DOES SYSTEMATIC RISK MATTER FOR INVESTORS IN CAPITAL MARKET OF PAKISTAN?

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ABSTRACT

Risk and returns relationship is not similar in emerging and developed stock markets. Moreover, due to reasons such as family ownership, lesser trading volume, and smaller capital market, investors in Pakistan are not sufficiently diversified. Therefore, it is argued that both idiosyncratic and market risks are relevant, and hence beta (measure of market risk) under- estimates the risk premium. More specifically, we use measures of risk such as beta, systematic risk, unsystematic risk, and total risk as independent variables to investigate if unsystematic and total risk will explain variation in stock prices in stock market of Pakistan? Data of 194 non- financial firms listed on KSE (now PSX) for a period of time from January 5, 2004 to October 13, 2008 is analyzed. It is concluded that assets' pricing decisions in Pakistan stock market are based on factors other than these measures of risks. To make right decisions, we suggest that investors in Pakistan must use alternate asset pricing models and shall not rely solely on CAPM.

Keywords: CAPM, Risk and returns, Rolling regression, Time series regression

INTRODUCTION

Pakistani stock market is one of the emerging markets of the world. Extant literature proposes that the risk and return relationship in emerging equity markets varies from that in the developed equity markets. Fayyad and Daly (2010) argue that there is high variation in share prices, expected returns and serial autocorrelation and also document existence of skewness, kurtosis, and volatility clustering in emerging equity markets. Investment in equity market in Pakistan is not highly diversified because of family ownership, group ownership, narrow market and low trading volume of stocks (Hussain & Uppal, 1998). Hence these reasons allow us to consider both diversifiable (unsystematic) and un-diversifiable (systematic) risk instead of only considering the systematic risk

in determining stock prices. The motivation of this study is to examine the degree of responsiveness of variation in share prices of Pakistani listed firms towards market determinants (systematic risk) and firm or sector specific determinants. This study is expected to benefit academicians, practitioner, investors, institutional investors, and financial analysts etc. In this study we estimate traditional capital asset pricing model *(CAPM)* originally developed by Sharpe (1965) and Lintner (1966). We use multiple approaches to determine how well *CAPM* can explain variation in stock prices.

The study is organized as, the first chapter consists of introduction, second chapter presents literature review, third chapter presents the methodology and fourth chapter discusses the results and conclusion respectively.

LITERATURE REVIEW

It is explained that through diversification i.e., by pooling different assets with lesser covariance an investor can maximize expected rate of return against specific risk level; on other hand one can minimize the portfolio risk for a given level of portfolio returns (Markowitz, 1952). The theory suggests investing in portfolios on so called Markowitz efficient frontier line. The groups of securities on efficient frontier line are considered the optimal investment in the context of trade-off between risk and returns. One of the important assumptions of this theory is that investors evaluate risk as a whole rather than considering the risk associated with an individual security. Empirical evidences show that influence of diversification can be quickly attained e.g., by investing in up to ten securities (Evans & Archer, 1968). Literature reveals that investors have various degrees of risk preferences and that individuals would allocate funds to cash or risk free assets subject to the degree of their risk propensity (Tobin, 1958). Further, Tobin added that investors prefer to invest in market portfolio which can give high excepted returns with minimum risk in comparison to all those portfolios on the efficient frontier line with low return or high risk.

Although Tobin did simplify the process of portfolio selection but Markovitz model was still not fully utilized. Soon after, Sharpe (1964), Mossin (1966), and Litner (1965) made their historic contributions that produced the capital asset pricing model (CAPM). The mathematical form of the model is given below:

$$R_i = R_f + \beta_i (R_m - R_f) \quad \text{.....(1)}$$

In Equation (1) above, R_i symbolizes return on stock i; R_f represents risk free rate; R_m is return on market portfolio; and β_i stands for systematic risk of stock i. Note that $(R_m - R_f)$ is market risk

premium.

The model shows relationship between security/portfolios' returns and market premium. As this model is the extension to Markowitz portfolio model and therefore indicates that required rate of return of a given stock/portfolio is free of unsystematic risk. Moreover, investments are assumed to consist of risk free assets and a group of risky securities on efficient frontier line, presented as security market line (SML). Consequently, it shows that only market risk is of consideration towards the security/portfolio required rate of returns. This model assumes that investors avoid high risk, capital market is efficient, assets are divisible, no transaction cost, no tax, symmetric information; investors can lend and borrow money at constant rate. King (1966) analyzed data of sample of 63 firms for the time period from 1927 to 1960 from six different sectors and concluded that stock prices highly co-vary with the return on market.

