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Full Length Research Paper

Impact of Kpi's on Systematic Risk: a Case of Petroleum Industry

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Abstract

Purpose: The aim of this study is to analyze the impact of key performance indicator on systematic risk that affects the entire market performance. **Methodology:** This study analyzed the monthly data of selective industry using the multiple regression analysis. This approach has been applied on 12 listed companies of petroleum sector covering 15 years period, 2005 to 2015. **Findings:** The regression results of seven independent variables reveals that profitability, operating efficiency, growth, tobin q are significant effect on determinants of systematic risk and rest of the variables liquidity, dividend payout, chin model are against their association with systematic risk. **Conclusion:** The outcome of this study is helpful for all stakeholders to maximize the return by decreasing the risk factor. This study is helpful for decision making process of all stakeholders of selective industry.

Keywords: Systematic Risk, KPI's, Petroleum Sector, Pakistan Stock Exchange.

INTRODUCTION

The analyzing of risk factor is remains the center point of all previous studies (Nucera *et al.*, 2016, Gupta and Gurjar 2014, Iqbal and Shah 2012). These studies have been provided as significant role towards contribution of knowledge that is constructive for all stakeholders to understand the nature of risk that is related to investment of individual's, (Angel et al, 2018). The performance of individual company and whole sector is highly associated with verdicts of all stakeholders. But in a way, their decisions might be good or bad in some situations.

This study has analyzed the un-diversifiable risk through key performance indicators (KPI's) of study industry. Systematic risk affects the entire market such as investment policy changes, foreign investment policy changes, changes in taxation clauses, shift in socio-economic parameters, global security threats, wars etc. A very good example of Systematic risk is black Monday of 1929 and similarly stock market crashes of 1987 and 1998 (Reinhart, et al. 2009) Specification of this risk is that it's beyond the control of investors and can't be eliminated. This study analyzed the KPIs have a significant predictor of Systematic risk and evaluate, if KPI are better predictor of Systematic risk. Eldominat *et al.*, (2009) "To suppression the Systematic risk is really

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tough condition, is neither feasible nor acceptable situation. But positive way the risk is a necessary element to real economic development. Rowe and Kim (2010) are highlighted that the financial indicators are the best predictor of Systematic risk by using the data of casino industry. Gu and Kim (2002) focused on determinant of beta by using the data of restaurant industry. Lee et al (2006) define the Systematic risk by using the airline industry in East Asia. Kim, et al (2007) analyzed the financial ratios in full service restaurants industry.

Pakistan economy is growing steadily. The petroleum industry also has its vast authentic role in progress of country. Now in modern era, petroleum industry is also considered as backbone for economy of the country. Pakistan mainly depends upon petroleum sector to fulfil energy and other requirements. As a result of heavily requirement of growing economy, need to import large quantity of oil from Middle East countries. Currently in oil sector, there are many (local and international) companies involved in this business. These companies are very prominent in stock market with current performances. The performances of companies rely on a large number of consumers like transports, energy, industrial, residential sector etc. Further to boost up this business the government (Ministry of petroleum, Established in 1977) offers several taxes and royalties and payment incentives to oil companies working in the country. According to Ahmad et al., (2008) the one of the usage drawback for country economy is to bear the burden of, import of the crude oil and oil based product. Instead of all, to fulfil deficiency it's necessary to import of oil and oil products to the country in order to keep the wheels of the economy moving.

This study is helpful to prevent the risk factor from studied sector with enhancement of knowledge of all stakeholders. It's creating the better understanding of risk factor for aversion Systematic risk from market. It has developed the comprehensively understanding of all concerned factors and their relationship which influence on Systematic risk. In academic context, it's providing the base for other researcher/analysts to comprehensively analyze this issue and modifying the characters for setting the future direction.

LITERATURE REVIEW

Based on literature review, the aimed of previous studies to diversify the risk, which affect the individual firms and market performance. Systematic risk is directly associated with market and term beta used as

symbolized for Systematic risk. it shows that variation in the stock is in response of variation in market behaviour, in generalize form it is covariance of stock returns of capital market, Gu and kim (2002). Nucera *et al.*, (2016) this study propose the Systematic risk, ranking order for financial institutions using the technique of principal components. For analyzing, they used a sample of 113 listed financial firms in the European Union covering the period 2012~13. The finding revealed that the combined ranking is more constant at the top and is less volatile then individual input rankings.

