

## **Online Appendix A for “Millionaires Speak: What Drives Their Personal Investment Decisions?”**

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In this Online Appendix, we discuss a principal components analysis that explores whether respondents who report that a certain equity share factor is very or extremely important tend to report that certain other equity share factors are also very or extremely important. The factors we include in this analysis are the 38 factors in Table 3 about which all quarterly survey respondents were asked.<sup>22</sup> The outcome variables are binary indicators for whether the respondent rated each factor as very or extremely important.

Using the common criterion of retaining only principal components with an eigenvalue above 1, we identify five important principal components which together capture 46% of the variance in whether individuals rate factors as very or extremely important. To aid interpretation, we perform an orthogonal varimax rotation of these principal components. We employ the common rule of thumb of considering loadings whose absolute value is at least 0.30 to be economically significant when interpreting the principal components, but show in Table A.1 all factors whose loading on a principal component has an absolute value of at least 0.20.<sup>23</sup>

The first principal component captures external social factors and non-professional advice. Those who rate the desire to become wealthier than other rich people more highly also tend to rate advice from the media as more important. Other factors whose loadings are just below the 0.30 cutoff also fall into the categories of external social factors (external habit) and non-professional advice (rules of thumb and peer advice).

The second principal component captures the importance of neoclassical asset pricing factors: long-run risk, aggregate consumption covariance with stock returns, rare disaster risk, and stock return covariance with the marginal utility of money. The third principal component shows that those whose lack of trust in advisors or market participants importantly influenced their portfolio allocation also tend to rate their religious beliefs, values, and experiences as more important for this choice. The fourth principal component loads heavily on personal experiences

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<sup>22</sup> We include advice from a professional financial adviser in this analysis even though respondents who did not use such an adviser were not asked about this factor, since we impute “not at all important” responses to this factor for those who were not asked about it (see footnote 10).

<sup>23</sup> There is an arbitrariness to this commonly used cutoff. Tabachnick and Fidell (2007) suggest an alternative cutoff of 0.32, but this higher cutoff would leave no significant factors in the first principal component.

of returns and investing. The fifth principal component indicates that those who rate advice from a professional financial advisor as more important also tend to say that their need for cash on hand for routine expenses is important for their equity share.

Table A.2 shows the results of regressing portfolio equity share on the first five principal component scores, using either ordinary least squares or tobit regressions where the dependent variable is considered censored at 0% and 100%. The scores are normalized so that they each have unit standard deviation. Higher scores on the first three principal components (external social factors and non-professional advice, neoclassical asset pricing factors, and trust and religion) are associated with lower equity allocations, although the statistical significance of the coefficient on the first principal component score fades when respondent demographics are controlled for. Higher scores on the fourth principal component (personal experiences) are associated with higher equity allocations, and scores on the fifth principal component have no significant relationship with equity allocations. These coefficients do not necessarily represent causal relationships, as it is quite plausible that relevant omitted variables such as risk aversion are correlated with principal component scores. Nonetheless, the significance of these correlations is further suggestive evidence that the ratings provided by our respondents contain meaningful information rather than being pure noise.

## References

Tabachnick, Barbara G., and Linda S. Fidell, 2007. *Using Multivariate Statistics*, 5th edition. Boston, MA: Pearson Education, Inc.

**Table A.1: Principal Components Analysis**

This table shows loadings on the first five principal components computed over the equity share factors asked of every respondent in Table 3. Factors with a loading magnitude above 0.30 are bolded.

