)	(0.016)
Competitiveness	-0.199***	
	(0.095)	
Status Seeking		-0.236***
		(0.079)
Education	0.024	0.031
	(0.030)	(0.029)
Income	0.121	0.129
	(0.085)	(0.085)
Age	1.077***	1.077***
	(0.138)	(0.138)
Female	0.466***	0.469***
	(0.087)	(0.087)
Pseudo R2	0.0188	0.0181
Observations	1759	1759
* $p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$		

Note: Standard errors are in parentheses.

Table 3: Explaining Loss-Aversion

Variable	**(1)**	**(2)**
Financial Wellbeing	0.032**	0.033**
	(0.016)	(0.016)
Competitiveness	0.054	
	(0.080)	
Status Seeking		-0.181**
		(0.078)
Education	-0.050*	-0.042
	(0.029)	(0.029)
Income	-0.070	-0.053
	(0.088)	(0.088)
Age	0.816***	0.737***
	(0.135)	(0.137)
Female	0.341***	0.310***
	(0.086)	(0.086)
Pseudo R2	0.0080	0.0086
Observations	1759	1759

* $p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$

Note: Standard errors are in parentheses

Figure 1: Expected utility function: Utility is a function of wealth

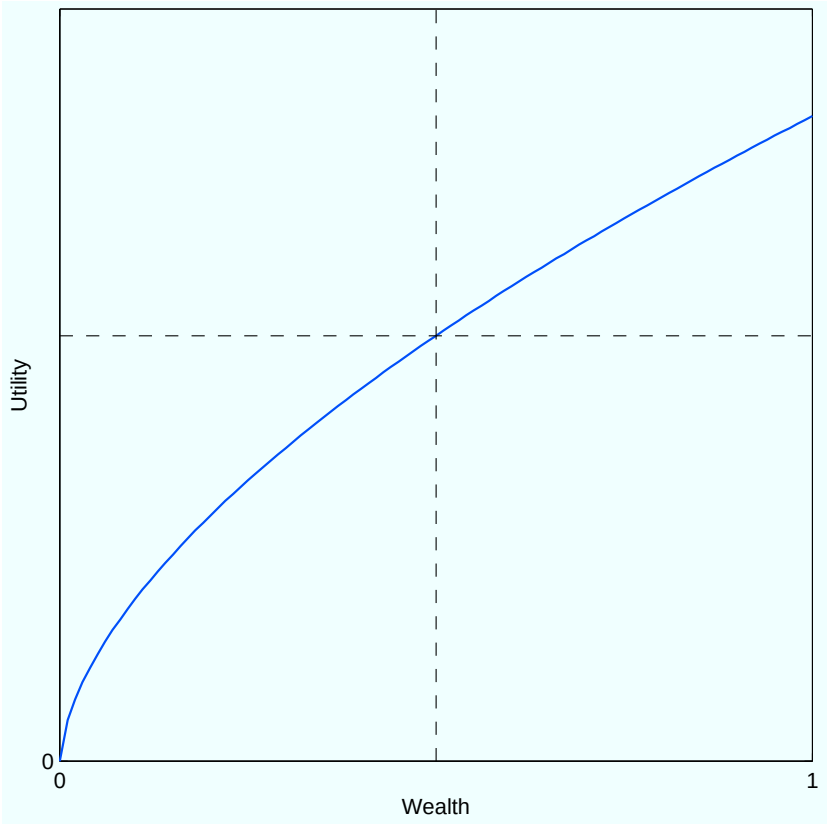

Figure 2: Prospect theory function: Value is a function of gains and losses

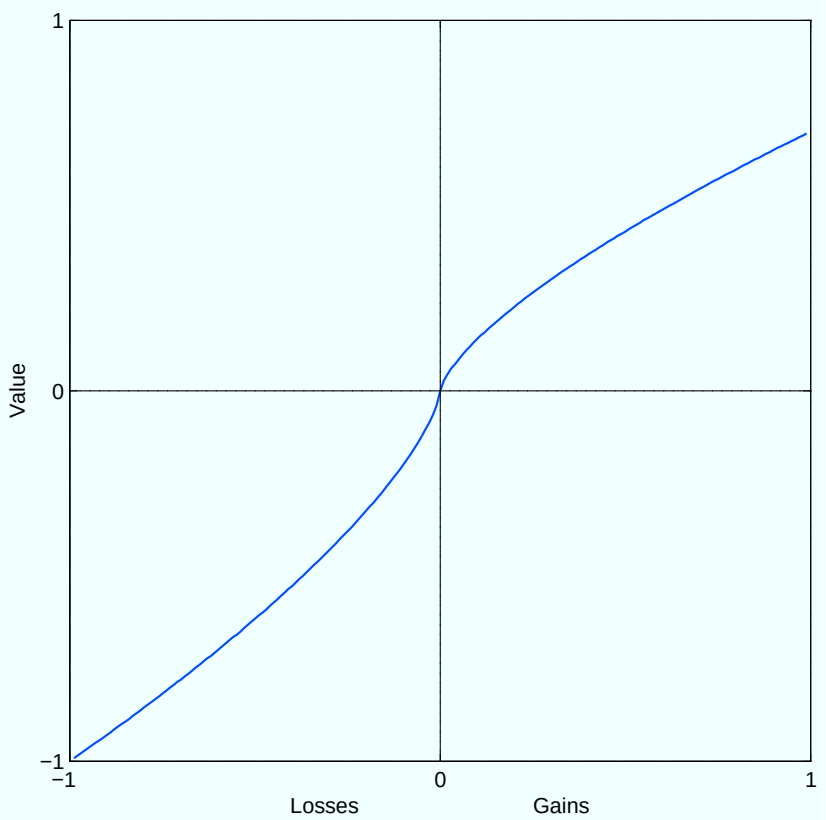

Figure 3: The association between financial well-being and risk-aversion: People with low financial well-being have low risk-aversion and people with high financial well-being have high risk-aversion

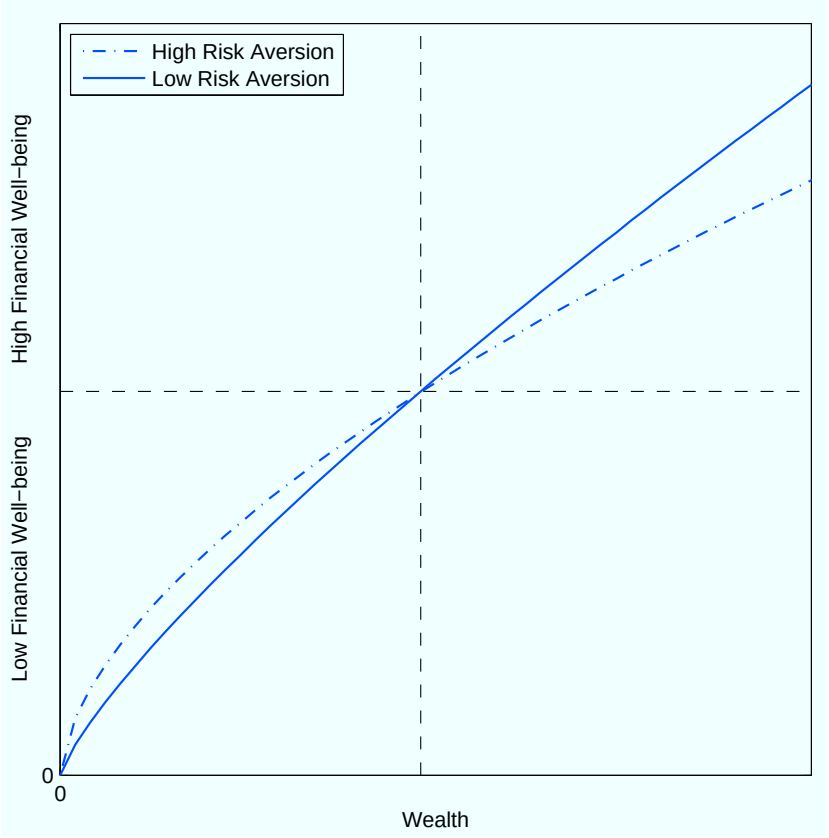

Figure 4: The association between financial well-being and loss-aversion: Low financial well-being is associated with low loss-aversion, and high financial well-being is associated with high loss-aversion.