Ullah *et al.*, (2012), the authors have examined the association between capital structure and risk exposure. To analyzing the strength of relationship, 5 years data (2006~2010) of motor and vehicle sector was collected from KSE. The results of study have shown that all selected factors must be performed in smooth way. But, it's most important to assuming the certain per bus condition for rest of the effects. It's relatively considered as decent study for selective industry. Ange`l k (2018), the study has highlighted the impact of systematic equity risk in American tourism industry context, and also argues the information of firms and stock market. To carry out the research, panel data was used. The sample consisted of 79 firms for the period of 2004~2013. The authors have analyzed the two different scenarios of 2008 crisis. He has developed two dummy variables to discuss the pre and post facto impact of 2008 crisis. The findings have shown that risk is explained by business size growth, along with three indicators of business efficiency, consumer price and shown 50 indices. The 2008 financial crisis did not alter the behaviour of the estimated model and no difference was found between the two sectors. Wael mustafa, W. Sukri, s. (2016) have described about maintaining of liquidity level for aversion of risk factors. The multivariate regression analysis has revealed that Islamic banks maintaining high level of liquidity as compared to conventional banks.

Tzang S-W, Yu M-T (2016) in this study has described the impact of systematic risk and volatility skew is appraised under the CAPM-GARCH framework context. This relationship was analyzed between assets price and market index. Due to constraint appearance, this study support that higher systematic risk proportional does not always lead to bring higher level of implied volatility in stock. Namvar E. Rau P.R (2016) define the technique for managers and investors to how, they can averse the risk factor from market and respective stocks. All stakeholders need to focus on

minimization of systematic risk by allocation of funds/stocks. Liu J, Zhang T (2015). This study has discussed the terminology of investor's behaviour. In a risky situation, most of the investors, try to exist from market to reduce the loss of their shares. They are risk averse and closely observe the volatility behaviours of market. Rest of the investors, who avail the option to remain in market to make investment are heavily relying on government policies and supportive incentives. In the meanwhile, their decisions are very productive with flourishing of market also attracted the new investors.

Li Y, Li D (2013), the proposed portfolio optimization model described with the active control of Systematic risk allocation, the theme of the model to control the sensitivity of the model. The findings of the study show that the proposed model is more effective and efficient along with vast knowledge of portfolio risk management and numerical experiments. According to a study by Borde (1998), high liquidity might be indicating that available resources are being unusually invested, which can increase the investors risk perception. Rowe and Kim (2010) described the association between Systematic risk and financial variables by using casino industry data; result shows that significant relationship between betas and financial variables. Iqbal and Shah (2012) using the eight financial variables are used to explore the Systematic risk of non-financial firms in KSE. The outcomes are very fruitful for investor and policy makers. Most of the variables are significantly as per suggested at hypothesis.

Gupta and Gurjar (2014) explored the betas and average returns for providing a supportive role for an investor in decision making process. Randomly two companies are selected from three selected industries. The beta co-efficient is measure the relative Systematic risk of assets (industry to industry). Mohammadi, *et al.*, (2015) their study is shown the significant relationship between the portfolio return, financial leverage and the Systematic risk. Pearson's correlation technique was used for testing the hypothesis; he found significant relationship between portfolio of 21 selective companies of Tehran stock market and Systematic risk as well as financial leverage. Muturi and Omondi (2013) study conducted at Nairobi securities exchange, the finding shows that leverage has negatively relationship on financial performance.

In oppose of this, liquidity is more essential to determinant and improving the firm's financial performance. Kim and Gu (2004) suggests that movement of Systematic risk should be related to change in financial and operating management practices.

Hypothesis of the Study

In order to achieve the objectives of the study and answer the research questions, following research hypothesis have been designed;

H1: Liquidity is inverse relationship with Systematic risk.

H2: Profitability is positive relationship with Systematic risk.

H3: Operating efficiency is inverse relationship with Systematic risk.

H4: Growth is inverse relationship with Systematic risk.

H5: Dividend payout is inverse relationship with Systematic risk.

H6: Tobin Q is inverse relationship with Systematic risk.

H7: CHIN model is inverse relationship with Systematic risk

DATA AND METHODOLOGY

To analyzing the hypothesis of study we used secondary data from 12 selected companies of petroleum industry. These companies are well prominent and convenient for sampling purpose. In this study we collect 11 years data over the period of 2005~2015 from selective companies. Data which has been previously issued by companies is used for the purpose of analysis. For a briefed analysis, we have a both cross-sectional and time series data. This type of data is called panel Data, Its multidimensional data. Panel data was taken from annual reports of selective companies of industry, Pakistan Stock Exchange, Yahoo finance etc. Data of KPI's are collected using different financial ratios from annual reports of companies. Dependent variable Systematic risk (Beta) data was annually collected from PSX and Yahoo finance website.

KPIs represent a set of measures that focusing on that aspects/area of company performance that are the most essential for the current and future success. It is considered as the performance metrics that enable us to look at the relationship in a company's financial numbers in new way. KPIs are best accompanied by a benchmark, a standard against which the metrics is compared to see if the company is doing better or worse than was expected or hoped for. In our study, we identify some KPI that are consider as the best measure of performances of any company The following are the KPI of different company that we use to detecting the systematic risk.

