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The changing assessment of risk for young investors

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Abstract

Investment advice is changing to incorporate new products and platforms, and the rate of change is likely to accelerate as millennials and Gen Z increase their involvement in investment markets. Using survey methodology, we examine the changing landscape of risk tolerance for young people, concluding that the typical risk assessment tools advisors use may not be as applicable to the next generation of investors. We find that the components that drive willingness to take risk are interest in investments, self-reported investment risk tolerance, and ownership of investment accounts. Our findings indicate that it is time to start assessing risk differently.[1,2,3]

JEL classifications: G11; G59; D81

Keywords: Investment risk; Risk assessment; Risk tolerance

1. Introduction and literature review

According to McKinsey & Company research, the wealth management industry in North America has been evolving tremendously over the last 20 years. Between 2000 and 2010, total assets grew by approximately 45%, from $13 trillion to $19 trillion, and by 2018 client assets were up to $30.5 trillion.[4] More importantly, McKinsey determined that both the demographic composition of those who invest and their investment choices are very different today than they were 20 years ago. Millennials and Gen Z segments of the population control more assets than ever, and their ease of use with digital tools is extremely high. For example, while 31% of affluent Gen Z use a robo-advisor, only 13% of Gen X do so.[5] But

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how do Gen Z investors decide on investments and how do they measure their risk tolerance and capacity?

Many instruments are available to assess risk tolerance for portfolio construction, some linking risk tolerance to financial knowledge. It is unclear, however, how well these tools capture the changing world of investment risk. When a 20-year-old has a Cryptocurrency wallet, access to a brokerage account in the form of a Robinhood app, and is having conversations about GameStop, one wonders how well the traditional risk profiling tools capture both financial knowledge and risk tolerance.[6] What is becoming clear is that the large segment of the population that is moving into the asset accumulation phase has a very different perception of risk than the prior generation of advisory clients. As a result, it is important to modify the tools used to assess those risks to better capture the shifts in financial risk tolerance.

Understanding a client's risk tolerance is the most pressing issue in a successful financial planning process (Moreschi, 2005). We argue that traditional risk-based portfolio construction methods may not be the most suitable way to build portfolios for divergent generations. Several research papers have already questioned whether traditional questionnaires could truly assess a client's risk tolerance (Yook & Everett, 2003; Bouchey, 2004; Roszkowski, Davey, & Grable 2005). Risk assessment tools developed by academics and used by advisors for decades may not accurately assess the risk tolerance and risk inclination of incoming investors. To partially solve this problem, Roszkowski and Grable (2005) propose to introduce psychology and psychometrics into designing a more appropriate questionnaire to assess true risk tolerance. More recent literature proposes to design an instrument to assess various aspects of risk tolerance (risk knowledge, risk capacity, risk attitude, and risk propensity) from psychological perspectives (Wahl & Kirchler 2020). Traditional factors such as gender, age, and household income are determinants of investor risk tolerance (Sung & Hanna 1996; Yao & Hanna 2005). Education level is also found to be positively related with risk tolerance in these studies.[7] In particular, research shows the financial knowledge of college students is related to greater risk tolerance (Park et al., 2020; Rabbani et al., 2022; Sjöberg & Engelberg, 2009).

Given changing investment demographics and the way investment decisions are now made, we seek to understand risk tolerance firsthand by surveying college students enrolled in courses that cover investment fundamentals. We measure changing perceptions young investors have toward investment risk to understand how young adults who have been exposed to modern investment tools see risk and the components that make up their risk profile. We analyze the impact of the individual willingness of each survey participant to take risks. Specifically, we explore the following questions: (1) Does enrollment in additional finance classes change the perception of risk tolerance? In other words, do advanced finance classes matter to the individual in the analysis of risk? (2) Does the knowledge component (both objective and subjective) still have an impact on risk tolerance given the changing dynamics of the investment landscape? (3) Does interest and experience with investments affect risk tolerance for current college students? This study is a first step aiming at informing academics of the need to develop new and adaptive tools or questionnaires to accurately

assess the way young adults make investment decisions. The results will also help advisors serve their future Gen Z clients.

2. Survey design and results

During the Fall 2021 semester, we conducted a survey of students who have taken at least one finance class in the college of business at a large public university. We limit the sample to business majors/minors for two reasons: first, we are targeting individuals who have taken at least one introductory finance class and have a basic understanding of financial markets and investments. Second, we want to capture shifting demographics and believe the university environment provides the best access to individuals who participate in the modern investment landscape. We survey juniors and seniors who by the end of 2021 have taken at least one finance course.

