Prospect Theory

&

Customer Choice

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Prospect Theory Overview.

Prospect versus Utility Theory

Marketers are implicitly interested in how and why people make decisions. Most of us have a self-image of ourselves as rational beings that weigh up the odds and apply the laws of probability when making decisions. If this were the case unilaterally across the population, marketing would be a simple science. The fact of the matter is that most decisions are not straight forward but complex in nature and are often made under conditions that may be confusing indistinct or even frightening. However, there is some structure to our decision making process, and the task of the marketer is to understand how and why our behaviour deviates from rational decision models. (Bernstein 1997)

Utility theory and prospect theory are two decision process models that have been presented to try and predict how and why we make decisions. Utility theory postulates that decisions are dependant on the utility of the outcome of the decision process and that the context of the decision process should have no bearing on the outcome. Put more simply two prospects with the same expected utility will be given the same preference by rational decision makers.

Prospect theory postulates and demonstrates that the outcome of decision-making under conditions of gains and losses is not symmetrical. Sometimes the population appears to make irrational decisions. However this irrationality has some consistency. Kahneman and Tversky found that in the positive domain the population are risk averse and when in the negative domain the population are risk seekers.

It is not so much that the population are uncomfortable in making decisions under conditions of uncertainty, but they do hate losing. This manifests itself in behaviour that exhibits the traits of, loses looming larger than gains. In fact losses that go unresolved will accumulate and will often provoke intense irrational risk aversion.

Prospect theory has wide ranging marketing implications. These include but are not limited to:

- How an advertising message is framed.
- How a new product is positioned
- How a product is priced relative to the competition and consumer expectations.
- How a product is priced and the premium a consumer is willing to pay.
- What markets will respond to what types of offer.

Prospect Theory

Psychology literature has for some time promoted prospect theory as a descriptive model of decision-making under risk or uncertainty. The theory suggests that people evaluate a prospect on gains and losses rather than on final assets and further that they view gains and losses separately.
Prospect theory can be deconstructed into four distinct processes, the editing process, the value function, probability weighting and risk attitude assessment.

The editing process

The editing process is used to try and bring some simplification to decision making. It is suggested that our cognitive processes often involve short cuts or “rules of thumb”. These rules of thumb are known as heuristics. There are a number of different types heuristic that we use to break down a complex problem to a number of more simplistic concepts.

Representative Heuristic

We can sometimes see something as being representative of the bigger picture. There is a danger here as we may be operating on a small sample of data and use that data to make assumptions about a wider problem. A good example of the use of the representative heuristic is making a decision to employ a person based on their performance at a job interview and resume. Data received from these sources can often be skewed and biased. However due to the lack of information we may have to resort to decision making based on this representative sample.

Availability Heuristic

We use the available heuristic to estimate the probability of a certain event by the ease to which it comes to mind. We would estimate the likelihood that it will rain today higher if it is overcast than when it is sunny. The available information is reflected in our decision choice.

Anchoring

Kahneman & Tversky showed that people can be influenced by quite a random number in their estimates. When people were asked if the Mississippi was longer or shorter than 2000 miles they gave a lower estimate than those who were asked whether the river is longer or shorter than 5000 miles. It has been found that once people make an initial pass at a problem their initial judgement may prove to be remarkably resistant to revision. (Nisbett & Ross)

Analogy

Analogies can shape the way people think about issues. People, when analysing a situation tend to say that this situation is just like this other situation. The outcome from the other situation is known and often inferred into the current situation. There is a fine distinction between analogy and metaphor. The difference between analogy and metaphor is that analogy is the comparison of situations in the same domain whereas metaphor draws together situations from differing domains.

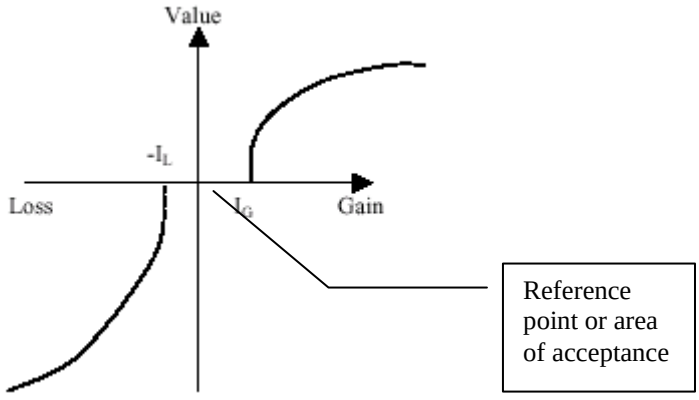
In addition to using heuristics to edit the decision making process we need to relate the problem and the result of the probable outcomes to some form of benchmark.

