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Prospect Theory and Risk-Seeking Behavior by Troubled Firms

Hina Mushtaq
Muhammad Ali Jinnah University, Islamabad. Pakistan
P-637, B-Block, Street #2, Jamia Salfia Road, Johar colony, Faisalabad,Pakistan

Najaf Aslam
Muhammad Ali Jinnah University, Islamabad, Al-Najaf Colony, Faisalabad, Pakistan

Nadeem Mushtaq
Riphah University, Faisalabad
P-637, B-Block, Street #2, Jamia Salfia Road, Johar colony, Faisalabad,Pakistan

Abstract
The paper studies the relationship between the risk and returns to check its conformance with the prospectus theory which is affecting the rational decision making behavior of investors and it is argued by many critiques. The study uses a different approach for measuring the reference point which is an important element of Prospect theory and for the measurement of the risk as well. Data is taken from 2003 to 2011 from the BSA and results are quite consistent with the prospect theory which means that firm which shows the return below their target level, they start showing the risk seeker behavior while on the contrary, firms with the returns above their target level start showing a risk averse behavior.
Keywords: Prospect Theory

Introduction

Earlier studies show lots of discussion on the risk, return trade off corresponding to different theories, which provide support to this risk return relationship. Daniel Bernoulli initiated expected utility theory in 1738, which were used for making investment decisions based on specific risk return categories the traditional assumption of risk aversion behavior, the core assumption of EUT estimate a significant positive relationship between the risk and return But later on there was much criticism on EUT as (a) conservatism in updating beliefs, (b) irrational deviations, (c) preference reversals over uncertain outcomes, (d) uncertain probabilities. In 1979, Kahneman and Tversky gave another model for explaining the behavior of rational investors and that was called Prospect theory (PT, Kahneman and Tversky [1979]), their model gave such results which are totally opposite to the basic assumptions of EUT.

Brealey & Myers, 1981) suggests that there is positive relationship between risk as return as those firms expected more return will take more risk but Bowman (1980) discovered that negative relationship also exists between risk and return. Bowman (1982) also discovered that troubled firms take more risk despite of having their poor condition. Prospect theory (PT, Kahneman and Tversky (1979) argues that, losses effect the investors more than the equal amount of gain. For instance, in normal situations, the utility gained from getting $50 should be equal to that utility which you gained $100 and then lost $50. In both situations, the result is a net gain of $50 but that's really not the case we actually would be feeling more regret in second situation because we lost $50 in the second situation.

Prospect theory actually deals with the behavior of human beings when they choose between the different alternatives that involves risk and when the probabilities of the consequences are known to them. The theory suggests that people behave on the basis of the potential value of gains and losses instead of the outcome; furthermore they evaluate their gains and losses by using different heuristics. Take an instance; supposed one investor is given with the option of purchasing the stocks of a company by the two different financial advisors. The first advisors tells him that stock is giving the average returns of 10% over the last 10 years while the second financial advisors tells him that stock was performing well in the last two decades, but recently its returns started declining. Now prospect theory suggest that even though the investor is given the option to buy the stock of the same company but he would be more interested to buy that stock from the first financial advisor, who have told about the overall gain of 10%, rather buying the combination of gain and losses.

This study attempts to explore the role of attitude towards the risk in the management of Strategic Risk. Recent Studies in prospect theory shows that the individuals use the reference or target points in evaluating the risky choices, moreover individuals are not wholly risk averse or risk seeker, instead they adopt a mixture of risk seeking and risk adverse behavior. This study is an attempt to see whether Prospect theory hold in the Pakistani environment and does the troubled firms shows a risk seeking behavior in managing their strategic risk.

Based on the proposition of the PT, this study examines the relationship between the risk and return by using a different accounting measure which is ROE (Return on Equity) at the company level. The study proposes the negative and significant relationship between the risk and returns. Overall, the study examines the effect of the

company's returns on the corresponding level of the risk which it takes in future, thereby allowing the behavior of the firms to change with the passage of time.