Grable, Heo, and Kruger (2016) identify factors that are associated with financial risk tolerance and recommend financial planners gather information such as gender, age, education, marital status, household income, household size, and net worth during the planning process. Using the same variables, we conduct a survey consisting of questions designed to assess the following independent variable categories associated with risk: (1) demographic data, (2) investment knowledge/acumen, both objective and subjective, (3) interest and experience with investments, and (4) control variables that have been shown to be associated with risk tolerance in prior research. We measure each respondent's risk tolerance by asking both hypothetical risk assessment questions and current situational questions about the ability to undertake risk.[8]

We collected results during the first two weeks of December 2021 for 262 respondents who were finishing the fall semester. We measure risk tolerance across four categories/dimensions and present the results in the first four rows of Table 1. All four dependent variables are measures of risk derived from answers to a specific survey question. For example, the first question is "*Protecting my money is more important than high returns*." The answers range from 1 to 5, depending on the degree of agreement with the statement. The second assessment asks the respondents to invest a hypothetical $1,000 from a relatively conservative target date fund to a portfolio of cryptocurrency. The third question assesses what they would do in case of a sharp stock market decline, and finally, the last measure is an aggregate score (*Aggriskscore*) of the first three questions. *Aggriskscore* is our main measure of risk assessment. The results in Table 1 show that aggregate risk ranges from 3 to 13, with a mean of 7.9 and a standard deviation of 1.97.

The next two panels of Table 1 summarize the independent variables used. It is noteworthy that about 40 of the students took another finance course beyond the basic finance class. Respondents are neither overly optimistic nor pessimistic in their assessment of investment knowledge, with the mean at 4.97 out of 10. The objective knowledge measures at 3.04 out of 5. Interest in investments averages 2.58 out of 3, which shows that this group of students has considerable interest in investments. About 47% of respondents own stock investments

Table 1 Descriptive statistics for the sample

Variable	Mean	*SD*	Min	Max	*N*
ProtectMoneyCat	2.4847	0.9697	1	5	262
1KinvestCat	2.3587	1.0654	1	4	262
StockMarketDownCat	3.0801	0.8516	1	4	262
Aggriskscore	7.9236	1.9695	3	13	262
AdvancedClassCat	0.4083	0.49247	0	1	262
Self-KnowldCatI	2.8549	0.8034	1	5	262
SelfRatedKnowledgeInvestments2	4.973	2.0799	0	10	261
KnowledgeScore	3.0419	1.4836	0	5	262
InterestedInvCat	2.5839	0.5593	1	3	262
OwnETFsMutualCat	0.4656	0.4997	0	1	262
InvAttCat	2.7022	1.0735	1	5	262
GPACategory	3.5725	0.9099	1	5	262
GenderCat	0.5190	0.5005	0	1	262
AgeCat	1.4541	0.70289	1	4	262
HHIncomeCat	2.6436	1.5760	1	6	261
DebtCat	2.3282	1.4030	1	6	262
SavingsCat	0.7786	0.4159	0	1	262
AccountsHeldCat	1.8320	1.6077	0	4	262

Note. The first four rows represent dependent variables, and the rest indicate independent variables. *ProtectMoneyCat* ranges from 1 to 5, where 1 is strongly agree and 5 is strongly disagree with the statement "*Protecting my money is more important than high returns.*" *1KinvestCat* ranges from 1 to 4, where a respondent chooses how to invest $1,000 from 1, most conservative in a target date fund, to 4, most aggressive in cryptocurrency. *StockMarketDownCat* ranges from 1 to 4, where 1 is equal to selling all investments immediately in response to a sharp market decline, and 4 to immediately buying more. *Aggriskscore* is the sum of the previous three variables, and ranges from 3 to 13. *AdvancedClassCat* is equal to 1 if the respondent completed an advanced finance class and 0, otherwise. *Self-KnowldCatI* represents self-reported perception of investment knowledge, ranging from 1 to 5, where 1 is poor and 5 is expert. *SelfRatedKnowledgeInvestments2* is a wider measurement of self-reported investment knowledge, ranging from 0 to 10 where 0 is not knowledgeable at all and 10 is an expert. *KnowledgeScore* is an aggregate objective investment score ranging from 0 to 5 on five investment-related questions. *InterestedInvCat* represents self-reported interest in investing, ranging from 1 to 3, where 1 is not interested and 3 is very interested. *OwnETFsMutualCat* is equal to 1 if the respondent owns any stock, ETFs or mutual funds and 0, otherwise. *InvAttCat* is a self-reported measure of attitude in investments, ranging from 1 to 5, where 1 is very conservative/do not know to 5, very aggressive. *GPACategory* ranges from 1 to 5, where 1 is a GPA of 2.0 and 5 represents a GPA of 4.5. *GenderCat* equals 1 if the respondent identifies as a female and 0, otherwise. *AgeCat* ranges from 1 to 4, with 1 representing younger respondents. *HHIncomeCat* ranges from 1 to 6, based on the combined income of the family, from lowest to highest. *DebtCat* represents debt held, from 0 for category 1 to more than $50,000 for category 6. *SavingsCat* represents individual savings, where 1 represents existing savings designated for emergencies and 0, otherwise. *AccountsHeldCat* represents the complexity and range of investment accounts held, where 0 means no accounts, 1 represents work-sponsored accounts and IRA types only, and 4 includes brokerage and cryptocurrency accounts.

