

Inevitability of Cross-Section Stock Returns: Evidence from Equity Markets of Pakistan

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Abstract: In recent economic recession, portfolio theory progressively motivated banks to strategically concentrate on shareholders' investment returns. The analysis of the determinants of bank performance and their association with investment returns has become increasingly important. In presence of alternative investment opportunities of competitive market returns, bank stock performance is explored under depressed investment environment. For this research study, a sample of 16 banks listed at Karachi Stock Exchange was extracted on random basis. To calculate monthly stock returns, daily stock prices were used for a period of 2003-2010. Capital Asset Pricing Model (CAPM) was used to compute the expected bank stock returns. Results of performance metrics demonstrated insignificant correlation in movements of bank stock returns. Findings of this study suggested that in reflection of better market returns, banks tend to outperform for improvement of their shareholders' investment returns and value maximization.

Key words: Stock returns • Karachi Stock Exchange (KSE) • CAPM • Systematic Risk • Market Returns

INTRODUCTION

Karachi Stock Exchange (KSE) was established on 18th September, 1947 just after independence of Pakistan with an initial capital of PKR 37 million. KSE has its four indices which are working under governing mechanism of KSE which includes 1) KSE 100 index, 2) KSE 30 index, 3) KSE share index and, 4) KMI 30. KSE is equipped with world's best electronic trading system where 655 companies of different financial and non-financial sectors are listed and execute their buying and selling of shares on daily basis. Gulf news (2008) declared KSE as the best and progressive stock exchange of the world for financial year 2002 due to its incredible business returns.

Over the last few years, due to central role of Pakistan in 'War Against Terrorism' at its southern borders and linked tribal areas, an unstable political and economic conditions is subsist and KSE stock returns have been highly un-extrapolative for domestic and international business investors who are incessantly facing confused and deviant business environment. Due to unstable political environment, institutional investors are also reluctant to show their presence. Hatching on speculations in the market, investors are mainly rely on making investments in projects with positive net present

value (NPV). Many stock exchanges around the world compute indices for specific sectors like banks and financial institutions which are economic engines owing to their mediator function between depository funds and investment opportunities. From the investors point of view, it becomes important that how bank stocks are performing over time in the markets and if a portfolio of banks and financial institutions is devised, would that help in reaping more economic benefits. The metrics devised by Sharpe, Treynor and Jensen are used in this research for measuring the performance portfolios and mutual funds. This paper attempts to provide answers to questions posed above and entails a rationale for an index of finance and banking institutions at Karachi Stock Exchange.

Literature Review: In most recent years, there has been a growing interest in prospecting best practices in banking sector to satisfy the interest of shareholders. Several research studies, till now, have been conducted to analyze the factors which affect the performance of stock exchanges [1-4]. After invasion of Russia from Afghanistan in late 1980s, economy of Pakistan was highly unstable due to its joint borders with Afghanistan. This unevenness is amplified after 9/11 attacks and a

longstanding 'War On Terror' inside and on borders of the country is persist to create imbalances for domestic and international investors. To investigate this unevenness, [5] conducted a study on KSE stocks volatility and found various factors which affect the performance of KSE stock returns.

Several research studies associated various macro economic factors like inflation, interest rate, stock returns and oil prices which put direct impact on volatility of returns on KSE performance. Ali *et al.* [6] investigated the association of different macro economic factors and found that there is no direct relationship of these factors on the performance of KSE. Using Vector Error Correction Model, [7] investigated long-term relationship between KSE and different macro economic factors such as interest rate and inflation using data from 1973 to 2004. Findings of their study revealed that both macro economic factors have negative relationship with equity returns of KSE. Using financial data from 1971-2006, [8] conducted a study to investigate the impact of inflation and consumer price index (CPI) on KSE indices. Using Autoregressive Distribution Lag (ADL), he found that inflation has significant impact on short-term and long-term stock indices. Using monthly data from 1998:1 to 2008:12, [9] investigated the impact of various macro economic factors including exchange rates, money supply, inflation and interest rates on Turkey Stock Exchange (TSE). Using Granger Causality model, he found that inflation and interest rates have inverse relationship with market equity returns. Despite of a long academic debate, above studies have limitations to investigate bank stocks performance with alternate investment competitiveness which yet needed to be explored to generate guidance for market investors to mitigate higher speculative business environment.

