

PRINCIPLES OF BEHAVIORAL ECONOMICS

Prof. Sujata Kar

**Department of Management Studies
IIT Roorkee**

Week 34

Lecture 34

Hello, and this is the 34th lecture of Principles of Behavioral Economics. We have been discussing mental accounting. In the previous modules, I have talked about the basic principles of mental accounting, which are the hedonic editing hypothesis, transaction utility, and acquisition utility. Now, I will start talking about applications of mental accounting.

But before that, I will begin with the concept of reference price. If you remember in the previous module, while introducing the concept of transaction utility, we talked about reference price—the price that consumers expect to pay, the regular price of a product. Now, what determines the reference price? There will be a short discussion on the determination of reference price.

The most important factor in determining P^* , the reference price is fairness, what we consider to be fair. Fairness, in turn, depends in large part on the cost to the seller. To establish this, Thaler talked about an experiment with first-year MBA students in his 1999 paper. Imagine that you are going to a sold-out Cornell hockey playoff game, and you have an extra ticket to sell or give away.

The price marked on the ticket is \$5. Now, in this experiment or survey, a few things need to be remembered. First of all, the price marked on the ticket is \$5, but you were given your ticket for free by a friend or which is what you paid for each ticket that is you paid \$5 for each ticket, but you paid \$10 each for your tickets when you bought them from another students. So there are three alternatives.

Always the fact is that the price marked on the ticket is \$5 but there are three alternatives in terms of the price that you paid: you might have got it for zero, you might have got it for \$5, the price that is printed. or you might have paid \$10 when another student sold it

to you at a higher price. You get to the game early to make sure you sell the ticket. An informal survey of people selling tickets indicates that the going price is \$5.

You find someone who wants the ticket and takes out his wallet to pay you. He asks how much you want for the ticket. Assume that there is no law against charging a price higher than that marked on the ticket. What price do you ask for if he is a friend or a stranger? What would you have said if instead you found the going market price was \$10?

So in the previous slide, we said that the market price, the going market price, was \$5. People were selling already-sold tickets at \$5. So what price would you ask if you are selling it to a friend or selling it to a stranger? And if the going market price is \$10, then what price would you quote for a friend or for a stranger? The idea behind that questionnaire was that the price people would charge a friend would be a good proxy

for the estimate of a fair price. For each question, these three prices were available as possible anchors upon which people could base their answers: the price marked on the ticket, the market price, and the price paid by the seller—that is, the cost. Now, the price marked on the ticket has always been \$5. The market price has two options: \$5 and \$10, and the price paid by the seller. It has three options: one is 0, another is 5, and the other one is 10, which is referred to as the cost of getting the ticket.

Now, these are the results that were obtained. You can see that there are three alternative costs mentioned here. Then these are the two alternative market values for each of the costs. And then, basically, what prices are you going to ask for? Is it 0, 5, or 10, or something completely different when the individual is a friend? And if the individual is a stranger, then again, what price is it that you are going to ask for—0, 5, 10, or something else?

Now, the modal answers are highlighted. So, see these are basically for this table, this is the maximum number, the maximum numbers that is the modal numbers are highlighted in each cases, right. So, what are, how do we summarize this result? As can be seen in the table, the table is reproduced here. The modal answer in the front condition are equal to the seller's cost except in the unusual case where seller's cost was above the market price.

So this is the only unusual case. Here the cost was higher than the market price. but since the individual is selling it to a friend he or she was willing to incur a loss but in all other cases he or she is charging exactly the cost, the market price that is charged is equivalent

to 0 when the cost was 0 for the majority, it is 5 when the cost was 5, was 5 it is 10 when the cost was 10 but it is actually 5 even when the cost was 10 for a friend

In a similar fashion, the modal answers in the stranger condition are equal to market price with the same lone exception. Now, here see the market price is 0, you are charging 0. The market price is 10, you are charging 10 to a stranger. Again, market price 5, you are charging 5. Market price 10, you are charging 10.