like mutual funds, ETFs, or individual stocks. We also measured the self-reported risk attitude from 1 (very conservative/do not know) to 5 (aggressive); the average is 2.7. Along with demographic variables, the respondents have a higher GPA than the average student, are roughly even gender-wise, have a range of investment accounts already, and about 75% have some savings and some debt.[9]

Table 2 presents the multivariate analysis for the three risk questions, exploring how risk is influenced by category. We further differentiate aggregate risk in Table 3. Models 1-3 in Table 2 present the results for each of the three individual risk questions. As each of the individual questions measures a slightly different risk dimension, it is important to look at the results by individual question. In Model 1, we look at the agreement with the statement that "*Protecting money is more important than high returns*." We find that the only measure with a significant impact on the result is the self-reported assessment of one's risk tolerance, *InvAttCat*. The higher the self-reported risk tolerance, the more risk the person is willing to take, as evidenced by the strongest disagreement with this statement. There appears to be a positive relationship between willingness to take investment risk (look for higher return vs. conservative money protection) and the way an individual perceives themself in relation to risk.

When asked to rate a different category of risk, hypothetically investing $1,000 in a range of options, the answers ranged from a relatively conservative target date fund to a risky allocation of 100% cryptocurrency. We found that the main variable influencing investment is prior ownership of financial assets. The more account diversity the investor has, the more likely the person is to make a risky investment. This is a key finding that has implications for how we teach finance and the type of practical knowledge students should be exposed to in a finance class.

The final individual risk question presents another hypothetical scenario in which the stock market declines sharply. The measure of risk ranges from conservative, where a respondent decides to sell the rest of the position, to aggressive, where a respondent decides to buy more of the same, now low, investment. We find several variables that influence this risk tolerance dimension. The same two variables mentioned in the previous questions are

Table 2 Regression analysis. Influence of risk by category

Variable	Model 1	Model 2	Model 3
AdvancedClassCat	0.05988 (0.659)	0.08012 (0.565)	−0.0229 (0.828)
SelfRatedKnowledgeInvestments2	0.06633 (0.128)	0.0044 (0.914)	0.02821 (0.357)
KnowledgeScore	−0.04883 (0.298)	0.0638 (0.176)	0.03902 (0.302)
InterestedInvCat	0.17453 (0.142)	0.1071 (0.375)	0.2307 (0.022)**
OwnETFsMutualCat	0.08036 (0.585)	0.2789 (0.112)	0.1144 (0.387)
InvAttCat	0.17935 (0.012)**	0.0994 (0.169)	0.03731 (0.471)
GPACategory	0.02548 (0.735)	−0.0206 (0.799)	0.1548 (0.007)***
GenderCat	−0.1336 (0.350)	−0.0586 (0.692)	−0.1923 (0.121)
AgeCat	−0.07843 (0.426)	−0.0278 (0.757)	0.12962 (0.090)*
HHIncomeCat	−0.06061 (0.123)	−0.0305 (0.462)	0.01238 (0.676)
DebtCat	0.04026 (0.439)	0.0181 (0.724)	0.0497 (0.121)
SavingsCat	−0.1764 (0.249)	−0.1072 (0.511)	0.0559 (0.633)
AccountsHeldCat	−0.06035 (0.218)	0.12049 (0.044)**	0.0784 (0.072)*
Constant	1.7172 (0.000)***	1.4883 (0.001)***	1.1004 (0.001)***
Model *p*-value	.0031***	.0000***	.000***
Adj R^2	0.1222	0.1834	0.2530
N	260	260	260