Coding

Point of Reference

Coding includes the use of some reference point that is known or desired to which the outcome of a decision can be measured. Kahenman and Tverski (1979) propose that the most powerful reference point is the status quo and that most people have a status quo bias. A reference point can also be a reference price or a reference quality. It is proposed that people are subject to an adaption level which is based on past experiences. For example if you were in the market for a new car, your perception of an acceptable price will be influenced by how much you paid for your last car, (past experience) and prices you have seen in show rooms and in advertisements (environmental). So when you are presented with a price for the car that is below your reference price you code this as a gain and when presented with a price above your reference you code this as a loss. Harbaugh and Kornienko (2001) conclude that local status (ie the social or wealth standing a person has or aspires to in their local community) can also form a reference point and can influence the decision process. Since individuals are most likely to compare their status with others of comparable wealth, they are most concerned with small changes around their current wealth, and are therefore risk loving in losses and risk averse in gains.
A reference point may not always be a point but can be an area of acceptance. Moving within the acceptance area is not likely to result in a different outcome. You need to move outside the area of acceptance to make a change.

Graph 1



Cancellation

This is the process where decisions that yield a common outcome are cancelled out and take no further part in the evaluation stage.

Segregation

People will segregate riskless components from risky components for evaluation. This is an important form of the editing process. Any riskless component of a gamble is stripped away, allowing them to focus directly on the more risky aspects of the decision.

Combination

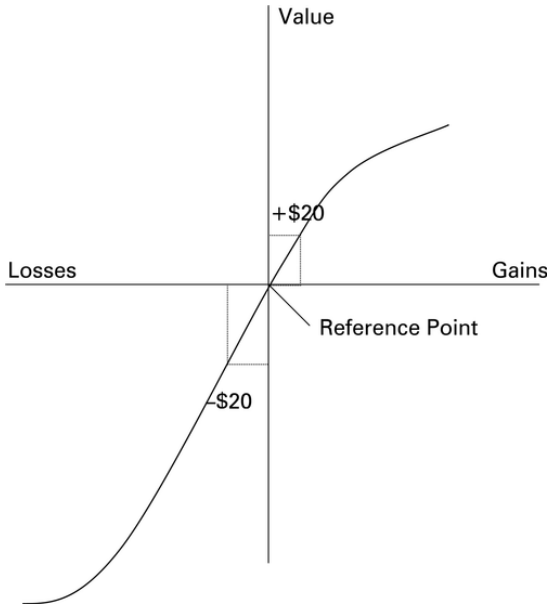
People will integrate identical outcomes to transform an outcome.

While there seems to be general acceptance of the coding process there seems to be some controversy regarding the processes of cancellation, segregation and combination. Further research is required to validate these additional processes in real world situations.

The value function

People rate value functions for gains and losses differently. They put a decision weight based on the probability of that outcome. Tversky & Kahneman found that people value a certain gain more than a probable gain with an equal or greater expected value. The opposite is true of losses. Gains and losses are valued from a subjective reference point. If graphically represented the function relating to the subjective loss was steeper than that for gains. (Graph 2) It can therefore be inferred from this research that the displeasure associated with loss is greater than the pleasure associated with the same amount of gains. It can then be further inferred that people respond differently, depending on whether the choices are framed in terms of gains or in terms of losses.

Graph 2



Probability weighting and risk attitude assessment.

Small probabilities tend to be over weighted.
It is possible that people use different weighting schemes when evaluating simple problems (2 outcomes) as opposed to complex problems (greater than 2 outcomes) This tendency for people to have a systematic bias towards overweighting very low probability events and under weighting very high probability events puts more focus on how the problem is presented or framed. It has also been found that people keep separate mental accounts. The often-cited example of this behaviour is:

> *"...people were posed a hypothetical situation involving theatre tickets, which cost $40 each. Imagine that you have already bought a ticket, the researchers asked, but when you arrived at the theatre you find it missing. Do you buy another ticket? Most people said no, citing $80 as being too much to spend on a single theatre ticket. Imagine however that you have yet to buy the theatre ticket, and you just arrive at the theatre to purchase the ticket and you find that you have lost two twenty dollar bills from your wallet. Do you still purchase the ticket? Most people said yes saying that the missing $40 had nothing to do with the price of the theatre ticket."(Patt, A G 1997)*

This focus on the framing of the message has implications for marketers. If it can be quantified what type of framing results in a positive decision leading from a high or low probability event the advertising of product offers moves closer to science than art.

