

TESTING THE VALIDITY OF CAPM AND APT IN THE OIL, GAS AND FERTILIZER COMPANIES LISTED ON THE KARACHI STOCK EXCHANGE

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Abstract

The Capital Asset Pricing Model (CAPM) and Arbitrage Portfolio Theory (APT) have been commonly used techniques in the global investing community for calculating the required return of a risky asset. This paper investigates whether CAPM and APT are valid models for determining price/return of the fertilizer and the oil & gas sector companies listed on the Karachi Stock Exchange (KSE). The purpose of the research is also to identify plausible reasons for deviations from the theories. The conclusions arrived at through data analysis reveal weak correlation between realized excess returns (i.e. actual returns over and above the risk free rate) and the expected return based on CAPM. With respect to APT model, the study reflects that macroeconomic factors including changes in GDP, inflation, exchange rate and market return do not serve as valid determinants of returns on oil, gas and fertilizer stocks.

Key Words: Asset pricing theory, Capital Asset Pricing Model, Arbitrage Pricing Model, macro-economic factors, Karachi Stock Exchange.

JEL Classification: G11, G12

I Introduction

The Capital Asset Pricing Model (CAPM) has been one of the most widely used techniques in the global investing community for calculating the required return of a risky asset. This paper aims to test whether CAPM is a valid model for predicting the price/return of the fertilizer and the oil & gas sector companies listed on the Karachi Stock Exchange (KSE). Also we investigate, whether there appear to be some deviations from the model and look for plausible reasons to explain these. For the purpose of the research, actual quarterly returns of sample companies listed on KSE for the period January 2004 to December 2009¹ are compared with the CAPM based (predicted) returns for the corresponding time period. The benchmark for the risk free rate R_f is taken as Karachi Interbank Offer Rate (KIBOR)² corresponding to the relevant monthly and quarterly time periods. For estimating market return R_m , changes in the KSE-100 index for each relevant time period is used. Stability tests are also conducted to assess the consistency of results over the entire range of data.

The paper also attempts to empirically compare CAPM with Arbitrage Portfolio Theory (APT) to find out which of the two is a better method for predicting stock returns of companies belonging to the above mentioned sectors on KSE. The conclusions arrived at through data analysis might lead to useful recommendations about how and to what extent CAPM/APT can be used as tools for predicting stock returns and facilitating investment decisions, in general, and particularly for the fertilizer and the oil & gas sector companies in Pakistan.

¹ excluding the last two quarters of 2008 due to a floor set for stock prices to halt a plunge that wiped out \$36.9 billion of market value since April 2008

² KIBOR could be considered a good proxy for risk free rate, given its high degree of certainty

II. The Theory and Literature Review

CAPM developed by Sharpe (1964), Lintner (1965) and Mossini (1965) builds upon the "Portfolio Theory" introduced by Harry Markowitz (1959). CAPM presents the basis for determining the required rate of return on all risky assets. CAPM theory is built upon the assumptions of the Portfolio Theory plus some additional ones. The major factor that allowed Portfolio Theory to develop into CAPM Theory is the concept of the risk free asset. The inclusion of the risk free asset resulted in the derivation of a Capital Market Line (CML) which was referred to as the new efficient frontier. The required rate of return on a risky asset (R_i) was derived as a function of the risk free rate (R_f) and risk premium of the individual asset. The risk premium is the product of systematic risk of the asset referred to as beta (β_i) and the current market risk premium. Market risk premium is defined as the difference between return on the market (R_m) and R_f . The CAPM equation is as follows:

$$R_i = R_f + \beta_i (R_m - R_f) \quad (I)$$

Systematic risks are those market risks which cannot be diversified such as interest rates, inflation and economic downturns. On the other hand, unsystematic risk can be diversified by increasing the number of stocks in the portfolio. According to CAPM, the only relevant measure of stock risk is beta. It determines the sensitivity of the stock to the market i.e. by how much will the price of the stock go up or down in relation to specific up and down movements of the stock market. The equation for β_i is:

$$\beta_i = \frac{\text{Cov}(i,m)}{\text{Var}(m)} \quad (II)$$

where,

$\text{Cov}(i,m)$ = Covariance between the returns on a risky asset i and the stock market

$\text{Var}(m)$ = Variance of the market

Ansari, Naeem and Zubairi (2005) stated that, according to CAPM, the market rewards risk bearing, since people are generally risk averse. The risk premium for the aggregate of all risky assets must be positive to induce people to hold the total amount of risky assets in a financial system. The market (according to CAPM theory) rewards only efficient risk bearing. The risk premium on any individual security is not related to its own risk but to its contribution to the total risk of an efficiently diversified portfolio.