Now, here the market price is 5, but you are still charging 10 because your cost was 10. Here, the cost was 10, the market price is also 10, and you are charging 10. So, in the case of a stranger, the individual was charging the market value or the market price. In the case of friends, the individual was charging the cost that he or she incurred. The implication of this is that the buyer's perception of a seller's cost will strongly influence their judgment about what price is fair. And this, in turn, influences their value for the reference price P^* .

Now, we talk about applications of mental accounting. We begin with the concept of opening and closing accounts. When do we open and when do we close mental accounts? That's the basic idea. One of the discrepancy components of an accounting system is the decision of when to leave accounts open and when to close them.

Consider the example of someone who buys 100 shares of stock at \$10 a share. This investment is initially worth \$1,000. But the value will go up or down with the price of the stock, which generally happens on a regular basis. If the price changes, the investor has a paper gain or loss until the stock is sold, at which point the paper gain or loss becomes a realized gain or loss. For example, I have purchased these 100 shares at \$10 each, which was initially worth \$1,000.

Now the prices of the stocks have gone up, and the total value of the investment is now \$1200. But this is—I am still holding on to my shares. So this is what we call a paper gain of, say, \$200. I leave it there. So as long as I leave the investment there, there is no realized gain.

Suppose I wait for another 6 months. But in the meantime, the stock prices have started coming down. And as a result, after 6 months, I am back at my initial investment of \$1000. The \$1000 have become \$700, which means I'm incurring a loss of \$300. Now this is also a paper loss if I do not sell my positions, but if I decide to sell my positions,

expecting that the prices may further go down and it may have even worse implications for me.

Then this \$300 becomes my realized loss. The mental accounting of paper gains and losses is tricky and depends on timing, but one clear intuition is that a realized loss is more painful than a paper loss. Because the longer it is on paper, I always have the hope that it may go up. But once I realize it, then there is no hope that it is going to go up. When a stock is sold, the gain or loss has to be declared both to the tax authorities and to the investor, as well as the spouse.

Because closing an account at a loss is painful, a prediction of mental accounting is that people will be reluctant to sell securities that have declined in value. In particular, suppose an investor needs to raise some cash and must choose between two stocks to sell, one of which has increased in value and one of which has decreased. Mental accounting favors selling the winner, whereas rational analysis favors selling the loser. Studies have found strong support for the mental accounting prediction where investors were more likely to sell one of their stocks that had increased in value than one of their stocks that had decreased.

Now you can see that when you are in need of money, mental accounting says that you would prefer to sell the winners, that is, the stocks where you are making money. But rational analysis says that you should actually sell the stocks that are losing. That is primarily because when you are making money and then you have a realized gain then you have to pay taxes on the realized gain. While if you have realized losses, you do not have to pay taxes. Additionally, it is possible that the losses will be considered as a deduction from your income.

So there are tax benefits by selling the losses as opposed to that there is actually more cost you would incur by selling the winners. So that is why rational decision-makers or rational analysis suggest that you should not sell the winner, but rather you should sell the loser. But in reality, people sell the winner and do not sell the loser. Mental accounting—that is how it explains the disposition effect. The disposition effect, discussed long, long back, actually says that

people have a tendency to sell the winning positions quickly and hold on to their losing positions. So, this is what mental accounting also favors or suggests. Most public corporations make official earnings announcements every quarter. Although earnings are

audited, firms retain some discretion in how quickly to count various components of revenues and expenses, leaving them with some control over the actual reported number.

Several studies show that firms use this discretionary power to avoid announcing earnings decreases and losses. Specifically, a plot of earnings per share or change in earnings per share—this quarter versus the same quarter last year—shows a sharp discontinuity at zero. Firms are much more likely to earn a penny per share than to lose a penny per share and are much more likely to exceed last year's earnings by a penny than to miss by a penny. So, small losses are converted into small gains. In contrast, large gains seem to be trimmed down to increase the chance of growth again next year.

