Summer 5-19-2016

Causes and Consequences of Risk Aversion in Middle Adulthood

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Submitted in partial fulfillment
Of the requirements for the degree of
Master of Arts in Economics
Hunter College of City University of New York

2016

Thesis Sponsor:

May 10, 2016 — Karna Basu
Date — First Reader

May 4, 2016 — Purvi Sevak
Date — Second Reader

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Abstract

According to the *Census Bureau*, the median asset value of people over 65 is over $170,000, and decisions about investments that led up to possessing these assets would have been made prior to retirement, during prime working age. In this paper, I examine some determinants of those decisions. We know that risk aversion plays a role in stochastic decision-making. However, I expand on that knowledge by analyzing how risk aversion may affect decision-making over time, what effects risk aversion may have on financial and health decisions, and whether one's level of risk aversion varies over the lifetime, using the *Health and Retirement Study* dataset. I find that risk aversion is correlated with certain maternal factors, income, depression, and ethnicity. Risk aversion, then, is correlated with decisions about financial investments and the likelihood of partaking in certain risky behaviors. The tendency to be variable in risk aversion preferences appears divided based on internal factors versus external circumstances.

Causes and Consequences of Risk Aversion in Middle Adulthood

Much research has been done on the role of risk aversion in stochastic decision-making, but there is a dearth of research on how risk aversion affects decisions made over time. There is even less research on how one's level of risk aversion may change over the lifetime. The Census projections show that between 2000 and 2030, the number of Americans 65 and older will double (Bellante & Green, 2004). We are currently just past the half-way mark to this doubling of the elderly population, which makes it very relevant to examine how the people in middle adulthood, approaching retirement age, make decisions, particularly those that pertain to health and financial standing, as this is the population that controls the majority of assets (Voronovitsky, Gottschalck, & Smith, 2013).

According to the Census Bureau, the median asset value of people over 65 is over $170,000. This fact begs to question: how do the elderly increase their asset value so much, when the median asset value for people between 55 and 64 is approximately $144,000 and the median asset value for people between 45 and 54 is approximately $85,000. Perhaps these patterns are cohort effects, and those people who will turn 65 in the next 15 years may not possess as much assets as the previous cohort, but one thing remains true: the investments that people make between 35 and 65 will affect what their worth in assets will be in the retirement years.

We consider 20-49 to be "prime" working years, but Kautonen, Luoto, and Tornikoski (2010) believe that one's work history between 50 and 64 years of age more strongly impacts different aspects of one's life. Thus understanding more about decision-making in both the earlier years and as the overall population ages past 65 years old will help those around the

elderly, including the government, to be able to predict behaviors of the elderly and take care of the elderly population better.

Smoski et al. (2008) considered behavioral withdrawal to be a method of avoiding unpleasant situations while also carrying the potential to miss out on rewarding situations. Behaviorally speaking, risk aversion can be considered a type of withdrawal since being highly risk averse can result in making decisions that will limit potential positive outcomes and rewards. If risk-taking is defined as behavior that can lead to possible rewards but might also have negative consequences (Smoski et al., 2008), then risk aversion would be behavior that aims to avoid negative consequences but may also result in missed rewards and opportunities. Our attitude toward risk is present in many decision we make, be it financial, health-related, or something as mundane as how we cross the street.

Bernoulli (1954) believed that it is not the price of a good, or in this case, choice alternatives, that we use to determine expected value, but rather the utility that the item, or decision, yields for the individual. When making a decision, the more risk averse we are, the more weight we put on the negative consequences that could occur, and thus the utility of that option is lowered. Risk aversion can also create a skewed perception that the negative consequence is much more likely to happen than it actually is. Together, this combination decreases the expected value of the outcome, which ultimately results in the safe choice having a higher expected value. Someone who is highly risk averse will tend to choose the alternative that he believes will avoid negative consequences, or the safe choice.

While risk aversion may be responsible for engaging in fewer behaviors that might be seen as risky to health, such as smoking (Pfeifer, 2012) and for investing more into insurance (Outreville, 1998), strong risk aversion can also hold us back. Someone who is highly risk averse

is less likely to change jobs, is more likely to invest money into safe assets with low payoffs than risky assets with high payoffs, and is less likely to move (Guiso & Paiella, 2004).

We can see that there are quite a number of consequences to being risk averse, both positive and negative. Since we know that risk aversion plays a role in our every day life and the decisions we make, it is important to study further and understand better the consequences of risk aversion on our choices over the lifetime, what factors can influence how risk averse we are, whether an individual's level of risk aversion is stable over the lifetime or if it changes according to circumstance, and if it is the latter, then what kind of circumstances bring about that change? It is particularly important to know whether our mental and physical state has an impact on risk aversion, and how that would affect the decisions we make.

In this paper, I aim to answer three questions: (1) what are specific causes of risk aversion, mainly mental and physical state, (2) what are the consequences of risk aversion and its importance on decision-making on health and financial behavior in middle adulthood over time, and (3) what factors affect whether one's level of risk aversion remains stable or varies over time?

