BEHAVIORAL ASPECTS IN THE INSURANCE MARKET

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***Abstract**: The insurance industry has an essential economic importance.In spite of the great progress,we have to emphase that the existing theoretic models cannot entirely explain the mechanism of the insurance market and of its decisional process,especially in the case of the events with low probabilities.That is the point where the behavioral economists come with a larger view of the factors that influence the consumer decision explained through the Prospect Theory of Kahneman and Tversky, through the Cumulative Prospect Theory that represents an enhanced view of the Prospect Theory and Prelec function.The concept of utility is also detailed in some extend in this paper contribuing to a larger perspective about decision in insurance market and its role in the development of insurance market.Prospect theory tries to emphasize the role of psychological effects upon the consumption decision showing that the economic agent does not have a rational behavior and is not risk averse in all situation.In this paper there are showed and debated some situation in which psychological effects like loss aversion, reference point, status-quo and framming effects can influence the deccision of the consumer and are not consistent with the standard economic model.In addition to this aspects, Cumulative Prspect Theory enhance the fact that decision makers overestimate low peobabilities and underestimate high probabilities,thus buying inadequate insurance in many situation.in thiss sense, in order to support this idea I tried to make a qualitative presentation of the model used on the insurance market using Prelec function which is the function related with the Cumulative Prospect Theory which can be used in the insurance context.The weak points of the theory of expected utility are explained through this new perspectives and nevertheless aspects like insensivity to bad news concerning incomes,elasticity of price,displacements of status-quo and default,disposition effect and equity premium are taken into consideration.As example,I chose a Kunreuther experiment about insurance decision in with is underlyined the fact that for moderate risk people buy insurance with premiums that exceed the expected loss.There are demands for low deductibles in the the markets for extended guarantees and insurances for mobile phones where was observed that the insurance underwriting rate increases with the probability of loss keeping the expected loss constant.It is better to mention that the theory and the model that are presented here comes as complementary to the economic standard theory not as a substitute.*

***Keywords**: Insurance market, Prospect Theory, Cumulative Prospect theory, consumer decision,estimated probabilities,expected utility*

***Jel**:D03.*

1.Introduction

In the insurance maerket people are suppose to act as rational human beings and have a tendency for risk aversion in all situation.But as we will see this is not a general low and people tend to avoid insurance and misunderstand the probabilities.They take different reference point related to their wealth or emotional stimulous and because of this tend to overestimate low probabilities and underastimate the high probabilities thus making vicious insurance decisions.

There are several standard theoretical statements regarding insurance decision and behavior in the insurance market, namely:

-decision makers overestimate low probabilities and underestimate high probabilities.

-decident makers tend to ignore very low probability events and cataloged events with very high probability of occurrence to be sure.

-the consumers buy inadecquate insurance in spite of the low probabilities

-even if the first is correct, incorrect or subsidized actuarial point of view is likely to continue insurance under reduced dramatically since the probability of loss decreases and loss probability increases, keeping constant the expected loss.

The most popular theory of decision, expected utility theory predicts a much insurance and contradicts all the axioms postulated in above.For example, a risk averse decision maker will buy full insurance if the premium is actuarially correct.In contrast, Kunreuther („ Insurance decision making and market behavior,2005) found that only 20% of some individuals in an experiment buy insurance at correctly calculated premium, if the probability of loss is 0.001. Moreover, rank-dependent utility and cumulative exploration theory was developed to provide better explanation of embedded risk behavior.There are probability weighing functions, one example being set by Prelec function to estimate probabilities (1998), which is consistent with the first axiom.

Kunreuther's study provides striking evidence regarding the purchase of insurance by individuals of inadequate insurance against events with low probabilities such as earthquakes, floods or hurricanes in areas exposed to these hazards.(Schoemaker,Kunreuther 1978)

Expected utility predicts that consumer will buy full insurance if the premium is actuarially fair in terms of all reported the following results probabilities.Kunreuther experiments presented various potential losses at different probabilities, keeping constant the expected value of the loss.Contracts included correct, incorrect and subsidized premiums, lead to the conclusion that in any case there is a point at which the subscription drops dramatically as the probability of loss decreases and the magnitude of the loss increases, keeping constant the expected loss .The potential insurance clients could be less aware of the losses involved in the process or could be subject to moral hazard.Lack of interest in buying an insurance remained active despite government attempts to: provide grants to counteract transaction costs, reduce premiums under actuarially fair rates, to provide reinsurance to companies or to provide relevant information. A good reason underlying insurance underwriting deficit is the lack of interest from the consumers.In different contexts, people ignore low probability events that can, in certain cases, to create a semnificative loss.Since many of these losses are imposed by consumers themselves because of individual actions, people choose not to insure.For example, people were reluctant to use their mandatory seat belts despite the evidence that they save lifes.By 1985, only 10-20% of drivers wore seat belts, so denying their own safety.