Note. Models 1–3 have the following dependent variables: *ProtectMoneyCat*, *1KinvestCat*, and *StockMarketDownCat*. See Table 1 for variable definitions. ***Significant at 1%, **Significant at 5%, *Significant at 10%.

also of interest here; the more interest one has in investments and the more accounts one already has, the more likely the person is to hold the existing positions and to see the decline as an opportunity. This is a key finding that can also be addressed when teaching finance. Given the challenge of timing the market and the fact that a typical investor on average realizes only about 38% of the broad market return, being comfortable with taking the risk and holding on to a position when the market declines would result in significantly higher wealth over the lifetime of the individual.[10] Additionally, we find some demographic variables have an association with willingness to stay invested. Specifically, an older survey respondent who has a higher GPA is more likely to see this as an opportunity to take risks than an opportunity to cut losses. This can be explained by older individuals having more experience with investments, and the fact that students with a higher GPA may have more knowledge regarding financial markets and, as a result, are more willing to take risks.

To further examine the relationship between aggregate risk and impacting factors, in Table 3 we assess individual components that may influence aggregate risk. The dependent variable is an aggregate risk measure constructed from the three individual risk questions. In Model 1, we test only demographic variables; in Model 2 we add existing savings and debt, variables that show the ability to undertake risk; in Model 3 we take a separate look at the most significant variables in the previous analyses, such as interest in investments and investment knowledge. The last model combines all variables.

We find that the demographic and knowledge variables have almost no relationship to the risk tolerance of a college student with some knowledge of finance; the only demographic characteristic with explanatory power is gender. As previously documented in literature, females are more prone to risk aversion (see, e.g., Olsen & Cox, 2001; Lascu, Babb, & Phillips, 1997). Unlike prior literature, we do not find that financial knowledge is linked to risk. The difference can be attributed to the sample used. It is possible that once someone has a basic understanding of finance and investments through exposure to introductory finance, the significance of the knowledge differential disappears. Our sample consists of students who already have a basic understanding of finance and investments. This aspect needs to be explored further as it affects the way financial risk should be taught in college and discussed with clients. Research is mixed on whether risk aversion increased during the pandemic so we cannot assume a higher or lower level of risk aversion for this sample.[11]

Of interest in our results is the focus on the variables that are not usually studied in the context of risk tolerance. The components that drive risk-taking willingness are the interest in investments, the self-reported risk tolerance attitude, and existing investment accounts. The more interest one has in investments, the more willing one is to take on investment risks, at least in hypothetical scenarios. The same holds true for how one perceives their own risk attitude. The more risk-tolerant one self-identifies, the more likely they are to choose riskier investments. Finally, someone who has several accounts, including riskier cryptocurrency and individual stock investments, and someone who already has investments is more likely to be comfortable with risk. These few factors explain about 31% of the variability in aggregate risk.

Table 3 Aggregate risk results

Variable	Model 1	Model 2	Model 3	Model 4
AdvancedClassCat			0.36027 (0.108)	0.3191 (0.169)
Self-KnowldCatI			−0.2309 (0.173)	−0.1691 (0.319)
KnowledgeScore			0.1373 (0.085)*	−0.1691 (0.319)
InterestedInvCat			0.5905 (0.005)***	0.6089 (0.004)***
OwnETFsMutualCat			0.5655 (0.046)**	0.5280 (0.065)*
InvAttCat			0.38895 (0.001)***	0.4035 (0.001)***
AccountsHeldCat			0.5908 (0.018)**	0.1663 (0.066)*
GPACategory	0.1034 (0.445)	0.2002 (0.177)		0.1584 (0.245)
GenderCat	−1.3034 (0.000)***	−1.2695 (0.000)***		−0.4546 (0.066)*
AgeCat	0.27856 (0.122)	0.1634 (0.386)		0.0665 (0.708)
HHIncomeCat	0.03264 (0.669)	0.01323 (0.861)		−0.0518 (0.473)
DebtCat		0.2304 (0.014)**		0.1032 (0.236)
SavingsCat		0.1617 (0.580)		−0.1728 (0.535)
Constant	7.7455 (0.000)***	6.9372 (0.000)***	4.7929 (0.000)***	4.6703 (0.000)***
Model *p*-value	.0000***	.000***	.0000***	.000***
Adj R^2	0.1115	0.1345	0.2940	0.3047
N	261	261	262	261

Note. Models 1–4 have the following dependent variables: *ProtectMoneyCat*, *1KinvestCat*, *StockMarketDownCat*, and *Aggriskscore*. See Table 1 for variable definitions. ***Significant at 1%, **Significant at 5%, *Significant at 10%.