Literature Review

There are numerous factors that affect risk aversion, whether increasing it or decreasing it. There may be biological differences in evaluation of risk based on age (Morin & Suarez, 1983; Bellante & Saba, 1986; Riley & Chow, 1992; Zuckerman, 1994), based on gender (Levin, Snyder, & Chapman, 1988; Zuckerman, 1994; Herch, 1996; Jianakoplos & Bernasek, 1998), or based on race and ethnicity (Zuckerman, 1994; Herch, 1996). Jianakoplos and Bernasek (1998) also found that race and the number of children one has interact with gender to further impact risk aversion.

Risk aversion can also be affected by social learning, such as through education (Herch 1996; Halek & Eisenhauer, 2001; Smoski et al., 2008), or through marital status (Zuckerman, 1994; Jianakoplos and Bernasek, 1998; Halek & Eisenhauer, 2001). Socioeconomic status also correlates with risk aversion (Zuckerman, 1994; Herch, 1996).

Mental health, particularly Major Depressive Disorder, has been found in numerous studies to have an affect on risk aversion (Zuckerman, 1994, p.123; Eisenberg, Baron, & Seligman, 1996; Must, Szabó, Bódie, Szász, Janka & Kéri, 2006; Smoski et al., 2008; Cella, Dymond, & Cooper, 2010; Smoski et al., 2011).

The extent of risk aversion one has and how it affects his decisions may change with certain circumstances or over time. In addition to changing with age (Riley & Chow, 1992), risk aversion has been found to change with the mental state. Kramer and Weber (2012) showed that financial portfolios change over the course of a year depending on whether or not one suffers from Seasonal Affect Disorder, and that the severity of the disorder further impacts the percentage of risky assets one invests in.

Methods

Data

I am using a sample of 12,202 respondents from the University of Michigan Health and Retirement Study (HRS) dataset to run my analyses. The HRS is a longitudinal panel dataset that surveyed Americans approximately every two years between 1992 and 2012. While I have data for 11 waves out of a total 13 (only from the even years), for many analyses, I transform the data into panel format, creating 11 observations for each individual in order to better see how specific variables may affect the causes and effects of risk aversion. The total number of observations then becomes 134,222, though not all are included in every analysis, as the variables in my

regressions may limit who is included. To be more specific, because risk aversion is a module only asked in waves 4 through 8, excluding wave 7, the majority of my analysis were made up of $N = 6{,}736$ responses.

The survey is conducted face-to-face with the respondent and their spouse. The HRS asks questions about health status, retirement decisions, income, assets, and behavioral questions about smoking, drinking, and having medical check-ups.

Demographics. My sample is aged between 35 and 85, as I follow this cohort as they age without adding anyone else in later waves.

Collected through the panel dataset and only for the 6,736 respondents who answered the risk aversion module, I find the following distributions. There were 2,205 respondents who identified as male and 4,531 respondents who identified as female. There were 5,529 respondents who identify as white, 965 respondents who identify as black, and 550 respondents who identified as ethnically Hispanic. There were 130 respondents who identified as Jewish, and 1,799 respondents who identified as Catholic.

The distribution of education in my sample is as follows: 5,176 respondents had a high school degree or lower, 981 respondents had an Associate's degree or a Bachelor's degree, and 579 respondents had a Master's degree or higher.

Marital status, which could change with each wave, had the following distribution: 4,837 observations were married, 21 were married but with an absent spouse, 194 were partnered, 116 were separated, 715 were divorced, 689 were widowed, and 160 were never married.

Health. One of the primary purposes of this analysis is to understand whether physical or mental health affects risk aversion preferences, and whether risk aversion in return affects health. One's perceived health, whether health limits one's ability to work, difficulty getting up from a

chair, having cancer, and having heart problems were the variables I used to measure physical health. Smoking and drinking alcohol were considered as behaviors risky to one's health.

In addition to stating whether one has a psychological disorder, and whether one has memory problems, depression was used to measure mental health. Depression was measured through the Center for Epidemiologic Studies Depression (CES-D) Scale (Radloff, 1977). Respondents were asked about a total of eight possible symptoms of depression, such as feeling lonely, feeling sad, not feeling happy, and other similar symptoms. The more symptoms the respondent said they had, the higher their final CES-D score.

Other researchers using the HRS dataset used a 3-or-more symptom cutoff to determine if individuals in their sample had probable depression (Steffick, 2000; Paulson & Lichtenberg, 2013). I wanted to be more certain of the likelihood of depression, and therefore, I chose my cutoff to be 5 or more reported symptoms before I considered an individual to have depression for that wave. I increased my cutoff for my analysis because I am not looking at probable depression, but rather more severe depression that can have an impact on behavior.

Of 6,736 observations, 3,195 were no symptoms of depression, 2,869 were 4 or fewer symptoms of depression, and 672 were 5 or more symptoms of depression.

I also measured how many respondents had transient depression, or short-term depression, for only one wave, between waves 1 and 8, and how many respondents had chronic depression, or long-term depression, since the beginning of the study in wave 1 until wave 8. Of 6,736 respondents, 1,128 had transient depression between waves 1 and 8; 65 respondents had chronic depression from wave 1 until wave 8.

Risk aversion. The HRS measured risk aversion in waves 4 through 8 as a categorical variable, dividing respondents into one of 6 categories based on their responses to items that

asked whether the respondent would leave his current job for another job with different chances of doubling the current salary or halving it. The HRS did not ask the risk aversion module of anyone older than 65, so with every wave, some of my sample aged out of the question. The risk aversion module was not asked of anyone in wave 7.