2.The weak points of Expected Utility in explainig insurance behavior

A major challenge is that individuals underinsure low probability events and overinsure moderate risks.For moderate risk they buy insurance with premiums that exceed the expected loss.Exemples for this are demands for low deductibles,the markets for extended guarantees and insurances for mobile phones.Thus keeping the expected loss constant the insurance underwriting rate increases with the probability of loss.There is a standard expected utility theorem that says that individuals will fully insure if they have received the correct acturial premium.Expected utility, gives a completely rational explanation of the phenomenon of underwriting.This has the implication that if the total provision is considered necessary, should be encouraged by subsidies or stimulated law.Expected utility is unable to explain certain insurance phenomena .First Kunreuther found that only 20% of subjects in the first experiment subscribe if the premium is fair and the probability of loss is 0.001. This theory was widely accepted and implemented as a descriptive model of economic behavior, as well as the model of rational choice, this means that the theory assumes that rational people would want to follow the theory axioms and,generally,they do this. Second, expected utility cannot explain why many people bet and ensure them simultaneously.The amount of gain or insurance makes it difficult to dismiss this behavior.Thirdly, the expected utility predicts that a risk averse decision maker will always buy insurance even if the premium is not echitable.However, many people do not buy insurance, even if they are available, especially for events with low probabilities.Fourthly, when first confronted with unfair premiums in terms of actuarial, expected utility predict that a decision maker is indifferent between full insurance and non-insurance and will prefer probabilistic insurance. Guilty for underwriting is a bimodal perception of risks which could provide an explanation in this sense.Some individuals focuses more on probability, others do not pay attention to the loss.The first don't pay attention to the size of losses that fall below a certain threshold probability, while for last dimension of loss is relevant.Thus, the first are more likely to ignore insurance, while the latter ones buy for low probability but semnificative events.One of the problems is that the demand for insurance underwriting is determined by the loss, if the referance point is given by the initial wealth. Difficulties in the expected utility theory are raised by the emergence of a number of alternative for this teory.The most notable are rank dependent utility theory (Quiggin, 1982,1993) and cumulative theory exploration. (Tversky and Kahneman, 1992).Unlike expected utility, the rank utility dependent theory of cumulative exploration functions are used for measuring the probability, w (p) to overestimate small probabilities and underestimate high probabilities.A function that is similar to w (p) which is consistent with many of the proofs of non-probability extreme events is the function of Prelec (1998).

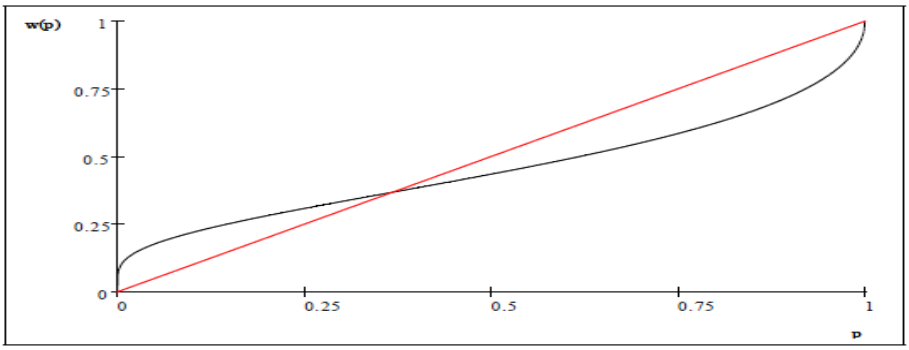

Fig.1.Prelec function
Source: :"The behavioral economics of insurance", Ali-Al Nowaihi, Sanjit Dhami,University of Leicester

The decidents who use the rank dependent utility and cumulative prospect theory fully insure even in the case of a probabilistic low loss, in the case of an actuarial unfair premium and the fix cost of the insurance and if participation constraint is satisfied.

