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Capital asset pricing model (CAPM) verses Fama and French three-factor model: An empirical comparison in Pakistani equity market

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Abstract
The objective of this paper is to test empirically and statistically the performance and efficiency of two stock-pricing models: CAPM (one-factor model) and Fama & French (three-factor model) by using three variables (size premium, market premium and book-to-market premium) in Karachi Stock Exchange for the period from January 2003 till December 2012. The CAPM relates the expected return on a stock/ portfolio to a single factor or the excess return on a market portfolio. Fama & French (1993, 1996) proved that three-factor model is better than CAPM because of its ability to capture returns due to anomalies such as size (SMB) and book-to-market equity (HML). Fama & French amended CAPM by adding two more variable size premium (SMB) and book to market equity premium (HML) to capture variation in average stock returns. Our study recommended that Fama & French three-factor model has the same descriptive power with that of the CAPM.

Keywords: capital asset pricing model, Fama & French three-factor model, Karachi stock exchange, risk premium

Introduction

Investor's demands higher expected return from an investment in stocks or projects besides high risk. Estimation of expected return and risk for individual stocks is central to many financial decisions such as those relating to portfolio management, capital budgeting, and performance evaluation. Modern investment theory is based mainly on two ideas. The first, presented by Harry Markowitz, is that in an efficient financial market, higher return expectations require higher risk exposures. The second, established by William F. Sharpe, is that since the risks associated with individual securities tend to cancel each other out in diversified portfolios, exposure to higher specific risks is not associated with higher expected returns. However, there is a payoff for exposure to greater systematic risk (undiversified risk).

Sharpe's CAPM describes that market β (beta) and stock returns has linear combination, investors are only compensated for systematic risk not for unsystematic risk, because unsystematic risk can be eliminated through diversification. The CAPM was the first factor model. "While the CAPM attributed risk to a single systematic factor, arbitrage pricing theory (APT), presented by Stephen Ross, established a firm theoretical foundation for the existence of multiple systematic sources of risk and return, and provides the way for the multi-factor models of today.

The base for the Capital Asset Pricing Model is the model of Portfolio choice developed by Harry Markowitz (1959). In this model a portfolio at time *t*-1 is selected that generate a stochastic return at time *t*. The assumption of the model is that the investors are risk-averse and they care only about the average return and risk of their single-period investment return, when selecting portfolios. As a result, investors select 'average return-risk-efficient' portfolios that is the portfolios minimize the variation of portfolio return, given estimated return, and maximize estimated return, given variation. Thus, the approach of Markowitz is also called 'mean variance model'. The fundamental purpose of using Capital Asset Pricing Model is to find the accurate value of securities based on their risk and return.

The experimental finding that the intercepts of CAPM diverge statistically from zero has naturally led to the experimental examination of multifactor asset pricing models. The fundamental approach has been to introduce supplementary factors in the form of surplus returns on portfolios and then re-test the zero-intercept hypothesis. Fama & French (1993) [3] used this approach and concluded that the estimates of the Capital Asset Pricing Model intercepts deviate from 0 (zero) for portfolios created on the basis of the relationship of book-value to market-value of equity (BE/ME).

The Fama & French (1993) [3] three factor asset pricing model was developed as a result of increasing empirical evidence that the Capital Asset Pricing Model performed poorly in explaining realized returns. In fact, Fama & French (1992) [2] studied the joint roles of market beta, size and book-to-market equity ratio in the cross-section of average stock returns for NYSE, Amex and NASDAQ stocks over the period 1963-1990. In that study, the authors found that beta has almost no explanatory power. On the other hand, when used alone, size and book-to-market equity have significant explanatory power in explaining the cross-section of average returns. When used jointly, however, size and book-to-market equity are significant. Fama & French (1992) [2] therefore, argued that if stocks are priced rationally, risks must be multidimensional.