Framing

Messages can be framed in the positive (there is 95% chance of recovery) or in negative terms (there is 5% chance of death) Prospect theory postulates that in certain circumstances (i.e very high and very low probability events) it is the way that the choices are framed that is most critical. It is important to note however that message framing may not be uniform in all circumstances and the decision outcome may be influenced by other factors. Schoemaker (1982) and Woodside & Singer (1994) found that other aspects of message context could influence the decision outcome, namely, verbal labels, modes of information presentation, social dimensions, and response modes.
Research carried out by Buda & Zhang (2000) that looked at the results of positive versus negative framed advertising messages concluded that a positively framed message rated product attributes significantly greater than those subjects who received a negatively framed message. While some would say that this is the expected outcome it is interesting to reflect on how many contemporary advertisements do not "accentuate the positive".

Myopia

Risk assessment can be influenced by the frequency of feedback according to a study conducted by Thaler, Tverski, Kahneman and Schwartz. (1997) They found that loss aversion and myopia may well be general conditions of human cognitive behaviour but they did not produce good decision-making. Providing subjects that were both loss averse and myopic with frequent feedback about the consequences of their decision-making was likely to encourage their worst tendencies. In fact to mitigate this phenomena it was better to provide aggregated data on a less frequent basis and to provide less opportunity to change decisions.

Strengths and Weaknesses of Prospect Theory

Prospect theory has helped to explain many of the behavior patterns that could not be adequately explained by basic utility theory. Kahneman & Tverski ascribed this behavior abnormality to two human shortcomings namely emotion and the inability to understand a problem fully. Thus prospect theory has helped to explain and predict behavior in light of these cognitive difficulties.

Not Readily Expandable

The original paper outlining prospect theory by Kahneman and Tverski importantly noted that the theory was developed for one shot gambles and that any application to dynamic contextual situations must wait for further research on how people react to sequential gains or losses. This challenge has been taken up by Thaler and Johnson (1990) and Linville and Fisher (1991). It is to this research we turn to draw conclusions when applying prospect theory to dynamic situations.

Coding Process Fragility

The entire decision making process can be derailed at the coding process. At this point the process is highly susceptible to how problems are framed and presented and by the norms, habits and expectation of the decision maker.

Real World Anomalies

There are a number of empirical studies that contradict the basis tenants of prospect theory, these have both included academic and real world subjects and situations. A study by Pablo (1997) found that original prospect theory as proposed by Kahneman and Tverski may predict inaccurate outcomes as it did not take into account such elements as decision context, sampling frame and decision makers characteristics (particularly the decision makers history and inertia).
West & Berthon (1997) also found that other factors influenced the propensity for advertising managers to take risks. These factors included the current companies performance relative to target, whether the advertising decision making process was top down or bottom up, and the decision makers interaction with the companies culture.
Further research is needed into other real world populations and contexts to further refine prospect theory.

Prospect Theory Applied to Insurance & Gambling

Literary Review

> *Expected utility theory combines linearity in probabilities and a utility function, which is either concave or convex if a decision-maker is risk averse or seeking. However, maximization of the expected utility as a criterion of choice among alternatives involving risk fails to explain the existence of both insurance and lotteries. (Basili 1999)*

To understand the existence of insurance and gambling we cannot use expected utility theory. We need to turn to prospect theory to gain a more fundamental understanding. Prospect theory leads to the following statement. Individuals will insure against sufficiently unlikely losses and will bet on sufficiently unlikely gains.
The tendency for consumers to simultaneously purchase insurance and lottery tickets argue Kahenman and Tversky is due to people overweighting both the small probability of winning a lottery and the small probability of events covered by insurance.

Harbaugh and Kornienko (2001) conclude from their study into local status and prospect theory that when individual's compare themselves to a group with higher wealth they will gamble and when they compare themselves to a group with lower wealth they will purchase insurance. This is consistent with Kahneman & Tverski's prospect theory construct.