3. Conclusions and implications

The requirements of investment advice are changing due to new products and trading platforms, and the expectation is that they will change even faster as millennials and Gen Z access investment markets.

In this paper, we look at the changing landscape of risk tolerance and perceptions for current college students, concluding that the typical risk assessment tools advisors use may not be as applicable to the investors who will be coming through their doors in the next decade. Although new risk assessment tools are beyond the scope of this paper, our study indicates that it is important to change the way we perceive and measure investment risk. Future research could also survey intergenerational changes in risk tolerance as well as include non-College Gen Z investors to address possible sample selection bias. Another implication of our study is the importance of updating how finance courses are currently taught in most universities. For example, we find that the type of investment accounts already owned is the major driver of how a young investor will choose to invest additional money. It is important to point out that many finance courses while succeeding in the delivery of theoretical knowledge, do not go into the practical aspect of opening investment accounts. Familiarizing students with investments, even if hypothetical through an investment simulation game, is a great way to create exposure and the willingness to increase risk. Advisors should also devote time to educating clients on risk tolerance.

Overall, we find that the components that drive willingness to take risks are interest in investments, self-reported investment risk tolerance, and ownership of investment accounts. Our findings point out the need to assess risk in finance, investment, and personal finance

courses to match the reality of the modern investment landscape. Many students are already holding assets that are traditionally perceived as risky. Creating a better understating of risk tolerance, how modern investments relate to risk, and the potential downfalls would be valuable to college finance students as well as young investment clients.

In addition to new generations of investors, trading platforms or channels of financial advisement have changed and raised high attention from media and clients. Large financial institutions such as Fidelity and Vanguard initiated roboadvisor to provide automated and algorithm-driven investment services and advise. With minimum human supervision, roboadvisor helps to save cost and keep account minimum low.

With the rise of roboadvising services, it is especially crucial to create a survey that could accurately capture true investor risk preference. Based on this study, financial institutions could consider practical variables such as ownership of investment accounts instead of testing clients finance course knowledge when assessing risk. In addition, providing clients with finance simulation courses or games to create exposure to investments will help educate concepts in risk assessment. Even in an environment with minimum human involvement of roboadvising, clients will be able to increase their financial literacy through practical courses and have a better understanding in their own risk tolerance.

Notes

1 Traditional risk tolerance questionnaires do not assess risk well for younger individuals.
2 The drivers of risk tolerance for Gen Z are willingness to take risks, self-reported investment risk tolerance, and ownership of investment accounts.
3 Academia needs to update how risk is assessed in finance, investment, and personal finance courses to match the reality of the modern investment landscape. Many students are already holding assets that are traditionally perceived as risky.
4 Trillion: https://www.mckinsey.com/industries/financial-services/our-insights/on-the-cusp-of-change-north-american-wealth-management-in-2030
5 https://www.investopedia.com/study-affluent-millennials-are-warming-up-to-robo-advisors-4770577.
6 According to Pew Research Center, 41% of men aged 18-29 have invested in cryptocurrency as of 2022: https://www.pewresearch.org/short-reads/2023/04/10/majority-of-americans-arent-confident-in-the-safety-and-reliability-of-cryptocurrency/#:~:text=Overall%2C%2017%25%20of%20U.S.%20adults,and%20women%20of%20any%20age.
7 See Sung and Hanna (1996), Grable (2000), Ardehali et al. (2005) and Halek and Eisenhauer (2001). Finke and Guillemette (2020) provide a though review on theories and factors related to measuring risk tolerance.
8 A full survey is available upon request; please email the authors for a copy.
9 The correlation matrix and VIF measures show no significant correlation between any of the variables.

10 Nick Murray of Behavioral Investment Counseling estimates that for the period ending in 2007, the average equity fund returned 10.81%, while the average investor in the same fund realized 4.18% due to poor market timing.
11 See, for example, Yue et al. (2020), Shachat et al. (2020), Angrisani et al. (2020), Heo et al. (2020), and Iqbal and Li (2022).

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