Approved Prep Provider CFA Institute

Level III

The Behavioral Finance Perspective

2020 Exam

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- Introduction
- Behavioral Versus Traditional Perspectives
- Decision Making
- Perspectives on Market Behavior and Portfolio Construction

1. Introduction

Traditional finance models people as ‘rational’

Behavioral finance models people as ‘normal’

2. Behavioral vs. Traditional Perspectives

Traditional (Standard, Theoretical) Finance

- Individuals are risk-averse and utility maximizing
- Modigliani and Miller's arbitrage principles
- Markowitz's portfolio principles
- CAPM
- Option Pricing Theory

Behavioral Finance

- Based on observed investor and market behavior
- Challenges rational investor assumption
- Challenges efficient market hypothesis
- Behavioral finance micro (BFMI)
  - Cognitive errors
  - Emotional biases
- Behavioral finance macro (BFMA)

2.1 Traditional Finance Perspectives on Individual Behavior

Rational investors: Make decisions consistent with utility theory
Revise expectations using Bayes formula

Utility Theory: Investors maximize utility or happiness

Completeness

Transitivity

Independence

Continuity

Bayes Formula

Example 1

Rational Economic Man (**REM**) will try to obtain highest possible utility given:

- Budget Constraints
- Information

He will only consider personal utility

Risk Aversion

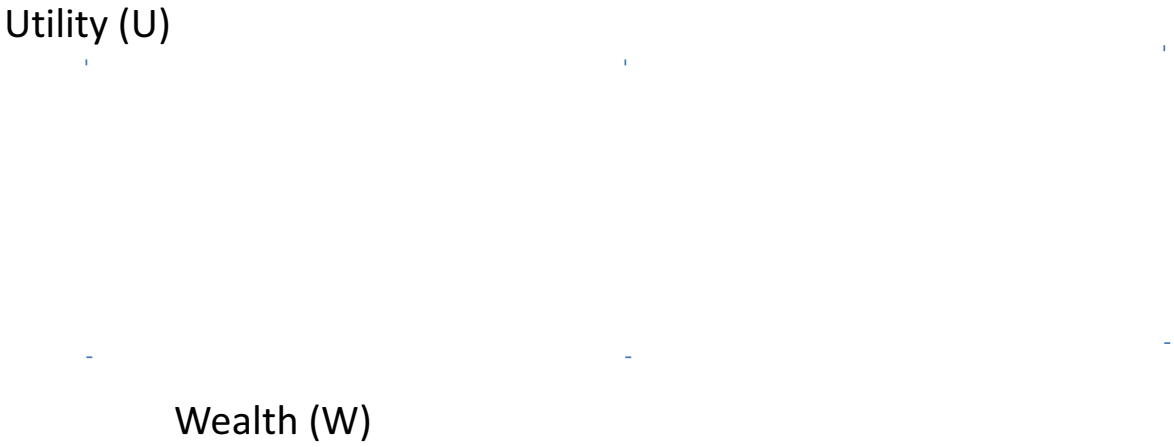


Exhibit 2

2.2 Behavioral Finance Perspectives on Individual Behavior

Challenges to REM

Human behavior also depends on fear, love, hate, pleasure and pain?

Inner conflicts → Prioritizing short-term vs. long-term aspirations

Do we really have perfect information → Bounded rationality

Utility Maximization and Counterpoint

Exhibit 3

Counterpoint:

Do normal people define mathematical equations and draw curves to determine optimal tradeoff?