I combined the three least risk averse categories and the three most risk averse categories to form a binary variable for risk aversion, rather than six possible risk aversion classifications. Of the total 6,736 respondents, 1,437 were classified as not being risk averse, while 5,299 were classified as risk averse.

Variance of risk aversion. Because the original dataset includes measures of risk aversion for four waves, which represent a time period of approximately ten years, I was able to go back and analyze the variance in individuals' level of risk aversion. The purpose of analyzing the variability of preferences was to measure whether one's risk aversion stays constant over time or if it changes based on life events. Of 1,787 total respondents, 916 respondents reported the same risk preference over a period of 10 years while 871 respondents reported varying levels of risk aversion. In other words, approximately half of the total sample that responded to the risk aversion module maintained their level of risk aversion, while the other half varied in their preferences. In addition, I found that out of 835 respondents who changed preferences over time, 414 (49.58%) respondents increased risk aversion over time, and 421 (50.42%) respondents decreased risk aversion over time. After determining which respondents had stable levels of risk aversion, which had increasing levels of risk aversion, and which had decreasing levels of risk aversion, I transformed the data into panel format once again for stronger analysis.

Results

Causes of risk aversion. I ran a logistic regression to determine which factors in a person's life are most responsible for affecting one's likelihood of being risk averse. I found that being divorced (ß = -0.240, $p < .05$), the higher one's mother's education is (ß = -0.043, $p < .001$), being Catholic (ß = -0.128, $p < .10$), and exhibiting certain numbers (2, 4, 5, or 7) of depressive symptoms (ß = -0.180, $p < .10$; ß = -0.423, $p < .01$; ß = -0.295, $p < .10$; ß = -0.541, $p < .01$) are correlated with a lowered likelihood of being risk averse.

Being Hispanic (ß = 0.258, $p < .10$), the higher one's income is (ß = 0.000, $p < .10$), being female (ß = 0.472, $p < .001$), one's mother being alive (ß = 0.115, $p < .10$), and one's health limiting their ability to work (ß = 0.169, $p < .05$) are correlated with an greater likelihood of being risk averse. See Table 1 for detailed models.

Effects of risk aversion. I ran OLS and logistic regressions to analyze the effect of risk aversion on financial and health decisions, contingent on the type of variable the dependent variable was. Controlling for demographic information and income, I find that being risk averse is correlated with investing significantly less money into stocks (ß = -31040.0, $p < .05$). See Table 2 for details.

Being risk averse is also correlated with being less likely to smoke (ß = 0.109, $p < .001$), and drinking less alcohol (ß = -0.129, $p < .10$). Being risk averse is further correlated with investing into a greater number of insurances (ß = 0.0390, $p < .05$), and a greater likelihood of investing into life insurance (ß = 0.154, $p < .05$). See Table 3 for details.

Variance of risk aversion. I ran a logistic regression controlling for demographic differences to determine what factors might be related to risk aversion preference change over time. Identifying as Hispanic (ß = -.491, $p = .005$), the higher one's mother's education (ß = -.041, $p = .002$), the later the birth year (in other words, the younger one is; ß = -.035, $p = .011$),

identifying as white (ß = -.551, p = .011), perceived health to be fair or poor (vs. excellent; ß = -.262, p = .085; ß = -.558, p = .015), having cancer (ß = -.168, p = .084), and being second most risk averse or most risk averse (ß = -1.516, p < .001; ß = -1.932, p < .001) are correlated with a lowered likelihood of having variable risk aversion preferences over time.

Being a veteran (ß = .358, p = .016), identifying as Catholic (ß = .181, p = .052), smoking (ß = .289, p = .003), drinking alcohol (ß = .085, p = .018), and exhibiting 5 (vs. 0) symptoms of depression (ß = .492, p = .039) are correlated with an increased likelihood of having variable risk aversion preferences. See Table 4 for detailed model.

I then ran a similar logistic regression controlling for demographic differences to determine what factors might be related to one's risk preferences decreasing over time, in other words, what factors are related to one becoming more risk tolerant over time. Identifying as Jewish (ß = -1.095, p = .004), having more education (ß = -.070, p = .079), and being married but separated (ß = -1.826, p = .091) is correlated with a lowered likelihood of being risk tolerant over time.

Identifying as Hispanic (ß = .519, p = .042), being a veteran (ß = .329, p = .069), being female (ß = 1.195, p = .023), the higher education one's father had (ß = .034, p = .004), drinking alcohol (ß = .066, p = .072), and being third least (in other words, moderately) risk averse (ß = .570, p = .018) is correlated with a greater likelihood of being risk tolerant over time. See Table 5 for detailed model.

Discussion

Causes of risk aversion. Risk aversion is a characteristic that is affected by social learning and through one's circumstances such as education (Herch, 1996; Smoski et al., 2008), marital status (Zuckerman, 1994; Halek & Eisenhauer, 2001), and depression (Zuckerman, 1994;

Eisenberg, Baron, & Seligman, 1996; Smoski et al., 2008; Smoski et al., 2011). The findings in my sample are consistent with previous studies and shows that risk aversion is affected by some of the previously noted factors as well as other factors.

