THE STOIC INVESTOR

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It's not what you said, it's how you said it!

"A casino offers a game of chance for a single player in which a fair coin is tossed at each stage. The initial stake begins at USD 2 and is doubled every time the outcome is 'Heads'. The moment the coin lands as 'Tails', the game ends and the player wins whatever is in the pot. Thus, the player wins USD 2 if tails appears on the first toss, USD 4 if heads appears on the first toss and tails on the second, USD 8 if heads appears on the first two tosses and tails on the third, and so on. Mathematically, the player wins 2^k dollars, where k is a positive integer equal to the number of heads tossed continuously. What price should the casino charge you for entering the game?"

This is the St. Petersburg Paradox posed in the year 1713. Why was it difficult to solve? Mathematicians, during those days calculated the value of a game based on the expected value (E) that can accrue to the winner viz. summation of all the possible payoffs (a) weighted by their probabilities (p):

$E = p_1a_1 + p_2a_2 + p_3a_3 + \ldots$ so

$E = {}^1/_2 \times 2 + {}^1/_4 \times 4 + {}^1/_8 \times 8 + \ldots$. Hence

$E = 1 + 1 + 1 + 1 + 1 \ldots$

$E =$ infinity (α)

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However, in 1738, a Swiss Mathematician – Daniel Bernoulli offered a solution to the paradox using the utility function instead of the expected value function. He depreciated the payoff of every subsequent toss aggressively as the utility or the happiness of every additional dollar will be lower than the previously accumulated ones. Thus, backing the law of diminishing marginal utility. He derived a price of the game in the range of USD 4-20 based on different assumptions.

Bernoulli also observed that most people disliked risk and if they were offered a choice between a gamble and a sure gain (with almost equal expected values), they will prefer the sure gain. For example: if there is a choice between

1. A sure gain of Rs. 40,000 or...
2. A gamble with 50% chance to win Rs.70,000 and 50% chance to win Rs. 10,000
   (expected value of 0.5 x 70,000 + 0.5 x 10,000 = Rs. 40,000)

Generally, people feel twice the pain of a loss of Rs.100 as much as the happiness they feel with a gain of the same amount. Hence the decision in choice problems about losses are different from gain

In this case, majority would choose option 1. This seemed quite logical and went unchallenged for more than 250 years. Many academic theories were built on the assumptions given by Bernoulli. Until Daniel Kahneman and Amos Tversky uncovered several errors in the theory.

WHAT REALLY INFLUENCES DECISION-MAKING?

Being psychologists, Kahneman and Tversky approached decision-making from the descriptive (or observed) side rather than normative (or how it ought to be) side. They found many important deviations from the standard behavior prescribed in the economic theory. I have discussed below some of the most important ones and have tried to express its relevance to investment decision making:

- **Loss Aversion:**
  One of the important points missing in the expected value as well as expected utility theory is that individuals weigh gains and losses differently. Generally, people feel twice the pain of a loss of Rs.100 as much as the happiness they feel with a gain of the same amount (read about loss aversion here). Hence the decision in choice problems about losses are different from gain. Consider the following pair of problems:

  a. Imagine you are facing a following choice:
     1. A sure gain of Rs. 25,000 or
     2. A gamble with a 25% chance to win Rs. 1,00,000 and a 75% chance to win nothing

     (remember your choice)

Most of the time, investors continue to hold the losing stocks in their portfolio purely because they have already invested a lot of time and money into them. They even average the stocks lower with a hope of getting out even later

In reality however, framing of the decision problems does influence the choice of decisions

b. Imagine you are facing the following choice:
   1. A sure loss of Rs. 75,000 or
   2. A gamble with a 75% chance to lose Rs. 1,00,000 and a 25% chance to lose nothing

Most of the people would choose option 1 in the first problem and 2 in the second one. This shows a risk averse behavior when it comes to gains. But a risk seeking behavior during losses.

From an investment perspective, this is important as investors (individuals or fund managers) may take higher risk in the portfolio than they normally would if they are running significant losses for the year. They may chase momentum or become late followers in a mature trend.

- **Sunk Cost Fallacy:**

Richard Thaler gives an interesting example in this case.

Two sports fans plan to travel 40km for a basketball game. One of them has paid for the expensive tickets. The other has got it free. A blizzard is announced on the night of the game. Which of the two fans will be keen to still venture out to see the game?

The one who paid for the ticket of course. Ideally the ticket cost should be considered as a sunk cost and it should not affect the decision. However, it does influence the decision as it is difficult for a lot of us to ignore it.