Principal component 1 (External social factors and non-professional advice)		Principal component 2 (Neoclassical asset pricing factors)		Principal component 3 (Trust and religion)		Principal component 4 (Personal experiences)		Principal component 5 (Professional advice and cash on hand)	
<b>Desire to become wealthier than other rich people</b>	<b>0.313</b>	<b>Risk of long-run aggregate consumption volatility</b>	<b>0.386</b>	<b>Lack of trustworthy advisor</b>	<b>0.502</b>	<b>Personal experience investing in stock market</b>	<b>0.633</b>	<b>Advice from a professional financial advisor</b>	<b>0.630</b>
<b>Advice from media</b>	<b>0.309</b>	<b>Risk of long-run aggregate consumption</b>	<b>0.381</b>	<b>Religious beliefs, values, and experiences</b>	<b>0.373</b>	<b>Experience of living through stock market returns</b>	<b>0.623</b>	<b>Need cash on hand for routine expenses</b>	<b>0.350</b>
Rule of thumb	0.294	<b>Risk of aggregate consumption over next year</b>	<b>0.367</b>	<b>Lack of trust in market participants</b>	<b>0.328</b>	Stock market returns mean-revert	0.254	Lack of knowledge about how to invest	0.241
Peer advice	0.286	<b>Rare disaster risk</b>	<b>0.336</b>	Hard to sell private equity shares	0.267	Stock market returns before I was born	0.208	Expected stock returns higher than usual right now	0.226
External habit	0.281	<b>Return covariance with marginal utility of money</b>	<b>0.314</b>	Lack of knowledge about how to invest	0.229			Risk of illness/injury expenses	0.210
Time until significant non- retirement expense	0.250	Risk of aggregate consumption volatility over next year	0.285	Ambiguity/ Parameter uncertainty	0.220			Ambiguity/ Parameter uncertainty	0.208
Loss aversion	0.246	Risk of illness/ injury expenses	0.249	Rare disaster risk	0.212			Hard to sell private equity shares	-0.208
Internal habit	0.216			Stock market returns mean-revert	-0.226				
Illiquid non-equity investments	0.206								

**Table A.2: Regression of Equity Share on Normalized Principal Component Scores**

This table shows coefficients from regressions of the fraction of each respondent's investible financial assets held in equities on the respondent's first five principal component scores normalized by each of their standard deviations. The regressions in columns (2) and (4) additionally control for respondent demographics: age, age squared, and dummies for gender, living situation, employment status, household income category, primary source of wealth, and investable financial asset amount category (the categories are those in Table 1). Columns (1) and (2) are estimated using OLS, and columns (3) and (4) are estimated using tobit regressions censored at 0% and 100%. Standard errors robust to heteroskedasticity are in parentheses below each point estimate. \* Significant at the 5% level. \*\* Significant at the 1% level.

	OLS		Tobit	
	(1)	(2)	(3)	(4)
PC 1 (External social factors and non-pro advice)	-2.57* (1.04)	-1.78 (1.11)	-2.93* (1.15)	-1.98 (1.20)
PC 2 (Neoclassical asset pricing factors)	-1.95* (0.92)	-2.03* (0.94)	-1.95* (0.96)	-2.06* (0.97)
PC 3 (Trust and religion)	-2.25** (0.82)	-2.06** (0.79)	-2.48** (0.87)	-2.27** (0.83)
PC4 (Personal experiences)	2.96** (0.70)	2.61** (0.70)	3.07** (0.73)	2.68** (0.73)
PC 5 (Professional advice and cash on hand)	0.52 (0.75)	0.76 (0.76)	0.70 (0.80)	0.93 (0.80)
Constant	53.3** (0.64)	-6.15 (17.8)	52.7** (0.68)	-17.7 (20.6)
Demographic controls	No	Yes	No	Yes
Observations	1,662	1,662	1,662	1,662
R <sup>2</sup>	0.036	0.087		
Adjusted R <sup>2</sup>	0.033	0.071		
McFadden's pseudo R <sup>2</sup>			0.004	0.010

## Online Appendix B for “Millionaires Speak: What Drives Their Personal Investment Decisions?”

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*This online appendix contains the text of the relevant questions from the two surveys analyzed in the paper.*

### Quarterly survey

S1. In what **year** were you born?

S2. What is your **role in making financial and investment decisions** for your household?

- a. I make all decisions
- b. I make most decisions
- c. I share the decision-making equally with my spouse/partner
- d. My spouse/partner makes most decisions
- e. I do not participate in the decision-making

S3. Do you **work with a professional financial advisor** who helps you manage your finances and make investment decisions?