So, if you have made large gains, they are actually reported, but the numbers are somewhat decreased. So that next time, when you report another large number, there is a better chance of an increase. If last year's number was very similar, then the growth will be small, or if there is a slight decline, the growth would be negative. So, it is always better to take the precaution of reporting a somewhat smaller number.

Whereas moderate losses are somewhat inflated—a procedure known in accounting circles as taking the big bath. So, basically, they increase the moderate losses. So, again, the same purpose—the purpose is that the next time, if there are gains, then the gains would appear bigger or better. If there are losses, the losses would actually appear smaller.

Apparently, firms believe that shareholders or potential shareholders react to earnings announcements in a manner consistent with prospect theory. Another situation in which a consumer has to decide when to open and close an account is when a purchase is made well in advance of consumption. Suppose you have paid 1000 rupees for two tickets of a cricket match to be held in a month's time. Assume that the tickets are being sold at the reference price, so transaction utility is zero. You are paying exactly the price that you expect to pay and that's why there is no transaction utility.

In this case, the consumer can be said to open an account at the point at which the tickets are purchased. So the matches are-- the cricket matches probably say after a month or two months. you have purchased it in advance. We often do so for large concerts. The tickets are purchased much in advance. So then the account is being opened. You have made certain purchases but have not realized it or consumed it. At this time the account has a negative balance of thousand rupees. Once the date of the game comes and the game is attended, the account can be closed.

You have consumed the item for which you paid. What happens if something like a blizzard prevents the consumer from attending the game? In this case, the consumer has to close the account at a loss of 1000 rupees. In accounting terminology, the loss has to be recognized. Notice that this event turns a cost into a loss which is basically a concept to which we are averse.

Still, why does the prior expenditure which is now a sunk cost make someone more willing to go to the game in a blizzard? Because we want to close the account. To answer this question, we need to consider how transactions are evaluated. For most routine purchases, there is no explicit evaluation of the purchase when the account is closed. Here again, I discussed this concept of explicit, which implies that something which is happening after the transaction has taken place.

So for most routine purchases, like we buy groceries, we buy vegetables, fruits, we buy smaller items, stationary items, for them, we do not actually go for an explicit evaluation of the purchase and the moment I purchase it, the account is closed. Such evaluations become more likely as the size of the transaction increases or as the purchase of our situation becomes more unusual. For example, if I purchase something worth 10,000, then possibly I will be more careful about the functioning of the product, whether it is working properly or not.

If not, then how can I return? How can I get a service? So, explicit evaluations are more crucial when the size of the transaction is actually large or the purchase or situation are somewhat unusual. For example, when we go for advanced purchases and things like that. Failing to attend an event that has been paid for makes the purchase highly salient

and an evaluation is necessary. By driving through this storm, the consumer wants to close the account by converting it into the category of normal transactions that are not explicitly evaluated. So basically, the longer we do not have that account closed, there is certain discomfort. So the way we mostly buy things and close the accounts, we want to do it for each and everything. If I do not close that account, then

that account would imply a loss for me and as a result of which there is always a tendency to attend the match despite having bad weather conditions even if an explicit evaluation is made the extra cost of going to the game may not be included in the evaluation for example when the weather is very bad then there are certain additional costs as well. For instance I may meet with an accident and there could be other hazards

also driving in bad weather conditions. Because the cost of driving to the game are not monetary.

They may not be included in the analysis as they are incidental and included in a different mental account. So that is the point that the additional hazards that I am going to take up. They are not included in this thousand rupees that I paid for the cricket match. They are considered in a separate mental account that can be seen later on. But I want to close this account for the time being.

