

Introducing Behavior Finance – A Student Quiz

Kevin Bracker, Pittsburg State University

ABSTRACT

This paper introduces and discusses a brief quiz designed to introduce students to the field of behavioral finance. A series of eighteen questions are provided which highlight a variety of behavioral biases that influence the decision making process. These biases can be categorized into three basic areas: framing, loss avoidance and heuristics. The purpose of this quiz is to serve as a starting point to illustrate the prevalence of behavioral biases so that the results and implications can be addressed in a class discussion period. Limitations of the quiz are also addressed.

INTRODUCTION

The majority of coursework for an undergraduate finance student is focused on traditional finance. In traditional finance, decision makers are rational, utility-maximizing individuals who appropriately apply probability analysis under uncertainty. However, in the past twenty years there has been growing acceptance of an alternative frame of thought. Behavioral finance recognizes that people are sometimes irrational, tend to exhibit loss-aversion instead of risk-aversion, and often rely on heuristics as a decision making tool. In 2002, Daniel Kahneman, was awarded the Nobel Prize in Economics “for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty.” (Nobelprize.org, 2002)

While the recognition of the importance of behavioral finance has become mainstream and the body of research associated with the field has become significant, it currently occupies only a small component in most textbooks in the field of business finance and investments analysis. One way to introduce the topic of behavioral finance in class is through a quiz that allows students to see that not only do behavioral biases exist, but that despite their training in the techniques of traditional finance, they fall victim to these same biases. The quiz introduced in this paper (Appendix) is designed to be a learning tool to introduce behavioral finance to students in a two-part process. First, before talking about the variety of behavioral issues that have been documented as part of the decision-making process, the students take the quiz. Second, after the instructor tabulates the results, the students have their quizzes returned and the class results are discussed in class. The rest of this paper discusses the behavioral bias associated with specific questions within the quiz.

FRAMING

The concept of frame dependence is a significant component of behavioral decision making. In traditional finance, people make decisions with frame independence. In frame independent decision making the information presented matters, but the way and order in which that information is presented does not. Frame dependence suggests that the decision depends not only on the information, but in how that information is presented. Kahneman and Tversky (1979) discussed the importance of framing when they introduced prospect theory as an alternative to expected utility theory. Prospect theory is based on the ideas that individuals do not view gains and losses independently and tend to overweight small probabilities. Framing

becomes relevant because decision makers do not focus on the net change in value, but in the individual gains and losses along the way. Hedonic editing (Thaler and Johnson, 1990) suggests that the order of the potential gains and losses can result in differing decisions even if the end result is the same. In their paper, Thaler and Johnson (1990) introduce a series of questions which are presented as questions 1, 6, 7 and 10. These questions address the issue of framing with respect to hedonic editing.

Consider questions 1 and 7 from the quiz. In question 1, the student is presented with a choice of taking a guaranteed \$500 payoff or a gamble with a 50% chance of receiving \$1000 and a 50% chance of receiving nothing after having been given \$1000. In question 7, the student is presented with the opportunity to take a coin flip which will result in winning \$500 for heads and losing \$500 for tails after having won \$1500. Note that in both cases, the end result is a choice of taking \$1500 guaranteed or a gamble which will result in a 50% chance of \$2000 or a 50% chance of \$1000. While risk-aversion would argue that everyone should take the \$1500 guaranteed, the interesting aspect from a framing perspective is that the results are often inconsistent with some people taking the guaranteed payoff in one situation and the gamble in the other. In addition, typically more people take the gamble in question 7 after they have just won the first \$1500 in a coin flip.

Now look at questions 6 and 10 from the quiz. In question 6, the student is presented with a choice between a guaranteed loss of \$750 or taking a coin flip in which they will lose \$525 for heads or lose \$975 for tails. In question 10, the student has just lost \$750 in a coin flip and now has the option for a second flip. In the second flip, the student can win \$225 for heads or lose \$225 for tails. As with questions 1 and 7, the end result is the same in both questions. The student can choose a guaranteed loss of \$750 or a gamble that will have a 50% chance of losing \$975 and a 50% chance of losing \$525. Traditional finance would suggest that everyone should take the guaranteed loss (due to risk-aversion), but if people did take the gamble, they should at least be consistent (frame independence). Instead, many students will exhibit inconsistent responses (taking the guaranteed payment in one instance and the gamble in another). Also, they are more likely to take the gamble in question 6 than they are in question 10 after having just “lost” \$750 on a previous flip.