- a. Yes
- b. No

S4. Please think about the total value of your **household’s investable assets**. By investable assets, we mean all of your household’s savings and investments, including deposit accounts, mutual funds, stocks, bonds, IRAs, and 401(k)’s or 403(b)’s, **EXCLUDING** real estate and any private business assets. Which of the following broad categories includes your household’s total investable assets?

- a. Under \$50,000
- b. \$50,000 to under \$100,000
- c. \$100,000 to under \$250,000
- d. \$250,000 to under \$500,000
- e. \$500,000 to under \$1 million
- f. \$1 million to under \$2 million
- g. \$2 million to under \$5 million
- h. \$5 million to under \$10 million
- i. \$10 million or above
- j. Prefer not to answer

S5. What is your total household income?

- a. Under \$50,000
- b. \$50,000 to under \$75,000
- c. \$75,000 to under \$100,000
- d. \$100,000 to under \$150,000
- e. \$150,000 to under \$250,000
- f. \$250,000 to under \$400,000
- g. \$400,000 or more
- h. Prefer not to answer

S6. In which of the following **financial services firms** do you, or does any member of your household, currently have an account, product or service? Please select all that apply.

1. Ameriprise
2. Ameritrade / Datek / TD Waterhouse
3. Bank of America
4. Bank of NY/Mellon
5. Charles Schwab
6. Chase
7. Citibank
8. E\*Trade
9. Edward Jones
10. Fidelity
11. Goldman Sachs
12. JP Morgan
13. LPL Financial
14. Merrill Edge
15. Merrill Lynch
16. Morgan Stanley Smith Barney
17. Northern Trust
18. Oppenheimer
19. RBC Dain Rauscher
20. Raymond James
21. Scottrade
22. UBS
23. Vanguard
24. Wells Fargo Advisors
25. An independent advisor/registered investment advisor
26. Other: \_\_\_\_\_
27. None

D1. Please indicate your **gender**.

1. Male
2. Female

- D2. Are you currently?
- a. Self-employed
  - b. Employed full-time
  - c. Employed part-time
  - d. Unemployed
  - e. A homemaker
  - f. A student
  - g. Retired

**Ask if D2 = a-c**

- D3. Which of the following best describes your business role?
- a. Business owner
  - b. Professional role (doctor, attorney, accountant)
  - c. Senior executive (C-level and above)
  - d. Middle Management
  - e. Employee
  - f. None of the above

**Ask if D3 = a**

- D4. How many employees do you have?
- a. None – it's just myself
  - b. 1-10
  - c. 11-50
  - d. 51-100
  - e. 100-250
  - f. 251-500
  - g. 501-1,000
  - h. More than 1,000

**Ask if D3 = a**

- D5. What is your approximate annual revenue?
- a. Less than \$100,000
  - b. \$100,000 to less than \$250,000
  - c. \$250,000 to less than \$500,000
  - d. \$500,000 to less than \$1 million
  - e. \$1 million to less than \$10 million
  - f. \$10 million to less than \$50 million
  - g. \$50 million or more

- D6. What has been your primary **source of wealth**?
- a. Salary / Bonus / Stock options
  - b. Inheritance / Marriage
  - c. Investments
  - d. Business income
  - e. Prefer not to answer

D7. Which option listed below best describes your **marital status**?