Another example came from a work of Tversky and Kahneman in 1981, where there are two questions that were asked to individuals. In the first, there were 183 individuals who were asked this question. Imagine that you have decided to see a play where admission costs \$10 per ticket. As you enter the theater, you discover that you have lost a \$10 bill, that is, you have lost a \$10 note. Would you still pay \$10 for a ticket to the play?

So you have just decided to see the play and have not bought the ticket yet. When you go to buy the ticket, you see that you have lost \$10. Would you still pay \$10 for the ticket? 88% say yes, while 12% say no. So the majority says yes, they will.

Question number two: 200 individuals are asked to imagine that they decided to see a play and paid the admission price of \$10 per ticket. So now you have already purchased the 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 \$10 for another ticket?

Here, the financial implications are again the same. There, you lost \$10, and you would be paying \$10 for another ticket. So, the total expenditure is \$20. Here, you purchased a ticket for \$10. You lost the ticket.

You again have to pay \$10. If you are willing to buy another ticket, the total expenditure is \$20. But here, in this case, the majority said no. In this problem, subjects are less willing to buy a ticket to a play after having lost their ticket than after having lost an equivalent sum of money. Because buying a second ticket is aversive, since it is included in the mental account.

For the theater outing, but the loss of the money is not. So for the theater outing or for the theater ticket price, you set aside \$10. \$10 is lost, and that's why you do not want to spend another \$10. So mental accounting says that the amount you had in that account is

already exhausted. So that's why a large number of people say they won't buy another ticket.

But when you lose \$10, which is not associated with that particular theater event, then you are still open to buying another ticket. So we have been talking about advanced purchases, sunk cost, and now a related concept of payment depreciation. Although sunk costs influence subsequent decisions, they do not linger indefinitely. A thought experiment illustrates this point nicely. Suppose you buy a pair of shoes.

They feel perfectly comfortable in the store, but the first day you wear them, they hurt. A few days later, you try them again, but they hurt even more than the first time. What happens now? The more you paid for the shoes, the more time you will try to wear them. This choice may be rational, especially if they have to be replaced with another expensive pair. The second possibility is that eventually you stop wearing the shoes, but you do not throw them away. The more you paid for the shoes, the longer they sit in the back of your closet before you throw them away.

So basically higher the price of the shoes, the more it pinches for you to throw them very quickly. This behavior cannot be rational unless expensive shoes take up less space and finally at some point you throw the shoes away regardless of what they cost. The payment have been fully depreciated. So when we think that the price that you paid for the pair of shoes sitting in your closet have been actually now it is enough long time the payment have been already depreciated

you have kept it with yourself for sufficiently longer period of time regardless of whether you have you know worn them or not the payment is depreciated then you finally throw them. There are evidence in the literature about the persistence of sunk cost. In an experiment, people who were ready to buy season tickets to a campus theater group were randomly placed into three groups. One group paid the full price, one group got a small discount of say 13% and one group received a large discount of 47%. The experimenters then monitored how often the subjects attended plays during the season.

In the first half of the season, those who paid full price attended significantly more plays than those who received discounts. But in the second half of the season, there was no difference among the groups. So in the initial time period, that is the first half of this season, the people who paid full price or a higher amount they were attending in larger numbers or maybe they were attending more plays. But as time passed, they thought that the payment had been sufficiently depreciated.

So all those who paid in full, those who paid an amount with a smaller discount or a larger discount, all of them actually had the same amount of attendance, and attendance was pretty low. That is primarily because the payment was thought to be sufficiently depreciated. People do ignore sunk costs eventually. That is basically the bottom line.

So, after a point in time, you start ignoring or you consider that it is possible to ignore the sunk cost. It is time we, you know, get over it. Similarly, Gourville and Soman found that attendance at a health club is highest in the month in which the dues are paid and then declines over the next five months. Payments are made every six months, only to jump again when the next bill comes out.