What about risk aversion, size of payout

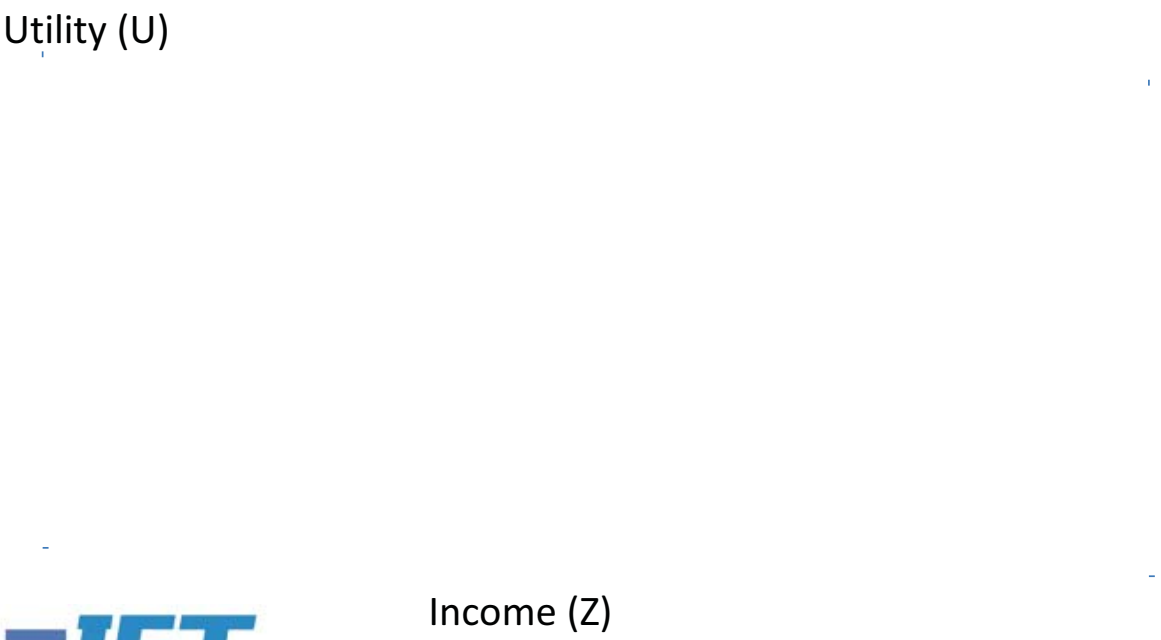
What about exogenous factors such as state of the economy

Attitude Towards Risk

Traditional view:

Behavioral view:
Risk evaluation is reference dependent
Risk seeker for some for some levels of wealth
Lottery tickets

Exhibit 4: Double Inflection Utility Function



2.3 Neuro-economics

Explain how humans make economic decisions

It relies on multiple disciplines:

Neuro-science: uses images of brain activity

Psychology

Economics

a contrast traditional and behavioral finance perspectives on investor decision making;

3. Decision Making

Decision Theory

Bounded Rationality

Prospect Theory

3.1 Decision Theory

Estimate values

Probability

Evaluate other uncertainties

Make optimal decision

3.2 Bounded Rationality

Relax assumption that perfect information is available
Recognize that individuals lack cognitive skills to make optimal decisions

Available information

Heuristics

Adequate Decisions

(not necessarily optimal)

Example 2

c discuss the effects of cognitive and knowledge capacity limitations on investment decision making;

3.3 Prospect Theory

Alternative to expected utility theory

How do individuals evaluate potential losses and gains

Framing: How prospects (alternatives) are perceived based on their framing

Evaluation: Evaluate and decide

Framing or Editing Phase

Alternatives ranked according to heuristic selected by decision maker

How is this different from expected utility theory?

Six operations in the editing process (representative, Note 16):

Codification: We perceive outcomes as gain/losses rather than final wealth

Combination: Prospects simplified by combining probabilities of similar events

Segregation: Riskless component separated from risky component

Applied to each prospect

Cancellation: Discard common probability events

Simplification: Round off

Detection of Dominance: Items that are strictly dominated are rejected

Applied to two or more prospects

Different choices framed differently → inconsistent preferences → Isolation Effect

Gamble A: 25% → $3,000 and 75% → $0

Gamble B: 20% → $4,000 and 80% → $0

65% selected Gamble B

Next we look at 2-stage gamble:

75% chance of moving to second stage; 25% change of being rejected

Gamble C: 100% → $3,000

Gamble D: 80% → $4,000 and 20% → $0

78% selected Gamble C

Evaluation Phase

People compute utility based on potential outcomes and respective probabilities

U =

Exhibit 5

People are loss-averse, not risk-averse

Would you take this gamble?
50% Probability → Win $150
50% Probability → Lose $100

What if change to wealth was less than $100

Most people reject gamble with equal win/loss chance
… unless possible win is at least twice the possible loss

What about:

100% → Lose $100

OR

50% Probability → Win $50
50% Probability → Lose $200

Different attitudes to gains and losses

Prospect theory explains apparent deviations in decision making from the rational decisions of traditional finance

People…

Overweight low probabilities

Underweight high probabilities

Are loss-average rather than risk averse

b contrast expected utility and prospect theories of investment decision making;

4. Perspectives on Market Behavior and Portfolio Construction

Traditional Perspectives on Market Behavior

Traditional Perspectives on Portfolio Construction

Alternative Models of Market Behavior

4.1 Traditional Perspectives on Market Behavior

Efficient Market Hypothesis:

Markets fully, accurately, and instantaneously incorporate all available information into market prices