The two fundamental assumptions underlying the CAPM can be stated as:

- All investors have the same forecast of mean expected rates of return and its associated standard deviation and correlation of rates of return of risky assets; therefore they hold risky assets in the same proportion.
- When investors are optimally holding these risk portfolios, the aggregate demand for each security is equal to its supply and the financial market is in equilibrium.

When testing the validity of the CAPM in the real world, there are two key questions. First, how stable is beta? It is important to establish the validity of past betas for predicting stock returns in the future, since beta measures the only risk under consideration. Second, is there a positive linear relationship as hypothesized between beta and the rate of return on risky assets? More specifically, how far is the CAPM equation able to explain stock market returns.

A number of studies have examined the stability of beta and generally concluded that the estimates were more stable for portfolio of stocks compared to individual securities. Further, the higher the number of stocks (e.g. over 50 stocks) and longer the period (over 26 weeks), the more stable the beta value of the portfolio.³

³ Frank Reilly, *Investment Analysis and Portfolio Management*, 7th Ed.

Various tests have also been conducted to test the usefulness of CAPM in explaining returns on risky assets and the existence of a significant positive linear relationship between beta and stock returns. A study by Douglas (1969) showed that intercepts were larger than existing risk free rates and the coefficients for the systematic risk were not significant. Sharpe and Cooper (1972) discovered a positive return and risk relationship between NYSE common stocks during the period 1931-67, although it was not completely linear.

Black, Jensen and Scholes (1972) studied the risk and return relationship for portfolio of stocks and found a positive linear relationship between monthly excess return i.e. return over and above the risk free rate and portfolio beta, although the intercept was higher than the expected value.

Fama and French (2004) revealed that empirical work since the late 1970s challenged the Black version of the CAPM. Specifically, evidence mounts that much of the variation in expected return is unrelated to market beta.

A study by Basu (1977) showed that when common stocks were sorted on the basis of earnings/price ratios, future returns on high E/P stocks were higher than those predicted by the CAPM. Banz (1981) documented a size effect; when stocks were sorted on the basis of market capitalization (price times shares outstanding), average returns on small stocks were higher than those predicted by the CAPM. Bhandari (1988) found that high debt-equity ratios (book value of debt over the market value of equity, a measure of leverage) also helped explain the cross section of average returns after both beta and size are considered. A study by Fama and French (1992) concluded that during the period 1963 to 1990, beta was not relevant. The study also showed that the most significant predictor variables were book to market value and size.

Another problem was raised by Roll (1981) who contended that it was not possible to empirically derive a true market portfolio, due to which it is not possible to test the CAPM model properly or to use the model to evaluate the market portfolio.

Ross (1979) developed the Arbitrage Portfolio Theory (APT) which was both simpler and also had fewer and more realistic assumptions as compared to CAPM. Unlike CAPM, APT did not assume the following:

- A market portfolio contains all risky assets and is mean-variance efficient
- Normally distributed security returns
- Quadratic utility function

The theory assumes that stock returns depend on pervasive macroeconomic influences. The return is assumed to have the following simple relationship:

$$E_i = \lambda_0 + \lambda_1 b_{i1} + \lambda_2 b_{i2} + \dots + \lambda_k b_{ik} \quad (\text{III})$$

Where,

E_i = Return on the risky asset i

λ_0 = expected return on asset with zero systematic risk – risk free rate is generally taken as the proxy for this rate of return

λ_k = the risk premium related to each of the common macroeconomic factors - for example the risk premium related to interest rate risk

b_{ik} = the pricing relationship between the risk premium and asset i , i.e. how responsive is asset i to the common factor k

APT does not offer any guidance as to how many factors should be used to explain return and what these factors should be. These factors may also differ from one period to the next. There could be an oil price factor, an exchange rate factor, and so on. The return on the market portfolio might also serve as one of the factors.

Empirical tests of CAPM and APT have been conducted in different markets. Yang and Donghui (2006) concluded that CAPM does not give a valid description of the Chinese Stock Market. The test was conducted on 100 companies listed on the Shanghai Stock Exchange during the period 2000-05. In accordance with CAPM model, the expected returns and betas were linearly related with each other during the entire period. However, the results offered evidence against CAPM hypothesis for the intercept, which should equal zero and the slope that should equal to the average risk premium.