The purpose of these four questions is to show students that (a) there are many situations where people may choose not to be risk-averse, (b) the way in which information is presented can cause them to make inconsistent choices, and (c) they are likely to become less risk-averse after a “win” and more risk averse after a “loss” regardless of the net result.

Another question that deals with framing is question 5. Tversky and Kahneman (1981) introduced a scenario related to framing that illustrates we can get confused by making value judgments based on how the information is worded. In their example, they create a scenario where a medical decision must be made to treat a disease. Belsky and Gilovich (1999) offer a similar scenario about a military decision. This is the scenario in question 5. However, for this question to work well as a teaching tool in the classroom there need to be two separate versions of the quiz. Half the students in class will receive question 5A while the other half will receive question 5B. Here, the scenario is exactly the same in both scenarios – save 1/3 of the soldiers with certainty or make a choice that will have a 1/3 chance of saving all or a 2/3 chance of losing all. The difference is in the phrasing. In one version, the wording is structured so that your decision will “save 200 soldiers” while in the other version, the same decision will result in “400 soldiers under your command die”. Mathematically the results are identical since saving 200 of the 600 soldiers implies the other 400 will die. However, the emotional connection to words can

influence the decision as we are focused on saving 200 rather than letting 400 die. Also, in the second version the soldiers that die are specifically connected to the decision maker by adding the phrase “under your command”. While typically there is a tendency to choose route B (the all-or-nothing option), students presented with the opportunity to “save 200 soldiers” are more likely to take route A than those presented with the knowledge that “400 soldiers under your command will die”. According to frame independence, there should be no relationship between the route chosen and the wording of the alternatives.

Mental Accounting can also be seen as an aspect of framing. Thaler (1985) provides several examples of mental accounting. Simply stated, mental accounting is the process of separating money into specific categories rather than evaluate our wealth as a whole. For example, if an individual receives an unexpected windfall, he will likely treat that money differently than his regular income. Or, as in question 3 from the quiz, if an individual associates an expenditure as tied to another larger expenditure, it may be treated differently than it is on its own.

As with question five, there need to be two different versions of question three. Half the class will receive question 3A and the other half will receive question 3B. In the first version, the student is considering the purchase of a relatively expensive house (the home price may need adjusted based on geographic location). The two houses under consideration differ only based on the price and the inclusion of a home theater system. The house with the home theater system costs an extra \$7000. In the second version, the house was purchased last year and now the student must decide whether or not to purchase a \$7000 home theater system. In the first version, the vast majority of students choose the house with the home theater system. In the second version, only a small portion of students choose to buy the home theater system. Due to mental accounting (classifying the purchase as part of the house or separately), the decision is altered. According to the decision-making methodology of traditional finance there should be little difference between these two cases and an equal proportion of students should choose to acquire a \$7000 home theater system.

A final framing bias that is introduced through the behavioral quiz presented in this paper is the decoy effect. The decoy effect refers to a situation where a choice is presented to individuals in order which alters their preference among other alternatives (Huber, Payne and Puto, 1982). Question thirteen presents a situation to illustrate the decoy effect.

In question thirteen, half the class is presented with a choice between two televisions. One television is less expensive, smaller and receives less favorable reviews relative to the second television. The other half of the class is presented with a choice between three televisions. The first two are exactly the same as the televisions presented in the other version of the quiz. However, the third is a premium model that is more expensive, larger and receives better reviews than the other two. While traditional decision-making theory recognizes that the third television may be preferred to the first two, it should not alter preferences between the first two. The results support the decoy effect. In version A, students typically choose the cheaper television. However, students with version B are more likely to choose the mid-priced television. By introducing a more expensive alternative, the lowest priced model is now less appealing.