Capital Asset Pricing Model (CAPM) describes the association between risk and expected return and applied for price settlement of risky securities. CAPM used to determine a theoretically rationale required rate of return for risky assets whereas, it considers more sensitive to the assets being used rather than the market proxies [10]. Study findings of Resti [11] suggested that when historical betas can predict future betas, they can also predict future price changes. To examine the relationship between future economic growth and banking sector stock returns, [12] used panel data from 18 developed and emerging markets. A significantly positive relationship between stock returns and economic growth (GDP) was inferred by their study. Chi *et al.* [13] carried out an empirical study to explore the relationship and

determinants of Australian bank performance and foreign exchange rates. Study results indicated that foreign exchange rates have no significant relationship with performance of Australian banks. Study of Lin and Zhang [14] found that cost efficient banks are more profitable and generate more returns to their shareholders. Evaluating stock performance returns, many studies found higher correlation between risk strategies and stock performance which enable banks to ensure certain stock returns to their investors [15-18]. Relationship between inside trading and stock returns is examined by [19] in which they provided evidences that using confidential information, insiders are the only proficients to predict the future stock returns at firm level but they are not able to predict an aggregate marketing trend which may arise due to uncertain volatility in the equity market. Existing literature has traditionally focused on determinants of cost efficiency and management control over costs rather than over outputs but rare evidence is available to estimate the overall performance of bank stocks and to find the answer that "how the bank stocks outperform the market and how they uplift the economic development of Pakistan"? To fill this research gap, this research study is conducted to evaluate the overall performance of bank stocks and generate significant insights and valuable knowledge for academic researchers and stock investors.

MATERIALS AND METHODS

In this study, a sample of 15 banks was selected from all listed banks of Karachi Stock Exchange on random basis. For a regular period of 8 years (2003-2010), closing prices for month end index were obtained whereas closing indices for KSE 100 index was taken as a proxy for investment portfolio. Semi annual Treasury bill rates were also obtained for the same tenor as another proxy. 'Treasury bill rates' and 'closing price values' were obtained from authenticated source of the central bank of Pakistan (SBP, 2012).

Stock returns for banking portfolio were derived by following formula:

$$\text{Stock Returns} = \frac{[(\text{Ending stock prices} - \text{Beginning stock prices}) + \text{Dividends}]}{\text{Beginning stock prices}}$$

KSE 100 index was used to investigate systematic risk for each of the security and regressed with excessive monthly returns. Using sample of stocks, Sharpe, Jensen and Treynor analysis was used whereas stock indices

showing higher values were designated as star performers. To investigate performance trends, this process was repeated for whole study period. Capital Asset Pricing Model (CAPM) was used to calculate risk premium and stock returns for sample banks and KSE 100 index on monthly data basis.

Capital Asset Pricing Model which introduced by Jack Treynor in 1961, is the best known model for calculating expected returns of a stock using risk free rate, stock's beta and market risk premium. CAPM was calculated using following equation:

$$E(r_i) = r_f + \beta_i(r_m - r_f)$$

Where;

$E(r_i)$ = Expected security returns for a particular level of risk
 r_f = Risk free rate, 6 month treasury bill rate is used as a proxy
 β_i = Covariance of the stock returns with that of the market
 $(r_m - r_f)$ = Market risk premium

To calculate the systematic risk for each of the bank stocks, formal OLS regression was applied using following regression model:

$$\text{Bank stock excess return} = \alpha + \beta (\text{market excess returns})$$

Treynor, Sharpe and Jensen metrics were used by obtaining a provisional picture of bank stocks performance in comparison with market stock performance over a certain period of time.

Following equations were used to measure Jensen, Sharpe and Treynor measure:

$$\begin{aligned} \text{Jensen's Measure} &= R_p - \{R_f + \beta(R_m - R_f)\} \\ \text{Sharpe Measure} &= (R_p - R_f) / \sigma_p \\ \text{Treynor Measure} &= (R_p - R_f) / \beta_p \end{aligned}$$

Where R_p is denominated as yearly geometric return of portfolio,

R_f = Refers to yearly risk free rate,
 σ_p = Represents the standard deviation (S.D.) of the portfolio returns,
 β_p = Is denominated as non diversifiable risk of the portfolio and,
 R_m = Refers to the return on Karachi Stock Exchange (KSE) 100 index