The results of the tests conducted by Michailidis, Tsopoglou, Papanastasiou, and Mariola (2006) on data of 100 companies listed on the Athens Stock Exchange for the period of 1998-2002 provided evidence against the CAPM. The tests refuted the CAPM's prediction that the intercept should equal zero and the slope should equal the excess returns on the market portfolio. However, their findings did not present evidence in support of any alternative model.

Canegrati (2008) studied the relationship between the sign of market returns and beta coefficients within six sectors of stocks listed on the Milan Stock Exchange. The evidence showed that the intercept was equal to zero, supporting CAPM theory which assumes that the only relevant variable in the regression is the excess return on the market portfolio. As a consequence of this, it was concluded that betas completely capture the cross sectional variation of expected excess returns and can be seen as a measure of asset risk. Tests using a fifteen-year sample of monthly returns examined the relation between the sign of market returns and beta coefficients and detected existence of an excess positive (when the market is at an Up state) and negative

(when the market is at a Low state) relationships between returns and betas.

Nguyen (2010) examined the stock price behavior of the Stock Exchange of Thailand (SET), by applying APT. Employing the data for the period before the Asian financial crisis of 1997-98, i.e. between January 1987 and December 1996, the research investigated the relationship between stock returns in Thailand and some economic fundamentals, namely returns on the SET-Index, changes in exchange rates, industrial production growth rates, unexpected changes in inflation, changes in the current account balance, differences between domestic interest rates and international interest rates and changes in domestic interest rates. The test results showed that the APT does hold in the stock market of Thailand, while the CAPM fails to do so.

Dash and Rao (2009) studied a sample of fifty stocks listed on the National Stock Exchange (NSE), belonging to eight most flourishing industries in the Indian economy. The objectives of the study were to compare and assess applicability of the CAPM and APT to Indian capital markets, and to find out how macroeconomic variables affect the returns of different securities. The results of the study show that the APT does not have a significantly better explanatory power over the CAPM for Indian capital markets.

In Pakistan, Javid and Ahmad (2008) investigated the risk and return relationship of 49 companies listed on the Karachi Stock Exchange (KSE) during the period July 1993 to December 2004. The empirical findings did not support the standard CAPM as a model for explaining asset pricing in the Pakistani equity market. The critical condition of CAPM—that there is a positive trade-off between risk and return—was rejected and some role of residual risk was identified in pricing risky assets. The empirical results of this study partially vindicated the conditional CAPM, with time variation in market risk and risk premium. The results confirmed the hypothesis that risk premium was time-varying type in Pakistani stock market and strengthened the notion that

rational asset pricing exists, although inefficiencies were also present in unconditional and conditional settings.

Iqbal, Brooks and Galagedera (2008) investigated whether allowing the CAPM parameters to vary improves the performance of the CAPM and the Fama-French model. The data comprised of monthly closing prices of 101 stocks and the Karachi Stock Exchange 100 index (KSE-100) during the period October 1992 to March 2006. The findings of the study revealed that conditional asset pricing models scaled by conditional variables such as trading volume and dividend yield, generally resulted in small pricing errors. However, a graphical analysis showed that the predictions of conditional models are generally upward biased. They found that the unconditional Fama-French model augmented with a cubic market factor performed the best among the competing models.

Nikolaos (2009) analysed 39 stocks from London Stock Exchange on monthly basis for the period of January 1980 to February 1998, to test the validity of CAPM. Results of the study indicated that CAPM was not valid, although beta was found to be compatible to the model as it was a significant coefficient for measuring returns.

Hanif and Bhatti (2010) have also rejected the CAPM model in the local institutional frame work based on their study of 360 companies in the Pakistani market during the period 2003-08. Their findings suggested that CAPM showed accurate results for a limited period and for few companies only - out of 360 observations only 28 results supported the theory. Another study conducted by Hanif (2010) on tobacco sector companies listed on stock exchanges in Pakistan presented similar results for the period 2004-07. The study showed that beta calculation depicted different results for different periods. Monthly relationship between actual and CAPM forecast returns was found to be stronger than a similar relationship based on weekly data since beta with smaller period observations was found to be higher than that for longer period observations.