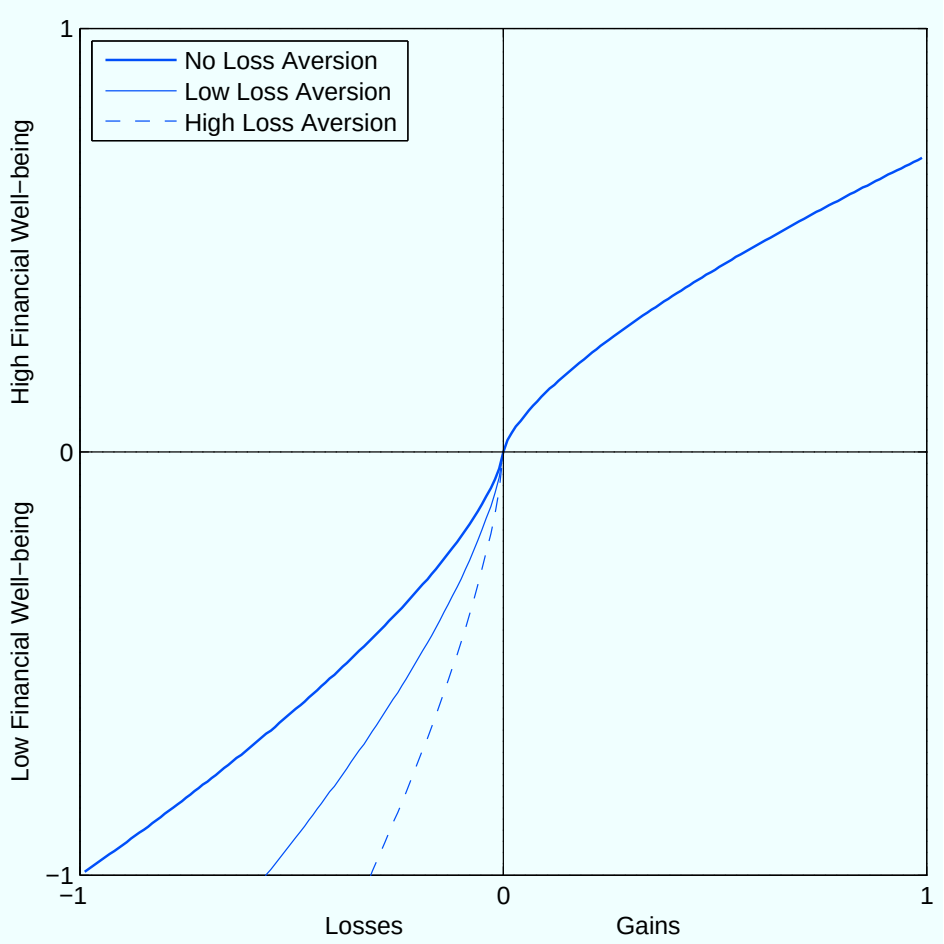

Figure 5: The association between financial well-being and aspirations as reference points

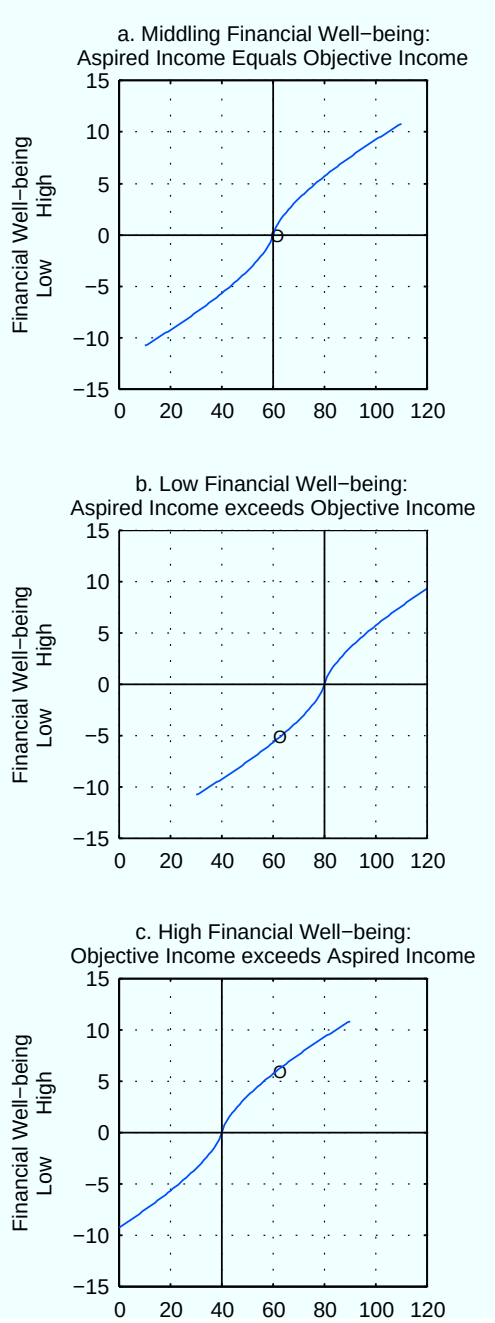

Figure 6: The association between competitiveness, status-seeking and risk-aversion: Low competitiveness and status-seeking are associated with high risk-aversion. High competitiveness and status-seeking are associated with low risk-aversion.