The Sharpe ratio is an appropriate measure of performance for an overall portfolio particularly when it is compared to another portfolio or another index like used in this study for investigating and comparing bank stock returns in comparison with market stock returns. This ratio evaluates the returns earned in surplus of the risk free rate (in general, Treasury instruments) on an investment portfolio to the portfolios' total risk (as investigated by the standard deviation in its market returns over the certain measurement period of time). Sharpe value is computed by:

Sharpe Ratio = Return portfolio - Return of Risk free investment / Standard Deviation of Portfolio

Treynor ratio, also known as 'reward to validity ratio' with determines the excess investment returns on those investments per unit of market risk which has excess to risk free investment. Treynor ratio is measured as follows:

Treynor Ratio = Return of Portfolio - Return of Risk Free Investment / Beta of Portfolio

A portfolio of sixteen banks (on random basis) was taken to estimate the S.D. and beta of a portfolio. To evaluate bank stocks performance, a comparison was accomplished with market stocks performance to generate an alternate investment option to market investors subject to given circumstances and opportunity benefit. To estimate the weighted beta factor, identical weights were denominated for randomly selected 15 banks.

$$\begin{aligned} \beta_p &= W_1\beta_1 + W_2\beta_2 + W_3\beta_3 + \dots + W_n\beta_n \text{ or} \\ \beta_p &= 0.0635\beta_1 + 0.0635\beta_2 + 0.0625\beta_3 + \dots + 0.0635\beta_{15} \end{aligned}$$

Using given equation, Markowitz portfolio variance and return were estimated:

$$\begin{aligned} \sigma_p^2 &= [W_1^2\sigma_1^2 + W_2^2\sigma_2^2 + \dots + W_{15}^2\sigma_{15}^2] + \\ &[2W_1W_2\sigma_1\sigma_2r_{12} + \dots + 2W_{15}W_{16}\sigma_{15}\sigma_{16}r_{15}r_{16}] \end{aligned}$$

Where $W_1 = W_2 = W_3 = \dots = W_{16} = 0.0625$

Whereas, $R_p = W_1R_1 + W_2R_2 + \dots + W_{15}R_{15}$

Results and Interpretation: Numeric values for systematic risk of 15 sample banks are given in Table 1 which is comprised of study period from 2003 to 2010. Due to limitation of data, some of the betas could not be computed. Over the study period, no bank stock from any sampled banks presented steady correlation with market stocks portfolio including positive or negative indication. Average risk categories, as detailed in given table were betas. To estimate Treynor, Jensen and Sharpe metrics,

Table 1: Distribution of betas of banks

Year	2003	2004	2005	2006	2007	2008	2009	2010
Askari returns	-0.493	0.006	-0.211	0.318	0.312	0.319	0.219	0.391
BOP returns	-0.327	-0.581	-0.553	-0.81	0.345	0.229	-0.214	-0.306
MCB returns	0.077	-0.377	-0.153	0.442	0.242	0.314	0.319	0.229
Faysal returns	-0.406	0.028	-0.102	-0.07	0.75	0.443	0.581	0.823
Atlas returns	-2.37	0.76	n/a	n/a	n/a	-0.11	n/a	-0.17
Alfalalah returns	0.074	n/a	n/a	n/a	n/a	0.028	n/a	0.081
United returns	0.07	-0.541	0.11	0.42	-0.23	0.095	0.067	0.63
Crescent returns	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a
KASB returns	-0.101	n/a	n/a	n/a	n/a	-0.083	n/a	-0.132
Meezan returns	-0.744	-0.339	-0.17	n/a	n/a	-0.13	-0.023	-0.18
NBP returns	-0.531	0.019	0.52	n/a	n/a	0.34	0.051	0.23
NIB returns	1.09	n/a	n/a	n/a	n/a	-0.12	-0.78	-0.05
Barka returns	0.361	-1.2	-1.57	n/a	n/a	0.032	0.076	0.13
Soneri returns	-0.238	-0.008	-0.316	0.62	0.32	0.43	0.64	0.25
HMB returns	-0.167	0.163	0.133	0.559	1.04	0.986	0.794	0.883