Later on various empirical evidences challenged the validity of CAPM because of its idealistic assumptions and this allowed the researchers to relax the assumption of CAPM. For instance, Brennan (1970) tested the existence of tax; Black (1972) considered the assumption of the availability of risk free borrowing which resulted in the reformed version of CAPM. Similarly, Roll and Ross (1980) and Chen, Roll and Ross (1986) examined the co-movement of share returns with factors other than the market factor. The traditional CAPM is also found inefficient to explain the relationship between required rate of return and risk in dynamic state of capital markets, which resulted in intertemporal CAPM of Merton (1973). According to intertemporal CAPM the investors do not hold a single constant portfolio because if interest rates are expected to change in future it will influence the need for portfolio re-formulation. The concrete upshot of these studies currently is that investors look for a pool of versions of risk free, risky securities and market risk to determine their required returns. Hawawini and Michel (1982) conducted a study in Brussels' equity market and concluded that security returns are explained by the market risk. Hawawini, Michel, and Viallet (1983) conducted a study in France's equity market and reported that security returns are explained by the market risk but these returns are negatively related to systematic risk because of worst performance of the equity market. Fama and MacBeth (1973) conducted a study in US equity market for the time period of 1935 to 1968 and revealed that there is positive relationship between stock returns and risk. Further this study supports the CAPM and shows that stock returns are more explained by market risk. Schwert (1983) reported that stock returns are significantly explained by market risk but was found insignificant in sub- periods. Some empirical studies in US equity markets also found that when market is going upward

than beta is positively and significantly associated to stock returns but when market is going downward then beta is negatively and significantly related to stock returns (Pettengill, Sundaram, & Mathur, 1995). Isakov (1999) conducted a study in Swiss equity market and examined the conditional context of positive (negative) market returns and concluded that required rate of returns are significantly related to systematic risk. Tang and Shum (2004) confirmed this conditional relation between stock returns and risk in Singapore's equity market for the time period of 1986 -1998. Further this study also found that firm specific risk (diversifiable risk) has its own significance towards the stock returns. Thus in case of optimally diversified portfolios an investor may ignore unsystematic; however, all investors are not so diversified. Therefore, when pricing stocks investors should consider both systematic and unsystematic risks particularly when they are not well diversified. Other empirical studies challenge the efficiency of CAPM. For example, Reinganum (1981) observed that returns of portfolios with high beta values are not significantly high as compared to returns of portfolio with lower beta. Similarly, Haugen and Baker (1991) analyzed stock returns data of 1000 largest US firms for time span of 1972 to 1989 and found that lower risky firms outperform high risky firms. Other studies have found various anomalies regarding the risk and returns relationship, for instance monthly or daily effect. It is found that in the month of January the risk premium of stocks are higher than other month and in result it gives high return (Tinic & West, 1984). Literature today criticize CAPM that beta is not the only factor to predict required rate of returns but there are other firms' specific factors which contribute towards the required rate of returns of individual security or portfolio. These other factors include price/earnings ratio, book-to-market equity ratio, size, leverage and momentum effect (Basu, 1977, Stattman, 1980, Reingaum 1981, Banz, 1981, Bhandari, 1988, Jagadeesh & Titman, 1993) respectively. From this discussion it could be inferred that CAPM and hence beta cannot capture the real linkage between stocks' required rate of returns and risk.

Literature support positive, negative and even some time no relationship among unsystematic risk and expected returns. Ang. et al., (2009) conducted a study using monthly data of developed countries, and reported existence of negative relationship between lagged volatility of unsystematic risk and expected returns. Peterson and Smedema (2011) also supported the negative relationship between lagged unsystematic risk and expected returns except for the month of January in US market. Guo and Savickas (2010) while controlling for the size factor, reported that firms with low unsystematic risk outperformed firms with high unsystematic risk.