Liquidity means that measuring of a firm short term capability to meet its current commitments. The purpose of liquidity ratio is to measure or identifying the firm's short term ability to meeting its currents obligations/commitments. As per earlier studies, liquidity has both positive and negative influence on systematic risk. Jensen (1984) described a positive relationship among systematic risk and liquidity. He stated that with increase in liquidity, agency cost of the firms also increase, it enhance the chance of occurrence of systematic risk. The most of investors used liquidity ratios at the time of investment to forecast the current position and reflection of any firm performance. However, most of the studies conclude a negative relationship between systematic risk and liquidity. Logue and Merville (1972); Moyer and Charlfield, (1983); Gu and kim (1998) and (2002); Lee and Jang (2006); Eldomiaty (2009) found negative relationship between systematic risk and liquidity. Liquidity of the firm can be calculated by quick ratio.

$$\text{Quick Ratio (QR)} = \frac{\text{Current Asset} - \text{Inventory}}{\text{Current Liabilities}}$$

The portion of profit defined the firm/company success, how it's performed well in the market. The profitable firms have and less chance to effect with of systematic risk, Logue and Merville (1972). The most of the previous studies of Scherrer and Mathison, (1996); Gu and Kim, (2002); Lee and Jang (2006); Rowe and Kim (2010) showed a negative relationship between profitability and systematic risk. However, this relationship might be gone inversed due to nature of the business Borde (1994) determined a positive relationship of profitability and systematic risk in case of insurance companies and gave the reason that in finance companies more profit lead towards greater risk and reason behind this greater risk is that finance companies become more profitable when they take more credit risk. To calculating the profitability of business in this study we used following ratio.

$$\text{Return on Asset (ROA)} = \frac{\text{Net Income}}{\text{Total Assets}}$$

Operating efficiency is the capability that enables a company to attain the level of higher profit margins or be made more successful in highly competitive markets. The efficient structure of company generating high level profit and due to more profit, it will reduce the risk (Gu and Kim, 2002). In generalize condition it have a negative impact of operating efficiency on beta. The

operating activities highlighted the direction of individual company, where it can move in future. Gu and Kim, (1998 & 2002) in their study found the relationship of high efficiency and low systematic risk. Eldomiaty (2009) also found negative relationship in his study while analyzing the nonfinancial sectors between systematic risk and operating efficiency. In this study we used following ratio to calculated the operating efficiency of company.

$$\text{Asset Turnover (ATO)} = \frac{\text{Total Revenue}}{\text{Total Assets}}$$

The positive outcome of operating efficiency will lead the growth of firm. The growth is considered as the process of improving enterprise's success. Business growth can be achieved by setting the product sales targeted and also achieved in stipulated time period. The main task of the firm is to reduce the cost and increase the revenue of the business the beta value highlighted the performance of firm in the market also considered a diminishing function of growth (Hong and Sarkar, 2007). Rapid growth in companies increases risk factor (Gu and Kim, 2002). According to law of diminishing, the firm achieved his maximum level of production. In previous study, negative and positive relationship has been found among growth and systematic risk. According to Roh (2002), growth is positively related with systematic risk. To further supporting his finding, he explained that companies with high growth want more resources to fulfil the requirement/targets. To attain these resources firm need extra financing, it will created a problem for firm. Here in this study we annual percentage change in EBIT is used to compute the growth of any firm.

The dividend has a crucial role to attract the investor and shareholder. In this regard a firm collects investment for boosting of business. The firm announced dividend for shareholder at the end of each year. The top management of company has to make the decision about how much cash withdraw in context of dividend for shareholder or return to invest in business for future need. That is called the divided decision. Dividend practice is very popular in common routine matter but it is irrelevant in a competitive market. Dividend paid by the company after calculating profit. The relationship between earnings and dividends is important. This ratio is differs from company to company. The high value firms usually have higher dividend payout ratio. Newly established companies which are young and seeking the higher level of growth, lower or modest dividend payout ratio. The agency cost

can be reduced the dividend portion (Ang 1985). Impact of high dividend payout is negative on systematic risk because investors apparent more certainty in flow of returns from dividends as compared to the returns from higher stock prices Logue and Merville (1972). Gu and Kim (2002) described the inverse relationship between systematic risk and dividend payout. The conclusions of previous studies have shown negative impact of dividend payout on systematic risk. Through the following ratio we calculated the dividend of companies.

$$\text{Dividend Payout} = \frac{\text{Annual Dividend Payout}}{\text{Net Income}}$$