LOSS AVERSION

In addition to addressing framing, prospect theory (Kahneman and Tversky, 1979) also addresses the issue of loss aversion. One of the principle concepts of traditional finance is that of

risk-aversion. According to risk-aversion, investors will only take on additional risk if they receive adequate compensation. While the specific degree of risk-aversion is not specified and typically is assumed to vary depending on the individual, the basic premise of risk-aversion is assumed to underlie financial decision making. However, Kahneman and Tversky argue that people are loss averse rather than risk averse. This implies that they feel the pain of losses more than they feel the pleasure of gains and that they may actually take on additional risk to avoid a loss. Questions two and four from the quiz address the issue of loss aversion.

In question two, there is a decision involving risk aversion. The student is offered a guaranteed \$240 or a gamble with an expected value of \$250. Note that either decision is consistent with risk-aversion. If the student takes the gamble, then she earns a compensation for risk of \$10 in terms of expected value. Whether or not this is sufficient compensation depends on the individual. However, with question four the answer with regard to risk aversion is clear. The student is offered a guaranteed loss of \$740 or a gamble with an expected loss of \$750. If the student takes the gamble, then she not only takes on higher risk but also is penalized \$10 in terms of additional expected loss. If students display risk averse behavior, they should all choose the guaranteed loss of \$740. In my experience, a significant majority will take the guaranteed payoff in question two while taking the gamble in question four, illustrating that loss aversion better fits their utility function than does risk aversion.

HEURISTICS

Heuristics refer to shortcuts for decision making that are developed from learned behavior or past experience. In traditional finance, decision making is handled using probability analysis under uncertainty and utility theory. However, these processes can sometimes be complex and people often rely on simple heuristics to make decisions instead. Unfortunately, this can create biases in our decision making based on our specific past experiences and how our brains store those experiences.

One heuristic that we use is representativeness. Kahneman and Tversky (1972) define representativeness as a situation where “subjective probability of an event, or a sample, is determined by the degree to which it: (i) is similar in essential characteristics to its parent population; and (ii) reflects the salient features of the process by which it is generated.” Shefrin (2000) discusses an experiment where he asks students in his MBA class to estimate an expected return for two stocks, Dell and Unisys. The results were very high (20.9% on average) for Dell and quite low (6.3% on average) for Unisys. Based on the yield on Treasuries and betas at the time, the CAPM predicted returns of 19.1% for Dell and 21.7% for Unisys (Shefrin, 2000, pp. 82-83). Why the big difference between the traditional-finance CAPM estimate and the estimates of the MBA students? Shefrin suggests that it was because Unisys was seen as a “bad” company and Dell a “good” company. Therefore, students did not base their analysis on risk and return, but on their image of the company.

Questions 8 and 18 address this risk-return inversion that results when students apply the representativeness heuristic to their evaluations of common stocks. In question 8, the students are given a list of 9 companies and asked to rank them based on how the student perceives the potential return from each company. While the students do not need to estimate a specific expected return, they are basing their rankings off of their expectations. In question 18, they are given the same set of companies (in a different order) and asked to rank them based on perceived risk. According to traditional finance, we should expect to see a strong correlation between the rankings for risk and those for return. Specifically, the stocks with the highest expected returns

should be the riskiest while the stocks with the lowest expected returns should be the least risky. Instead a different picture forms. Students tend to identify “good” stocks and rank them as less risky with higher expected returns. Alternatively, “bad” stocks are ranked as riskier with lower expected returns. In the most recent version of this quiz, Apple and Google were ranked as the stocks with the highest expected returns, but both were also among the three stocks with the least perceived risk. On the flip side, Citigroup and Toyota were perceived to be the riskiest stocks and were also among the three stocks with the lowest expected return. Note that prior to the quiz, students are asked to spend some time looking at the nine stocks that are on this list so that they are familiar with each as a potential investment. In addition, the list of nine stocks used on the quiz is generated each year based on current conditions so that students are more likely to be aware of the companies and have a “good” or “bad” view of them.