While one's own and one's father's education did not have a significant effect on the likelihood of being risk averse, one's mother's education was correlated with a lowered likelihood of one being risk averse. Prior research (Jianakoplos and Bernasek, 1998) and my results show that females are more likely to be risk averse. And while there was no significant interaction effect between gender and education, it is possible that being raised by a more educated mother gives the adult offspring some freedom in making decisions, even if the decision is a risky one.

According to Zetterdahl (2015), divorce is considered to create an uncertainty about future income, so one's decisions about financial investments are likely to change. This is supported by my results, which show that divorced people are also less likely to be risk averse. Being in a state of uncertainty might encourage one to make riskier decisions to try and ensure a more stable environment following divorce.

Also supported by prior research is that depression affects risk aversion. However, contrary to Smoski et al. (2008), my data shows that exhibiting symptoms of depression is correlated with one being less likely to be risk averse. It is possible that people with depression are actually more willing to take risks because they feel that they don't have anything to lose or would feel a certain excitement, which is usually missing from their lives, when they take on a risky decision. Despite only specific numbers of depressive symptoms being statistically significant, exhibiting any or all symptoms showed a negative effect, though not always significant. This trend means that exhibiting any sign of depression correlates with being less

likely to be risk averse, and thus depression itself, not only certain symptoms, might make one more likely to take risks.

One's mother being alive, but not one's father, correlated with one being more likely to be risk averse. Perhaps when one's mother is no longer alive, they, like people who have gone through divorce, feel uncertainty in their life and deal with those feelings by making more risky decisions.

People with a disability that limits one's ability to work are also more likely to be risk averse. This can be because the disability causes some fear in a person and makes them more vary of their decisions. If there are certain activities one cannot do due to poor health, it makes sense for them to not want to make risky decisions, in case the consequences of those decisions make their conditions worse.

Unlike what Halek and Eisenhauer (2001) found in their data, my results showed that Hispanics were more likely to be risk averse. I believe this is related to their initial endowment, which is typically less than that of whites', and might be less than blacks'. Potentially living in worse conditions and having less disposable income can be the reason behind Hispanics being less likely to make risky decisions, as they have less that they feasibly can risk.

Noussair, Trautmann, van de Kuilen, and Vellekoop (2013) found that church members are more likely to be risk averse than non-church members, and that Protestants were more risk averse than other religions. While my data did not include Protestants, I did find that Catholics (vs. other religions) were negatively correlated with being risk averse in my data, which is supported by the literature.

Somewhat counter-intuitively, I found that people with higher income are also more likely to be risk averse. I had expected to find that the more one earns, the more likely he or she

would be to make risky investments because one has more resources. However, it is likely that because risk aversion in this dataset was measured by the respondent's willingness to accept a gamble for a new job that had probability *p* of doubling one's income and halving one's income with probability 1-*p* (or *q*) versus staying at the job they currently had, the higher one's income is, the less they likely they would be to want to change jobs. Therefore, the results that are seen in my data regarding income may be internally biased by how the dependant variable was measured.

Effects of risk aversion. This leads us to examine what behaviors are affected by one's level of risk aversion. One evident behavior affected by risk aversion is financial decisions. I found that risk averse people invested significantly less into stocks. This makes sense, as stocks are considered to be a risky financial asset, and thus, someone who wishes to avoid risk would steer away from stocks.

Risk aversion affects health and behavioral decisions as well. Smoking and drinking alcohol are considered to be risky behaviors because they are associated with certain health risks, such as cancer (Carbone, 1992) and liver disease (Maddrey, 2000). I found that risk aversion correlated with being less likely to smoke cigarettes and, on average, to drink less alcoholic beverages. Risk aversion drives a person to think more about the potentially negative consequences of behaviors, which then discourages participation in those behaviors.

I also found that risk aversion is associated with investing into a greater number of insurances, and with a greater likelihood of investing into life insurance. Insurance is a protective tool. We tend to invest into insurance when we believe the benefit of having insurance will outweigh its costs, and the more insurances one invests in, the more they believe they will

benefit in the end. The positive correlation between risk aversion and investment in insurance is reflective of the desire to avoid potential negative consequences.

Variance of risk aversion. If one's level risk aversion can be affected by social learning and other circumstances in one's life (Zuckerman, 1994; Eisenberg, Baron, & Seligman, 1996; Herch, 1996; Halek & Eisenhauer, 2001; Smoski et al., 2008; Smoski et al., 2011), it is also possible that one's preferences can change (or not) over time due to some internal or external factor. I find that primarily internal factors seem to be correlated with one being more stable in his or her risk aversion preference over time. Being Hispanic, white, one's age (the younger one is), and even one's mother's education is correlated with a higher likelihood of not changing the level of risk aversion one has over a time period of 10 years. These are factors that are determined from birth and cannot be changed, and yet, they seem to be strongly correlated with one's preferences. One's health, having cancer, and identifying as risk averse also correlate with one being stable in preferences over time, even though they are more external in nature.