Krish (2010) tested the validity of CAPM theory in Indian capital market & the stability of beta. The study was conducted on 10 stocks & 10 sectoral indices listed on the Bombay Stock Exchange (BSE), for a period of 4 years (January 2005 to December 2008). The study provides evidence against the CAPM hypothesis as well as the stability of systematic risk.

Empirical tests on CAPM conducted so far have yielded mixed results, largely indicating inapplicability of the model in its original form. However, the tests mainly uphold the basic risk and return principle underlying CAPM theory. Although the APT model requires fewer assumptions and includes multiple factors for explaining the risk of an asset, the CAPM has an advantage in that its single risk factor is well defined.

I Methodology and Sample

This section describes the variables used in the study, null hypotheses tested and methodology used to test the hypotheses. Furthermore, various measures of the variables along with the sources of data are also presented. Following is a brief discussion of the variables employed to estimate R_i , the required rate of return as per the CAPM equation

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

Risk-Free Rate of Return (R_f)

R_f represents the compensation received by the investor for placing money in an asset with almost entirely certain expected (nominal) return. In other words, the standard deviation of the nominal return expected on such an asset equals zero. The return on government securities is generally used as a proxy for this return. For the purpose of this study, Karachi Interbank Offer Rate (KIBOR) was used as the risk free rate given the fact it is an actively used benchmark with a high degree of certainty. KIBOR was also used as a proxy for measuring expected return on an asset with zero systematic risk while calculating the required rate of return using the APT equation.

Return on Market (R_m)

R_m is the expected rate of return on the stock market. In this study, KSE 100 index was selected as an appropriate proxy for the Pakistani stock market. Quarterly change in this benchmark was taken as a measure for expected rate of return on the market for the purpose of this study.

Beta (β)

Beta is a measure of systematic or non-diversifiable risk of the asset. Beta was calculated by dividing covariance between quarterly stock and market returns during the period 2004-09 with the variance of the market over the same period. Beta was assumed to be constant while calculating CAPM based returns during each quarter.

Return on Risky Asset (R_i)

The required rate of return (R_i) was calculated for each quarter and then compared with corresponding actual return on the stock to assess the validity of CAPM. Actual quarterly returns on stock were determined using change in stocks prices i.e. difference between the opening and closing price divided by the opening price. The effect of dividends was not taken into account while calculating actual stock returns due to difficulty in gathering data.

The APT equation to calculate R_i (the dependent variable) for the purpose of this study was expressed as a function of the following four factors (independent variables):

Table 1: Determinants of the APT Equation

Factor t	Measured by
Real GDP (R_1)	Change in GDP
Exchange rate (R_2)	Change in value of Pak Rupee relative to US Dollar
Inflation (R_3)	Change in CPI Index
Market Return (R_4)	Change in KSE-100 Index

The equation for estimating stock return for this research can be stated as follows:

$$R_1 = R_f + \beta_1 (R_1 - R_f) + \beta_2 (R_2 - R_f) + \beta_3 (R_3 - R_f) + \beta_4 (R_4 - R_f) \quad (IV)$$

Where,

R_1 = Return on risky asset as explained above

R_1, R_2, R_3 and R_4 = Return on each factor (R_{factor}) measured as mentioned in Table 1

$R_{factor} - R_f$ = Risk premium associated with each factor

$\beta_1, \beta_2, \beta_3$ & β_4 = Sensitivity of the risky asset to each factor risk calculated by dividing covariance between the return on the factor and the risky asset by the variance of the factor return.

The main objective of this research is to determine the explanatory power of CAPM and APT in predicting returns of oil, gas and fertilizer companies listed on the Karachi Stock Exchange. In order to achieve this objective, the realized excess return was measured applying the following statistical model on actual return R_1 and the return calculated using the CAPM equation.

$$R_1 - R_f = \alpha + \beta_i (R_m - R_f) \quad (V)$$

where α termed as intercept should be zero if CAPM equation was imposed on the data.

Similarly, the model when applied to APT equation based return will be as follows;

$$R_1 - R_f = \alpha + \beta_1 (R_1 - R_f) + \beta_2 (R_2 - R_f) + \beta_3 (R_3 - R_f) + \beta_4 (R_4 - R_f) \quad (VI)$$

The validity of CAPM and APT was tested by determining whether the alpha of any security as determined through equations V and VI was statistically different from zero. The regression was run with available stock returns data in order to test the following two hypotheses:

Ho: The intercept α when CAPM is imposed on the stock returns data is equal to zero.