Another example of the representativeness heuristic is the conjunction fallacy introduced by Tversky and Kahneman (1983). This is based on basic probability analysis which states that the probability of a conjunction, $P(A\&B)$, cannot be greater than the probability of the individual components, $P(A)$ and $P(B)$. In order for both A and B to be true jointly, the need to each be true individually. However, individuals may perceive the conjunction to be more likely if it is more representative of how they characterize an event. One of the examples, provided by Tversky and Kahneman (1983), is similar to question nine in the quiz. The characteristics of Linda and the outcomes that need to be ranked have been modified to reflect the current cultural environment.

In this question, the image of Linda is presented in a manner that we would be more likely to expect her to take yoga classes and be active in protests against global warming, but less likely to be involved in a finance profession such as a loan officer at a bank or a financial planner. Therefore, when the student is asked to rank the probability of her being a loan officer or financial planner, he is likely to assign a low ranking (less probable). However, when the student is asked to rank the possibility of being a loan officer at a bank who is active in protests against global warming, the second characteristic is representative of his image of Linda and it gets a higher ranking (more probable). Typically, about 80-90% of students rank the conjunction as more likely the less representative individual component.

Another common heuristic is anchoring. Anchoring refers to the phenomenon in which people make forecasts based on some initial value and adjust from there. Interestingly, there is evidence that the anchor may not even be related to the issue being forecasted. For example, Kahneman and Tversky (1974), ran an experiment asking people to forecast a percentage for the number of African countries in the United Nations. However, before they made their forecast, they spun a wheel of fortune to generate a random number. Then, they answered a two part question. Was the correct number higher or lower than the number on the wheel and what was the number? The answers were correlated to the number spun on the wheel. Question Twelve poses a similar experiment.

As with some previous questions, two versions of this question need to be presented to the class. The first part of the question is to write down the number on the bottom of the page. For half the class this will be a low number (e.g. 15), while the other half will receive a high number (e.g. 78). The second part of the question is some forecast. In the latest version of the quiz, the students are asked to forecast the market acceptance of 3D television. The specific forecast does not matter, as long as it is something that can be in percentages and where the answer will either be subjective or something which the students are unlikely to know with any precision. In the most recent semester that I administered the exam, the students with the low

number on their page had an average forecast of 34% vs. 53% for the students with the high number.

A final heuristic addressed in the behavioral quiz is that of overconfidence. Overconfidence is one of the best-known and well-documented behavioral biases and extends beyond finance-related decision making. A study of drivers in Texas finds that 90% believe they have above average driving skills and 82% rank themselves in the top 30 percentile of safe drivers (Svenson, 1981). An alternative approach to looking at overconfidence is in forecasting. Alpert and Raiffa (1982) found that when people were asked to make a forecast with a 99% confidence interval, there was only about a 60% chance of them being right. In other words, forecasters overestimate their forecasting ability. Both of these approaches to evaluating overconfidence are addressed in this quiz.

Question fourteen through sixteen asks students to evaluate themselves relative to their peers in three categories – driving ability, time spent on homework, and ethics. The results of two of these three questions are consistent with Svenson's analysis of Texas drivers in that students consistently rank themselves as better than average with respect to driving ability and ethics. However, an interesting result occurs with question fifteen when students rank their time spent on homework. Here, the class average is typically close to an average ranking and the distribution includes several who rank themselves on either side of average. Two possible explanations for this are (a) students have a better frame of reference for evaluating the time spent on homework relative to peers and (b) there is less incentive towards self-esteem to have an inflated view of one's time spent on homework.

Question seventeen asks students to estimate 8 specific factors within a 75% confidence interval. In initial attempts at this quiz, students had a difficult time understanding this question and following instructions, so very specific instructions have been created. Results are consistent with Alpert and Raiffa in that most students get fewer than 6 of the 8 questions correct and each question is answered correctly by less than 75% of the class (often only 10-25% of the ranges include the correct answer.)