It seems that primarily external factors work in tandem with one's preferences and result in higher variability in his or her risk aversion preferences over time. Being a veteran, smoking, drinking, and exhibiting a certain number of depressive symptoms are all correlated with changing risk preferences. Veterans may have to learn to adapt their decision-making to the situation. Smoking cigarettes and drinking alcohol can affect one's behavior while under influence of the substances. Depression, similarly, affects the brain chemistry and could result in one showing different responses to risk over time. Being Catholic is the only factor that is usually intrinsic since parents usually raise children to follow religious ideologies, and that also correlates with having variable risk preferences.

One potential explanation for why we see these trends might be that humans tend to develop at a certain level of risk aversion that is determined through one's early years, in other words, a product of one's early life circumstances. Certain external factors might reinforce one's pre-existing preference for risk aversion, such as having poor health. Other external factors might discourage stability and teach that one has to be flexible because situations change, such as being a veteran. Whether one's preferences eventually become stable or variable is contingent on one's early and later life experiences, as a whole.

I took this analysis one step further to determine what factors encourage one to become risk tolerant, or less risk averse, over time. I found that being Jewish, more educated, and being married but with an absent spouse correlates with a lowered likelihood of becoming risk tolerant over time. Barsky, Juster, Kimball, and Shapiro (1997) also used the HRS data to evaluate risk aversion and risk tolerance, but they ran analyses on only one wave. Their results showed that Jews were the least risk averse of all other religions, but my results expand on this finding by showing that this pattern does not seem to hold over time, as Jews are significantly less likely than other religions to be risk tolerant. Similarly, unlike the results derived by Sung and Hanna (1996), my data shows that more educated people are also less likely to become risk tolerant over time. I believe this is because with education comes the knowledge of potential negative consequences to risky decisions, and thus, the higher one's education is, the less likely they are to become risk tolerant. The lowered likelihood of growing to be risk tolerant when married but with an absent wife may come from the social learning derived from the marriage and through the experience of having an absence spouse. Perhaps the negative consequences associated with the spouse leaving correlated with one also wanting to take less risks in other aspects of life.

On the other hand, I found that being Hispanic, being a veteran, being female, one's father's education, one's alcohol use, and being moderately risk averse correlate with an increased likelihood of becoming risk tolerant over time. Although Barsky, Juster, Kimball, and Shapiro (1997) find that Hispanics are less likely to be risk averse in a single wave, which my earlier data did not support, my current results imply that any absence of risk aversion behavior that Hispanics exhibit becomes stronger over time. Veterans were also more likely to be risk tolerant, which might be explained, as earlier, by veterans' necessity to make difficult decisions, which teaches them to be more comfortable with risky decisions. Females, in any single wave, are more risk averse than males, which is perhaps why, over time, their decisions can become less risk averse, as experiences grow.

The higher one's father education is, the higher the likelihood that one will become risk tolerant. This seems counterintuitive, as one's own education is related to the opposite effect, but the way one was raised and the effects of parental, and specifically paternal, education on one's own adult preferences do not have to correspond to how one's social learning affects preferences. Alcohol use, like veteran status, may correlate with more risk tolerance because alcohol changes one's behavior, and the more alcohol one intakes, the more in can change behavior and preferences over time.

Finally, being at a moderate level of risk aversion, as opposed to at a low or high level, is also correlated with an increased likelihood of becoming risk tolerant over time. I believe this is because once one is at a middle ground, one is already accustomed to making certain risks. Unless those decisions result in incredibly negative consequences, there is no reinforcement for becoming more risk averse. On the other hand, if there was no negative consequence, then one might feel like there is more to be earned from making more risky decisions. Thus, it makes

sense for someone at a moderate risk aversion to become more risk tolerant over time than for someone at any other level.

Conclusion

The purpose of this paper is to take a broad look at risk aversion in both a static and dynamic sense. First, I analyzed what factors affect whether or not one will be risk averse, and what the consequences of being risk averse are. Then, I worked to understand what factors affect one's stability or variability in risk aversion preferences over time. Finally I examined what factors are present one's preference for risk aversion decreasing, thus making one more risk tolerant, over time.

I find that many internal and external factors correlate with whether one is risk averse or not, whether one's preferences change, and in what direction. Gender, education, race, ethnicity, religion, as well as parent's education, marital status, depression, veteran status, and health are the most important factors that interact with one's risk preferences, both at a single period and over time.

This information is very important for both individuals to know and for anyone who advise individuals as they age, as these are factors that one must keep in mind when planning how best to invest in financial assets and how best to take care of one's health. As the number of people aging past 65 years old is growing, and as their health and financial standing becomes the responsibility of their families and the government, it is increasingly important to understand how this population makes decisions both as they approach this time and afterward as well.

Limitations

An important limitation in my analyses is the intrinsic setback of using a publicly available dataset. Data for some participants may be missing, and furthermore, the method in

which data were collected might differ by wave. As a result, there may be heterogeneity even between the same variables but in different waves. It is possible that there is enough information to impute any missing data and, perhaps, use instrumental variables in further analyses.