Tanga and Shuma (2004) conducted a study is Singapore stock market by considering different

types of risks. They found that systematic risk, total risk, and unsystematic risk were positively and significantly associated with stock returns; however, it was observed that relative to explanatory power of market risk, explanatory power of both total and unsystematic risks was higher. Guo and Whitelaw (2006) examined risk and return relationship in the context of time series data instead of portfolio or cross-sectional data. The reason for not considering the cross-sectional data for CAPM is the aggregate inclusion of risk hedging component. Further, if volatility is the basic source of adjusted price than the market risk (beta) is useful proxy for explaining the expected stock returns in cross-sectional form. Otherwise time series is better to explain the expected returns. Malkiel and Xu (2004) used Fama and MacBeth (1973) procedure for the formation of portfolio constructions and documented positive relationship between expected stock returns and lagged unsystematic risk. Fu (2009), Huang et al. (2010), Vozlyublennaia (2012) and Eiling (2013) documented positive relationship between unsystematic risk and expected returns by using multiple methodologies and different proxies.

We conclude from the above literature review that in the absence of any other valid and reliable model, CAPM or APT in its simple or modified forms will continue to be used by investors to determine risk and return relationship. Moreover, the literature also suggests that total risk of a financial asset is the sum of diversifiable and non-diversifiable risk components; the later component is believed to be priced by investors in stock markets. However findings of number of empirical studies discussed do not support this tall claim. Theoretically, non-diversifiable risk explains covariance of securities' returns with the market returns and diversifiable risk describes relative volatility of stocks. Moreover, under the premise that investors in Pakistani stock markets are not diversified or under-diversified, theory of CAPM suggests that total risk i.e., sum of the two components of risks shall be relatively more directly associated with securities' returns. This current study is therefore conducted to determine if total risk and risk component other than systematic risk can explain variation in stock prices in Pakistan. To achieve this purpose, we use the following methodology.

METHODOLOGY

Sample and Data Sources

Weekly Data of KSE 100 index and stock prices for the period from January 05, 2004 to October 13, 2008 (244 weeks) of 194 non-financial firms listed on KSE (PSX) is downloaded from the

website of KSE.

The Model

To investigate the risk and return relationship, this study uses several alternate estimation techniques and models. First, we use Fama and MacBeth (1973) cross-sectional regression technique followed by rolling regression (RRG) estimation procedure and then time series regression method is used. The following section explains these models.

Cross-sectional Regression

We first divide the sample period into two sub-periods of 72 weeks (January 5, 2004 to May 30, 2005) and 172 weeks (June 6, 2005 to October 13, 2008). In the first 72 weeks period, individual securities' betas, and three different measures of risk total risk (TR), systematic risk (SR), and unsystematic risk (UR) are calculated as explained. *TR* of a security and market is calculated with the help of the following formula:

$$\sigma_i^2 = \Sigma (\Pi_{i,t} - \Pi_i)^2 / n\text{-}1 \ldots\ldots (2)$$

In equation (1) above, σ_i^2 stands for the variance of ith stock (market index) $\Pi_{i,t}$ is the rate of return of ith stock (market index) at time t. Π_i is the average rate of return of ith stock (market index). *SR* is computed by multiplying total security risk with coefficient of determination (R^2); alternatively, *SR* could also be computed by multiplying beta square with total market risk. Both beta and R^2 is obtained by estimating market model of Sharp (1964) that predicts a security required rate of return as a linear function of risk-free rate of return and expected return on market factor. The model is:

$$\Pi_{i,t} = \alpha + \beta\, \Pi_{m,t} + \epsilon_{i,t} \qquad (3)$$

In equation (2) above, $\Pi_{i,t}$ is the ith stock rate of return at time t; α is rate of return of a security when Π_m is zero; β represents relative systematic risk of ith stock; $\Pi_{m,t}$ the market rate of return at time t and $\epsilon_{i,t}$ the regression error term at time t and it represents the component of risk attributable to a firm's or an industry's unique characteristics. The coefficient of determination (R^2) in equation (2) shows percentage variation in $\Pi_{i,t}$ due to variation in $\Pi_{m,t}$. This is used to measures the percentage of total risk accounted for by systematic risk. Following James and Philip (1978) *UR* is computed as *TR* minus *SR.*

For calculation of the individual stock return and market return following formula is used:

$$\Pi_{i,t} = \ln(\Psi_t / \Psi_{t-1}) \qquad (4)$$

Here Ψ_t and Ψ_{t-1} are the current and previous period prices of a stock/ market index.