A person's propensity to gamble or to take out insurance has been proven to be often based on an irrational decision process. This irrational behaviour comes about through

the concepts of loss aversion and mental accounting. Samuelson observed that a colleague would not take the bet “heads you win $200 and tails you lose $100” on a once off basis, but was willing to take 100 such bets. This of course is an irrational decision. If a person is not willing to take the bet once he should not take it many times.

Other Peoples Money

The utility a person receives from gains or losses in wealth depends on his prior investment outcomes. Prior gains cushion subsequent losses – this is referred to as the “house money” effect – while prior losses intensify the pain of subsequent shortfalls. (Thaler & Johnson 1990)
This is particularly pertinent to the gambling industry.
Put differently, this work suggests that the utility derived from a specific wealth change is not the same in all circumstances. Thaler and Johnson (1990) propose that a loss is less painful to people when it comes after substantial earlier increases in wealth: those earlier gains cushion the subsequent loss, making it more bearable. Thaler and Johnson (1990) argue that this idea explains another of their findings, namely that people with recent gains act in a less risk-averse manner, taking on bets they would otherwise find unattractive. This result has been labelled the “house money” effect, reflecting gamblers' increased willingness to bet when ahead. Conversely, there is evidence that after a loss, people tend to shy away from risky bets that they might otherwise take. Thaler and Johnson (1990) argue that this is because losses that come on the heels of other losses are more painful to investors than on average. An informal interpretation is that in the aftermath of a painful loss, while the investor is still reeling from the shock, he is particularly sensitive to additional setbacks, increasing his risk-aversion. Further study of this effect was undertaken by Linville and Fisher (1991) who propose that people have limited loss-buffering resources that are consumed when coping with a bad outcome. These resources renew over time but on a slow basis. This strengthens the theory that people are more sensitive to losses that come immediately after other losses.

Practical Applications

Gambling

We only need to turn to our state government to garner examples of prospect theory in application. Below are two graphics for current promotions for instant scratchies being promoted by the state government.

Exhibit 1

The chances of winning the major prize are remote, however thousands of people invest in instant scratchies every day of the week. Why is this so?
If we return to our prospect theory we see that framing of the offer becomes very important in low probability situations. We can see sound application of positive framing in the samples of current promotions, as well as positive imagery.

Exhibit 2

We also see the sound application of ensuring that people code the outcome of the lottery as a gain by ensuring that it is right outside of most peoples natural reference point (status quo). “Win money for life” is a very powerful motivator and is likely to appeal to the majority of the population. This can also be related to the research

conducted by Harbaugh & Kornieko (2001) which links decision making to local status. Free money for life would surely raise both the financial and social status of a person within their "community".
It would be interesting to conduct research on the above two offers to determine whether there were measurable differences in the ratio of sales of the two offers between higher and lower socio-economic localities. Harbaugh & Korniekos research would postulate that sales of exhibit 1 should be higher in the lower socio-economic suburbs as a higher proportion would see the smaller prize as being appealing. If this proved to be true there are important implications for media selection and product distribution (logistics) for the State Lotteries Board.

We can also see that each of the tickets has a number of games incorporated into the package. This gives the impression that you have two and three chances respectively to "win money for life". Closer examination reveals that the mechanics of the offer are slightly different and the prize differs for each game, although they fall under the headline of "win for life". This further complicates the calculation of odds in the lottery to the extent that it is virtually impossible to ascertain the risk/reward relationship.

In the past we have seen the State Lotteries exploiting our love of certainty. A recent promotion offered that "if you bought 7 tickets in a line," you were guaranteed to win a prize. This is likely to have been a very successful promotion to drive the average sale upwards. Combine this with the "house money" effect postulated by Thaler and Johnson and you have a very effective promotional tool.

Insurance

Below is an except from AMP's current web site that is promoting their insurance products.

Exhibit 3

Home and contents

We know that there is a lot at stake when you're a home owner. That's why our Home and Contents Insurance provides protection you can depend on for unforseen loss or damage to your property.

You'll find our plain language policy information easy to read. It states clearly what is covered and what isn't, so you know exactly where you stand. We offer a quality new for old policy with no hidden catches when it comes to new for old.

Our policies are flexible - allowing you to add options that are important to you, and to suit your needs and budget. Optional covers you may want to consider.