Earlier studies measured the firm's reference points and their corresponding levels of risk and returns by using the time series data of the returns. The basic assumption which is being followed by all studies was that firm's behavior and their corresponding situations are time invariant. That approach is being criticized by many critiques because that measure will work only if the returns distribution is constant over the time period under study. This criticism is being important in the context of PT, as the position of the companies relative to their reference level and hence all of their actions are state dependent. The underlying motive of this study is to provide investors with an empirical setup which can deal with all such issues. This study investigates the relationship between risk and return by different accounting measure which is Return on equity. The study develops a research methodology to test the hypothesis that risk attitudes conceptualized in terms of prospect theory's utility function can explain the relationship between risk and return both within and across the different industrial sectors.

Bowman's conducted a study and find a significant negative relationship between the risk and returns and attributed it to the two main factors. Firstly, the good managers sometimes, simultaneously reduces their risks and increases their returns. Secondly, managers become risk seekers under certain circumstances and start accepting the projects with the highest level of risks. The study on the Risk seeking behavior of the troubled firms as predicted by the prospect theory has been done on many countries like USA, Bangladesh and Belgian Firms, while this paper, by incorporating the behavior in standard finance, is an attempt to check the prospect theory in Pakistan by using accounting measures instead of focusing on Primary time series data.

By using data from BSA (Basic Financial Analysis) of different companies from five different sectors, the study expects a negative Risk-Return relationship for the firms with return below the target and positive Risk-Return relationship for the firms with returns above the target levels. So by doing, the study will support the basic proposition of prospects theory.

Literature review

In last decades, all the research in the era of business administration has devoted all of their efforts in explaining the relationship between risk and returns and most of the literature which deals with the returns of the company and their corresponding levels of risk were developed under the basic assumptions of EUT. The EUT and Risk aversion predicts the positive relationship between the risk and returns while PT suggests a different thing while considering the behavior of the human beings.

The literature said, there exists a positive relationship between Risk and Return i.e. when Firms take more Risk, there would be more return and that has proved by many researchers but Bowman (1980) discovered that, within most industries, Risk and Returns are negatively correlated. His findings as a paradox for the strategic risk management because findings were contradictory to the existing literature on Risk and Return which argued for a positive relationship between the risk and return. He further argued that this risk attitude of the firms effect the choice of their risk-return profiles and ultimately the troubled firm started taking the risk seeker behavior.

Being a rational investor/firm, whenever the risk is increased then returns should be large enough to compensate for the increased level of risk which means there should be a positive relationship between risk and return but in real life when we include the behavior in standard finance then we observe that when the firms have below average returns then they start showing the risk Seeking behavior instead of focusing on risk averse behavior because this situation as there Business Risk is already very high they should go for less financial Risk and try to reduce their risk but on the contrary they go for risk seeking behavior.

This study attempts to explore the role of attitude towards the risk in the management of Strategic Risk. Recent Studies in prospect theory has showed that the individuals use the reference or target points in evaluating the risky choices and moreover individuals are not wholly risk averse or risk seeker, instead they adopt a mixture of risk seeking and risk adverse behavior. Marc Jegers (1991), conduct the research on the Belgian Accounting Data and used the four profitability variables and two risk variables and confirmed the previous study that the firm with above level returns shows the risk averse while the firms with below level returns shows the risk seeking behavior.

Avi Fiegenbaum and Howard Thomas (1998) conduct the research on USA firms and confirmed the existing literature on Prospects theory. Alan Collins, Wesley N. Musser and Robert Mason (1991), applies the prospect theory to reinterpret historical studies of risk preferences of Oregon grass seed growers and found a significant relationship between the changes in income and changes in classification of preferences.

Katsuhiko Shimizu (2007), combine the prospect theory, Behavioral Theory and the Threat Rigidity Thesis to see their combine effect on organizational decisions to divest formerly acquired units and found that the divesture decisions are influenced by both individuals and organization level factors that cannot be explained solely by any one theory and provide a great understanding of organizational Risk-seeking Behavior.

Ajay Bhootra and Jungshik Hur (2012), find the relation between the High idiosyncratic Volatility and Low Returns and find that under prospect theory, investors are risk averse in the domain of Gain, they exhibit

risk-seeking behavior in the domain of losses and further negative volatility-return relationship is stronger among the stocks with greater proportional ownership by individual investors means by including more of individual attitude towards risk Management.