This ratio is derived by the James Tobin of Yale University. The purpose of using Tobin's q is to measure the performance of company. It is essential for firms to visualize it direction in the market, how much capitalization/segment hold by the firm in market. In his theory he gives the importance to replacement cost against the combined market value of all the companies. It states that if q value is greater than one ($q > 1$) (representing equilibrium), its shows that the extra portion of investment is beneficial for company because, company generating profit against the each portion of investment. If q is less than one ($q < 1$), would represent the condition where company need to sell off its assets due to losses situation. It's better for company not to put themselves into danger or risk. The Q ratio is calculated as the market value of a company divided by the total asset value of company. The ratio is as under;

$$\text{Tobin Q} = \frac{\text{Total Market Value of the Firm}}{\text{Total Asset Value}}$$

The CHIN model basically describes the concept of change in net income of selective companies. This model is derived by McKibben (1972), that specially discuss the companies' bankruptcy conditions. It also used as important tool in Ohlson's (1980) model/index of bankruptcy and finding reveal that is significantly effective. In this study we will used the determent of systematic risk of financial and non-financial industry context. Selective industries need to maintain the minimum income for aversion of risk. We will calculate the CHIN model from following method.

$$\text{CHIN} = \frac{(NI_t - NI_{t-1})}{(|NI_t| + |NI_{t-1}|)}$$

CHIN mean change in net income annually. Where NI_t is representing the net income for the most current year period and NI_{t-1} for last year of income.

Methodology

To test of these hypothesis simultaneously, we have a multiple regression equation in the study, due to large set of independent variables. Being a panel data, we have applied panel test (Fixed and Random Effect tests) to observe the impact of KPI's on Systematic risk.

Fixed Effect Model

When we are interested to analyzing the effect of variables that change over the time, then it is best to use fixed effect model to analyze the relationship between the predictor and outcome variables. Here in this study we have explanatory variables (KPIs) and the Systematic risk is the dependent variable. The equation for the fixed effect model becomes;

$$Y_{it} = \beta_1 X_{it} + \alpha_i + \mu_{it}$$

α_i = ($i=1, \dots, n$) unknown intercept

Y_{it} = dependent variables, where i = entity and t = time

X_{it} = one independent variable

β_1 = Coefficient for independent variable

μ_{it} = Error term

Random Effects Model

In oppose to the fixed effect model, here we considered the variation across entities is assumed to be random and uncorrelated with the independent variable. If the researcher have seen that difference across entities have some influence on your dependent variables then you should use random effects. The benefit of this model is that you can include time invariant variables. In the fixed effects model these variables are absorbed by the intercept.

The equation of random effect model is;

$$Y_{it} = \beta X_{it} + \alpha + \mu_{it} + E_{it}$$

E_{it} = within entity error

μ_{it} = between entity error

The Hausman Test

The Hausman test is expressed to support to choice between the fixed effects and random effects model.

Hausman test is applied in imperial studies in order to determine either fix test is applied or random test applied. If value of p after determining Hausman test is greater than 5% then random test is applied.

Fixed Effect Model

When we are interested to analyzing the effect of variables that vary over the time then it is best to use fixed effect model to explore the relationship between the predictor and outcome variables. Here in this study we have explanatory variables (KPIs) and the systematic risk is the dependent variable. While studying we found the individual variables have a different characteristic that may affect/influence the predictor variable. When we apply fixed effect model we got the idea, during the analysis we found some of variable have an impact and bias the predictors, for that situation its need to control those variables. This is the rational assumption that existing of correlation among error term and predictor variable. The best distinction is that fixed effect removes the effect of those time invariant characteristic, then its east to get the net effect of outcome variable. Another key assumption of this model is that those variables considered as unique characteristics and they should not be correlated with other individuals. Being the differentiated among the variable then the variable error term and constant should not correlate with others. If it happen then fixed effect model is not suitable, then the inference may not be correct. Its need to require/apply same model that get the solution/address the relationship, this the rational for the Hausman test.

The equation for the fixed effect model becomes;

$$Y_{it} = \beta_1 X_{it} + \alpha_i + \mu_{it}$$

$\alpha_i = (i=1 \dots n)$ unknown intercept

Y_{it} = dependent variables, where i = entity and t = time

X_{it} = one independent variable

β_1 = Coefficient for independent variable

μ_{it} = Error term

Random Effects Model

In oppose to the fixed effect model, here we considered the variation across entities is assumed to be random and uncorrelated with the independent variable included in the model. "The crucial distinction between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with the repressors in the model, not whether these

effects are stochastic or not" (Green 2008) p, 183. If you have reason to believe that difference across entities have some influence on your dependent variables then you should use random effects. The benefit of this model is that you can include time invariant variables. In the fixed effects model these variables are absorbed by the intercept. The equation of random effect model:

$$Y_{it} = \beta X_{it} + \alpha + \mu_{it} + E_{it}$$

E_{it} = within entity error

μ_{it} = between entity error

This model is assume that the entity error term is not correlated the predictors which allows for time invariant variable to play a role as explanatory variable. In random affects you need to specify those individual characteristic that may or may not influence the predictor variables. The problem with this is that some omitted variable bias in the model.