How do I protect my possessions?

Home Buildings and Home Contents Insurance

Imagine how you'd feel if your house was burgled, or worse still, if a fire damaged or ruined your home.

These things do occur and you just hope that it won't ever happen to you. But if it did, and you were insured, things wouldn't be so bad.

http://www.amp.com.au/au/ampweb.nsf/Content/E60%2E2+Home+and+contents

Insurance relies on people's aversion to loss. In the above example the copy has been written to play on this fact. It has been written to accentuate the feeling of loss that would be experienced if a person were to lose their home. In this situation the framing of the offer is not as critical as our gambling example as we are dealing with a situation where a person is making a decision about a potential loss as opposed to a gain. From prospect theory we know that under these conditions people are very risk averse. If advertisements and offers can be presented to magnify this sense of loss the probability of a sale will surely be increased.

Exhibit 4

What is the AMP Multifund Flexible Income Plan?

The AMP MultiFund Flexible Income Plan is an allocated annuity that gives you the choice of up to 10 investments from 33 options . The value of your plan is determined by the growth of your investment less the regular income payments and any additional withdrawals which you receive less any fees or charges. Regular income payments last until your plan runs out of money.

Who is the AMP MultiFund Flexible Income Plan designed for?

The AMP MultiFund Income Plan is designed for retirees looking for a tax effective regular income with flexibility.

How safe is my investment?

The value of your plan over time will depend on your chosen investments. There is no guarantee your plan will last for any set period or your lifetime. To better understand the risk profile of each investment option, see the AMP MultiFund Flexible Income Plan Customer Information Brochure and Investment Choices catalogue.

http://www.amp.com.au/au/ampweb.nsf/Content/E50%2E2+AMP+MultiFund+Flexible+Income+Plan

Our love of certainty presents the insurance industry with a premium price opportunity. Exhibits 4 and 5 are excerpts from AMP's web site promoting retirement income plans. Presumably the majority of people will assume that they will one day retire. Wealth in retirement is no doubt an issue that needs to be addressed. A number of insurance products have be developed to meet this need. Within these products there are a number of variations. These variations primarily revolve around risk. The product outlined in exhibit 4 is designed to provide such an income by allowing the customer to invest in a number of options but does not give a guaranteed return. This product would not suit all people. From prospect theory we know that under conditions of uncertainty people become risk averse. No matter whether the above product is the best available and will yield a superior return in the long run there will be a section of the population that will not buy this product because of the perceived risk is outside their area of acceptance. This section of the population will be motivated to consider the product outlined in exhibit 5. This product whilst probably yielding less than exhibit 4 will be more acceptable because of it's inbuilt guarantee of certainty.

Exhibit 5

What is the AMP Guaranteed Income Plan?

The AMP Guaranteed Income Plan is an annuity that provides you with the choice of a guaranteed regular income for:

The rest of your life or

A fixed term period of between 1-20 years*.

Who is the AMP Guaranteed Income plan designed for?

The AMP Guaranteed Income Plan is generally designed for retirees with a lump sum investment looking to secure a tax effective guaranteed regular income.

How safe is my investment?

AMP Life as issuer of the product guarantees how much and when you will be paid in accordance with the agreed terms when you purchased your plan.

How much income will it provide?

The income from an AMP Guaranteed Income Plan depends on the amount you used to purchase the plan, interest rates at the time of purchase, your own situation and the options you choose. The regular payments include deductions for all fees and charges. You will need to contact you Adviser or Financial Planner or call AMP on **133 888** to obtain a quote.

http://www.amp.com.au/AU/AMPWeb.nsf/Content/E50.1+AMP+Guaranteed+Income+Plan

Conclusion

Prospect theory goes a long way towards explaining why we often make decisions that seem irrational. If the population always made decisions on a utilitarian basis, there would be little need for insurance and few is any people would gamble. In fact if utility were the basis for all decision making there would be little need for marketing.

But the real world does not work like this. Not all things are black and white. People cannot distill the facts and calculate the odds for all decisions that they make.

Prospect theory however cannot be applied to and predict outcomes of all decisions made under uncertainty. There are many other factors involved in the making of decisions under uncertainty that prospect theory cannot or does not embrace at this point in time.

In the future there are bound to be many new hypothesis proposed and constructs developed that use prospect theory as a base that will help us to further understand why we decide what we do.

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