# Risk attitude, investments, and the taste for luxuries vs. necessities

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**Abstract**

Financial advisors generally assume that people differ in their risk attitudes, and they sometimes try to assess these attitudes with questionnaires about risks. But attitudes toward risks are influenced by many factors that are irrelevant to ultimate outcomes. Arguably, what is most important is the utility of money. Some people are satisfied with a no-frills retirement, while others hanker after travel, yachts, and large legacies. The latter group should take risks, if anyone should, as their utility for money is less concave, more linear. I report two questionnaire studies in which questions about risk itself were uncorrelated with answers to direct questions about the utility of money and with answers to questions about the taste for luxuries vs. necessities, which were correlated in reasonable ways with each other. Questions about risk may measure differences in the utility of risk itself, which might be more salient than it should be for determining optimal long-run investment strategies.

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# 1 Introduction

It is generally recognized that most people who save money for retirement fail to make optimal decisions about saving (Benartzi & Thaler, 2007). Most people save too little. That is, the gain in expected utility in their later years from additional saving would exceed the loss in their earlier years. Young people may be too risk-averse, putting too much money in fixed-income investments. On the other hand, people are too risk-seeking to the extent to which they fail to diversify.

Paternalistic regulation may be warranted for some of these examples. Regulations should, and often do, discourage company stock for pension funds, encourage saving, and encourage diversification. Paternalistic measures may be warranted by thinking of a person in the future as a somewhat different person, whose well-being may be neglected by the current person who inhabits (roughly) the same body. The future person would be upset at the current person's failure to provide (Parfit, 1984). The state may intervene to protect the interests of that future person, just as it protects the interests of current people against the neglect of their contemporaries.

Simple paternalism, however, does a poor job of taking individual differences into account. Here, regulation may be best achieved through a "libertarian paternalist" approach (Thaler & Sunstein, 2008), which gives people freedom while "nudging" them toward options that would benefit most people. For investments, it is generally assumed that people differ in their willingness to take risks. It is likely that the best investment options, with respect to risk differ considerably across individuals. For one thing, people face different profiles of income streams. A freelance writer (or freelance anything) typically faces considerable variability in income, and unpredictability over the long term. These should generally be compensated by less risky investment. But a tenured professor faces little variability or unpredictability and can thus afford to take more risks elsewhere, other things being equal. For another thing, people have different tastes for expenditures. Some people really value the "finer things" that money can buy, while others are convinced that the best things in life are free.

Theoretically, decisions about risk should conform to expected-utility theory. What matters are the probabilities of the outcomes and their utilities. For investing, the relevant utilities are those for money, or for the things that money can buy, when the investments are cashed in. Expected-utility theory implies that the utility function for money should determine decisions.

We have reason to think that people's choices about risk are influenced by many factors other than those that affect the utility of money for them. If decisions are distorted by these factors, people could choose options that are consistent with their immediate preferences yet not best for them in the long run, once the consequences happen.

Many investment companies and individual advisors try to assess the risk preferences of clients with questionnaires. All the examples of this that I have seen ask directly about risk attitude, in various ways. For example, TIAA-CREF provides questions like the following in its web site:

Which of the following portfolios is most consistent with your investment philosophy?

* a. Portfolio A will most likely exceed long-term inflation by a significant margin and has a high degree of risk.

* b. Portfolio B will most likely exceed long-term inflation by a moderate margin and has a high to moderate degree of risk.

* c. Portfolio C will most likely exceed long-term inflation by a small margin and has a moderate degree of risk.

* d. Portfolio D will most likely match long-term inflation and has a low degree of risk.

Yet, what ultimately matters is the income level of investors at different ages, and the wealth they pass to their heirs. The relevant issue is the utility (subjective value) of income and wealth. The best decisions are those that maximize the expected utility of the money obtained. For example, if I have a choice between $2,000,000 for sure and a 50% chance of getting either $1,000,000 or $4,000,000, I should take the gamble only if the difference between $2,000,000 and $4,000,000 matters more to me than the difference between $1,000,000 and $2,000,000. The former difference could matter less, if all I care about is what I could get for $2,000,000. I should not take the risk in that case.