The Hausman Test

The hausman test is expressed to support to choice between the fixed effects and random effects model. Housman test is applied in imperial studies in order to determine either fix test is applied or random test applied. If value of p after determining hausman test is greater than 0.01 then random test is applied. Hausman test p value is also shown as 0.05 in different empirical studies.

In the panel data the appropriate choice between the fixed and random effects models, examines whether the repressors are correlated with the individual effect. The advantage of fixed effect estimator is that it is consistent even when the estimators are correlated with the individual effect. In other words, during the panel data techniques where fixed effect would be appropriate the Hausman test investigates whether random effect is reliable.

The Hausman test (also called the Wu–Hausman test, Hausman specification test, and Durbin–Wu–Hausman test) is a statically technique used to analyze either fix effect test or random effect test will be used in panel regression analysis. This test gives significance of fix effect model and random effect model. There are two hypotheses.

H_0 = random effect is most suitable and consistent for panel regression analysis.

H_1 = random effect test will be inconsistent in panel

regression analysis.

H0 will be accepted if value of p in Hausman test is lesser than 0.05, if value is more than 0.05 then H0 will be rejected.

FINDINGS AND DISCUSSIONS

The regression equation developed in this study takes the following form:

$$Y = \beta_0 + \beta_1 LIQ + \beta_2 \pi + \beta_3 EFY + \beta_4 g + \beta_5 DP + \beta_6 TQ + \beta_7 CHIN + \mu$$

Y = Systematic Risk (Beta)
 β_0 is the Constant or intercept
 β 's = Slope or Coefficient of independent variables
LIQ = Liquidity
 π = Profitability
EFY = Operating Efficiency
g = Growth
DP = Dividend Payout
TQ = Tobin Q
CHIN = CHIN Model (Change in Income)
 μ = Standard Error Term of Coefficient

Correlation Analysis

Table 1: Correlation Matrix

| | Beta | Liq | π | Op Eff | Growth | DP | TQ | CM |
|--------|-------|--------|--------|--------|--------|--------|-------|-------|
| Beta | 1.000 | | | | | | | |
| Liq | 0.068 | 1.000 | | | | | | |
| π | 0.178 | 0.423 | 1.000 | | | | | |
| Op Eff | 0.129 | -0.471 | -0.046 | 1.000 | | | | |
| Growth | 0.174 | -0.052 | -0.045 | 0.033 | 1.000 | | | |
| DP | 0.052 | 0.176 | 0.144 | -0.068 | -0.070 | 1.000 | | |
| TQ | 0.118 | -0.151 | -0.236 | -0.098 | -0.023 | -0.344 | 1.000 | |
| CM | 0.053 | -0.432 | -0.381 | 0.089 | 0.153 | -0.395 | 0.477 | 1.000 |

To investigating the multicollinearity problem we apply Pearson correlation to examining the relationship and strength of the association among all quantitative variables. According to rule of thumb that if the correlation among independent variables are 0.9 or greater. According to Frisch R (1934), the multicollinearity means the perfect or exact linear relationship between all explanatory/independent variables of a regression model. In our study, Table (I) has shown the correlation among all variables and it's highlighted that multicollinearity don't exist in model. The coefficient values of explanatory variables are less than benchmark figure. Firm size, Profitability, Dividend

payout, growth, operating efficiency and Chin model, are negatively correlated with Systematic risk (Beta) and liquidity, leverage and tobin q are positive correlation with dependent variable. The maximum correlation is lie between leverage and Chin model (0.7) that will not disturb the finding of research.

Descriptive Statistics

To check the normality of data we used the descriptive statistic (Table No. II) that describe and summarized the data into meaning full way.

Table 2: Descriptive Statistics

| Description | Beta | Liq | π | Op Eff | Growth | DP | TQ | CM |
|-------------|--------|--------|--------|--------|---------|---------|--------|--------|
| Mean | 0.3033 | 1.2919 | 0.1516 | 2.4526 | 0.9770 | 0.4096 | 1.6193 | 0.3968 |
| Median | 0.1510 | 1.0200 | 0.0962 | 2.0250 | 0.3928 | 0.3632 | 1.1877 | 0.2503 |
| Max | 1.3365 | 6.2600 | 0.7344 | 7.0200 | 9.7564 | 3.0338 | 8.2445 | 1.0000 |
| Min | 0.0002 | 0.0100 | 0.0006 | 0.2300 | 0.0000 | 0.0000 | 0.0013 | 0.0046 |
| StdDev | 0.3320 | 1.0995 | 0.1536 | 1.7675 | 1.3888 | 0.4134 | 1.5934 | 0.3442 |
| Skewness | 1.3638 | 1.8645 | 1.4991 | 0.5345 | 3.0809 | 2.2248 | 1.3481 | 0.7007 |
| Kurtosis | 4.0552 | 7.8144 | 5.0130 | 2.1082 | 15.6242 | 13.7730 | 4.9787 | 2.0585 |
| Obs | 132 | 132 | 132 | 132 | 132 | 132 | 132 | 132 |