LIMITATIONS

The purpose of this quiz is to introduce some of the more common behavioral biases to students in a manner that involves them more personally than a general lecture. It is one thing to hear about behavioral biases in general, however by seeing the biases in oneself and one's classmates they become more real. However, there are also several potential limitations to this quiz. These include a limited sample of behavioral biases, potentially small sample sizes for interpreting results, the behavioral biases are not always linked to finance-related decisions, and the critique that professionals making real-world decisions may respond more rationally than students taking a quiz designed to highlight biases.

There are a wide variety of common behavioral biases that have been well-documented in the literature. Only a handful of these are covered in this quiz. However, the instructor needs to find a balance between time and inclusiveness. While adding more questions can highlight more biases, doing so would also increase the length of the quiz. As the time required to complete the quiz increases, there is a greater chance that the students may lose interest and answer the questions quickly as opposed to trying to think about how they would respond in that situation. As structured, students can typically complete this quiz in about 20-30 minutes. If an instructor would like to modify the quiz to add more questions, the instructor is welcome to do so.

One problem that instructors may encounter if they are teaching a small class (e.g. 20 or fewer students) is a sample size that is too limited to make the results reliable and meaningful when presented back to the students. This is especially true for the questions in which there need to be one version presented to half the class and a second version presented to the other half of the class. For example, in question five, if there are only seven or eight individuals answering each version there may not be a clear pattern to illustrate the framing bias. When dealing with a small class, the instructor can choose to omit those questions which require separate versions or just address the issue of small sample size in class when discussing the results.

As this quiz is presented as a way to introduce/discuss behavioral finance in class, one may wonder about the inclusion of a question that addresses the decoy effect. Similarly, students may recognize that they fell victim to the conjunction fallacy, but wonder what that has to do with making decisions about portfolio allocations or capital budgeting analysis. This falls back to the purpose of the quiz. The quiz is not designed to teach behavioral finance, but to introduce how often the traditional, rational decision making model is not a part of the decision process for many individuals. Once students take the quiz and see the results, they can better relate to the various framing issues and heuristics that influence decisions. At that point, the instructor can then discuss some financial implications in class lecture or ask students to think of finance implications as part of homework or class discussion. Based on feedback from students, taking the quiz and seeing how they and their classmates answered the questions had a significant impact on how they viewed behavioral finance.

The behavioral questions and situations used in this quiz are not new. While many have been slightly modified and/or updated, they are all based on examples created by researchers to illustrate a specific effect. However, a common criticism against many of these examples that applies equally to this test is that many of the results are taken from students and not business professionals with a strong financial incentive to behave rationally. For example, it is easy for a student to say that she would buy a \$220,000 house with a home theater system rather than choosing the \$213,000 house without. However, what would she really do in that situation when real money was on the line? We don't know. However, we can point out that it is just as easy for a student to say that he would spend \$7000 to buy a home theater system to add to his existing house. Also, while a student may use representativeness to rank stocks on risk and return in a quiz, he may be more careful when it comes to actually investing in these stocks with real money. Here though, we can point out that the finance students typically hear the risk-return mantra so many times that if they can easily replace it with characterizations of good/bad it is not a stretch to imagine real investors doing the same. Ultimately, the best response is to defer to the explanation offered earlier. The behavioral quiz in this paper is a tool to introduce behavioral biases and get students personally connected to the material so that they are more engaged. An instructor can, and arguably should, present counterpoints.

CONCLUSION

This paper presents a sample behavioral quiz that can be used in finance and/or investments classes to introduce and discuss behavioral finance. The questions are tied to specific behavioral biases (framing, loss aversion, and heuristics) that have been well-documented in the literature. The purpose of this quiz is to help engage students by making the specific biases real through the responses of the individual student and her classmates. The results of the quiz can then be used to initiate discussion and address the implications of these biases on decision making within the field of finance.

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APPENDIX – BEHAVIORAL FINANCE QUIZ

1) In addition to whatever you own, you have been given \$1,000. You are now asked to choose between

- A) A sure gain of \$500
- B) A 50% chance to gain \$1,000 and a 50% chance to gain nothing.