- a. Married
- b. Living with significant other
- c. Single
- d. Widowed
- e. Divorced
- f. Prefer not to answer

Q1. Please provide your approximate **overall asset allocation** across all your accounts. Please refer to your latest statement(s) if needed. **[Responses constrained to be between 0 and 100, and sum of all responses must = 100]**

- a. Cash
- b. CDs / Money market funds
- c. Government bonds
- d. Other U.S. bonds (e.g. munis, corporate)
- e. International bonds
- f. U.S. stocks
- g. International stocks
- h. Hedge funds / Venture capital / Private equity
- i. Structured products
- j. Real estate investments (excluding own home)
- k. Commodities / Futures / Options

Q2. How important are the following factors in determining the total percentage of your net worth that is currently invested in stocks—both in private businesses and publicly traded companies? (Don't count factors that affect which stocks you hold but don't affect the total amount invested across all stocks.) **[Answer options: Not important at all, A little important, Moderately important, Very important, Extremely important. Factor order randomized.]**

- a. Concern that when I especially need the money, the stock market will tend to drop.
- b. Concern that when I have to cut my spending, the stock market will tend to drop.
- c. Concern that when bad news arrives about how the U.S.'s material standard of living will change **over the next year**, the stock market will tend to drop.
- d. Concern that when bad news arrives about how the U.S.'s material standard of living will change **over the 5 year period starting 1 year in the future**, the stock market will tend to drop.
- e. Concern that when uncertainty increases about how the U.S.'s material standard of living will change **over the next year**, the stock market will tend to drop.
- f. Concern that when uncertainty increases about how the U.S.'s material standard of living will change **over the 10 year period starting 1 year in the future**, the stock market will tend to drop.
- g. Concern that when the quality of my physical living situation (how nice my housing is, the safety of my neighborhood, etc.) is dropping faster than the rest of my material quality of life, the stock market will tend to drop.
- h. Concern that in an economic disaster where the amount that the U.S. economy produces in a year shrinks by more than 10%—like the Great Depression—a dollar I invested in stocks would lose more value than a dollar I put in a bank savings account or government bond.



- i. Concern that I (or my spouse/partner, if applicable) might become unemployed, receive a pay cut, or not receive an expected bonus or pay increase.
- j. Concern that the value of my home(s) might fall.
- k. The risk of expenses due to illness or injury to me or someone else in my family.
- l. A belief that stocks are attractive because when my living expenses increase unexpectedly, the stock market will tend to rise.
- m. The difference between how much money I have available to invest right now and all the money I (and my spouse/partner, if applicable) expect to earn in wages or other compensation over the rest of my life.
- n. The number of years I (and my spouse/partner, if applicable) have left until retirement.
- o. How soon I will have significant expenses (like a home purchase, school tuition, major charitable donation, etc.).
- p. My fixed expenses (like mortgage payments, tuition bills, charitable commitments, etc.) that are difficult to adjust in the short run.
- q. The difference between my current material standard of living and the level I am used to.
- r. The difference between my current material standard of living and the level everybody else around me has experienced recently.
- s. The desire to become wealthier than other wealthy people
- t. I don't have a good sense of the average returns and risks of investing in stocks.
- u. The possibility of even small losses on my stock investments makes me worry.
- v. Advice from a professional financial advisor I hired. **[if has financial advisor]**
- w. Advice from a book or an article I read, or from somebody on TV, radio, or the internet.
- x. Advice from a friend, family member, or other acquaintance.
- y. The feelings, attitudes, and beliefs about the stock market I've gotten from my personal experiences of investing in the stock market.
- z. The feelings, attitudes, and beliefs about the stock market I've gotten from living through stock market ups and downs (whether or not I was invested in stocks at the time).
- aa. What I know about the stock market's returns during the decades before I was born.
- bb. My lack of knowledge about how to invest.
- cc. Difficulty in finding a trustworthy advisor.
- dd. Concern that companies, managers, brokers, or other market participants might cheat me out of my investments.
- ee. My religious beliefs, values, and experiences.
- ff. A rule of thumb (for example, "The percent you invest in stocks should be 100 minus your age" or "Invest one-third in stocks, one-third in bonds, and one-third in real estate").
- gg. Concern that stock investments will take too long to convert into spendable cash in an emergency.
- hh. The fact that a significant fraction of my non-stock assets are in illiquid investments (such as fine art, real estate, etc.).
- ii. The amount of cash I need to have on hand to pay routine expenses.
- jj. A belief that **low** stock market returns tend to be followed by more **low** stock market returns.
- kk. A belief that **low** stock market returns tend to be followed by **high** stock market returns.
- ll. A belief that the returns I can expect to earn from investing in stocks right now are **lower** than usual.