Utility theory rank and cumulative theory exploration could explain the above four axioms given that:
- during the editing phase, decision makers choose which improbable events to treat as impossible and which to treat as being sure. "because people are limited in their ability to understand and evaluate extreme probabilities, unlikely events are either ignored or overstated, and the difference between high probability and certainty is either neglected or exaggerated." (Kahneman şi Tversky-Prospect Theory,1979:283)
-in the stage of decision / evaluation following that of publication, makers apply psychological theory lotteries already psychological editated.Choosing to ignore low probability events during the editing phase, decision makers do not require insurance for such events during decision-making.
-Axiom captures Prelec's function as the makers overestimate low probabilities and underestimate high probabilities, but invalidated by the second the small probabilities and large ignored deemed reliable.
-If you change heads and Prelec's function is considered as the editing phase of the evaluation were synchronized, the result will be composite Prelec's function
Those who use composite Prelec function will ignore low probability events by assigning subjective values to this.So, they will not buy insurance for low probability events unless are mandatory for a probability interval, policymakers overestimates the probabilities. Tversky and Kahneman cumulative theory introduced in addition to the Theory prospecting prospecting by completing the following: the psychological-editing phase which resulted, among other things, that events with small probability that are ignored should be eliminated.
Cumulative transformation of probabilities replaced the transformation point of Prospect Theory, a decision-maker who uses cumulative theory exploring options will never choose the dominant options in a stochastic manner.With other words, the

theory of cumulative prospect theory is nothing but prospect Theory complemented with composite function Prelec. Kunreuther argues otherwise: "The main reason for market failure is that most people do not use insurance as a means of risk transfer them to others, this behavior is caused by the refusal of people to worry about losses whose probability is below a certain thredshold. "
The model that follows explain how the decision in insurance can be made when we have in consideration a certain loss and an interval of probabilities of (0,1).There are also put the conditions if the premium is fair or unfair and which are the effects of this fact upon the insurer's decision.In this context, it can be seen how Cumulative Theory define the utility and disutility function in this insurance context.

3.Model

Suppose that a decision maker may suffer a loss L> 0, with probability p belonging to (0,1)} in these conditions can buy a cover C belonging to the interval [0, L], at a cost rC + f, where r belongs (0,1) being first rate and f ≥ 0 fixed cost of insurance.(Ali-Al Nowaihi, Sanjit Dhami,2010)
Insurance premium rate r is: r = (1 + θ) where θ = 0 corresponds p.Unde fair actuarial and if θ> 0, an incorrect actuarial conditions.
In other words, wealth maker is: *W-rc-f*, with probability p

W-rc-f-L + C ≤ *W-rc-f*, with probability 1-p

Let Ui (C) utility decision maker when deciding to buy a certain amount of insurance coverage, C> 0.Fie C *, the optimal level of insurance coverage, Uni maker utility if he decides not to buy insurance, then decision maker who buys C * satisfies the participation.

$$Uni \leq Ui (C^*)$$

The four main features of the theory of cumulative exploration (CP) are:
- In CP, unlike rank-dependent utility theory and the expected utility, utility determinants are the level of wealth, assets or property, but the difference between them and reference point.Reference point is usually, but not necessarily represented by status quo.
- the utility function is concave for gains exploring theory and convex for losses (decreasing sensitivity).
- disutility of loss is greater than the utility gain of the same size, it illustrates the loss aversion.

Probabilities are transformed so that small probabilities are overestimated but higher probabilities are underestimated.Considering the wealth level y and a reference point r, transformed variables x = y - r, where wealth is relative to the reference point.
CP utility function is defined on x, x> 0 is a gain when x <0 is a loss.
Utility function of CP, v (x) (- ∞, ∞) is a continuous function, satisfying increasing reference point dependence v (0) = 0, decreasing sensitivity for gains v (x) is concave for x ≥ 0, decreasing sensitivity loss v (x) is related to x ≤ 0 and aversion to loss-v (-x)> v (x) for x> 0.
A popular utility function is axiomatic theory of cumulative exploration of the form:
v (x) = x ^ $_{\gamma}$ if x ≥ 0
- $_{\gamma}$ (-x ^ $_{\gamma}$,) if x <0
The vast majority of the elements of this theory are important precedents, particularly through contributions of Markowitz (1952) and Allais (1953). Theory models exploring refers to choices that split the process into two stages: the first stage involves "editing" and the second phase involves "evaluation". Using an editing stage

is the most obvious feature of the PT. The second feature that distinguishes PT these theories is that the results are measured in terms of gain and loss relative to a certain reference point.In PT results are defined relative to a reference point that serves as "zero point" scale of values. It is often assumed in the analysis that the relevant reference point in assessing the gains and losses is the current wealth or welfare, but not always so. In particular, the relevant reference point can be expected status rather than current.

Expectations play an important role in the phenomenon of reference point. When people expect to receive a salary increase of 10%, for example, but receive only 5%, they tend to be disappointed. Their point of reference in this case is given by how much money currently receive, but as expects, so they encode and evaluate additional percentage of 5% as a loss rather than a gain.