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- **Framing Effect:**

Rational Choice (including expected value as well as expected utility) requires fulfillment of the condition of invariance, which means that preference order within prospects should not depend on the manner in which they are described. In reality however, framing of the decision problems does influence the choice of decisions. An

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interesting example of this is a survey conducted by Kahneman and Tversky. The total number of respondents in each problem is denoted by N, and the percentage who chose each option is indicated in brackets.

Problem 1 (N = 152): Imagine that the country is preparing for the outbreak of an unusual disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

1. If Program A is adopted, 200 people will be saved. (72%)
2. If Program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved. (28%)

Which of the two programs would you favor?

Problem 2 (N = 155):

1. If Program C is adopted, 400 people will die. (22%)
2. If Program D is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die. (78%)

It is easy to verify that options C and D in Problem 2 are undistinguishable in real terms from options A and B in Problem 1, respectively. However, the framing of the questions led to a change in the preference of participants.

When an investment advisor tells the client to sell a particular investment at a loss, the client may undergo an emotional struggle to accept the mistake. However, if the same change is advised as a switch from investment to another, the client is likely to execute it quickly. To the client, the switch option doesn't mean closing an investment at a loss but to just transfer the money to a better prospect.

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- **Mental accounts or Buckets:**

  People earmark money in separate jars, envelopes or just mental accounts for different needs. Normally they are labeled for a particular use and not interchanged. The decision-making criteria is also different for these different accounts.

  Imagine that you have decided to see a play and paid the admission price of Rs.1000 per ticket. As you enter the theater, you discover that you have lost the ticket. The seat was not marked, and the ticket cannot be recovered.

  Would you pay Rs.1000 for another ticket? General response: Yes (46%) No (54%)

  Imagine that you have decided to see a play where admission is Rs. 1000 per ticket. As you enter the theater, you discover that you have lost a Rs. 1000 note.

  Would you still pay Rs.1000 for a ticket for the play? General response: Yes (88%) No (12%)

  Though in monetary terms, the loss is the same in both the above cases, the responses are different as people mentally debit the loss to different accounts.

  A lot of investors separate their retirement money or their children's fund from their regular investment fund. Many investors also differentiate between long term investments and play money (trading fund) for the stock markets. The risk tolerance is different for these accounts and hence decisions vary for the same probability distribution based on the account the money is coming from. House money effect discussed in the previous issue (read here) is also part of mental accounting.

- **Hedonic Editing:**

  This notion is related to framing in which individuals themselves arrange the information in a way that brings them the highest perceived value. For example, individuals often classify small losses as costs.

1. Would you accept a gamble that offers a 10% chance to win Rs.9500 and a 90% chance to lose Rs.500?

   Or

2. Would you pay Rs.500 to participate in a lottery that offers a 10% chance to win Rs.10,000 and a 90% chance to win nothing?

Both the above alternatives have the same value. However, people prefer the second one as they can rationalize it as cost of Rs. 500 rather than a loss, represented in the first case. Insurance premiums would often work like that.

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Investors change the narrative for dividends for their emotional comfort. When the stock they have bought is moving up, they take dividend has a separate income to be spent. When the stock price is down dividend is treated as part of the return and hence helps accounting for a lower loss. When investors take a dividend option in a mutual fund scheme, though the money is coming out of their NAV, they treat it as an income rather than systematic withdrawal of capital.

AWARENESS = IMPROVEMENT

When diving into finer elements of financial decision making, we discover a number of influences (Kahneman sarcastically calls them "seemingly inconsequential" and Thaler calls them "supposedly irrelevant factors") that have a profound impact. Being aware of these influences is a big step towards addressing them. The common solution to these biases is to broaden the frame or the context i.e. enlarge investment evaluation timelines (loss aversion), think portfolio performance rather than each security performance (sunk cost fallacy) , layout appropriate pre-commitments for different investment accounts (mental buckets) , and set up right performance evaluation parameters (Hedonic editing). Not all biases can be avoided, however, a stoic investor can use some to his/her advantage.

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Nimesh Chandan is Head-Investments, Equities at Canara Robeco. He has almost two decades of experience in the Indian Capital Markets. Nimesh has been with Canara Robeco since 2008 and in his current role, he guides the equity team in providing a strategy for various equity funds. He is a keen follower of Behavioral Finance and has developed tools and processes which help improve the investment decision making process. He also conducts workshops wherein he presents the concepts of Behavioral Finance to investors and financial advisors under a series called 'The Money and the Mind'.

ABOUT STOIC INVESTOR:

The word "Stoic" is used to describe someone who remains calm under pressure and avoids emotional extremes. For the purpose of this newsletter we refer to the "Stoic investor" as an investor who is realist (avoiding extreme optimism and extreme pessimism), resilient (withstand difficult conditions) and rational (who acts with logic and reason).