EXPECTED UTILITY THEORY, AGENCY THEORY AND LIMITS TO ARBITRAGE

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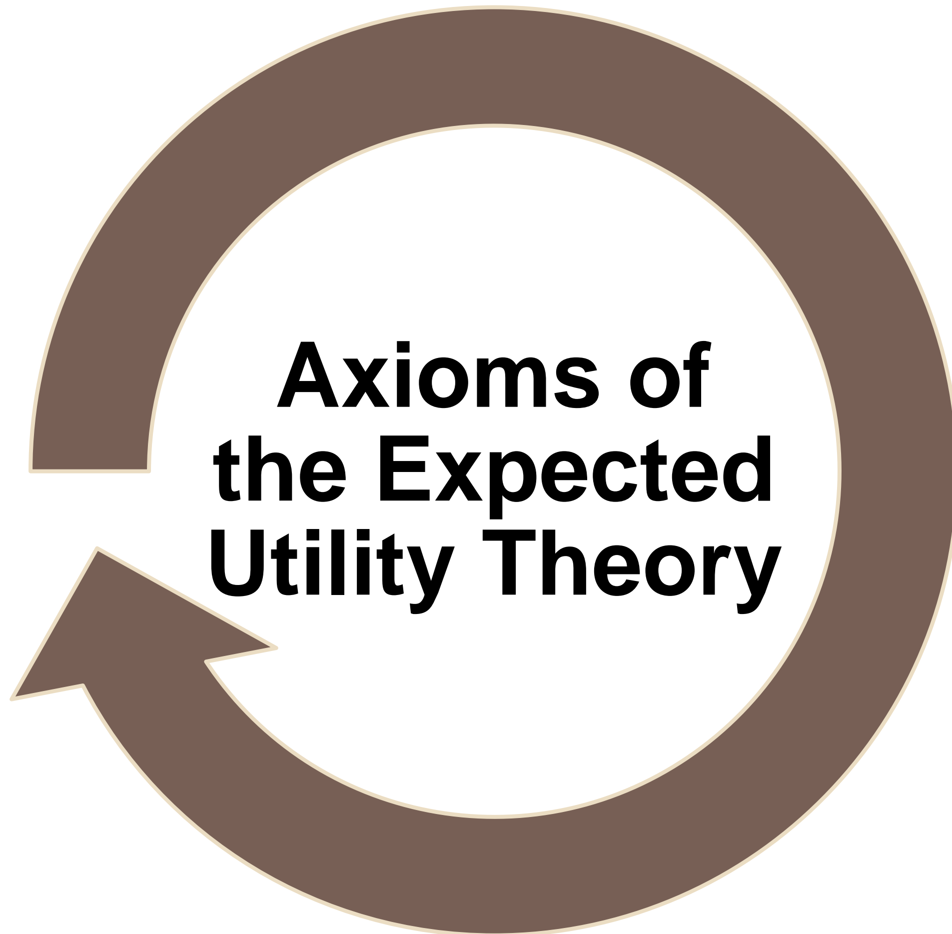
MEANING AND ORIGIN OF EXPECTED UTILITY THEORY

- "Expected Utility Theory (EUT) states that the decision maker chooses between uncertain or risky prospects by comparing their expected utility values- the weighted sums obtained by adding the utility values of outcomes multiplied by their respective probabilities".
- This theory originates with Daniel Bernoulli in 1738 and possibly earlier with Gabriel Cramer in 1728.
- Behavioural finance has showcased various examples where people's choice deviate from the principles of EUT. There are instances where axioms of EUT have been violated. These deviations are termed as irrational choices wherein individuals do not base their decisions on cost, rewards and probabilities and do not want to maximize their utility.
- The expected utility hypothesis assumes that individuals are rational when facing uncertain situations. Every individual has information available, which can differ amongst them. This means that information is not equally available. But all information is rationally processed by them.