Here in table (2) the summarized the data of Systematic risk (beta) and seven independent variables. The mean values of all the variables are positive. The mean value of beta is 0.3033. It's indicating that the stock of selected industries is less risky and less volatility than the market. In same way, mean value of liquidity is 1.29 and standard deviation of 1.09. Subsequently the mean value of profitability, operating efficiency, growth, dividend payout, tobin q and chin model are 0.15, 2.45, 0.97, 0.40, 1.61, 0.39 respectively. The standard deviation values tell the dispersion of data with the mean value. Skewness tells that how symmetrical the distribution of variables.

Regression Result

The result is shown in table (3) that significant relationship of KPIs and Systematic risk of petroleum industry. According to results of OLS method, most of the KPIs are significant (Profitability, Growth, Tobin Q, Operating efficiency,) at 5 percent level, in oppose to this some of KPIs are insignificant (Chin model, Dividend payout, Liquidity). The f-statistic has shown the model is significant at 1%, 5% and 10% level. Durbin-waston value (1.65) shows that there is no autocorrelation problem.

Table 3: Regression Result

| Variables | Coefficient | S.E | t-stat |
|-------------------------|-------------|------------------------------|-------------|
| Intercept | -0.0857 | 0.1120 | -0.7654 |
| Liquidity | 0.0448 | 0.0338 | 1.3267 |
| Profitability (π) | 0.43658 | 0.20747 | 2.1874 |
| Operating Efficiency | 0.0421 | 0.0183 | 2.3036 |
| Growth (g) | 0.00005 | 0.002 | 2.1735 |
| Dividend Payout | 0.1116 | 0.0742 | 1.5041 |
| Tobin Q | 0.0449 | 0.0205 | 2.1874 |
| CHIN Model | 0.0946 | 0.1066 | 0.8870 |
| R Square | 0.14 | Durbin-Waston F-Statistic | 1.65 |
| Adj R Square | 0.09 | | 0.00 |
| Observations | 132 | | |

Liquidity power considered a strong impact on company. As per to our first hypothesis of study that liquidity is inversely associated with Systematic risk. The finding shows that the increase in one unit of liquidity it will decrease 1.32 units of Systematic risk and result is insignificant. Studied industry has a week

liquidity power for reduction of risk factor. The previous study Lee and Jang (2006) have negative and insignificant results. The profitability is inversely related with Systematic risk (beta). The results show that the coefficient sign is positive and significant relationship with Systematic risk.

This relationship is identify that the increase in profitability that will also increase the risk factor. In previous studies, Iqbal and shah (2012), Borde (1994) found statistically significant results.

The industry is strictly depending on operational activities of business like to utilize the all resources in efficiently and effectively manner called the operational activities of business. Fifth hypothesis, operating efficiency have a positively association between Systematic risk. This relationship is shown statistically highly significant (2.30%) value. It increases the reputation of individual company or industry in the market that will decrease the Systematic risk. Sixth hypothesis, the growth is inversely associated with Systematic risk (beta). The consistency in the growth is highly appreciated attitude of industry and individual companies. The positive growths rectify the good glimpse of industry. In our study, finding shows that the inverse and highly significant relationship as compare to previous studies, Iqbal and shah (2012). Gu and Kim (2002) argue with their finding that negative coefficient of growth lead to create problem of financing, alternatively it hit Systematic risk.

The dividend payout is inverse relationship with Systematic risk (beta). This hypothesis is rejected with (1.50) t-statistic value and also there is positive coefficient sign (0.111). In oppose to previous studies, Iqbal and Shah (2012) have a different finding as we

identify. According to Benavides et al H. (2016) that dividend payout has positively related to profitability and negatively linked to past indebtedness and investment opportunities. In this study, we used tobin q ratio for analyzing the market worth of selected industries. The finding shows that if industry performing well in the market respectively, it identify to decrease the Systematic risk. The coefficient has positive sign 0.449 and t-statistic show the highly significant relationship with Systematic risk. Chung, *et al.*, (1994) found the significant outcomes. Our last hypothesis is that the CHIN model has an inverse relationship between Systematic risks (Beta). The finding shows that the significant relationship with dependent variable. In previous study, Keener, M. H. (2013) this model has a significant impact on firm health to avoid the bankruptcy situation. The increase in level of income will decrease the level of risk. The selective industries have a strong capacity to hold minimum level of income. Further to depth of the analyzing we applied some panel test to more reliable outcomes.

