FINM3407 - Behavioural Finance

Tutorial 9 Questions/Answers - Behavioural Factors and Stock Market Puzzles

Note: This topic has more questions than can be covered in a 2-hour session. The questions to be covered by your tutor are indicated by an asterisk (*); the rest questions should be viewed as extra practice problems.

In this tutorial, we are going to cover the following topics: Behavioural Factors and Stock Market Puzzles/CFA Questions

        There are a few references reading for these relevant topics:

AckertDeaves Chapters 14

- **Part One: Behavioural Factors and Stock Market Puzzles**

1*. Differentiate the following terms/concepts:

        a. Certainty equivalent and a gamble

A certainty equivalent is the wealth level that leads a decision-maker to be indifferent between a particular prospect and a given wealth level and a gamble is a lottery or series of wealth outcomes, each of which is associated with a probability.

        b. Loss aversion and myopic loss aversion

For a person who is loss-averse, losses loom larger than gains. In contrast, myopic loss aversion implies the person also evaluates her portfolio frequently.

        c. Speculative price bubble and ex post rational stock price

A speculative bubble is said to exist when high prices seem to be generated more by traders' enthusiasm than by economic fundamentals. Shiller defines ex post rational stock price as the stock price if you actually knew all future dividends.

        d. Greater fool theory and speculation

Traders speculate or take on risk in order to earn returns. The greater fool theory suggests that people buy assets that they realize are overvalued because they think there is a foolish individual out there who will pay even more.

2*. In a Ponzi scheme, named after Charles Ponzi, investors are paid profits out of money paid by subsequent investors, instead of from revenues generated by a real business operation. Unless an ever-increasing flow of money from investors is available, a Ponzi scheme is doomed to failure. What's the difference between a Ponzi scheme and an asset price bubble?

Ponzi schemes are generated by fraudulent schemers and the existence of a bubble does not necessarily suggest fraud.

3*. An individual with cash to invest has two investment choices:

  Buy a stock fund which every year either earns 40% or -20% with a 50/50 probability.

  Buy a bond fund that every year returns either 5% or 0% also with a 50/50 probability.

Assume that the returns on the two funds are independent and that returns from year to year are also identical. Also, assume an initial portfolio value of $1. (The answers, however, will be unaffected if you use a different initial portfolio value.)

In addition, suppose the value function is linear and is specified as:

  $v(z) = z$ for $z \geq 0$ and $v(z) = -3(-z)$ for $z < 0$

a. Which fund does the investor prefer if he looks at his portfolio (a) once a year; or (b) once every two years?

One year:

If we arbitrarily start from $1, after one year the investor will have experienced a wealth increase of .40 with a .5 probability and a wealth change of -.20 also with a .5 probability. The value of the prospect which is the stock investment is:

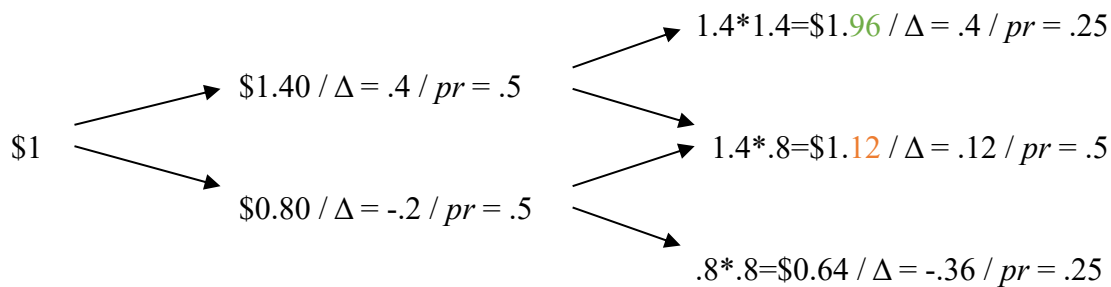*1 year stock: $V = .5 * .40 + .5 * (-.20) * 3 = -.10$*

For the bond fund, after one year the investor will have experienced a wealth increase of .05 with a .5 probability and a wealth change of 0 also with a .5 probability. The value of the prospect which is the bond investment is:

1 year bond: $V = .5 * .05 + .5 * 0 = 0.025$

Therefore, the bond fund is preferred over a 1-year horizon.