Then in the second period from June 6, 2005 to October 13, 2008 returns for individual securities and market index are calculated. To predict individual stock returns, we use *beta, TR, and SR,* as explanatory variables and estimate 171 sets of cross-sectional regressions. At the end we calculate average values slopes (coefficients) of *beta, TR, and SR,* and apply t-test to determine their statistical significance.

Rolling Regression

The proponents of CAPM argue that in an environment of changing economic conditions, it is unfair to assume that estimated parameters of CAPM remain constant. Therefore, they emphasize that rolling regression is relatively more appropriate method as it accounts for time varying nature of beta. This method is suitable for time series data and linear association among variables. Using OLS estimation technique, multiple coefficients are estimated by rolling the initial fixed regression period forward such that first observation of the period is dropped and a new observation at the end of the period is added.

More specifically, the first week of earlier regression is replaced by adding new week at the end of the earlier regression period. In this way total 171 regressions are run till the end of the entire sample period. Average values of 171 estimated coefficients are shown in Table 2- Panel A.

In addition to the above we also form portfolios and apply the rolling regression method. The entire sample period is divided in three sub-periods of time. For the sub-period from Jan 5, 2004 to May 30, 2005, step 1 discussed earlier in the case of cross-sectional regression is repeated. We stake stocks in descending order on the basis of values of their betas to form thirty-nine equally weighted five stocks portfolios. As such portfolio with the largest betas is positioned on top portfolio with the smallest betas is placed at the bottom of the series. We calculate returns of these portfolios and regress them against market returns. Then for the period from Jan 6, 2005 to April 16, 2007 (week 73 to 168), slopes and other risk measures i.e., *SR, UR,* and *TR* are computed. Finally, we match portfolio returns with betas and *SR* calculated during the estimation period. Rolling regression procedure is used to complete this process for the testing period from April 23, 2007 to Oct 13, 2008. Single set of slope coefficients for parameters is estimated where weekly returns of the portfolios are used as dependent variable and their corresponding estimated risk coefficients are used as independent variables.

Time Series Regression

The entire length of sample period is split into approximately three equal sub-periods. The four different measures of risk β, *SR*, *UR*, and *TR* are estimated in the first sub-period. Then 39 equal weighted portfolios of five stocks each are formed by arranging securities in descending order and returns of these portfolios are computed. Portfolio returns and their respective time varying β, *SR*, *UR*, and *TR* are matched. Finally, stacked cross-sectional regression is run to determine association of the portfolio returns with the different measures of risk. The investors would be pricing these risk components if coefficients of these measures of risk turn to be statistically significant.

RESULTS AND DISCUSSION

In the following text results of the three different methods are discussed. In this section results of concurrent regression estimation i.e., securities' returns are regressed against the estimated values of β of the same period (January 5, 2004 to May 30, 2005) are also discussed.

From the left, in Table 1, first column shows equation of the models estimated through cross-sectional regression method. Average values of the estimated parameters, standard errors and t-statistics are reported in the column 2 to 4. The results show that none of the coefficients of independent variables is statistically significant. Hence, against the claim of CAPM, it is concluded that variation is stock prices in Pakistan is attributable to factors other than the measures of risk considered in these analysis. In fact, these results are not unique, moreover, insignificant negative β are reported in previous studies as well (see e.g., Hawawini et al., 1983 in French stock market; Fama and MacBeth, 1973 insignificant β in sub-periods). Some research studies in different stock markets around the globe suggest that β can not fit well and therefore alternate factors shall be identified to more efficiently explain variation in stock prices (see e.g. Chan, Hamao & Lakonishok, 1991; Fama & French, 1992, 1996a). But the still other proponents of CAPM argue that β becomes insignificant and/or negative because of the overall condition of a stock market. They argue that when a stock market is up (down) β will be positive (negative) (see for detail Pettengill et al., 1995). In Table 1 from insignificant coefficient of *TR* it is inferred that investors in Pakistan consider some other factors when they price securities.