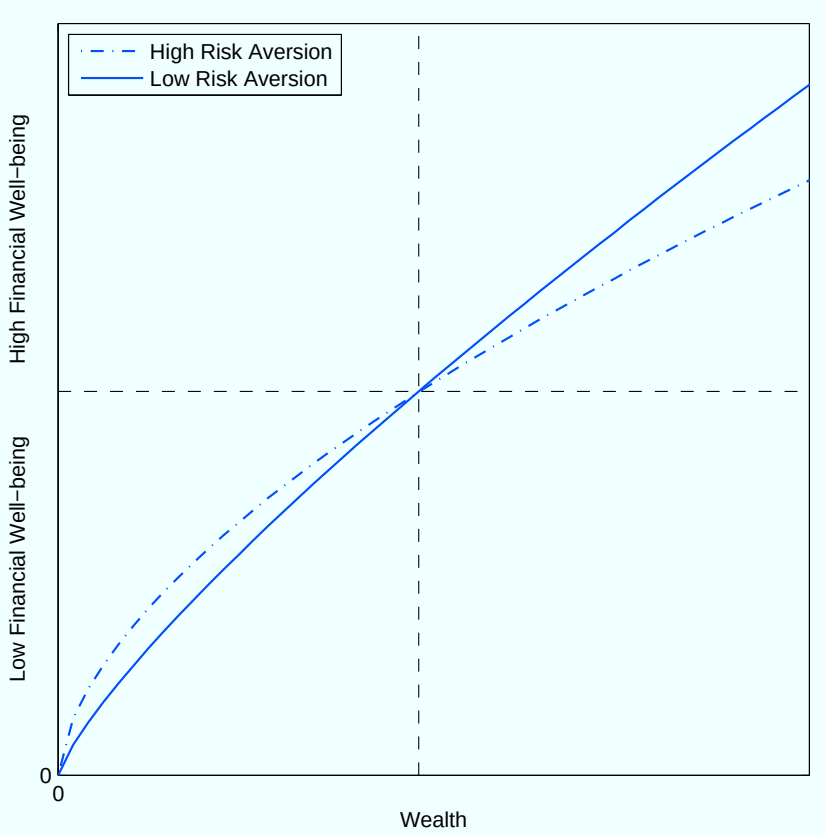

Figure 7: The association between competitiveness, status-seeking and loss-aversion: Low competitiveness and status-seeking are associated with high loss-aversion. High competitiveness and status-seeking are associated with low loss-aversion.

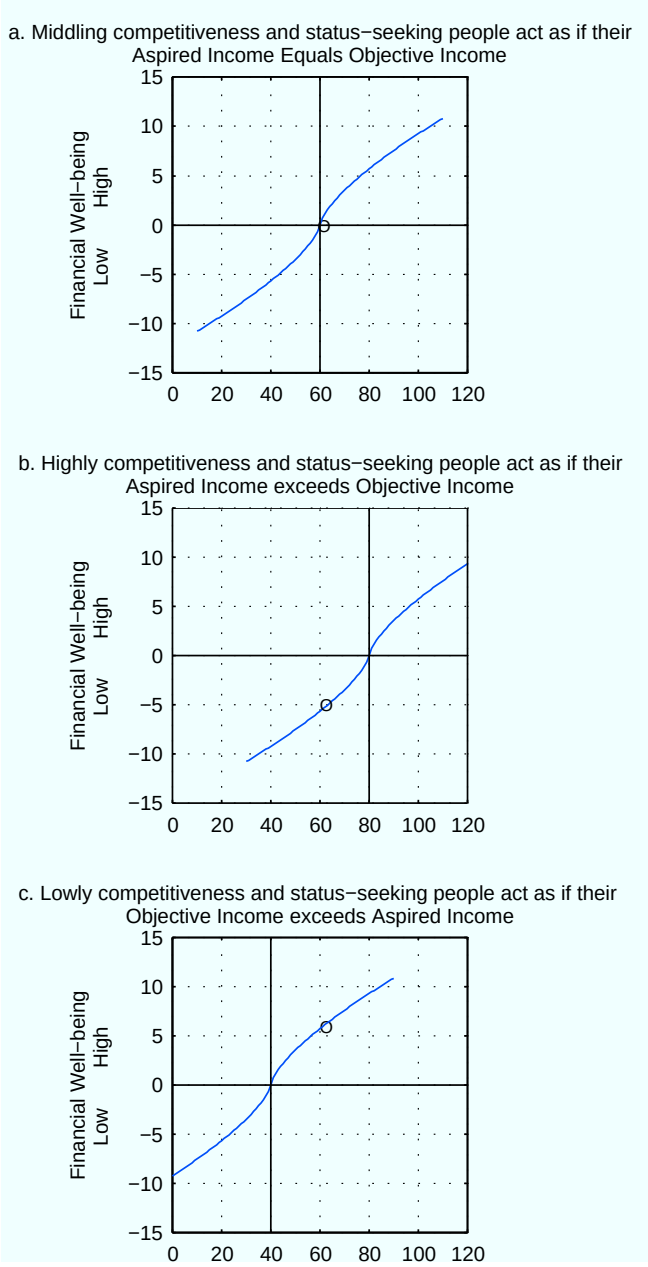

Figure 8: Financial Wellbeing and Income