So basically, at the time of payment or around the time of payment, you attend the health club more regularly. Over a period of time, there is less and less attendance, primarily because the payment is thought to be sufficiently depreciated. They dubbed the gradual reduction in the relevance of prior expenditures as payment depreciation. Similar issues are involved in the mental accounting of wine collectors, who often buy wine with the intention of storing it for 10 years or more while it matures. What happens at the time of consumption?

So, with this, Shafir and Thaler ran an investigation. For example, suppose you bought a case of good 1982 Bordeaux in the futures market for \$20 a bottle. The wine now sells at auction for about \$75. The simple thing about these two lines is that you purchased it for \$20 a bottle, and now the price has gone up to \$75. You have decided to drink a bottle.

Which of the following best captures your feeling of the cost to you of drinking this bottle? Respondents were given five answers to choose from. The first is zero because I have already paid for it. And 30% confirmed or agreed with this option—30% of the respondents. The second option is that you think the cost is \$20, as the question was: 'Which of the following best captures your feeling of the cost to you of drinking this bottle?'

So the cost in the first case is zero. In the second case, \$20 because that is what you paid for it, and 18% said so—\$20 plus interest. That was answered by 7%. \$75—what I could get if I sold the bottle. So this is sort of an opportunity cost of the bottle.

That was answered by 20% of the respondents. And minus \$55 because I get to drink a bottle that is worth \$75. That I only paid \$20 for, so I have saved money by drinking this

bottle. Ideally, if I want to buy it, I have to pay \$75, so I am saving \$55. That was answered by 25% of the respondents.

Now, Thaler mentioned that actually the opportunity cost related to the answer or the answer related to the opportunity cost was given by 20% of these respondents. And most of them were actually economists. Now, more than half the respondents—that is, here 25% and here 30%—report that drinking the bottle either costs nothing or actually saves them money. So this is a situation which we would, you know, term later as payment decoupling. So first of all, we discussed this in the context of payment depreciation.

So payment was made some time ago. So by the time one drinks the bottle of wine, he or she feels that either there is no cost associated with it or maybe they are saving money, and that is roughly 55% of the respondents. In a follow-up survey, the following was asked: Suppose you buy a case of Bordeaux futures at \$400 a case—so, a case of wine bottles. The wine retails at about \$500 a case when it is shipped.

You do not intend to start drinking this wine for a decade. At the time that you acquire this wine, which statement more accurately captures your feelings? Respondents rated each answer on a five-point scale, starting from one as strongly agree to five as strongly disagree. So there were three statements given. I feel like I just spent \$400, much as I would feel if I spent \$400 on a weekend getaway.

so the mean was 3.31 which implies that this is somewhere here and this is neutral, this is strongly disagree, so this is more towards disagree I feel like I made a \$400 investment which I will gradually consume after a period of years And here the mean is 1.95, which is very close to 2. This means this is more towards strongly agree or rather agree. This is strongly agree; this is agree.

And I feel like I just saved \$100. The difference between what the futures cost and what the wine will sell for when delivered. The mean answer was 2.88, which is again the neutral position, starting from strongly agree to strongly disagree. The mean score for b at 1.94 equals to or approximately equal to 2 implies that most respondents coded the initial purchase as an investment. This choice means that the typical wine connoisseur thinks of his initial purchase as an investment and later considers the wine as free when he drinks it.

The same mental accounting applies to timeshare vacation properties. The initial purchase of a week every year at some resort feels like an investment, and the subsequent

visits feel free. So basically, again, there is payment depreciation when you initially make the payment, specifically in the case of these timeshare vacation properties. When you make the initial payment you think that you have made a payment then of course utilize it more but over a period of time you think that the subsequent visits are free because the payment have been sufficiently depreciated similar to the case of wine connoisseurs.

With this, I conclude this module on various concepts and applications of mental accounting. We have discussed primarily the opening and closing of accounts and, in that context, advanced purchases, sunk costs, and payment depreciation. We will continue with other applications of mental accounting in the next slides, the next modules. Thank you.