- mm. A belief that the returns I can expect to earn from investing in stocks right now are **higher** than usual.
- nn. The difficulty in selling private equity shares.

- Q3. Do you currently hold more than 10% of your net worth in a single company's stock?
- Yes – more than 10% of my net worth is currently invested in the stock of one and only one company
  - Yes – more than 10% of my net worth is currently invested in the stock of each of two or more companies (for example, 11% of my net worth is invested in Company A, and 12% of my net worth is invested in Company B)
  - No
  - Unsure

**Ask if Q3 = a or b**

- Q4. How does the fact that you have a concentrated ownership stake in one or more companies affect the total amount of stock (summed across both concentrated and non-concentrated investments) you choose to hold in your portfolio? **[Order of options a and c randomized.]**
- It makes me hold more in stocks than I otherwise would
  - It has no effect on the total amount I invest in stocks
  - It makes me hold less in stocks than I otherwise would
  - I don't know

**Ask if Q3 = a or b**

- Q5. How important are the following factors in causing you to hold more than 10% of your net worth in a single company's stock? If more than 10% of your net worth is currently invested in the stock of each of two or more companies, please answer with respect to your largest single holding. (For example, if 11% of your net worth is invested in Company A and 12% in Company B, please answer with respect to your investment in Company B). **[Answer options: Not important at all, A little important, Moderately important, Very important, Extremely important. Factor order randomized.]**

- A lockup agreement that prevents me from selling shares in the company or an investment fund.
- The desire to maintain a significant voting stake in the company.
- A strong association between me or my family and the company.
- The desire to maintain a significant amount of stock in the company in order to pass it on to my heirs.
- The desire to build others' confidence in the company by holding a significant ownership stake in it.
- The desire to build others' confidence in my commitment to the company as an employee or board member by holding a significant ownership stake in it.
- The difficulty of finding a buyer for my shares
- I believe this stock will give me higher returns on average than other stocks in the market
- I believe this stock will give me less risky returns than other stocks in the market

## One-off survey

S1. In what **year** were you born?

S2. What is your **role in making financial and investment decisions** for your household?

- a. I make all decisions
- b. I make most decisions
- c. I share the decision-making equally with my spouse/partner
- d. My spouse/partner makes most decisions
- e. I do not participate in the decision-making

S3. Are you currently?

- a. Self-employed
- b. Employed full-time
- c. Employed part-time
- d. Unemployed
- e. A homemaker
- f. A student
- g. Retired

S4. Which of the following best describes your business role?

- a. Business owner
- b. Professional role (doctor, attorney, accountant)
- c. Senior executive (C-level and above)
- d. Middle Management
- e. Employee
- f. None of the above

### ASK IF S4 = a

S5. How many employees do you have?

- a. None – it's just myself
- b. 1-10
- c. 11-50
- d. 51-100
- e. 100-250
- f. 251-500
- g. 501-1,000
- h. More than 1,000

**ASK if S5 = b-h**

D3. What is your approximate annual revenue?

- a. Less than \$100,000
- b. \$100,000 to less than \$250,000
- c. \$250,000 to less than \$500,000
- d. \$500,000 to less than \$1 million
- e. \$1 million to less than \$10 million
- f. \$10 million to less than \$50 million
- g. \$50 million or more

S6. Please think about the total value of your **household's investable assets**. By investable assets, we mean all of your household's savings and investments, including deposit accounts, mutual funds, stocks, bonds, IRAs, and 401(k)'s or 403(b)'s, **EXCLUDING** real estate and any private business assets. Which of the following broad categories includes your household's total investable assets?