Another potential limitation is possible endogeneity in the analyses. Endogeneity problems arise when an unobserved factor is correlated with our observed effects. In my analyses in particular, it is possible that there were variables that were not measured by the original creators of the dataset that may be correlated with risk aversion or with its effects. Such variables may include parenting styles of one's parents or certain circumstances that were not accounted for such as if one was ever homeless or bankrupt. If factors like these are in fact correlated with one's preferences, my analyses might be biased. Similarly, if any of my predictor variables are correlated with an unobserved factor that is correlated with risk aversion, then the effect of that included variable might have been biased due to the unobserved effect. Again, instrumental variables to control for unobserved effects may be used in future analyses. Furthermore, modules to ascertain this additional information may be added to future surveys and interviews.

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Table 1. Results of Risk Aversion Causation Regressions.

Risk Aversion	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Age	0.0663	0.0582	0.0350		
	(0.47)	(0.42)	(0.26)		
Age^2	-0.000482	-0.000414	-0.000190		
	(-0.40)	(-0.35)	(-0.16)		
White	0.0870	0.125	0.159	0.164	0.165
	(0.46)	(0.66)	(0.89)	(0.93)	(0.94)
Black	0.0548	0.0870	0.148	0.155	0.154
	(0.26)	(0.42)	(0.75)	(0.79)	(0.79)
Hispanic	0.225	0.249*	0.251*	0.259*	0.258*
	(1.46)	(1.62)	(1.73)	(1.79)	(1.79)
Catholic	-0.119	-0.127	-0.130	-0.128	-0.128
	(-1.52)	(-1.63)	(-1.72)	(-1.70)	(-1.71)
Jewish	0.0208	-0.00497	0.00842	-0.00231	
	(0.09)	(-0.02)	(0.04)	(-0.01)	
Marital status					
Married, spouse absent	0.193	0.206	0.260	0.257	0.262
	(0.31)	(0.33)	(0.42)	(0.42)	(0.43)
Partnered	-0.121	-0.0894	-0.185	-0.169	-0.167
	(-0.61)	(-0.45)	(-0.98)	(-0.90)	(-0.89)
Separated	-0.198	-0.201	-0.205	-0.221	-0.221
	(-0.76)	(-0.79)	(-0.84)	(-0.92)	(-0.92)
Divorced	-0.252**	-0.251**	-0.259***	-0.240**	-0.240**
	(-2.43)	(-2.45)	(-2.59)	(-2.43)	(-2.43)
Widowed	0.0795	0.0724	0.0829	0.116	0.117
	(0.67)	(0.62)	(0.72)	(1.02)	(1.02)
Never married	0.132	0.138	0.147	0.0586	0.0553
	(0.61)	(0.64)	(0.69)	(0.29)	(0.27)
Female	0.192	0.239	0.175	0.486****	0.472****
	(0.58)	(0.73)	(0.55)	(5.71)	(7.05)
Education	-0.0297	-0.0284	-0.0340	-0.0161	-0.0153
	(-1.49)	(-1.43)	(-1.78)	(-1.17)	(-1.12)
Female x education	0.0217	0.0190	0.0248		
	(0.89)	(0.77)	(1.04)		
Mother's education	-0.0420***	-0.0435***	-0.0402****	-0.0428****	-0.0430****
	(-3.08)	(-3.21)	(-3.62)	(-3.91)	(-3.94)
Father's education	-0.000877	0.000265			
	(-0.08)	(0.02)			
Father alive	-0.0515	-0.0713			
	(-0.45)	(-0.62)			
Mother alive	0.143*	0.137*	0.163**	0.115*	0.115*
	(1.86)	(1.79)	(2.18)	(1.66)	(1.66)
Veteran	-0.00274	-0.00668	0.0110	0.0321	
	(-0.03)	(-0.06)	(0.11)	(0.32)	
Inheritance	-0.000982	-0.000873	-0.00112		
	(-0.95)	(-0.85)	(-1.13)		
Income	0.0000024**	0.0000024**	0.0000021**	0.0000018*	0.0000018*
	(2.28)	(2.27)	(2.10)	(1.82)	(1.82)
Chronic depression	-0.0183				
	(-0.05)				
Transient depression	-0.0488				
	(-0.45)				
Depressive symptoms					
1	-0.0193	-0.00588	-0.0494	-0.0658	-0.0656

		(-0.22)	(-0.07)	(-0.59)	(-0.79)	(-0.79)
	2	-0.225**	-0.216**	-0.194*	-0.180*	-0.180*
		(-2.00)	(-1.99)	(-1.82)	(-1.69)	(-1.69)
	3	-0.202	-0.184	-0.197	-0.187	-0.187
		(-1.37)	(-1.31)	(-1.44)	(-1.37)	(-1.38)
	4	-0.380**	-0.371**	-0.372**	-0.423***	-0.423***
		(-2.27)	(-2.33)	(-2.41)	(-2.81)	(-2.81)
	5	-0.382**	-0.377**	-0.317*	-0.296*	-0.295*
		(-1.98)	(-2.04)	(-1.77)	(-1.67)	(-1.67)
	6	-0.266	-0.280	-0.239	-0.233	-0.234
		(-1.19)	(-1.33)	(-1.17)	(-1.16)	(-1.16)
	7	-0.461	-0.445**	-0.489**	-0.542***	-0.541***
		(-1.95)	(-2.04)	(-2.33)	(-2.62)	(-2.61)
	8	-0.341	-0.280	-0.408	-0.403	-0.402
		(-1.00)	(-0.86)	(-1.37)	(-1.36)	(-1.35)
Health						
	Very good	0.115				
		(1.16)				
	Good	0.123				
		(1.15)				
	Fair	0.196				
		(1.45)				
	Poor	-0.212				
		(-1.11)				
Psychological problems		0.130				
		(1.20)				
Health limits work		0.206**	0.212**	0.165**	0.168**	0.169**
		(2.17)	(2.51)	(2.03)	(2.09)	(2.10)
Cancer		0.117				
		(1.25)				
Memory problems		-0.298				
		(-0.77)				
Difficulty getting up from chair		0.0260				
		(0.42)				
Heart problems		-0.00209				
		(-0.03)				
Constant		-0.613	-0.306	0.284	1.493****	1.499****
		(-0.15)	(-0.07)	(0.07)	(5.78)	(5.90)
N		5776	5819	6174	6268	6271