Then Thierry Post & Haim Levy, tried to find a stochastic Dominance Analysis of Aggregate investors and found Reverse S-shaped utility functions with risk aversion for losses and risk seeking for gains can explain the stock returns which were consistent with a reverse S-shaped pattern of subjective probability transformation.

Livio Stracca (2002), worked on the Risk preferences of and individual investor and find out that individual investor is risk seeking over losses, with the consequence that the property of diversification of averaging downside risk is welfare-reducing rather than welfare improving. So the same research could be applied on the corporations because they also behave like individuals and show a risk seeking behavior when they are having below average returns. On the same pattern William T. Harbaugh (2002), studies the Prospect theory in choice and Pricing tasks.

This Study attempted to explain the Bowman's Risk-return paradox in terms of recent research in Prospect Theory. The Research emphasized the role of Target returns levels in analyzing the risk attitudes of the firms. For the returns above the target levels, the firms appears to show a risk averse behavior while for the returns below the target level, the firms appears to show a risk seeking behavior. By using data from BSA (Basic Financial Analysis) of different companies from five different sectors the study proposes a negative Risk-Return relationship for the firms with return below the target and positive Risk-Return relationship for the firms with returns above the target levels. By doing so, we would be able to support the basic proposition of prospects theory.

The study develops a research methodology to test the hypothesis that risk attitudes conceptualized in terms of prospect theory's utility function can explain the relationship between risk and return both within and across the different industrial sectors. The study expects a risk averse attitude for the firms having returns above the target and risk seeking attitude for the firms having returns below the target. This will lead towards the hypothesis of U-shaped risk-return function and the expectation of a negative risk-return association for the below target level firms and a positive risk-return association for above target level firms.

Determining the Reference Point

An important stage in implementing PT at the organizational level is defining the reference point. Kahneman and Tversky indicated that there is no general rule for deciding on such a definition. Nevertheless, they mentioned that the location of the reference point, and the consequent coding of outcomes as gains or losses, may be affected by the aspiration level of the decision maker. Most researchers who examined the risk-return association under PT assumed a common reference point at the industry level, usually measured by the industry median or mean of the returns.

This measure implicitly assumes that firms within the industry evaluate their performance relatively to each other. Fiegenbaum and Thomas found that firms periodically adjust their performance and financial ratios to their industry means.

The vast majority of the cited above studies have measured the industry median (or mean) of returns by calculating this measure over the time period under study. This approach is appropriate, however, only if the expected return is constant over the period. Another shortcoming of this approach is the latent assumption that firms know the current industrial performance, although it is fully revealed only in the subsequent period. In other words, there is an implicit assumption that firms base their future risk attitude on a target level before it is realized.

The study considers these two arguments and suggests an alternative determination for the firm's reference point. Firstly, the study calculate the reference point annually based on the industrial performance, and, secondly, it employs it only to a firm's decisions in the subsequent period.

A majority of the studies modeled the hypothesized relationship between risk and return according to PT by a linear relationship between risk and return, which was estimated separately for above and below the reference point. The study takes the industry Median of last year as the reference point of this year which would be compared with the actual performance of the company in this year.

Hypothesis

The study track the following sequence: Firms evaluate their year t-1 returns relatively to the returns of the other firms in their industry and particularly relative to their reference point, which is determined as the industry median return at *t -1*. At the beginning of year t , each firm has to decide on its subsequent risk level, given its industry position (below or above the reference point). In accordance with the assumption above, a firm's risk level is measured as the distance between its realized return and the industry's median return at year t .

We hypothesize that firms with returns above (below) their reference point would take lower (higher) levels of risk, which will be expressed by a smaller (larger) return distance. The intuition under this hypothesis is that a higher risk offers firms the chance to achieve a larger positive return at the price of a larger negative return. Thus, firms that achieved a return below their reference point at t -1 are expected to take higher risk levels since,

by doing so, they increase their chances to change their position from below to above the reference point. Formally, the research hypothesis is:

Hypothesis: A negative association exists between firms' return positions within the industry (i.e., being below or above the industry median return at year *t -1*) and their subsequent risk level, measured by the distance between the firms' returns and the industry median return at year t. The data is collected from BSA from 2002 to 2011 of five sectors of Pakistan name: Food, Chemical, Cement, Fuel and Energy and Paper and Board.