Table 2: Summary of stock returns and risk free rate

	Range	Min	Max	Count	Standard Error	Median	Kurtosis	Skewness
Six month T bill	11.87	1.21	13.09	93	0.35	7.44	-1.09	-0.24
KSE 100 Index	0.49	-0.25	0.24	93	0.01	0.02	0.56	-0.10
Askari Bank	0.69	-0.38	0.32	93	0.01	0.02	2.51	-0.69
Bank of Punjab	1.33	-0.52	0.80	89	0.02	0.00	1.78	0.41
MCB Bank	0.86	-0.45	0.41	93	0.01	0.02	1.31	-0.36
Faysal Bank	0.75	-0.28	0.46	85	0.01	0.01	0.99	0.56
Atlas Bank	1.83	-0.61	1.22	49	0.04	0.00	9.19	1.79
Alfalalah Bank	0.71	-0.43	0.28	37	0.03	0.01	0.13	-0.56
United Bank	0.77	-0.42	0.36	86	0.02	0.03	0.31	-0.35
Crescent Bank	0.79	-0.33	0.45	33	0.03	0.05	1.94	-0.04
KASB	0.58	-0.25	0.33	49	0.01	0.00	1.72	0.36
Meezan Bank	0.49	-0.26	0.23	61	0.01	0.01	0.85	-0.12
NBP	0.53	-0.22	0.31	65	0.01	0.03	-0.07	0.00
NIB Bank	1.04	-0.57	0.48	39	0.03	-0.04	2.24	0.12
Al-Barka Bank	1.20	-0.42	0.79	65	0.02	0.02	5.76	0.99
Soneri Bank	0.59	-0.36	0.23	89	0.01	0.01	2.39	-0.80
HMB Bank	0.69	-0.45	0.24	93	0.01	0.02	3.49	-1.18

Table 3: Using Regression Analysis of market stock prices from the period of 2003-2010, Analysis of Variance and Parameter estimated

	Jensen	Treynor	Sharpe	δ	B	μ	δ	E(ri)
KSE 100 Index	3.01	0.08	1.09	0.00	1.00	0.03	0.09	11%
Askari Bank	0.22	0.01	0.08	0.016	0.083	0.02	0.12	7%
Bank of Punjab	0.53	0.01	0.19	0.019	0.185	0.02	0.21	8%
MCB Bank	0.16	0.00	0.06	0.021	0.062	0.02	0.13	7%
Faysal Bank	0.55	0.02	0.20	0.015	0.189	0.02	0.13	8%
Atlas Bank	-1.57	-0.04	-0.57	0.009	-0.508	0.00	0.27	5%
Alfalalah Bank	0.06	0.00	0.02	0.014	0.029	0.01	0.16	7%
United Bank	-0.49	-0.01	-0.18	0.027	-0.151	0.02	0.15	6%
Crescent Bank	0.11	0.00	0.04	0.031	0.044	0.03	0.15	7%
KASB	-0.08	0.00	-0.03	-0.002	-0.018	0.00	0.10	7%
Meezan Bank	-0.48	-0.01	-0.17	0.012	-0.148	0.01	0.09	6%
NBP	-0.48	-0.01	-0.17	0.031	-0.148	0.03	0.11	6%
NIB Bank	0.36	0.01	0.13	-0.022	0.128	-0.02	0.18	7%
Al-Barka Bank	0.39	0.01	0.14	0.018	0.139	0.02	0.17	7%
Soneri Bank	0.55	0.02	0.20	0.003	0.191	0.01	0.10	8%
HMB Bank	0.81	0.02	0.29	0.004	0.276	0.01	0.11	8%