Research in judgment and decision making has shown repeatedly that measures of risk attitude are influenced by many other factors aside from the utility of money (Baron, 2008; Schoemaker, 1993). For example, decisions about risks are affected by: general beliefs about risk taking as a character trait, such as a desire to avoid being foolhardy, or timid; personality traits such as impulsiveness, anxiety level, and sensation-seeking; social pressures connected with these beliefs; superstition; anticipation of emotional reactions to losses, such as regret, guilt feelings (if others are affected), and disappointment, which go beyond the financial consequences in terms of lost purchasing power; lack of understand of comparative risks and benefits, or the risk/benefit trade-off; mis-perceptions of probability, such as neglect or exaggeration of very low probabilities; and isolation of individual decisions, so that they are not seen in the context of a total portfolio of income streams from various sources. Simonsohn (2009) discusses the uncertainty effect, in which people often place less value on a gamble than on its lowest outcome. He suggests that people have a disutility for risk itself. If they do, then this disutility may be over-weighed because it is more immediate than the ultimate outcomes of investment decisions.

We might, then, expect to capture people's values for outcomes better with measures based on outcomes rather then hypothetical choices of gambles. In theory, outcome-based measures should be more consistent with the total utility of the individual over time. Goldstein, Johnson, and Sharpe (2008) have taken a step in this direction by asking people to evaluate probability distributions of retirement income, rather than the investments that might lead to these distributions. My approach here is to ask people to evaluate a sample of possible expenditures, which I then place, post hoc, along a continuum from necessities to luxuries.

# 2 Experiment

The experiment compares two measures of the utility of money with ratings of possible expenditures in retirement. One utility measure is a standard gamble. The other is what is (to my knowledge) a new form of difference measurement, i.e., direct comparison of intervals (Baron, 2008). The two methods are completely parallel in using the same numbers.

The ratings of expenditures allow me to do define a continuum of luxuries vs. necessities in terms of consensus among the subjects. Those items rated highly by everyone are considered necessities.

## 2.1 Method

Subjects were 77 members of a panel who did studies on the World Wide Web for pay. (Four others were omitted because they did the study too quickly to have read carefully.) Ages ranged from 20 to 76 (median 44); 36% were male.

The study began with 36 pages about expenditures after retirement (defined as no longer working or reaching age 65, whichever came last). The expenditures were:

owning one inexpensive car (vs. no car)

owning a second inexpensive car (vs. one inexpensive car)

owning two top-of-the line cars (vs. two inexpensive cars)

having access to a private airplane and pilot, on short notice

owning a boat that sleeps two

having an extra bedroom in your home, for visitors

having an extra two bedrooms in your home, for visitors, as opposed to one

having access to a vacation home (such as a time share) for 2 weeks each year

owning a vacation home or apartment

owning a television (as opposed to none)

owning a home theater

buying fresh fruit and vegetables daily (vs. occasionally)

having a high-speed (fiber optic or cable) Internet connection (as opposed to something that uses the phone)

spending $1000/year on clothing (including accessories and jewelry, vs. minimal maintenance

spending more than $5,000/year on clothing (including accessories and jewelry), vs. $100

traveling as a tourist for 2 weeks each year (vs. not at all)

traveling as a tourist for 4 weeks each year (vs. 2 weeks)

flying to see relatives (including children) or friends once a year

flying to see relatives (including children) or friends 5 times per year (as opposed to once)

going out to dinner once a week to an inexpensive restaurant (as opposed to special occasions only)

going out to dinner twice a week to an inexpensive restaurant (as oppose to once)

going out to dinner twice a week to a top-of-the-line restaurant (as oppose to twice to an inexpensive restaurant)

going to musical or theatrical events once a week (as opposed to rarely)

going to sports events once a week (as opposed to rarely)

going to movies once a week (as opposed to rarely)

regularly buying wine that costs about $10 for an ordinary bottle

regularly buying wine that costs over $20 for an ordinary bottle

hiring someone to clean your home once per week

hiring someone to maintain a garden or lawn

hiring a chauffeur or cook

being able to hire a personal assistant or nurse if you need assistance for health reasons

being able to buy appropriate presents for friends and relatives on holidays, birthdays, etc.

donating $1,000 to charity each year (as opposed to less than $100)

donating $10,000 to charity each year (as opposed to $1,000)

leaving a legacy of $1,000,000 on your death, as opposed to very little

leaving a legacy of $10,000,000 on your death, as opposed to $1,000,000

The order was reversed for half the subjects. Order had no effect on any measures of interest and thus ignored. (And likewise for the order of question types described later.) After each item, the subject answered the following:

How does this affect what is important to you about your life as a retiree or senior?

* I don't care about this at all.

* This would be nice, but it would have little effect.