2) You have the choice to receive a guaranteed \$240 OR participate in a game of chance. In the game of chance, you have a 25% chance of receiving \$1000 and a 75% chance of receiving nothing. Would you

- A) Take the guaranteed \$240
- B) Take the game of chance (25% chance of \$1000 or 75% chance of \$0)

3A) You are considering the purchase of your first house. You are evaluating two houses that are almost identical. Your best deal on House A is \$220,000 and has a brand new professionally installed home theater (with an approximate value of \$7000). House B, identical except for the home theater system will cost \$213,000. Assume that the difference in home prices is not enough to impact your ability to finance the purchase. Which house would you prefer?

Home A (with home theater system)

House B (no home theater system)

3B) One year ago, you purchased a new home valued at \$213,000. Today you notice an advertisement for a professionally installed home theater system for \$7,000. You do not have the cash on hand, but can arrange financing to purchase the system. Do you purchase the home theater system? YES NO

4) You have the choice to take a guaranteed loss of \$740 OR participate in a game of chance. In the game of chance, you have a 75% chance of losing \$1000 and a 25% chance of losing nothing. Would you

- A) Take the guaranteed loss of \$740
- B) Take the game of chance (75% chance of losing \$1000 and 25% chance of losing nothing)

5A) Imagine you're a commander in the army, threatened by a superior enemy force. Your staff says your soldiers will be caught in an ambush in which 600 of them will die unless you lead them to safety by one of two available routes. If you take route A, 200 soldiers will be saved. If you take route B, there's a 1/3 chance that 600 should will be saved and a 2/3 chance that none will be saved. Which route should you take?

- A) Take Route A – Save 200 soldiers
- B) Take Route B – 1/3 chance that 600 soldiers survive and 2/3 chance that none will survive

5B) Imagine you're a commander in the army, threatened by a superior enemy force. Your staff says your soldiers will be caught in an ambush in which 600 of them will die unless you lead them to safety by one of two available routes. If you take route A, 400 soldiers will die. If you take route B, there's a 1/3 chance that no soldiers will die and a 2/3 chance that 600 will die. Which route should you take?

- A) Take Route A – 400 soldiers under your command die
- B) Take Route B – 1/3 chance that all 600 soldiers under your command will live and 2/3 chance that they will all die.

6) You choose between a guaranteed loss of \$750 or take a gamble. In the gamble, we will flip a fair coin and you will lose \$525 for a head or lose \$975 for the tail. Would you take

- A) The guaranteed loss of \$750
- B) The gamble

7) Imagine that you have just won \$1500 on a coin flip. By winning the money, you have the opportunity to place a second bet. We will flip a fair coin. If the coin comes up heads you will win \$500 and if it comes up tails you will lose \$500. Do you partake in the second bet or do you stop after winning the \$1500?

- A) Take second bet
- B) Don't take second bet

8) Rank the following stocks based on which you expect to generate the highest returns over the next three years (**1 is the highest expected return** and 9 the lowest)

- | | | |
|-------------------|---------------------|---------------------|
| _____ Exxon Mobil | _____ Google | _____ Wal-Mart |
| _____ Apple | _____ Toyota Motors | _____ Ford Motors |
| _____ Baidu | _____ Citigroup | _____ Goldman Sachs |

9) Linda is 27 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also was involved with environmental issues. She is also a vegetarian.

Please rank the following statements by their probability, using **1 for the most probable** and 8 for the least probable.

- | | Ranking |
|--|---------|
| (a) Linda is a loan officer at a bank. | _____ |
| (b) Linda is a financial planner and takes Yoga classes. | _____ |
| (c) Linda is active in protests against global warming. | _____ |
| (d) Linda is a social worker. | _____ |
| (e) Linda regularly watches Grey's Anatomy . | _____ |
| (f) Linda works in a bookstore. | _____ |
| (g) Linda is a financial planner. | _____ |

(h) Linda is a loan officer at a bank and is active in protests against global warming. _____

10) You have just lost \$750 on a coin flip, but are offered a chance at another flip. On this second flip you will win \$225 if the coin lands on heads and lose \$225 if it comes up tails. Do you partake in the second bet or do you stop after losing \$750?