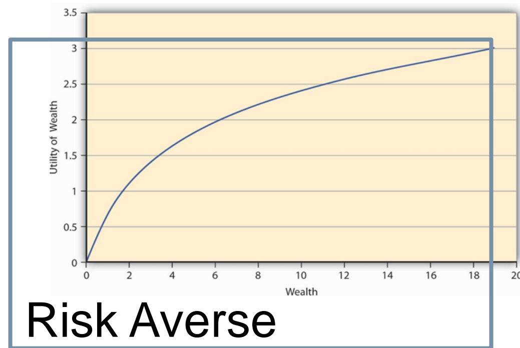


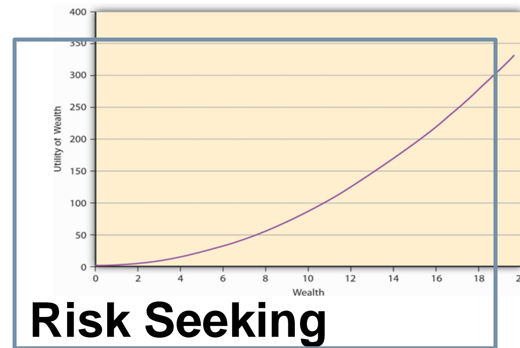
- Preference axiom
- Transitivity axiom
- Non-saturation axiom
- Continuity axiom
- Independence axiom

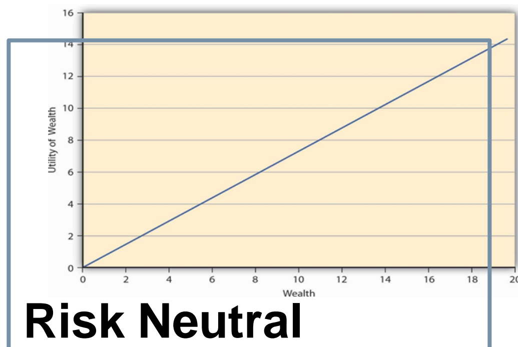
SIGNIFICANCE OF EUT

- Expected utility theory explains how decisions are made based on coherently weighing outcomes of actions by their probabilities.
- Those outcomes which gives more utility are chosen, thus shows preference for dominant alternatives.
- The expected utility theory deals with the analysis of choices among risky projects with possibly multidimensional outcomes. It is used to describe preferences under risk.
- The way alternatives are presented does not influence the decisions.

RISK TYPES AND UTILITY FUNCTIONS







- As per the E(U) theory, all economic agents can be classified into one of the three categories:
- Risk averse
- Risk neutral
- Risk seeking

EXPECTED UTILITY THEORY AND PROSPECT THEORY

- Expected utility theory has three main beliefs that helps in decision making under risk and uncertainty.
  - One, there is consistency in preferences for various alternatives.
  - Two, there is decision weights are assigned to alternatives linearly.
  - Decision is based on judgment with respect to fixed asset position.
- Prospect theory violates the assumptions of utility theory in the two-stage process.
  - Individuals measure wealth from current reference point. They are risk averse for profitable adjustments and risk seeking towards actions leading to losses.
  - Individuals overweight unlikely event and underweight likely events while assigning probabilities.

CRITICISM OF THE THEORY

- Expected utility theory is criticized by behavioural decision science. It argues that, while Bernoulli's paper was concise and brilliant, the theory is not perfect.
- Like any mathematical model, EUT is simplification of reality. It does not guarantee human behaviour and practices followed in real life.
- Researchers have tried to test the adequacy of EUT and found that there are deviations in actual behaviour which has lead to the development of behavioural finance.