Ho: The intercept α when APT is imposed on the stock returns data is equal to zero.

Under the alternative hypothesis, the intercept or alpha is not equal to zero. The standard test is a t-test on the intercept of the regression. If the intercept is more than 2 standard errors from zero (or having a t-statistic greater than 2), then there is evidence against the null hypothesis or the validity of CAPM and APT.

The study is limited to testing the validity of CAPM and APT in explaining returns on fertilizer, oil and gas companies listed on the Karachi Stock Exchange for the period 2004-09, excluding the last two quarters of 2008 when a floor was imposed on the market. A sample of 17 companies was taken resulting in 361 observations. Quarterly opening/closing data of stock prices and KSE100 index were taken from the website of Karachi Stock Exchange. KIBOR and macroeconomic data were sourced from the State Bank of Pakistan.

I Empirical Results

This section presents the results of the regression analysis. The interpretation and detailed discussion of the empirical findings are also reported in this section. Finally, a possible explanation, on the basis of the financial theory reviewed above, is presented to explicate the empirical findings.

Table 2: Pooled Regression Results (CAPM)

Dependent Variable: Realized Excess Return

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C(intercept)	5.780885	2.999115	1.92753	0.0547
CAPM	0.320824	0.119987	2.673812	0.0078
R-squared	0.019526	Mean dependent var		7.687368
Adjusted R-squared	0.016794	S.D. dependent var		55.82007
S.E. of regression	55.34935	Akaike info criterion		10.87073
Sum squared resid	1099815	Schwarz criterion		10.89228
Log likelihood	-1960.17	F-statistic		7.14927
Durbin-Watson stat	2.095235	Prob(F-statistic)		0.007842

The computed t-statistic reveals a significance level of 10% at which the intercept value is very high. Additionally, low R-squared value implies that only 1.9% variation in realized excess return is explained by CAPM. F- statistic is significant at 1% whereas DW statistics shows no auto-correlation problem. High standard deviation of realized excess return shows that there is no consistency in stock price performance of oil, gas and fertilizer companies listed on the KSE. The above results show that the CAPM model does not explain variations in realized excess return. Inefficiency and volatility in emerging markets such as Pakistan may be the underlying reasons for this behavior.

Similarly, we have taken the expected excess return based on APT as the determinant of realized excess return to test the validity of the APT theory. The results are shown in Table 3.

Table 3: Pooled Regression Results (APT)

Dependent Variable: Realized Excess Return

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.900988	2.891915	2.386304	0.0175
APT	0.189472	0.049843	3.801371	0.0002
R-squared	0.038694	Mean dependent var		.687368
Adjusted R-squared	0.036017	S.D. dependent var		5.82007
S.E. of regression	54.80563	Akaike info criterion		0.85099
Sum squared resid	1078313	Schwarz criterion		0.87253
Log likelihood	-1956.6	F-statistic		4.45042
Durbin-Watson stat	2.075036	Prob(F-statistic)		.000169

The computed t-statistic implies that the null hypothesis (that the intercept \pm when APT is imposed on the stock returns data is equal to zero) is rejected at 5% level of significance. Similarly, low R-squared value (only 3%) implies a weak relationship between excess return based on APT and realized excess return. F-statistic is significant at 1% while DW statistics shows no statistical problem signifying satisfactory results. High standard deviation of realized excess return in this case also shows that there is no consistency in stock price performance of oil, gas and fertilizer companies listed on the KSE.

The results are broadly the same for expected excess returns based on both CAPM and APT theories – neither provide any explanation of variation in expected excess return.

I Conclusions

In this study, data of a sample of 17 oil, gas and fertilizer sectors companies listed on KSE was analyzed through a pooled regression model to determine whether CAPM and APT models are valid determinants of the realized excess return on these companies. The study was based on quarterly data for the period 2004-2009, excluding the last two quarters of 2008 during which a floor was imposed on the market. This resulted in 361 observations for the regression analysis. The data analysis reveals almost no correlation between realized excess returns and the expected return based on CAPM. With respect to APT model, the study reflects that changes in GDP, inflation, exchange rate and market return do not serve as valid determinants of returns on oil, gas and fertilizer stocks. These results are generally in line with other studies conducted on listed companies in Pakistan, while minor differences are observed when the same results are compared with those of similar studies conducted on stock exchanges of other developed and developing countries.