Prospect theory complements other classical theories, especially the theory of expected utility in which the deviations from standard economic behavior are explained by introducing individual psychological mechanisms that explain consumer decision of the individual, such as aversion to loss function weighting decisions, framing effects, anchor effects, contrast effects or reference points .It wants to create an overview on consumer behavior especially in decision situations under risk and uncertainty.

In the table below, we can identify anomalies referred in Prospect Theory inconsistent with Expected Utility phenomena, phenomena involved and anomalies in accordance with the classification of belonging and Prospect Theory indicate those elements that are relevant to explain those anomalies.

Phenomen	**Domain**	**Description**	**Elements in PT**
Equity premium	Share market	Profitability of actions is too high in relation to the bonds	Loss aversion
Disposition effect	Share market	Keeping too long to actions that go to loss and resale of winning one	Loss aversion,reference point
Slope decreasing labor supply	Work economy	New York taxi drivers give up on working once they have reached the target	Loss aversion
Asymmetric elasticity to price	Consumer goods	Purchase is more sensitive to price increases than to decrease	Loss aversion
Insensivity to bad news concerning incomes	Macroeconomy	Consumers decrease their consumption	Loss aversion, reference point

displacements of „status qvo" and „default"	Consumer's choice	Consumers does not change health plans: choosing insurance that was before	Loss aversion
Effect "end of day"	Betting on horse racing	„Shift to long shots at the end of the day"	Reference point Depict marginal sensitivity
Favorite-long shot bias	Betting on horse racing	Favorits are under bet; „long shots" are over bet	Estimating the decision: overestimate low probabilities
Buying insurance by fax	Insurance	Consumers buy insurance at inflation prices	Estimating the decision: overestimate low probabilities
Loto demand	Loto bets	More tickets sold is as grand prize grows	Estimating the decision: overestimate low probabilities

Table 1 *„Inconsistent phenomen with EU" Source: "An introduction to behavioral economics-a guide for students", Nick Wilkison,p.87*

Expected utility theory is also difficult when you have to explain the different attitudes we encounter relative to insurance.A buy insurance involves risk aversion, as they say in utility theory. However, the assumption that the utility function is concave in the area where is located the assets making utility theory to imply a universal attitude of risk aversion. This is in contradiction with the fact that many people prefer insurance policies offer limited coverage with low or no deductible, to policies that provide maximum coverage with high deductibles. So, buying insurance is in itself evidence of risk aversion, but some insurance policies that can be of great popularity, may be inclined to risk than others.

There is another phenomenon linked to insurance which seems to be an anomaly for both prospect Theory and for Expected Utility. This attitude towards the provision of probabilistic insurance. For this type of policy purchaser pays only a fraction of the price of full insurance, but only receives payment probability of the same fractions if the event occurs. It seems that such a policy involves more risk than standard insurance. Empirical evidence of Kahneman's study shows that such insurance are not popular, which seems to contradict the predictions of the model PT. This apparent anomally of PT, with some tendencies towards risk taking in earnings can be explained only by a discussion of weighting decisions.

Conclusions:

-Prospect theory and Cumulative theory try to explain the consumer behavior in the insurance market taking into consideration the inconsistent phenomen of Expected utility theory in this context like: Insensivity to bad news concerning incomes,elasticity of price,displacements of status-quo and default,disposition effect and equity premium.

-there are taking into consideration the aspects that Expected Utility theory cannot explain such as: decision makers overestimate low probabilities and underestimate high probabilities, decident makers tend to ignore very low probability events and cataloged events with very high probability of occurrence to be sure, the consumers buy inadecquate insurance in spite of the low probabilities.
-even if the first is correct, incorrect or subsidized actuarial point of view is likely to continue insurance under reduced dramatically since the probability of loss decreases and loss probability increases, keeping constant the expected loss.
-cumulative transformation of probabilities comes as a transformation point of Prospect Theory, a decision-maker who uses cumulative theory exploring options will never choose the dominant options, the theory of cumulative prospect theory is nothing but Prospect Theory complemented with composite function Prelec.
- Prospect theory complements other classical theories, especially the theory of expected utility in which the deviations from standard economic behavior are explained by introducing individual psychological mechanisms that explain consumer decision of the individual, such as aversion to loss function weighting decisions, framing effects, anchor effects, contrast effects or reference points and Cumulative Prospect theory tries to explain why small probabilities are overestimated but higher probabilities are underestimated.

***Biography*:**

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