Result of Fixed & Random Effect Models

While applying the panel test, most of the independent variables are significant relationship with dependent variable shown in Table No IV.

Table 4: Result of Fixed & Random Effect Model

| Variables | Fixed Effect Model | | | Random Effect Model | | |
|-------------------------|--------------------|--------|---------|---------------------|---------|---------|
| | Coefficient | S.E | t-stat | Coefficient | S.E | t-stat |
| Intercept | -0.1537 | 0.1251 | -1.2279 | -0.0839 | 0.1071 | -0.7832 |
| Liquidity | -0.0300 | 0.0130 | -2.3067 | 0.0432 | 0.0323 | 1.3318 |
| Profitability (π) | 0.2661 | 0.3130 | 0.8501 | 0.4324 | 0.1982 | 2.1820 |
| Operating Efficiency | 0.1109 | 0.0307 | 3.6147 | 0.0427 | 0.0178 | 2.3959 |
| Growth (g) | 0.0004 | 0.0005 | 9.1603 | 0.00005 | 0.00223 | 2.2563 |
| Dividend Payout | 0.1033 | 0.0982 | 1.0512 | 0.1121 | 0.0706 | 1.5881 |
| Tobin Q | 0.0566 | 0.0204 | 2.7676 | 0.0454 | 0.0195 | 2.3247 |
| CHIN Model | 0.1122 | 0.0896 | 1.2516 | 0.0921 | 0.1010 | 0.9116 |
| R Square | | 0.30 | | | 0.14 | |
| Adj R Square | | 0.19 | | | 0.09 | |
| Durbin-Waston | | 2.04 | | | 1.67 | |
| F-Statistic | | 0.00 | | | 0.00 | |
| Observations | | 132 | | | 132 | |

But it is necessary to determine either random test used or fix test. A common practice used to judge either fix test used or random test to be use, in panel data analysis is Housman test. In this way to conduct Housman test it is compared either cross sections are more or coefficient to be measured are more. After analyzing, we need to choose which model is more appropriate, we applied Hausman test. Here for this purpose we develop a hypothesis.

H_0 = Random effect is most suitable and consistent for panel regression analysis.

H_1 = Random effect test will be inconsistent in panel regression analysis.

Table 5: HAUSMAN Test Result

| Test Summary | Chi-Sq Statistic | Chi Sq. d.f | Prob |
|----------------------|------------------|-------------|--------|
| Cross Section random | 20.157378 | 7 | 0.0052 |

According to rule of thumb, our p value is less than 5%. So we accept alternative hypothesis that fixed effect model are more appropriated and considered finding of this test are more reliable and reject the random effect model. Its show that the random effects test is be inconsistent in panel regression analysis.

CONCLUSION

The most important purpose/objective of a company is to increase the level of growth and attain the maximum profit and also increase the return for investors. The finding of this study, related to Systematic risk is very fruitful for all stakeholders. In investor point of view is very important and as well as financial policy makers should take them into account at the time of policy making. This study employed the relationship among Systematic risk and KPI's. Seven explanatory variables (Liquidity, Profitability, Operating Efficiency, Growth, Dividend Payout, Tobin Q, and CHIN Model) have and both positive and negative also inversely effect on determinant of Systematic risk. The finding of regression technique shows the aggregately our explanatory variables have statistical significant impact on Systematic risk.

The finding of this study is found to be statistically significant but as with any piece of research, this study is not without its limitations. The following have been identified as the major limitation to this study; in this study, analyze the only non-financial firms, due to convenient sampling it may not be implemented or generalized on whole population. In this study we used only financial variables (KPIs) for analyzing the Systematic risk; in this regard we can't be apply our results economic perspective.

The results of this study have very helpful for all stakeholders. To understand the situation and to tackle

the problem those occurs in the market and indirectly affect the company performance. To expand the study area it is important to including financial sector in order to carry out a comparison of the results with non-financial sectors.