Table 1: *Results of Cross-Sectional Regressions*

Equation	Coeff. (α_1)	Std. Errors	t-Stat	Remarks
$\Pi_i = \alpha_0 + \alpha_1\beta + \varepsilon_i$	-0.0010	0.0101	-0.1001	Insignificant

$\Pi_i = \alpha_0 + \alpha_1 SR + \varepsilon_i$	-0.4556	0.7502	--0.6100	Insignificant
$\Pi_i = \alpha_0 + \alpha_1 TR + \varepsilon_i$	-0.0089	0.0022	-0.4300	Insignificant

Note: Total 171 regressions from June 6, 2005 to October 13, 2008 are run for each of the above equations and average values of coefficients of β, SR, TR, standers errors with t- statistics are reported.

Two different sets of results are presented in Table 2. In Panel-A, results are based on returns of individual securities where Panel-B shows results based on portfolio returns. When testing reliability of β, generally it is argued that portfolio returns shall be preferred to use as dependent variable because it has lower estimation errors and control stock specific risk. In both cases rolling regression method is used. Interestingly, similar to results reported in Table 1, results reported in the two panels of Table 2 are statistically insignificant and therefore has same repercussion as explained in the case of Table 1 above.

Table 2: *Results of Rolling Regression*

Equation	**Coeff. (α_1)**	**Std. Errors**	**t-Stat**	**Remarks**
Panel – A				
$\Pi_{i,t} = \alpha_0 + \alpha_1 SR_{i,t} + \varepsilon_{i,t}$	-1.7246	1.1843	-1.46	Insignificant
$\Pi_{i,t} = \alpha_0 + \alpha_1 TR_{i,t} + \varepsilon_{i,t}$	-0.2345	0.1532	-1.53	Insignificant
$\Pi_{i,t} = \alpha_0 + \alpha_1 \beta_{i,t} + \varepsilon_{i,t}$	-0.0008	0.0028	-0.31	Insignificant
$\Pi_{i,t} = \alpha_0 + \alpha_1 SR_{i,t} + \alpha_2 UR_{i,t} + \varepsilon_{i,t}$	**(α_1)**	**(α_2)**		
Coeff.	-1.4401	-0.2000		
Std. Errors	1.1601	0.1535		
t-Stat	-1.24	-1.30		Insignificant
Panel – B	**Coeff. (α_1)**	**Std. Errors**	**t-Stat**	**Remarks**
$\Pi_{pi,t} = \alpha_0 + \alpha_1 \beta_{p\,i,t} + \varepsilon_{i,t}$	-0.0054	0.0037	-1.45	Insignificant
$\Pi_{pi,t} = \alpha_0 + \alpha_1 \beta_{p\,i,t} + \alpha_2 TR_{p\,i,t} + \varepsilon_{i,t}$	**(α_1)**	**(α_2)**		
Coeff.	-0.0056	0.0813		
Std. Errors	0.0043	1.6378		
t-Stat	-1.31	0.05		Insignificant

Note: Panel-A parents average values of coefficients of 171 regressions (rolling) estimated with stata. In panel β, using stata, average values of coefficients of beta, SR, and TR from 75 regressions are reported; here rolling regression procedure is used and portfolio returns are taken as dependent variable.

Results of time series regression are reported in Table 3 where first column from left shows equations and from second to seventh column coefficients of the explanatory variables followed by t statistics are reported respectively. In all these four cases, in line with the theory of CAPM constant terms of regressions have no significant explanatory power. From Row 1 through Row 4

coefficients of systematic risk, total risk, and unsystematic risk are statistically insignificant and inversely related to portfolio returns. Thus time series regressions also yield results similar to those of cross-sectional and rolling regressions in Table 1 and 2 respectively. Therefore, these results further support the deduction that investors in Pakistan make their investment decisions on the basis of factors other factors than these risk factors.

Table 3: *Results of Time Series Regression*

Equation	α_1	t-Stat	α_2	t-Stat	α_3	t-Stat
$\Pi_{p\,i,t} = \alpha_0 + \alpha_1 SR_{p\,i,t} + \varepsilon_{i,t}$	-0.0037	-0.75				
$\Pi_{p\,i,t} = \alpha_0 + \alpha_1 SR_{p\,i,t} + \alpha_2 TR_{p\,i,t} + \varepsilon_{i,t}$	-0.0009	-0.04	-0.0020	-0.11		
$\Pi_{p\,i,t} = \alpha_0 + \alpha_2 TR_{p\,i,t} + \varepsilon_{i,t}$			-0.0026	-0.75		
$\Pi_{p\,i,t} = \alpha_0 + \alpha_3 UR_{p\,i,t} + \varepsilon_{i,t}$					- 0.0069	-0.67

Note: Total numbers of observations are 5772. Coefficients, TR, and UR along with their respective t-statistics are reported.

