HOMEWORK 2

FINA 6325 – BEHAVIORAL FINANCE

SPRING A 2019

Instructions: Type your answer in this Word document then submit via upload on Canvas! You may work in groups to complete the assignment, but *please submit your own write-up.* The due date is March 8 by 11:59 pm. DO NOT LEAVE IT FOR THE LAST MINUTE, LATE SUBMISSIONS WILL NOT BE ACCEPTED.

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1. (Behavioral Biases and Beliefs) Kahneman and Reipe (1998) point out that merely learning about cognitive biases does not eliminate them. The goal is to develop the skill of recognizing situations in which a particular error is likely. As a step toward developing this skill, please give a new example of each of the three phenomena listed below. ("New example" means do not use examples found in the lectures, although these may be helpful as a starting point.) Draw at least two of your three examples in financial or investment settings. For ease of grading, please discuss them in the order below. (two or three sentences each)

   a. Availability

   The availability heuristic states that we as people (investors) selectively process information that is easy to process, especially when that information is right in front of them. For example, an investor reads a news article that Apple is releasing a new product designed to captivate the hearts and minds of all Millennials, and decides right then and there to invest $10,000 in Apple stock, without first investigating the performance of the stock and what might have led to the announcement of a new product in the first place. In another example, an investor might hear about a recall for Honda Civics for faulty airbags, and short Honda stock because they believe Honda's stock price will drop as a result of the news report. This

bias basically demonstrates the overarching ability that news media has to affect the purchasing decisions of investors susceptible to the availability bias.

b. Local representativeness

The local representativeness bias are those instances when a person (investor) relies on a relatively small sample size of data/information and extrapolates that information to wider/broader population. For example, this would be like wide receiver Adam Thielen (Minnesota Vikings) gaining 100 yards a game for the first ten weeks of the 2018 season and then sports bettors **wrongly** assuming that he will go for 100 yards in Week 11, and betting heavily on Thielen hitting the 100+ yard mark. In a financial setting, this is the tendency of investors to put their money **into** stocks that have performed well in the past (whether it is week, month, quarter) and pulling money **out** of stocks that have performed negatively. The investors believe that because the stock is/was performing well, it will continue to do so, even though we have seen that past performance does not predict future behavior!

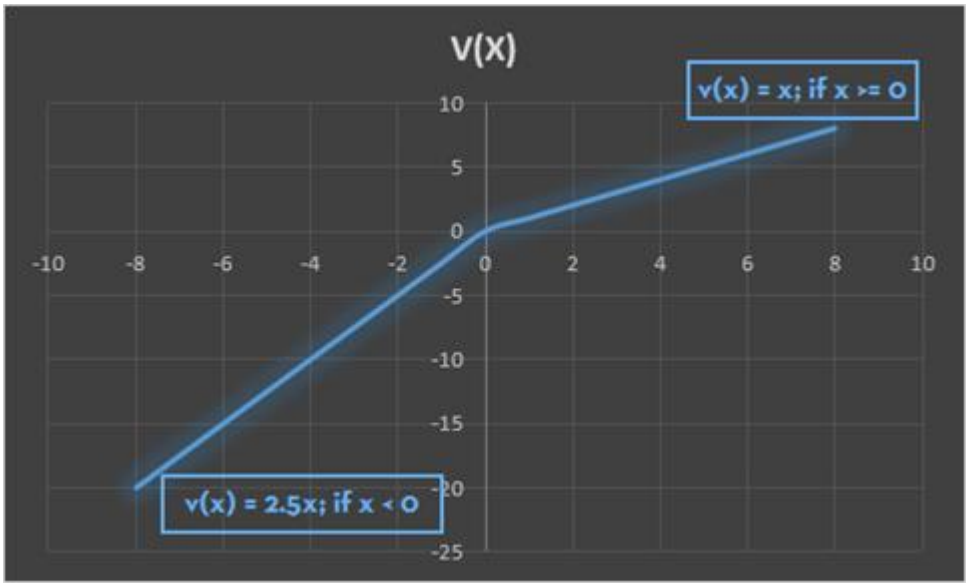
c. Overconfidence

The overconfidence bias states that people (investors) demonstrate too much confidence in their ability to make decisions, and thus are "surprised" too often when things do not go the way they expect. For example, an investor with a demonstrated history of successful investments is easily susceptible to this bias; they might believe that they can do wrong and invest in a substantially risky portfolio and then realize when it is too late that the investment is failing. In another case, I (as the investor) might foolishly choose to invest in a brand new housing development because I have lived my entire life in apartment buildings, so very clearly I know a lot about how they work since I have been in them all my life. This bias also explains why, in general, people are willing to trade so much; they don't realize they are at an informational disadvantage compared to those investors who have more information available to them (i.e. an investor with a direct line into the CEO of a Fortune 100 company) and thus more likely to lose money. Instead, they might actually think they are the ones with the advantage over market participants!