* This would have a noticeable effect.

* This would have a large effect.

* This is absolutely essential.

The last 20 items consisted of 10 items about direct utility measurement and 10 about risk. Five of the utility items were of this form:

Which would have a greater effect on what is important to you about your life as a retiree or senior?

* The difference betwen a household annual (pre-tax) income of $40,000 and [$50,000, $60,000, $70,000, $80,000, $90,000], or

* The difference between [$50,000, $60,000, $70,000, $80,000, $90,000] and $120,000.

The figures in brackets were for the intermediate value, which increased from $50,000 to $90,000 over the five pages (or decreased, for half the subjects). Then the sequence was repeated, again with $40,000 as the lowest income, but with all other differences from $40,000 multiplied by 3, so that the steps were in increments of $30,000 instead of $10,000 and the top income was $280,000 instead of $120,000. (Order of the two sequences was reversed for half the subjects.)

The other ten pages (which came first for half the subjects) were of the form:

Supposed you had a choice of two investments for retirement. Each would provide your sole income during your entire retirement at the given rate (the same for all years). Which would you choose?

* This one would pay [$50,000, $60,000, $70,000, $80,000, $90,000] per year (in current dollars) throughout your retirement.

* This one has a 50% chance of paying $40,000 per year and a 50% chance of paying $120,000.

The numbers used, and the orders, were the same as for the difference question. Because of this matching, I could directly compare the subject's risk attitude to the prediction of expected-utility theory.

## 2.2 Results and discussion

I calculated three measures for each subject. One, which I shall call necessity fever, was the slope of the linear regression of the subject's ratings (0-4) of the 36 expenditure items on the mean ratings of all the subjects. A high positive slope indicated that the subject rated items as essential when they received such high ratings from others, and as unnecessary when others gave them low ratings. A low slope indicated a tendency to rate the "essential" and "inessential" items (as determined from other subjects' ratings) similarly, hence to have higher than average relative utility for the luxury items, which were, presumably, those that most subjects rated as less than essential. A low slope should predict a less concave (more linear) utility function for money.

The other two measures were simply the mean responses to the difference items and the gamble items, where 1 indicates that the subject accepted the gamble or thought that the difference between the intermediate and high amounts was larger than the difference between the low and intermediate amounts. These means would be 0.7 for those who were risk neutral and had linear utility functions (assuming that these subjects would be indifferent when the intermediate value was equidistant from the high and low values, so that they would respond randomly). Numbers lower than 0.7 indicated risk aversion or concave utility.

The means were 0.22 for the gambles and 0.42 for the difference measures. Subjects were generally risk averse and had concave utility functions. (For the gambles, 6% were greater than 0.8, the highest possible value for risk neutrality, and 16% were greater than 0.8 for the difference measures, indicating convex utility functions.) The difference between gambles and difference measures was highly significant, which indicates that risk aversion cannot be explained entirely in terms of the utility function as measured by difference judgments. Indeed, the two means were uncorrelated across subjects ($r = .11$, $p = .34$).

Of greatest interest were the correlations of these two measures with the necessity fever measure. As hypothesized, the correlation between slope, the necessity-fever measure, and the difference measure was negative and significant ($r = -.41$, $p = .0002$, $p_{rep} = .99$). However, the correlation between necessity fever and the gamble measure was essentially zero ($r = .05$, slightly in the wrong direction). It is unlikely that this result is due to the unreliability of the gamble measure itself, as the ten items had a reliability ($\alpha$) of .88. Moreover, the two dependent correlations (.05 and $-.41$) were significantly different ($p = .0008$, $p_{rep} = .99$).

I computed a second necessity-fever measure by asking how each expenditure item correlated across subjects with *sum* of the gamble measure and the difference measure for each subject. The idea is to assume (against the apparent facts) that both the gamble measure and difference measure are measuring a similar dimension of risk attitude, then estimate that attitude for each subject by taking their sum (positive sums indicating less risk aversion). We would expect positive correlations for luxury items (the ones with low means) and negative correlations for necessity items (with high means). These item correlations in fact correlated $-.62$ with the item means, across items. To get the second necessity fever measure, I correlated these item correlations with each subject's responses to the expenditure items, thus producing a correlation for each subject as the second measure. This measure correlated .10 with the gamble measure, across subjects (n.s.) and .52 with the difference measure ($p = .0000$, $p_{rep} = 1.00$, rounded; again the two correlations were significantly different, $p = .0003$, $p_{rep} = .99$). Thus, the difference measure was doing all the work.