Notes.
1. * p < 0.10; ** p < 0.05; *** p < 0.01; **** p < 0.001.
2. Included in parentheses are t-statistics.

Table 2. Results of Financial Effect of Risk Aversion.

Variables	Stocks	Checking and Saving	Primary Residence	House Value	Financial Wealth	Total Assets
Risk Aversion	-31040.0**	546.2	-3209.8	1914.2	-19733.9	-1614.5
	(-2.12)	-0.3	(-0.48)	-0.31	(-0.50)	(-0.42)
White	3008.4	2827.1	-13038.1	16134.7	33755.6	7825.8
	-0.09	-0.68	(-0.84)	-1.13	-0.37	-0.88
Black	-42518.3	-7919.4*	-68029.6****	-37587.1**	-79863.1	-12858.1
	(-1.13)	(-1.72)	(-3.93)	(-2.37)	(-0.78)	(-1.29)
Hispanic	-6265.4	-9036.8***	-166.6	-7687.8	-13261.5	-15369.3**
	(-0.24)	(-2.80)	(-0.01)	(-0.69)	(-0.18)	(-2.21)
Catholic	23614.1	8248.7****	40541.5****	34411.5****	13799.3	18919.0****
	-1.63	-4.64	-6.07	-5.63	-0.35	-4.93
Jewish	92488.2**	6498.2	135186.4****	106532.6****	124350.3	29363.6***
	-2.15	-1.23	-6.83	-5.88	-1.06	-2.58
Female	9211.1	295.8	16997.0***	14908.5***	40316.1	4549.5
	-0.71	-0.19	-2.84	-2.72	-1.14	-1.32
Educ	12991.0****	2755.9****	14540.6****	11318.8****	32271.7****	6324.7****
	-5.1	-8.83	-12.41	-10.55	-4.66	-9.39
Income	0.228	0.0132	0.331****	0.0924	1.024*	0.893****
	-1.17	-0.55	-3.7	-1.13	-1.93	-17.34
Constant	-132808.1***	-21117.3****	-85138.3****	-88319.6****	-313243.8**	-45946.7****
	(-2.74)	(-3.55)	(-3.81)	(-4.32)	(-2.37)	(-3.58)
N	6120	6120	6120	6120	6120	6120

Notes.
1. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$.
2. Included in parentheses are t-statistics.

Table 3. Results of Health Effect of Risk Aversion.

Variables	Alcohol	Smoke	Flu Shot	Check Breast	Check Prostate	Number of Insurance	Life Insurance
Risk Aversion	-0.109***	-0.129*	-0.0287	-0.113	0.393	0.0390**	0.154**
	(-2.70)[a]	(-1.64)	(-0.16)	(-0.45)	(1.31)	(2.44)	(2.17)
White	0.0927	-0.229	-0.560	-0.229	-0.311	0.0903**	0.471***
	(0.99)	(-1.23)	(-1.24)	(-0.43)	(-0.26)	(2.46)	(3.03)
Black	-0.0449	-0.357*	-1.061**	0.00325	0.470	-0.0484	0.774****
	(-0.43)	(-1.72)	(-2.13)	(0.01)	(0.36)	(-1.18)	(4.35)
Hispanic	-0.0746	-1.055****	-0.819**	0.153	0.552	-0.184****	-0.780****
	(-1.02)	(-6.36)	(-2.43)	(0.34)	(0.90)	(-6.39)	(-6.51)
Catholic	0.240****	0.0613	0.117	-0.451*	-0.118	0.0496***	0.0226
	(5.98)	(0.77)	(0.67)	(-1.92)	(-0.37)	(3.13)	(0.32)
Jewish	-0.170	0.237	0.194	-0.175	0.394	-0.0514	-0.731****
	(-1.43)	(1.03)	(0.37)	(-0.23)	(0.36)	(-1.08)	(-3.72)
Female	-0.626****	-0.103	-0.209			0.0196	-0.469****
	(-17.41)	(-1.46)	(-1.38)			(1.38)	(-7.05)
Educ	0.0138*	-0.112****	0.0238	-0.0578	0.127*	0.0364****	0.0574****
	(1.96)	(-7.89)	(0.78)	(-1.30)	(2.34)	(13.08)	(4.61)
Income	0.000001	-0.000004***	0.000001	-0.000004	-0.0000	0.000003****	0.00002****
	(1.78)	(-2.90)	(0.41)	(-0.64)	(-0.34)	(13.87)	(10.57)
Constant	0.699****	0.522*	0.740	1.665**	-0.541	0.132**	-0.139
	(5.22)	(1.99)	(1.19)	(2.11)	(-0.39)	(2.50)	(-0.61)
N	6112	6120	795	471	324	6070	6092

Notes.
1. * p < 0.10; ** p < 0.05; *** p < 0.01; **** p < 0.001.
2. Included in parentheses are t-statistics.