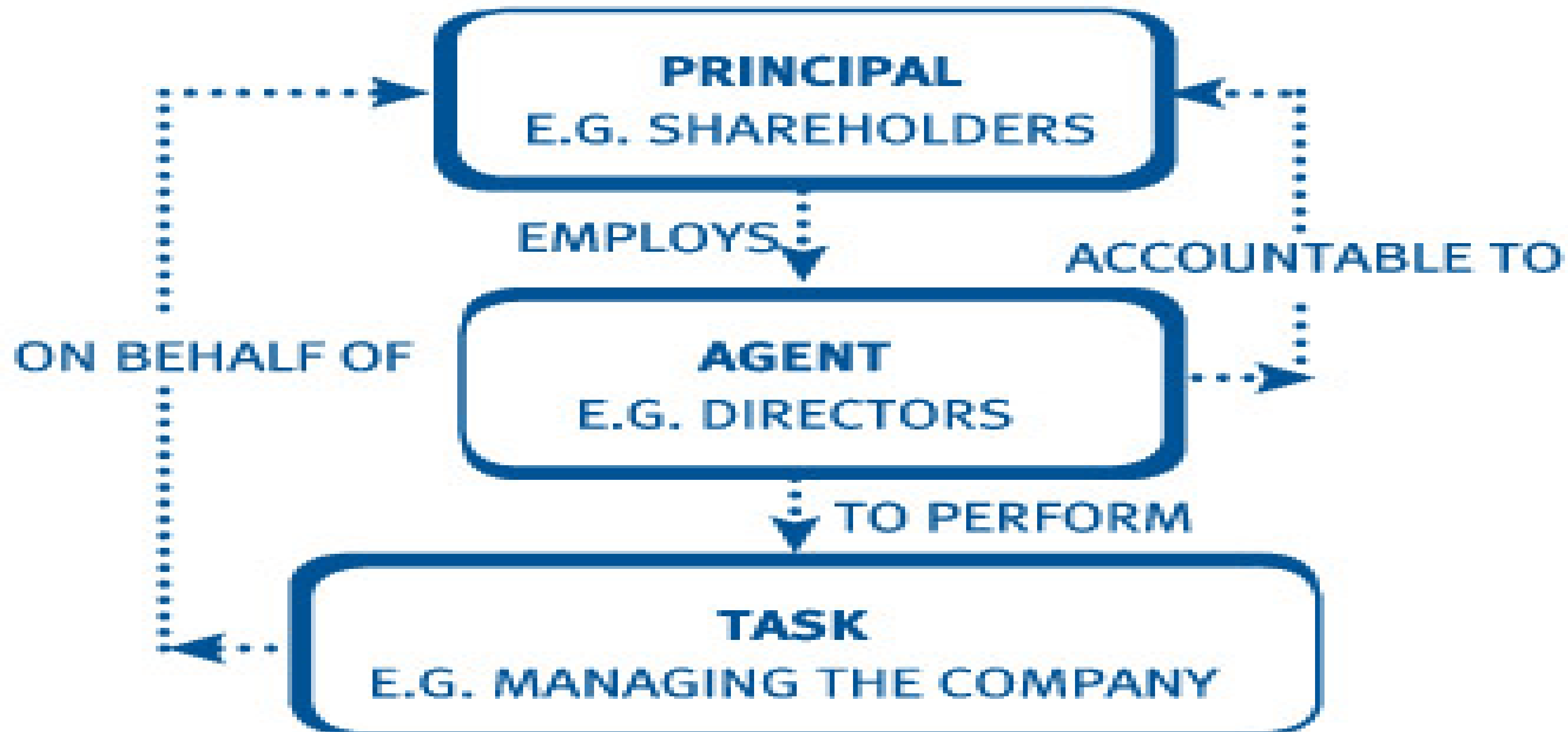
AGENCY THEORY

- An agency relationship refers to a situation in which one party (the principal) delegates work to another party (the agent).
- Agency theory attempts to explain two problems.
  - Conflict between management and owner interests is created because agency problem consists of the separation of ownership and control.
  - Agency problem arises from conflicts between controlling and non-controlling shareholders.