As discussed in the literature review, a similar study conducted by Dash and Rishika (2009) revealed low R-squared values of 16% and 24% respectively when CAPM and APT models were applied to 50 companies on NSE in India, implying that the models do not have sufficient explanatory power. Furthermore, standard CAPM does not appear to be a valid model for predicting stock returns based on the results of other studies discussed earlier, mostly pertaining to emerging markets including Greece, Bucharest, Thailand and Pakistan. The table below summarizes the tests/findings of the recent studies on CAPM and APT, reviewed by us:

Table 3: Summary of Results of Other Studies on CAPM and APT

Study	Tests/Findings
Testing the CAPM Model -- A study of the Chinese Stock Market	<i>t</i> -tests were used. CAPM does not fully hold good in the Chinese Stock Market during the period 2000- 2005.
Testing the Capital Asset Pricing Model (CAPM): The Case of the Emerging Greek Securities Market	<i>t</i> -tests were used primarily to test the data. The tests refuted the CAPM's prediction that the intercept should equal zero and the slope should equal the excess returns on the market portfolio. However, their findings did not present evidence in support of any alternative model.
Testing the CAPM: Evidences from Italian Equity Markets	Regressions were run to test the data Results of the work seem to confirm the validity of the three Sharpe-Lintner CAPM empirical tests.
Testing CAPM on Stocks traded at Bucharest Stock Exchange	<i>The coefficient t-statistic</i> – to measure the level of the significance of beta <i>Adjusted R-squared</i> – to check the goodness of the model <i>Durbin-Watson coefficient</i> – to check for serial in residuals; <i>Pattern of residuals</i> – to check the noise in data. Power of beta as an estimate of risk was not very strong, given the resulting readings of adjusted R-squared
Asset Pricing Models in Indian Capital Markets	The study uses the standard two-step regression method to estimate the CAPM and the APT using the sample scrips. To test for the significance of the difference between the CAPM and the APT, the F-test was employed. The results of the study show that the APT does not have better explanatory power over the CAPM for Indian capital markets.
Validity of Capital Asset Pricing Model & Stability of Systematic Risk (Beta): An Empirical Study on Indian Stock Market	<i>t</i> -tests were used. The studies provide evidence against the CAPM hypothesis and the stability of systematic risk.
Thai Stock Market	<i>t</i> -tests were used primarily to test the data. APT does hold in the stock market of Thailand, while the CAPM fails to do so.

An Empirical Evaluation of CAPM's Validity in the British Stock Exchange	Two step regression procedure was used. Results indicated that CAPM was not valid, although beta was compatible to the model.
Testing Conditional Asset Pricing Models: An Emerging Market Perspective (Pakistan)	Wald Test, Chi square, p-values, t-tests Conditional asset pricing models scaled by conditional variables such as Trading Volume and Dividend Yield generally result in small pricing errors. However, a graphical analysis shows that the predictions of conditional models are generally upward biased.
The Conditional Capital Asset Pricing Model: Evidence from Karachi Stock Exchange	Generalised Method of Moment approach and Generalised Least Square (GLS) approaches are used to test the data The empirical findings do not support the standard CAPM model as a model to explain assets pricing in Pakistani equity market. The empirical results of the conditional CAPM, with time variation in market risk and risk premium, are more supported by the KSE data, where lagged macroeconomic variables, mostly containing business cycle information, are used for conditioning information.
Validity of Capital Assets Pricing Model: Evidence from KSE-Pakistan	Absolute difference between CAPM and actual returns was analysed. CAPM gives accurate results for a limited period for a few companies only. Out of 360 observations only 28 results supporting CAPM while 332 are against it, hence model is rejected in this institutional frame work.
Testing Application of CAP Model on KSE- Pakistan A Case Study on Tobacco Sector	Absolute difference between CAPM and actual returns was analysed. Findings raised questions about the validity of CAPM Theory. Security returns are not as per the demand of the model.

Market inefficiency and uncertain political/economic situation in the country appear to be major factors responsible for the inapplicability of these models on local scrips. Volatile market conditions result in unexpected changes in systematic risk due to which predictability of returns based on constant beta values tends to result in deviations of actual returns from values determined through these models. Also it may be the case that stock prices are subject to manipulation by a small number of key players.

It is pertinent to mention here that the study has some limitations such as a small size of 17 companies belonging to only oil, gas and fertilizer sectors. Further, the study was restricted to unconditional version of CAPM not taking into account other factors like size and book to market value factors.

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