2 yrs:

2-year outcome tree for stock investment is:

$1.4*1.4=$1.96 / \Delta = .4 / pr = .25$

$1.40 / \Delta = .4 / pr = .5$

$1 \quad \quad 1.4*.8=$1.12 / \Delta = .12 / pr = .5$

$0.80 / \Delta = -.2 / pr = .5$

$.8*.8=$0.64 / \Delta = -.36 / pr = .25$

The value of the prospect which is stock investment is:

V = 0.25 * 0.96 + 0.5 * 0.12 + 0.25 * (-0.36) * 3 = 0.03

0.96=1.96-1 ($1 is the initial capital)

0.12=1.12-1

-0.36=0.64-1

2-year outcome tree for bond investment is:

$1.05*1.05=$1.1025 / \Delta = .1025 / pr = .25$

$1.05 / \Delta = .05 / pr = .5$

$1 \quad \quad 1.05*1=$1.05 / \Delta = .05 / pr = .5$

$1.00 / \Delta = 0 / pr = .5$

$1*1=$1 / \Delta = 0 / pr = .25$
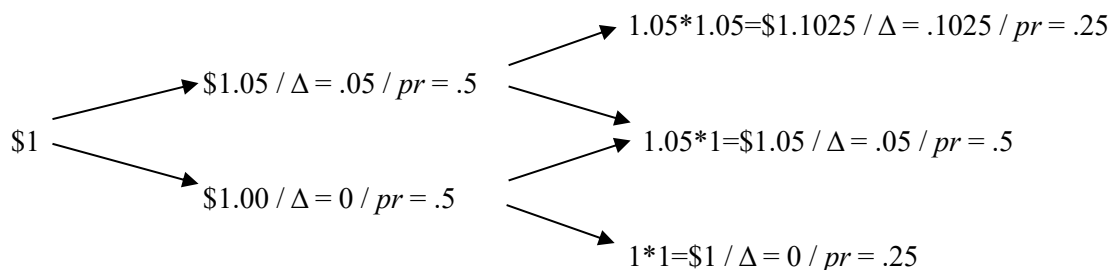
The value of the prospect which is the bond investment is:

V = 0.25 * 0.1025 + 0.5 * 0.05 + 0.25 * 0 = 0.051

Therefore, the bond fund is also preferred over a 2-year horizon.

<u>b. How does your answer to Part (a) help us understand the equity premium puzzle?</u>

Notice that the gap between the bond prospect value and the stock prospect value has narrowed. In fact, at some horizons longer than 2 years the stock investment will be preferred. Note as well that the lower is λ the shorter the horizon at which the stock fund will be first preferred. For example, if $\lambda=2$ the stock fund is preferred at 2 years (V = 0.12=0.25 * 0.96 + 0.5 * 0.12 + 0.25 * (-0.36) * 2 vs. V = 0.051 for bond fund). Further, the stock fund will be preferred

sooner if the expected return on the stock fund is higher. This question illustrates the myopic loss aversion explanation for the equity premium puzzle in that indifference between stocks and bonds appears to be consistent with a value for λ and an expected stock return that is in the neighborhood of what is likely.

4*. What do experimental bubble markets teach us about the likelihood of bubbles in the real world? In what sense does this research have its limitations?

If bubbles (mispricing) can generate simple market structures, it seems they would be fairly likely in much more complicated naturally occurring markets. This research allows a great deal of control for extraneous factors, but people may behave differently in a controlled laboratory situation.

5*. Do you believe that stock prices are too volatile? Be sure to explain what you mean when you say "volatility" and "too much."

This question can be argued either way but the student is expected to provide a basis for her arguments.

The belief in whether stock prices are too volatile or not depends on one's perspective and the context in which we evaluate volatility. Volatility, in the context of stock prices, refers to the degree of variation or fluctuation in the prices of stocks over a specific period. Here are arguments for both sides:

Believing Stock Prices are Too Volatile:

1. **Risk Perception:** Some may argue that excessive volatility can be problematic because it increases the perceived risk associated with investing in stocks. This can deter potential investors and contribute to market instability.
2. **Market Efficiency:** Those who advocate for lower volatility might suggest that it ensures a more efficient market where stock prices reflect fundamental values rather than being influenced by short-term speculation and emotional trading.