Table 4 shows results of concurrent regressions. Coefficients of the regressors their respective standard errors and t-statistics are shown in second, third, and fourth columns where first column is devoted to the estimated equations. Though coefficient of the systematic risk (*SR*) is positive but it is still staitically insignificant. These results further support the findings of the preceding regression analysis. These results suggest that neither of the risk measures (*SR, UR*, and *TR*) are priced by investors in stock market of Pakistan.

Table 4: *Results of Concurrent Regression*

Equation	Coeff. (α_1)	Std. Errors	t-Stat	Remarks
$\Pi_{i,t} = \alpha_0 + \alpha_1 SR_{p\,i,t} + \varepsilon_{i,t}$	0.8844	2.1283	0.42	Insignificant
$\Pi_{i,t} = \alpha_0 + \alpha_1 TR_{p\,i,t} + \varepsilon_{i,t}$	-0.0041	0.1446	-0.03	Insignificant

Note: Total 72 regressions from January 5, 2004 to May 30, 2005 are run for the two equations. Average values of coefficients of systematic risk (SR), total risk (TR) along with their respective standard errors and t-statistics are reported.

CONCLUSION

To examine the risk and return relationship, this study used weekly data from January 5, 2004 to October 13, 2008 of 194 non-financial firms traded on Karachi Stock Exchange (now PSX). Different measures of risk such as relative measure of risk *(β)*, systematic risk *(SR)*, unsystematic risk *(UR)*, and total risk *(TR)* are used as explanatory variables to analyze their impact on variation in stock returns. Stock returns as dependent variable are used in both individual securities' returns as well as in the form of portfolio returns. Analyses of this study are carried out

as per procedure developed by Fama and MacBeth (1973) and regression models are estimated through four different techniques. Irrespective of the techniques used, results are same. The conclusion drawn is that none of the above four measures of risk could explain variation is stock prices in stock market of Pakistan. The results suggest that standard capital asset pricing model (*CAPM*) has no significant utility for investors in Pakistan or Fama and MacBeth (1973) is not appropriate method in the context of capital market of Pakistan.

The results of this study are in line with the findings of other studies. For example, Ahmad and Zaman (1999) used GARCH-M model and reported volatility clustering in capital market in Pakistan. They suggested that higher-moment conditional CAPM is relatively more valid than the standard CAPM Similarly, Iqbal and Brook (2007) reported that risk and return relationship in equity market of Pakistan is non-linear and therefore standard CAPM will fail to explain this relationship. Iqbal, Javed, Brooks and Galagedera (2008) analyzed monthly data of 101 stocks for the period of October 1992- March 2006 to compare different capital assets models and reported that standard CAPM do not have predictive power to explain risk and return relationship and that trading volume and dividend to price ratio are more relevant variables. However, the results of their study were in favor of conditional models. Javid and Ahmad (2008) found conditional CAPM as a valid alternate of the standard CAPM. Standard CAPM was also rejected by Javid (2009). Hanif and Bhatti (2010) analyzed data of 360 stocks for the period 2003-08 but found that in few sub-periods, CAPM could explain variation in returns of just 28 stocks. Hanif (2010) analyzed both monthly and weekly data of tobacco stocks during the period from 2004 to 2007 and found that values of beta are not constant overtime. Moreover, they observed that the values of beta are lower (higher) for monthly (weekly) data Whereas the correlation between CAPM predicted and actual weekly returns was weaker than that for monthly data. More recently, presence of weak correlation is reported by Zubairi and Farooq (2011) between actual and CAPM predicted returns.

Findings of this study imply that more research work is needed to understand what factors or methodology could be used to predict changes in stock prices in Pakistan. For example, variables such as size, book to market ratio, and macroeconomic factors or methodology proposed by Pettengill et. al. (1995) might produce desired effect. Moreover, different data sets with respect to time such as daily, monthly, semi-annually, and annually shall be investigated to know if this could change the results in favor of investors. Finally, in the case of investors in Pakistani stock market, we suggest that right investment decisions could only be made if alternate and valid

capital asset pricing models are used and these decisions are not driven solely by standard CAPM.

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