- A) Take second bet
- B) Don't take second bet

12) A) Write down the number on the bottom of this page *For half the class, write down a small number (e.g. 15). For the other half, write down a large number (e.g. 78)

B) What percentage of people earning \$90,000+ do you expect to purchase a 3D HDTV within the next 3 years?

13A) You are in the market for a new flat-screen HDTV and are considering one of the following two models. Assume that your income is enough that purchasing any of these TVs is not going to cause you to eat Ramen noodles for the next two months, but that this is still considered a significant purchase.

A) This HDTV has a 45" screen and comes with a 3-year warranty. A popular review magazine gives it an overall score of 90 out of 100. The cost is \$1299.

B) This HDTV has a 51" screen and comes with a 3-year warranty. A popular review magazine gives it an overall score of 93 out of 100. The cost is \$2399.

Which TV are you most likely to purchase? A B

13) You are in the market for a new Plasma TV and are considering one of the following three TVs. Assume that your income is enough that purchasing any of these TVs is not going to cause you to eat Ramen noodles for the next two months, but that this is still considered a significant purchase.

A) This HDTV Plasma TV has a 45" screen and comes with a 3-year warranty. A popular review magazine gives it an overall score of 90 out of 100. The cost is \$1299.

B) This HDTV Plasma TV has a 51" screen and comes with a 3-year warranty. A popular review magazine gives it an overall score of 93 out of 100. The cost is \$2399.

C) This HDTV Plasma TV has a 53" screen and comes with a 3-year warranty. A popular review magazine gives it an overall score of 95 out of 100. The cost is \$3599.

Which TV are you most likely to purchase? A B C

14) Relative to the other people in this class, how would you classify your ethical character on a scale of 1 to 9 (**1 being significantly LESS ethical than the average person** and 9 being significantly MORE ethical than the average person)

Less Ethical				Average Ethics				More Ethical
1	2	3	4	5	6	7	8	9

15) Relative to the other people in this class, how would you classify your study habits.

Study Less				Study Average				Study More
1	2	3	4	5	6	7	8	9

16) Relative to the average PSU student, how would you classify your driving ability.

Bad Driver				Average Driver				Excellent Driver
1	2	3	4	5	6	7	8	9

17) Answer the following questions by providing a **range** that you are 75% confident your answer will fall in that range. **If you are a good judge of your level of knowledge, you should be within the range for 6 of the 8 questions. If you are right on more than six of the eight you are underconfident. If you are right on less than six of the eight you are overconfident.**

EXAMPLE: How many days in the last 200 trading days did the Dow Jones Industrial Average Increase in Value?

INCORRECT RESPONSE è 97 days (This is incorrect because it is not a range, but a single number)

POOR RESPONSE è 97-98 days (While this is a range, it is far too narrow to be 75% confident that you have captured the correct answer within your range)

POOR RESPONSE è 2-198 days (This range is too large to be only 75% confident that you have captured the correct answer within your range)

- A) How many months in the last 7 years (84 months) did the DJIA increase in value
- B) One dollar invested in Apple on April 23rd, 1998 would be worth how much

- F) The closing value of the DJIA on November 14, 1994 was _____
- G) The value of \$100 compounded at 13% annually for 30-years is _____ (**NO** calculations and note that this is a single cash flow...not an annuity.)
- H) If I invest \$1000 per year at the **end of each year** for 40-years and earn a 12% rate of return I will have _____ 40 years from today. (**NO calculations**)

18) Rank the following stocks based on which you expect to be the riskiest over the next three years (**1 is the highest risk** and 9 the lowest risk)

- | | | |
|---------------------|-------------------|---------------------|
| _____ Citigroup | _____ Apple | _____ Ford Motors |
| _____ Goldman Sachs | _____ Exxon Mobil | _____ Toyota Motors |
| _____ Baidu | _____ Wal-Mart | _____ Google |