Table 4: Correlation Matrix

	Monthly KSE 100 returns	Askari returns	BOP returns	MCB returns	Faysal returns	Atlas returns	Alfalalah returns	United returns	Crescent returns	KASB returns	Meezan returns	NBP returns	NIB returns	Al-Barka returns	Soneri returns	HMB returns
Monthly KSE 100 returns	1.00															
Askari returns	0.06	1.00														
BOP returns	0.08	0.55	1.00													
MCB returns	0.04	0.06	0.15	1.00												
Faysal returns	0.13	0.71	0.49	0.23	1.00											
Atlas returns	-0.20	0.09	-0.04	0.44	0.22	1.00										
Alfalalah returns	0.02	0.14	0.06	0.22	0.16	0.17	1.00									
United returns	-0.09	0.21	0.15	0.42	0.13	0.19	0.03	1.00								
Crescent returns	0.03	0.30	-0.10	0.27	0.16	0.26	0.28	0.07	1.00							
KASB returns	-0.02	0.25	0.14	0.02	0.15	-0.07	-0.22	-0.04	-0.14	1.00						
Meezan returns	-0.15	-0.04	-0.21	-0.08	-0.12	0.24	0.24	0.11	-0.21	0.01	1.00					
NBP returns	-0.11	0.00	-0.15	-0.07	-0.07	-0.27	0.08	-0.02	-0.07	-0.08	0.27	1.00				
NIB returns	0.07	0.05	0.15	-0.22	0.24	-0.36	-0.17	-0.17	-0.44	-0.05	-0.08	0.13	1.00			
Al-Barka returns	0.07	0.16	-0.01	-0.15	-0.09	-0.24	0.02	-0.08	-0.04	0.24	0.03	0.01	-0.08	1.00		
Soneri returns	0.16	0.64	0.33	0.12	0.63	0.14	0.28	0.17	0.26	0.07	0.01	0.05	-0.11	0.25	1.00	
HMB returns	0.22	0.55	0.21	0.18	0.53	0.26	0.38	0.07	0.41	0.20	0.14	-0.01	-0.32	-0.01	0.59	1.00

Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed). *

the selected banks were considered as portfolio of investment to obtain an approximate for non diversifiable portfolio risk.

Descriptive findings of banks stocks returns are depicted in Table 2. Tentative estimated returns of market stocks are looking better than banks stocks. As per given information, no bank returns seems to be noted above to 0.03 of market returns.

Table 3 statistics illustrated that from randomly selected banks, using either of the performance metrics, none of the banks appeared higher performer in the market. Treynor, Jensen and Sharpe analysis depicted that market stock returns are better than bank stock returns and the portfolio market leads to low standard deviation and higher average returns.

Results of Table 3 depicted that market portfolio returns have better investment returns than bank stocks returns. In our estimation, beta was calculated as 0.013 with an investment portfolio return of 0.0134, S.D. for portfolio returns depicts 0.0386. Annualized risk free rate was calculated as 0.067 and market average rate of return was computed 0.03.

To evaluate any significant correlation in movements of banks and market stocks, we calculated correlation matrix. As depicted in below Table 4 where astoundingly none of the correlation found significant.

Conclusions and Practical Implications: Competitive pressures of recent past decades have increasingly motivated banks to strategically concentrate on generating returns to shareholders. Free market economy system is dominated worldwide. In presence of accurate

investment information, where returns are associated with relatively less risk factors, investors are attracted to extend their investment in respective portfolios. Portfolio theory intricate direction for investments but does not provide up- dates about performance of specific markets. In this study, we explored a comparison of bank stocks returns in respect with market stock returns in economic perspective of Pakistan. This initiative was taken to investigate whether the bank stocks in Pakistan outperform the market and how the past performance of bank stocks reflects in comparison to the market performance? For this purpose, detailed literature was reviewed to evaluate the issue of bank stocks performance in different economic perspectives.

For this study, initially 30 banks were selected which were operating in Pakistan and data for the period of 2003 to 2010 were obtained on daily basis, however due to limitation in the available data, sample was reduced to daily stock prices of 15 bank stocks for the period of 2003 to 2010. For calculation of betas, excess stock returns were regressed against the excess market returns. To calculate monthly stock returns, daily stock prices were used. To compute expected returns of sample banks, Capital Asset Pricing Model (CAPM) was used to get the desired results; whereas, for computational purpose, Jensen, Sharpe and Treynor performance measures were used. An imaginative portfolio of Pakistani banks was derived for comparison of its stock performance with market stock performance. Surprisingly, the results of correlation matrix were giving no significant correlations. The findings of the study indicated that market stocks were performing better than bank stocks in Pakistan.

Performance metrics of this study also suggested that stocks of cost efficient banks tend to outperform their inefficient counterparts and the improvement of EPS and marketability of stocks is the only way to get consideration of stock investors.

Future Research Direction: This study has practical implications for domestic and international stock investors in capital markets of Pakistan. Though this research study is restricted to a limited bank stock portfolio due to limitation of data and resources, however, in future, same study may be extended by increasing sample size and including other countries for making comparison among more than two business regions.

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