Measures

The reference point for firm I in the year t and in the industry j is REF I,j,t which is calculated separately for each year and it is the median of the firm's industry's return in the previous year that is,

$$\mathbf{Ref}_{i,j,t} = \mathbf{MED}_{j,t-1}$$

Where $MED_{j,t-1}$ is the median ROE of industry j at year *t -1*. In this way, the reference point is being adjusted annually to the last known industry return median.

Many studies have used a mean-variance approach for analyzing the risk-return association. As indicated earlier, using this approach is appropriate only when the returns' distribution is constant over the studied time period. Return was usually measured as the mean ROE or return on assets (ROA) in a time period (usually 5–10 years). Risk was measured as the return's variance (or standard deviation) around the same time period. On the other hand, in this study, the return and risk are measures are separately calculated for each year. This will let the distribution of the returns, to change over the period under study, which is a property which is compulsory for the PT.

Formally, let $ROE_{i,j,t}$ be the ROE of firm i in industry j at year t (ROE is calculated as net income at time t divided by the time-t common equity). Risk is measured separately for each firm in each year by the absolute difference between the firm's return and its industry's contemporaneous median return:

$$\mathbf{Risk}_{i,j,t} = \mathbf{ROE}_{i,j,t} - \mathbf{MED}_{j,t}$$

As in previous research, the study also defines risk as a measure of dispersion. Nevertheless, in this study, it reflects the dispersion of the firm's annual return around the industry's contemporaneous median return (as opposed to around the firm's mean return in the studied time period). This definition enables the firm to control the effects of exogenous factors that affect the whole industry but are not controlled by the firm. For simplicity, we assume that all firms in a given industry are influenced by these factors in a similar way. In addition, as opposed to previous research which measured risk by the ex-post or actual variance (or standard deviation) of a firm's return, the study examines the influence of the firm's return in a given year on its selected risk level for the subsequent year. Hence, in this research, risk is measured ex-ante, given the industry's median return. Table 3 presents descriptive statistics of the research variables.

Empirical Analysis

To test the main research hypothesis, an empirical framework is formulated, describing the relationship between the firm's return position in the industry and its consequent risk level. The firm's return position is represented by a state variable defining whether the firm achieved a return that is above or below the reference level.

$$\mathbf{Risk}_{i,j,t} = \alpha + \beta \times \mathbf{I\ gain}_{i,j,t} + \mathbf{e}_{i,j,t}$$

Where $\mathbf{I\ gain}_{i,j,t} = \mathbf{I}\ [\mathbf{ROE}_{i,j,t-1} > \mathbf{Ref}_{i,j,t}]$.

The basic model for testing the research hypothesis is represented by the above equation is an indicator of function returning the value 1 whenever the proposed condition is true and 0 when it's not and $e_{i,j,t}$ is the error term. The effect of the firm's return position in the industry (State variable) on the firm's risk is represented by the coefficient B. According to the theory, the sign of the beta should be negative, which means firms with high returns will show a risk seeker behavior while the low returns firms will show a risk seeking behavior. Equation is estimated by the Ordinary-Least-Squares method in three configurations: (a) pooled regression; (b) separate regressions for the five industrial averages and regression for fixed effect model.

Descriptive Statistics:

Table: 1

	RISK	*IGAIN*
Mean	-21.18639611	0.488888889
Standard Error	1.133952543	0.022490508
Median	-26.485	0
Standard Deviation	25.22885141	0.50038222
Minimum	-282.5	0
Maximum	41.99	1

The table shows the descriptive statistics shows the research variables which are Risk and iGain. It shows the values of the mean and standard deviations as well.

Correlation

Table 2:

	RISK	*IGAIN*
RISK	1	
IGAIN	0.059835708	1

The correlation matrix is also showing significantly weak relationship between the two variables.