Weak Form

Semi-Strong Form

Exhibit 7

Studies Challenging EMH: Anomalies

Exhibit 8

Fundamental Anomalies

Technical Anomalies

Section 4.1.3.4 Anomalies: Conclusion

4.2 Traditional Perspectives on Portfolio Construction

Rational portfolio is mean-variance efficient

4.3 Alternative Models of Market Behavior and Portfolio Construction

But we don’t have perfect information about markets
And investors don’t necessarily act rationally

Several behavioral models have been proposed

1. Behavioral approach to consumption and saving
2. Behavioral approach to asset pricing
3. Behavioral portfolio theory
4. Adaptive market hypothesis

Behavioral Approach to Consumption and Saving

Traditional model: People exert self control and maximize overall long-term benefit

But people may succumb to short term satisfaction at the expense of long term benefit

Hence people use mental accounting: put money in different buckets even though money is fungible (interchangeable)

1. Current Income → High Propensity to Consume

2. Currently Owned Assets

3. Present Value of Future Income

Mental accounting and framing will result in some saving for long-term goals but the outcome will not match optimal short-term and long-term consumption of traditional model

Behavioral Approach to Asset Pricing

Investors display biased behavior → less than optimal decisions

Behavioral Stochastic Discount Factor-Based (SDF-based) Asset Pricing Models

Factor investor sentiment into asset pricing model

Dispersion of analyst forecasts is a proxy for sentiment risk premium

Behavioral Portfolio Theory

Markowitz's Portfolio Theory

- Real probability distribution
- Risk-averse investors
- Diversified portfolio based on mean-variance analysis
- Consider covariance

Behavioral Portfolio Theory

- Probability weighting function
- Portfolios in layers
  - Riskless, Moderate Risk, Speculative
- Return expectations and attitude to risk varies between layers
- Diversification is not necessarily the objective

Example 3

BPT Investor 1 has 2 million euros and his aspirational level is also 2 million euros

BPT Investor 2 also has 2 million euros but his aspirational level is 2.1 million euros

Adaptive Market Hypothesis

High Competition for Scarce Resources

Low Adaptability

High Likelihood
Of Not Surviving

What do pandas and Long Term Capital Management (LTCM) have in common?

Summary

	Traditional Finance	Behavioural Finance
Investor behaviour Information	Describes how investors should behave Investors have perfect information and process information in an unbiased manner	Tries to explain how investors actually behave Investors have limited information and try to make decisions that statisfice (satisfy + suffice, bounded rationality) They also exhibit cognitive and emotional biases while making these decisions
Attitude to risk	Investors are risk averse	Investors are not consistently risk averse
Utility	Based on 'utility theory'	Based on 'prospect theory'
Markets	Assumes markets are efficient	Assumes markets are not entirely efficient.
Portfolios	Investors create portfolios that are mean-variance optimized	Investors create portfolios that are layered to satisfy their goals

Under **utility theory**, investors are risk-averse and use Bayes' formula to update the probability of possible outcomes and choose the option that yields the greatest expected value at given level of risk. Due to risk-aversion, they have concave utility function. By contrast, **prospect theory** assumes that individuals are loss-averse, measure gains and losses not absolute wealth and decisions are reference-dependent; which means that they become risk-averse when there is a high probability of gains or a low probability of losses but become risk-seeking when there is a low probability of gains or a high probability of losses. As a result, they have S-shaped / asymmetrical "value function".

According to **bounded rationality**, individuals are neither fully informed nor fully rational. They gather what they consider a sufficient amount of information and apply heuristics to make a decision that is as rational as possible. Due to these limitations of knowledge and cognitive capacity, the decisions that individuals make are satisfactory, but not necessarily optimal decisions.

Portfolio Construction

- Traditional finance perspective: Under traditional finance "rational", "optimal" or "mean–variance efficient" portfolios are constructed which are based on overall risk tolerance, return objective, and investment constraints of investor and focuses on covariance between assets. Assets are priced using a discount rate that is a sum of risk-free rate and a risk premium.
- Behavioral finance perspective: Due to cognitive and emotional biases, investors have difficulty deferring current consumption and saving for the future (known as self-control bias). Portfolios are constructed in layers by treating money differently based on its source and intended use (known as mental accounting bias). Assets are priced using a discount rate that is a sum of risk-free rate and market sentiment premium.

Behavior of capital markets

- Traditional finance perspective: Traditional finance assumes that markets are efficient and if market anomalies existed, they would be arbitraged away.
- Behavioral finance perspective: Behavioural finance believes that anomalies exist in the market. These anomalies can be categorized as fundamental anomalies, technical anomalies, and calendar anomalies.