EXAMPLES OF PRINCIPAL-AGENT RELATIONSHIPS

Principal	Agent	Effort
Stockholders	Management	Profit maximization
Managers	Workers	Work effort
Stockholders	CPAs	Audit effort
Insurance Company	Policy Holder	Care to avoid loss.
Client	Lawyer	Settlements
Landowner	Sharecropper	Cultivation Efforts

SEPARATION OF OWNERSHIP AND CONTROL



COST OF AGENCY RELATIONSHIPS

- Agency costs occur largely from principals monitoring activities of agents and may be viewed in terms of money, resources consumed or time taken in monitoring.
- Some examples are as follows:
  - Remuneration packages and incentive schemes for directors.
  - Cost of principal reviewing annual report data and costs of management providing this data such as committee activity and risk management analysis.
  - Cost of meetings with principal shareholders and financial analysts.

AGENCY PROBLEM RESOLUTION MEASURES

- When the shareholder activities and market mechanism are not enough to monitor the company then some form of regulation is required. Apart from that there can be following measures for solving agency problems:
  - Meetings between the key institutional investors and directors.
  - Voting rights at the AGM in support of or against resolutions.

LIMITS TO ARBITRAGE

- **Limits to arbitrage** is a theory which is used to arbitrage away pricing inefficiencies. This theory is used by rational traders due to restriction on funds.
- The building blocks of behavioural finance include limits to arbitrage and psychology. They are described hereunder:
  - Limits to arbitrage- This refers to a where market prices do not match fundamental value (mispricing) and it has continued because individuals have retrained from arbitrage process due to cost and risk factors.
  - Psychology – This relates with economic agents who are not rational.

limitations to arbitrage

- Arbitrage is considered riskless without the need of capital. In practice, however, it does require capital and is associated with several forms of risk.
- Arbitrage needs to be performed by specialized traders who are not well diversified.
- Assets can further decline in price in the short run, even if it is a good bet long-term specially in value situations.
- Clients do not have perfect knowledge of the arbitrageur’s competence. It can thus be a rational choice to withdraw capital from an underperforming manager. This forces the manager to sell off assets, even though the expected return actually increased after the price drop.
- An agency problem breaks down the link between greater mispricing and higher expected return from the clients’ perspective. This can result in irrational prices while the arbitrageurs and their clients themselves act rationally.

CONDITIONS OF ARBITRAGE

- There should not be “the law of one price” meaning that the same asset does not trade in all markets at the same price. No two assets with same cash flows should trade at the same price.
- An asset should not be traded at its present value discounted at risk free, if its future price is known or the asset has significant costs of storage.