Believing Stock Prices are Not Too Volatile:

1. **Market Dynamics:** Volatility is a natural characteristic of financial markets. It allows for price discovery, as stock prices react to new information and market events. A degree of volatility is essential for markets to function efficiently.
2. **Investment Opportunities:** Some investors actively seek out volatile markets as they provide opportunities for profit through short-term trading strategies. To them, volatility represents a chance to capitalize on price fluctuations.

3. **Diverse Perspectives:** What one person considers "too much" volatility might be seen as an opportunity for another. It's subjective, and investors have varying risk tolerances and investment objectives.

In conclusion, whether stock prices are too volatile or not is a subjective matter, and it often depends on one's risk tolerance, investment strategy, and their view on market efficiency. What's crucial is that volatility is inherent to financial markets, and its level can vary over time due to economic events, market sentiment, and other factors.

6*. A series of questions related to the equity premium puzzle:

How is the equity premium typically calculated?

The equity premium is typically calculated as the difference between the average return on the stock market and the average return on a risk-free asset (usually short-term government bonds or Treasury bills).

Equity Premium = Average Return on Stocks - Average Return on Risk-Free Asset

6-1 Suppose the average real return on equities over the past decade was 8% per annum and the average real return on government bonds was 2% per annum. Calculate the average equity premium over the past decade.

Equity Premium = Average Return on Stocks - Average Return on Government Bonds

Equity Premium = 8% - 2% = 6%

6-2 If in a given year, stocks returned 15% and Treasury bills (risk-free rate) returned 4%, what is the equity premium for that year?

Equity Premium = Return on Stocks - Return on Risk-Free Asset

Equity Premium = 15% - 4% = 11%

6-3 A researcher believes that rare disasters can explain the equity premium puzzle. He states that if equities can lose 50% of their value with a 2% chance in any given year, this can justify a high equity premium. Using these numbers, what would be the expected loss due to these rare disasters?

Expected loss = Probability of Disaster x Magnitude of Loss

Expected loss = 0.02 x 0.50 = 0.01 or 1%

This means that the expected annual loss from a rare disaster is 1%. To justify a high equity premium, investors would demand compensation that's at least as high as this expected loss, and likely even higher.

6-4 Define the Equity Premium Puzzle

The Equity Premium Puzzle refers to the discrepancy between the observed excess returns on equities over risk-free rates and what is predicted by standard economic models. In empirical observations, equities tend to have a much higher return than risk-free assets, a difference that is significantly larger than what traditional consumption-based capital asset pricing models would predict.

6-5 How do 'rare disasters' play into some explanations of the Equity Premium Puzzle?

The 'rare disasters' explanation posits that the equity premium can be rationalized if there's a small probability of a large, catastrophic economic downturn (or disaster) in the future. Even if such events are rare, the potential for extreme losses in these scenarios can justify a high equity premium as investors demand compensation for the risk of these low-probability, high-impact events.

6-6 Name two popular explanations for the Equity Premium Puzzle.

- Risk Aversion and Consumption Habits: Some researchers believe that the puzzle can be resolved by considering extreme risk aversion among individuals. However, the levels of risk aversion needed to reconcile the puzzle often seem implausibly high.
- Behavioral Finance: Some theories attribute the puzzle to psychological factors and biases that affect investor behavior. For instance, myopic loss aversion suggests that investors are overly sensitive to short-term losses, which in turn leads them to demand a higher premium for holding equities.

- **Part Two: CFA Questions**

Ravi King is an advisor with an investment management company that classifies all investors into one of four Behavioral Investor Types (BITs): Passive Preserver (PP), Friendly Follower (FF), Independent Individualist (II), or Active Accumulator (AA). King prepares for a meeting with Amélie Chan, a client who exhibits moderate risk tolerance. King believes that Chan's prior investment choices are consistent with her BIT. In their last meeting one year ago, Chan expressed an interest in owning shares of a small, local startup company that she had heard about from friends. King explained the high level of risk associated with that investment idea, and Chan agreed that he should not buy the shares for her account. King recommended that Chan instead invest in shares of another company, Avimi S.A. The investment management company's data-backed research report suggested that the Avimi shares were undervalued. Chan agreed with King's recommendation, and King bought shares of Avimi for Chan's account. King will meet with Chan tomorrow and present the investment management company's updated research report on Avimi. The report justifies his belief that the shares are now overvalued, and he will recommend that Chan sell her Avimi shares.