2. (Unusual Preferences) Joe's value function for monetary gains and losses "x" is as follows:

$$v(x) = \begin{cases} x & \text{if } x \geq 0 \\ 2.5x & \text{if } x < 0 \end{cases}$$

a. Graph v(x). What feature of preferences does v capture? (2 sentences)



V is the prospect value function. This demonstrates the third principle of prospect theory, which states that people dislike losses about 2.5x as much as they like gains.

b. **Suppose Joe must decide whether to accept a gamble in which he wins $200 with probability 0.5 and loses $100 with probability 0.5. Will he accept the gamble? (one calculation)**

E(v(X)) = 200 * .5 + -250 * .5 = -$25

Joe will not accept this gamble, since the expected value of $-25.

c. **Now Joe is offered a second gamble, which simply repeats the gamble above twice. That is, a coin is flipped with heads leading to a gain of $200 and tails a loss of $100, and then the coin is immediately flipped again with heads leading to a gain of $200 and tails a loss of $100. What is the probability distribution of total gains and losses from this bet? (write the distribution)**

Possible results: {HH, HT, TH, TT}
HH = $200+ $200 = $400, and a 0.5 * 0.5 = 0.25 probability
HT, TH = $200-100 = $100, and a 2*0.5 * 0.5 = 0.5 probability
TT = $-100-100 = $-200, and a 0.5*0.5 = 0.25 probability

d. Given the distribution of total gains and losses you have just computed, will Joe accept this second gamble? (one calculation)

E(V) = 400 * 0.25 + 100 * 0.5 + -200(2.5) * 0.25
E(V) = 100 + 50 - 125 = $25

Joe would accept the second gamble, since the expected value of this gamble is $25.

e. Now suppose Joe is a mental accountant, meaning that when presented with the second gamble he evaluates the first coin flip and the second coin flip as two distinct gambles. Now will he accept it? (one sentence.)

For each gamble, the v(X) = -$25 (as calculated above), since the first flip does not have an impact on the second flip, and we would not use the total E(v); Joe would not accept the second gamble.

Answer:

3. An investor has two stocks in his portfolio, A and B. The returns on both, going forward, are equally unpredictable. Stock A has appreciated $10 since it was purchased. Stock B has gone down $10. The investor needs to sell either A or B to finance some consumption. The investor pays taxes on realized capital gains and on his labor income, which is substantial.

   a. If the investor is rational, which will he sell? (A, B, or indifferent)

   If the investor is rational, then he would sell B.

   b. If the investor is loss averse, which will he sell? (A, B, or indifferent)

   If the investor is loss averse, he would sell A.

   c. Explain your answers (a few sentences)

   If an investor is rational, then they are risk neutral and they only care about expected value. Normally, the rational investor would be indifferent to selling stock A or B, since both stocks

have the same utility function. However, the taxes they have to pay on realized capital gains reduces the utility of the portfolio if they sell A. If the loss is used to reduce taxable income, then selling B is the rational investor's best choice because it will reduce tax and increase the utility of the portfolio.

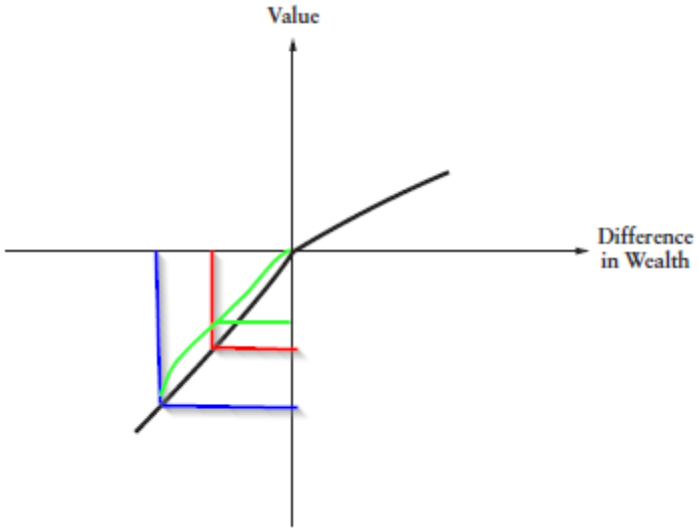
If the investor is loss averse, he will sell A because selling B would generate a loss for the investor. Investors who are risk averse have a concave utility function, and would rather hold on to a losing asset (stock B) in the hope that it rebounds and recoup the loss that occurred.

4. From 1970 to 1994, Robert Citron was the treasurer of Orange County. He was manager of the county's investment portfolio. The portfolio performed poorly in 1994 and caused the county to file for bankruptcy in December of that year, the largest municipal bankruptcy in U.S. history. In July 1993, Citron predicted that interest rates would not go up. When an investment banker asked Citron how he knew this, he is reported to have replied: "I am one of the largest investors in America. I know these things."

   a. What pervasive cognitive bias is apparent in Citron's response? (one sentence)

   Robert Citron is clearly demonstrating the "overconfidence" bias (*expressing an overly strong opinion and summary judgment*), and because he is "…one of the largest investors in America" he knows how interest rates will work.

   b. By August 1994, the (unrealized, i.e. "paper") losses to the Orange County portfolio were mounting. An article in USA Today reports that Citron actually increased his borrowing "in a desperate bid to recoup his losses." Use the prospect theory value function to shed light on Citron's behavior. (several sentences)



The prospect theory value function states that value is defined by gains and losses relative to a reference point, or a starting wealth value. People exhibit risk aversion in the positive domain (concave), and are risk seeking in the negative domain (convex). Decisions are made by focusing on gains and losses, which means that the argument for this function is not final wealth, but changes in wealth. People dislike losses, so the value function is steeper for losses than for gains. In Citron's case, since he is already losing money, he is going to borrow more, and expose himself to more risk, in an effort to avoid any potential loss; he would rather risk losing a greater amount of money for the chance to recoup his losses since he's already losing anyways.