Table 4. Factors Related to Risk Preference Variability vs. Stability.

Variables	Risk Variability
Hispanic	-0.491***
	(-2.82)
Education	-0.0220
	(-0.82)
Veteran	0.358*
	(2.40)
Mother's education	-0.0491***
	(-3.09)
Father's education	-0.00536
	(-0.39)
Birth year	-0.0348**
	(-2.54)
Female	-0.450
	(-1.10)
White	-0.551**
	(-2.54)
Black	-0.364
	(-1.51)
Catholic	0.181*
	(1.94)
Jewish	0.140
	(0.53)
Chronic depression	-0.0480
	(-0.10)
Transient depression	-0.106
	(-0.84)
Female x education	0.0257
	(0.83)
Marital status	
Married, spouse absent	-0.557
	(-0.87)
Partnered	0.176
	(0.81)
Separated	0.0831
	(0.27)
Divorced	0.132
	(0.96)
Widowed	0.160
	(1.14)
Never married	0.436
	(1.43)
Age	0.0400
	(0.28)
Age^2	-0.000998
	(-0.81)
Health	
Very good	-0.124
	(-1.05)
Good	-0.173
	(-1.37)
Fair	-0.262*
	(-1.72)

Poor	-0.558**
	(-2.43)
Income	-0.00000191
	(-1.51)
Psychological problems	0.181
	(1.56)
Smoke	0.289***
	(2.93)
Alcohol	0.0850**
	(2.36)
Depressive symptoms	
1	0.131
	(1.30)
2	-0.152
	(-1.11)
3	0.0173
	(0.10)
4	0.0861
	(0.42)
5	0.492**
	(2.06)
6	0.0301
	(0.12)
7	-0.246
	(-0.83)
8	-0.473
	(-1.32)
Cancer	-0.168*
	(-1.73)
Memory problems	-0.155
	(-0.34)
Risk aversion	
A little risk averse	0.213
	(0.86)
Slightly less risk averse	-0.0824
	(-0.35)
Slightly more risk averse	-0.118
	(-0.55)
More risk averse	-1.516****
	(-7.41)
Most risk averse	-1.932****
	(-9.82)
Constant	71.38***
	(2.63)
N	3535

Notes.
1. * p < 0.10; ** p < 0.05; *** p < 0.01; **** p < 0.001.
2. Included in parentheses are t-statistics.

Table 5. Factors Related to Becoming More Risk Tolerant Over Time.

Variables	Risk Tolerance
Hispanic	0.519**
	(2.04)
Education	-0.0118
	(-0.35)
Veteran	0.329*
	(1.82)
Mother's education	0.00237
	(0.12)
Father's education	0.0340
	(1.89)
Birth year	-0.0224
	(-1.22)
Female	1.195**
	(2.28)
White	0.299
	(1.06)
Black	0.468
	(1.45)
Catholic	-0.0407
	(-0.35)
Jewish	-1.095***
	(-2.87)
Transient depression	0.0876
	(0.50)
Female x education	-0.0695*
	(-1.75)
Marital status	
Married, spouse absent	-1.826*
	(-1.69)
Partnered	0.0838
	(0.30)
Separated	-0.222
	(-0.49)
Divorced	-0.0110
	(-0.06)
Widowed	0.106
	(0.56)
Never married	0.238
	(0.66)
Age	-0.241
	(-1.32)
Age^2	0.00153
	(0.97)
Health	
Very good	-0.0644
	(-0.43)
Good	-0.0525
	(-0.33)
Fair	-0.129
	(-0.63)
Poor	0.0250

		(0.08)
Income		5.19e-08
		(0.03)
Psychological problems		-0.245
		(-1.50)
Smoke		-0.0204
		(-0.16)
Alcohol		0.0656*
		(1.80)
Depressive symptoms		
	1	-0.000486
		(-0.00)
	2	-0.0126
		(-0.07)
	3	-0.208
		(-0.86)
	4	-0.152
		(-0.57)
	5	-0.281
		(-0.90)
	6	-0.377
		(-1.15)
	7	-0.0817
		(-0.20)
	8	-0.312
		(-0.40)
Cancer		0.0422
		(0.31)
Memory problems		0.831
		(0.94)
Risk aversion		
A little risk averse		0.0298
		(0.12)
Slightly less risk averse		0.570**
		(2.36)
Slightly more risk averse		0.160
		(0.75)
More risk averse		0.123
		(0.55)
Most risk averse		0.305
		(1.46)
Constant		51.64
		(1.42)
N		1743

Notes
1. * p < 0.10; ** p < 0.05; *** p < 0.01; **** p < 0.001.
2. Included in parentheses are t-statistics.