1. **Determine the BIT most likely to be assigned to Chan. Justify your response.**

Determine the BIT most likely to be assigned to Chan. *(circle one)*			
Passive Preserver	Friendly Follower	Independent Individualist	Active Accumulator

Justify your response.
- Chan is most likely to be classified as a Friendly Follower (FF).
- Chan exhibits moderate risk tolerance.
- Chan tends to follow leads from her friends and advisor when making investment decisions.
- Chan complied with the professional investment advice backed by databacked research reports, so she agreed with King's recommendation to purchase Avimi shares.
- The FF can often overestimate his or her risk tolerance, as Chan did when she wanted King to invest in the high-risk small, local startup company.
- The FF may follow "hot" ideas and show availability bias, as Chan did when she wanted to King to buy shares of the small, local startup company.

Chan is most likely to be classified as a Friendly Follower. This type of passive investor exhibits moderate risk tolerance and tends to follow leads from his friends, colleagues, or advisors when making investment decisions. The FF generally complies with professional investment advice supported by data-backed research reports, and Chan agrees with King's recommendation to invest in Avimi.

The FF often overestimates his or her risk tolerance, as Chan did when she suggested an investment in the small, local startup company, which King determined had a high level of risk. Chan sought to follow a "hot" investment idea and showed availability bias when she sought to own shares of the small, local startup company because she had learned of this investment idea from her friends.

2. Determine whether Chan will most likely hold or sell the Avimi shares after meeting with King tomorrow. Justify your response.

Determine the BIT most likely to be assigned to Chan.
(circle one)

Hold	Sell

Justify your response.
● Chan will most likely sell the Avimi shares.
● Chan tends to follow the lead of her advisor when making investment decisions.
● Chan will likely follow the sell recommendation because it is supported by the investment management company's updated research report.

Chan is likely to follow King's professional recommendation and sell the Avimi shares. Chan is most likely to be classified as a Friendly Follower (FF), and this investor type tends to follow the leads of friends and investment advisors when making investment decisions. Data-backed research reports tend to help the FF better understand the implications of his or her investment choices. One year ago, King's presentation of the investment management company's research report helped Chan decide to buy the Avimi shares. Now, the investment management company's updated research report is likely to help persuade Chan to sell her shares.

King prepares for a meeting with Lani Mikaele, a client who founded a successful, fast-growing business that has made her wealthy. Unlike many other clients, Mikaele is very involved in the decision-making process with King. She calls King often to suggest purchasing and selling positions, resulting in a higher turnover rate relative to other clients. At a business lunch last year, King recommended that Mikaele purchase shares of Withrow Inc., which has high growth potential but pays no dividends. Following their discussion, Mikaele was enthusiastic about the potential returns, so she followed King's recommendation and bought Withrow shares.

3. Determine the BIT most likely to be assigned to Mikaele. Justify your response.

Determine the BIT (PP, FF, II, AA) most likely to be assigned to Mikaele.
(Circle one)

Passive Preserver	Friendly Follower	Independent Individualist	Active Accumulator

Justify your response.
● Mikaele is most likely to be classified as an Active Accumulator (AA).
● Mikaele is actively involved in the investment decision-making process.
● Mikaele exhibits a high risk tolerance as evidenced by her founding of a successful fast-growing business.
● Mikaele has a high net worth resulting from the success of her business, a characteristic of the AA.
● Mikaele's account exhibits a high turnover rate relative to other clients. Mikaele is most likely to be classified as an Active Accumulator (AA). She is heavily involved in the investment management process. Mikaele exhibits a high-risk tolerance, evidenced by her founding a successful fast-growing business, and has accumulated significant wealth.

Additionally, Mikaele's account has a relatively high turnover rate. These are all characteristics of an AA.