Pool Regression

After running the pool regression, the beta of I gain is showing the negative sign which is in accordance to the prospect theory means when the firms shows above average results then the firm will show the risk averse behavior and those firms which shows the below average results that is troubled firms will show a risk seeking behavior which actually confirms the main hypothesis which was, the firms showing below average results shows the risk seeking behavior. The independent variable is having negative relationship with dependent variable and explaining 28% change in the dependent variable and affecting it negatively. R Square is 1.96% which means the explanatory power of this model is quite weak because the study has taken just independent variable while there are many variables which are affecting the level of the risk which the company would be taking in future. Overall, results corroborate our main research hypothesis that firms with a return above (below) the reference point take less (more) risk.

Table 3:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.8066	19.7394	-0.598126	0.55
IGAIN_?	-28.1463	28.58778	-0.984556	0.3253
R-squared	0.001962	Durbin-Watson stat		0.711732
F-statistic	0.969351			

Regression with Industry Averages

After running the regression with industry averages data instead of taking the companies wise data the same results could be observed which confirms the main hypothesis and IGain is carrying a negative sign and having negative relationship with dependent variable.

Table: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-20.39655	12.64432	-1.6131	0.114
IGAIN_?	-1.048812	26.21512	-0.040008	0.9683
R-squared	0.000037	Durbin-Watson stat		1.254721
F-statistic	0.001601			

Fixed Effect Model:

Firstly, the F test was applied to choose between the common and fixed effect by looking at its p value. It shows the significant results that means the data qualify for the fixed effect. After that the redundant test was applied to choose between the fixed and random effect and again it shows the significant results which means the intercept is not constant across all the sectors and it varies within the sectors i.e. it is sector specific. So, after running the fixed effect model, findings shows that the prospect theory does hold in cement, chemical and sugar sectors as their betas carrying the negative signs and confirming the hypothesis of the prospect Theory.

Table: 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-45.65922	12.4144	-3.677922	0.0007
IGAIN_?	51.50248	25.76092	1.999248	0.0526
Fixed Effects (Cross)				
CEMENT—C	-3.467739			
CHEMICAL—C	-1.392346			
FUEL—C	6.610559			
PAPER—C	3.765326			
SUGAR—C	-5.515801			
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.354177	Mean dependent var		-20.9007
F-statistic	4.277606	Durbin-Watson stat		1.466303
Prob(F-statistic)	0.003383			

Conclusion

The study employs the prospect theory (Kahneman and Tversky (1979) to explain the relationship between risk and return at the organization level. This research addressed the short- comings in the modeling approach used in previous researches and suggested an approach aimed at resolving those problems. This study suggests an alternative view for inferring the reference point, one of the key elements of PT, and the way of measuring risk, as well. Previous studies estimated a firm's reference points and risk and return position based on its time series of returns over the time period under study (usually 5–10 years). The underlying assumption in the approach taken by these studies was that a firm's behavior and situation are time invariant. The main criticism regarding this approach is that the use of the suggested measures may be appropriate only if the return distribution is constant over the studied time period. This criticism is especially noteworthy in the context of PT, as a firm's position relative to the reference level and hence its actions are state dependent. In our study, the reference point was calculated for each year separately, as the median of the industry return in the previous year, thus, resolving these shortcomings.

Overall, the results indicate that firms with a return that is above the reference level (measured as the industry median return in the previous year) take less risk than firms with a return that is below the reference level. The main research hypothesis was that investors of those firms which are achieving above (below) target returns (reference levels), would start reflecting a risk aversion (Seeking) behavior and that is reflected by the positive (negative) relationship between the returns and the risk and results shows that this theory does hold in Pakistan and the troubled firm means those firms having returns below their target level are actually showing a risk seeking behavior instead of going for risk aversion behavior as predicted by the mean variance theory. So from this it is obvious that when we incorporate the behavior in the standard finance as done by the Bowman then the results normally deviate from their expected values and relationships.

Future Research

The study has taken only one explanatory variable that's why the power of our independent variable in explaining the change in dependent variable is very weak. In future further variables could be added in the list of independent variables and by doing so investors and policy makers would be able to forecast the Future Risk of the firm.

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