- a. Under \$50,000
- b. \$50,000 to under \$100,000
- c. \$100,000 to under \$250,000
- d. \$250,000 to under \$500,000
- e. \$500,000 to under \$1 million
- f. \$1 million to under \$2 million
- g. \$2 million to under \$5 million
- h. \$5 million to under \$10 million
- i. \$10 million or above
- j. Prefer not to answer

S7. What is your total household income?

- a. Under \$50,000
- b. \$50,000 to under \$75,000
- c. \$75,000 to under \$100,000
- d. \$100,000 to under \$150,000
- e. \$150,000 to under \$250,000
- f. \$250,000 to under \$400,000
- g. \$400,000 or more
- h. Prefer not to answer

D1. Please indicate your **gender**.

- 1. Male
- 2. Female

An active stock investment strategy tries to beat the overall stock market's return by picking stocks to buy.

A passive stock investment strategy holds stocks in order to match the performance of a market benchmark (such as the S&P 500 stock market index) as closely as possible.

Q1. Have you ever pursued an active investment strategy through a fund or a professional manager?

- a. Yes
- b. No
- c. Unsure

**If Q1 = Yes**

Q2. How important were the following factors in your decision(s) to pursue an active strategy instead investing the money in a passive strategy? **[Answer options: Not important at all, A little important, Moderately important, Very important, Extremely important. Factor order randomized.]**

- a. The recommendation of an investment advisor I hired.
- b. A belief that the active strategy would give me **higher returns** on average than a passively strategy.
- c. A belief that even though the actively strategy would have **lower returns** on average than a passively strategy, the active strategy would have higher returns than the passive strategy when the economy does poorly (for example, during recessions or stock market crashes).

Q3. How much do you agree with the following statements? **[Answer options: Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree. Statement order randomized.]**

- a. When a stock investment fund following an active strategy gets more money to manage, it becomes harder for it to generate higher returns than the overall stock market.
- b. When a stock investment fund following an active strategy has had significantly higher past returns than the overall stock market, this is strong evidence that its manager has good stock-picking skills.

A value stock is a stock that has a low price relative to its company's current profits (and other fundamentals).

A growth stock is a stock that has a high price relative to its company's current profits (and other fundamentals).

Q4. Compared to a growth stock, I expect a value stock to normally be ...

- a. Riskier over the next year, on average
- b. Equally risky over the next year, on average
- c. Less risky over the next year, on average
- d. No opinion

Q5. Compared to a growth stock, I expect a value stock to normally have ...

- a. Higher returns over the next year, on average
- b. About the same returns over the next year, on average
- c. Lower returns over the next year, on average
- d. No opinion

Q6. Compared to a stock whose price fell a lot over the past year, I expect a stock whose price rose a lot over the past year to normally be ...

- a. Riskier over the next year, on average
- b. Equally risky over the next year, on average
- c. Less risky over the next year, on average
- d. No opinion

Q7. Compared to a stock whose price fell a lot over the past year, I expect a stock whose price rose a lot over the past year to normally have ...

- a. Higher returns over the next year, on average
- b. About the same returns over the next year, on average
- c. Lower returns over the next year, on average
- d. No opinion

Q8. Compared to the stock of a company with low current profits, I expect the stock of a company with high current profits to normally be...

- a. Riskier over the next year, on average
- b. Equally risky over the next year, on average
- c. Less risky over the next year, on average
- d. No opinion

Q9. Compared to the stock of a company with low current profits, I expect the stock of a company with high current profits to normally have...

- a. Higher returns over the next year, on average
- b. About the same returns over the next year, on average
- c. Lower returns over the next year, on average
- d. No opinion

Q10. Compared to the stock of a company that currently has low investment expenditures, I expect the stock of a company that currently has high investment expenditures to normally be...

- a. Riskier over the next year, on average
- b. Equally risky over the next year, on average
- c. Less risky over the next year, on average
- d. No opinion

Q11. Compared to the stock of a company that currently has low investment expenditures, I expect the stock of a company that currently has high investment expenditures to normally have...

- a. Higher returns over the next year, on average
- b. About the same returns over the next year, on average
- c. Lower returns over the next year, on average
- d. No opinion