REFERENCES

- Angel, K (2018), Risk Management Comparative Analysis of Systematic Risk and effect of the Financial Crisis on us Tourism Industry; Panel data research. International Journal of Contemporary Hospitality Management. Vol 00-00.
- Benavides, J., Berggrun, L & Perafan, H. (2016). Dividend payout policies: Evidence from Latin America. Finance Research Letters, 17, 197-210.
- Borde, S. F., Chambliss, K., & Madura, J. (1994). Explaining variation in risk across insurance companies. Journal of Financial Services Research, 8(3), 177– 191.
- Borde, S. (1998). Risk diversity across Restaurants Cornell Hotel & Restaurant Quarterly (4) 1998, 64-69.
- Breen, W. J., & Lerner, E. M. (1973). Corporate financial strategies and market measures of risk and return. The Journal of Finance, 28(2), 339-351.
- Chung, K. H., & Pruitt, S. W. (1994). A simple approximation of Tobin's q. Financial management, 70-74.
- Eldomiat, I.T. et al.,(2009). The Fundamental Determinants of Systematic Risk and Financial Transparency in the DFM General Indux. Middle Eastern finance and Economics.No.5.
- Gu, Z., & Kim, H. (1998). Casino firm's risk feature and their beta determinants, progress in Tourism and Hospitality Research, 4, 357-365.
- Gu, Z., & Kim, H. (2002). Determinants of restaurant Systematic risk: A re-examination. The Journal of Hospitality Financial Management, 10(1), 1-13.
- Gupta, N., & Gurjar S.A, (2014), A Study of Systematic Risk with reference of Selected Companies. Indian Journal of Applied Research. Vol. 4, No. 6.
- Iqbal, M. J., & Shah, S. Z. A. (2012). Determinants of Systematic risk. The Journal of Commerce, 4(1), 47-56.
- Keener, M. H. (2013). Value relevance of restructuring charges in firms with varying levels of health. Journal of Finance and Accountancy, 12, 1.

- Kim, H., Gu, Z., & Mattila, A.S. (2002). Hotel real estate investment trusts' risk features and beta determinants. *Journal of Hospitality & Tourism Research*, 26 (2), 138-154
- Kim, H., & Gu, Z. (2004). Impact of the 9/11 terrorist attacks on the return and risk of airline stocks. *Tourism and Hospitality Research*, 5(2), 150-163.
- Lee, S.J. and Jang, C.S. (2006). The Systematic risk determinants of US airline industry, *Tourism Management* No.28, PP. 434-442.
- Logue, L., & Merville, J. (1972). Financial policy and market expectations. *Financial Management*, 1(3), 37-44.
- McKIBBEN, W. "Econometric Forecasting of Common Stock Investment Returns: A New Methodology Using Fundamental Operating Data." *Journal of Finance* (May 1972).
- Mohammadi, et al., (2015) The impact of the Systematic risk and the financial leverage on the portfolio returns in Tehran stock market. *Indian Journal of Fundamental and Applied Life Sciences*, Vol. 5 (S2) pp. 388-393.
- Namvar E. Rau P.R (2016). Do hedge funds dynamically manage Systematic Risk. *Journal of Banking & Finance*. Vol (64) 2016, 1-15.
- Nucera, F., Schwaab, B., Koopman, S. J., & Lucas, A. (2016). The information in systematic risk rankings. *Journal of Empirical Finance*, 38, 461-475.
- Ohlson, A. (1980), Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research*, Vol. 18, No. 1, pp. 109-131.
- Omondi, M. M., & Muturi, W. (2013). Factors affecting the financial performance of listed companies at the Nairobi Securities Exchange in Kenya.
- Reinhart, Carmen M., and Kenneth S. Rogoff. 2009. "The Aftermath of Financial Crises." *American Economic Review*, 99 (2): 466-72.
- Rowe, T., & Kim, J. S. (2010). Analyzing the relationship between Systematic risk and financial variables in the casino industry. *UNLV Gaming Research & Review Journal*, 14(2), 47.
- Tzang S-W, Yu M-T (2016) Systematic Risk and Volatility Skew. *International Review of Economics & Finance*. Vol (43)2016, 72-87.
- Ullah, Z et al (2012), Managers Risk Taking Behaviour for Adjusting Capital Structure. *World applied Science Journal*. vol 20(11) 2012, 1478-1483.
- Waemustafa, W. Sukri, s. (2016) systematic and Unsystematic Risk Determinants of Liquidity Risk Between Islamic and Conventional Banks. *International Journal of Economics and Financial issues* Vol 6(4) 2016, 1321-1327.
- Yan Wang Shoudong Chen Xiu Zhang , (2014), "Measuring Systematic financial risk and analyzing influential factors: an extreme value approach", *China Finance Review International*, Vol. 4 Iss 4 pp. 385 – 398

APPENDIX

List of Petroleum Companies

| | | |
|-----|-------|---------------------------------------|
| 1. | APL | Attock Petroleum Limited |
| 2. | ARL | Attock Refinery Limited |
| 3. | BPL | Burshane LPG Pakistan Limited |
| 4. | BYCO | Byco Petroleum Pakistan Limited |
| 5. | MARI | Mari Petroleum Company |
| 6. | NRL | National Refinery Limited |
| 7. | OGDC | Oil & Gas Development Company Limited |
| 8. | PPL | Pakistan Petroleum Limited |
| 9. | PRL | Pakistan Refinery |
| 10. | POL | Pakistan Oilfields Limited |
| 11. | PSO | Pakistan State Oil Company Limited |
| 12. | SHELL | Shell Pakistan Limited |