Some other results were of interest. The variance of the risk measure was lower than that of the difference measure (.062 vs. .118, $p = .0060$ for the difference, $p_{rep} = .96$). It might have turned out the other way, which would have implied that paternalistic policies were more justified, on the ground that preferences for ultimate outcomes were similar across people. The obtained result implies the opposite, that people differ more in their utility functions than

what we would assume from their risk preferences.

Risk aversion as determined from the gambles, and concavity as determined from the utility measure, were both higher for the larger amounts of money ($280,000 maximum as opposed to $120,000). The means were .33 (low) vs. .52 (high) for utility measures, and .14 (low) vs. .30 (high) for gambles, on the same 0–1 scale as described earlier. This result is difficult to interpret without more information about the shape of the utility function. For example, we so not know whether subjects thought of $40,000 or $0 as the reference point.

I replicated this study with 65 undergraduate students in my class on judgments and decisions, as part of a homework assignment: 58% males, ages 18–22 (median 20), a majority majoring in Philosophy, Politics, and Economics. I collapsed four of the expenditure items into two ("having access to a private airplane and pilot, on short notice, or a boat that sleeps two", "going to musical, sports, or theatrical events once a week (as opposed to rarely)"), and the two income ranges were $40,000–$120,000 and $80,000–$240,000. Otherwise the method was the same.

The mean difference measure was .54, and the mean gamble measure was .41, suggesting that the students' utility functions were less concave on both measures, although we cannot be sure because the items were different. Once again these measures were significantly different ($t_{64} = 3.23$, $p = 0.0019$, $p_{rep} = .98$), indicating greater concavity for the gamble measure. And, once again, the variance was higher for the difference measure (.066) than for the gamble measure (.037; $p = .0199$ for the difference, $p_{rep} = .93$). The necessity fever measure correlated $-.34$ with the difference measure ($p = .0062$, $p_{rep} = .98$), and .07 with the gamble measure, again slightly in the wrong direction (and the difference was significant, $p = .0091$, $p_{rep} = .95$). The second necessity measure (described above) correlated .68 with the difference measure ($p = .0000$, $p_{rep} = 1.00$) and .04 with the gamble measure (n.s., and the difference was significant, $p = .0000$, $p_{rep} = 1.00$). Once again, the difference measure is more valid in predicting expenditure attitudes.

# 3 Conclusion

The results suggest two conclusions. First, asking people directly about their risk preferences seems to fail to capture what ought to be a substantial component of their utility function for money in retirement, their relative taste for luxuries vs. necessities. The failure of hypothetical gambles to capture this element suggests that the method is heavily influenced by attitudes toward uncertainty itself, at the expense of ultimate outcomes. Although the utility of uncertainty may be relevant, so too is the utility of the goods that money can buy in the end.

The failure of gambles to capture the utility for the use of money is not the result of a lack of individual differences. These differences are clearly present and easily measured. The technique used here seems simple to use for a sample without any particular education in decision making. Some people seem to have substantial utility for luxuries, so that they ought to be willing to take risks in hopes of being able to afford those luxuries. Other people have no use for

luxuries and have no conflict with the single goal of trying to insure a no-frills retirement. These two extreme types do not seem to be differentiated by their risk attitude as assessed from hypothetical gambles. But, if we ask them about their utility for money using a method of comparing differences, the results do reflect their different tastes.

It is not clear what the implications are for regulation. If regulations discouraged the use of risk-preferences and encouraged the use of utility differences and direct questions about expenditures, then people would receive recommendations that go against their initial inclinations. The risk-averse luxury lover would be advised to invest in aggressive growth funds, raising fears. In a sense, this advice would create a conflict between her (probable) future self and her present self. Clearly, any regulation must be at most a nudge. People probably cannot be forced to be altruistic toward future people, at the expense of their current peace of mind, which has its own utility.

It might be easier to deal with the opposite conflict, in which a risk lover with no interest in luxuries must be told, "Why take risks? What are you going to do if you make a lot of money? Do you care that much?" If this person says, "I find risks exciting," then that is an answer, but at least the person has been forced to face the issue.

More generally, the present results case doubt on the use of hypothetical gambles to measure utility functions. The results add to the literature suggesting that standard gambles are a poor measure of utility. The results also suggest that the use of a simplified measure based on comparing differences is feasible and easy enough for people to use.

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