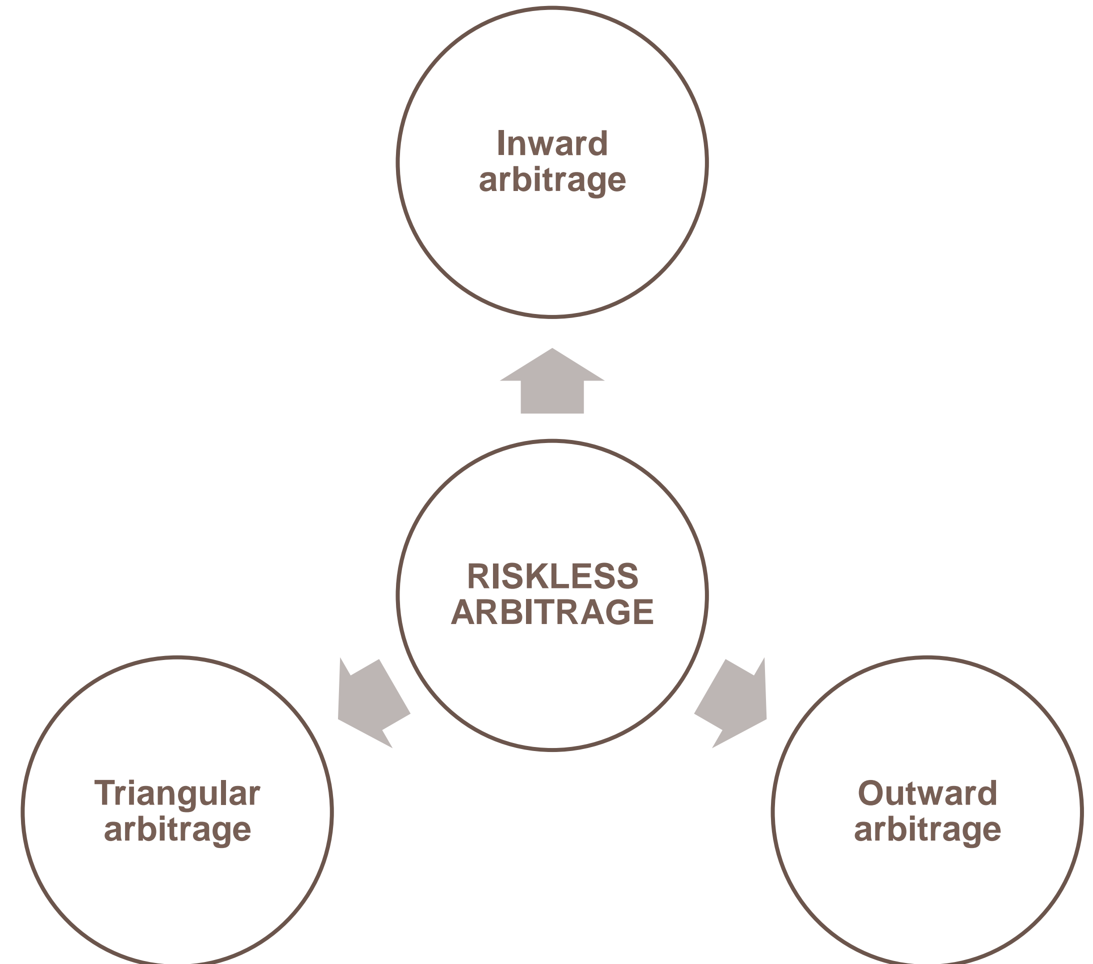
ARBITRAGEUR

- An arbitrageur are those players in the market who try to make a profit from mispricing in the market by making simultaneous trades and make riskless profits.

	Ability to select deals	Ability to influence bid outcome	Expectation to influence bid outcome	Source of abnormal return
Uninformed arbitrageurs	Low	Low	Low	Market inefficiency
Passive Arbitrageurs	High	High	Low	Ex ante private information about the bid outcome
Active arbitrageurs	Low	High	High	Knowledge about their own presence, which can influence the bid outcome

TYPES OF ARBITRAGE

- **RISKLESS OR "TRUE" ARBITRAGE**
  - Riskless arbitrage is an arbitrage which attempts to profit by exploiting price differences of identical financial instruments on different markets or in different forms.



RISK ARBITRAGE

- This type of arbitrage is also considered as "speculation," and is one of the most popular forms of arbitrage.
- There are some other forms of risk arbitrage available to retail traders include:
  - **Statistical arbitrage**
  - **Pairs trading**
  - **Takeover and merger arbitrage**
  - **Liquidation arbitrage**
  - **Fixed income trading**
  - **Depository receipts**
  - **Covered interest arbitrage**
  - **Uncovered interest arbitrage**
  - **Regulatory arbitrage**
  - **Telecom arbitrage**
  - **Political arbitrage**
  - **Volatility arbitrage**

COST OF ARBITRAGE

- **Fundamental Risk**
- **Noise Trader Risk**
- **Implementation costs or transaction costs**
- **Performance Requirements/Agency Costs**
- **Horizon Risk**

Thank You

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  PROSPECT THEORY

  Continued…