Fama & French (1993) [3] develop three-factor model for capturing the time series average monthly returns and use external two variables to scrutinize the undervalued/overvalued stocks. Towards a three-factor model, the starting point for our analysis, is the following of time-series regression model in which the realized excess return on a risky portfolio (RPf) is regressed against the realized excess return on a stock market index M.

Fama-French three-factor model is a widely used model for forecasting of assets in portfolio management. It explains more than 90% of return from markets therefore, mostly used by investors and portfolio managers in order to forecast returns on their investments.

Review of literature

Blume (1970) [14], Black Jensen and Scholes (1972) [11] and Stambaugh (1982) found out the evidence that beta and average return have a linear relationship; for higher beta, the firm will give higher return and there will be high risk involves for higher beta therefore, the firm will give high return.

Basu (1977) [10] exposed "CAPM underestimates the future returns on high earnings to price stocks. They also cited Banz (1981) [13] where there was an appearance of the size effect that demonstrated the inability of the CAPM to capture returns of small stocks. Small size firms have higher average returns than large size firms; small firm's gives better returns on the basis of systematic risk."

Statman (1980) found out that stocks with high book-to-market equity ratios had returns that were not captured by market betas (CAPM).

Basu (1983) showed that (E/P) ratios have additional explanation power on US stocks as compare to size and beta. Ball (1978) [12] argued that E/P can serve as a proxy for unnamed factors in expected returns. The reason being that, when stocks have relatively higher risks and expected returns, their prices are likely to be lower relative to earnings and thus the E/P is likely to be higher too."

Ferson and Harvay (1991) [7] concluded from US stocks and bonds returns that the variation in market risk premium for beta is more important. But Fama & French (1992) [2] observed that single-factor model is inadequate to explain stock's returns. It doesn't fit in the real world, because there are several other factors affecting the stock return for example size, B/M ratios, P/E ratios, leverage ratios. Moreover, according to them, the market portfolio in CAPM doesn't take into consideration the real world assets. Therefore, it cannot explain true risk and the expected return of an investment.

Bhardwaj and Brooks (1993) observed that the systematic risk varies according to market conditions i.e. the systematic risk for bullish-market is different from systematic risk in bearish-market.

Pettengil, Sundaran and Mathur (1995) [8] observed that the inconsistent results of studies testing relationship between risk and return is due to the conditional nature of the relationship between the beta and realized returns. According to them, when the realized returns are used, the relationship between beta and expected returns is conditional on the excessive market returns. They concluded that positive relationship exists between beta and returns during up-market and negative relationship exists during down-market.

Fama & French (1992) [2] found that beta has little or no ability in explaining variation in stock returns that is why they use variables such as size of the firm and the book-to-market value of equity to make variation in stock returns more reliable.

Connor and Senghal (2001) tested Fama & French three-factor model in Indian stock exchange. They tested both CAPM and Fama & French three-factor model and to observe which model is effective to predict portfolio returns in India's stock market. They took sample of CRISIL 500 and S&P 500 index in the US. Then they created six portfolios from the intersection of two sizes and three book-to-market equity group (S/L, S/M, S/H, B/L, B/M, and B/H). They presented their decision on the basis of intercept. They first looked at the level of intercept and their t-statistic, and then concluded that the three-factor model was superior because of the evidence provided by the intercepts of the time series regressions on the two asset-pricing models."

Pedro, B. de Ocampo, Jr (2003) tested the three factor model developed by Fama and MacBeth to found risk return relationship. They tested both unconditional as well as conditional CAPM. The results strongly supported conditional CAPM relationship between risk and returns but found weak relationship between risk and returns for unconditional CAPM.

Tang, G., Shum (2004) conducted a study to test CAPM validity at Singapore stock market over the period 1986 through 1998. The sample included 144 listed stocks at Singapore Stock Exchange. The unconditional test showed weak positive relationship between risk and returns while the conditional test found significant relationship between risk and realized returns.

Data and methodology

The objective of this paper is to test empirically and statistically the performance and efficiency of two stock-pricing models. Fifty company's data has used. The data was collected from the following sources. From the websites of KSE (Karachi Stock Exchange), business recorder, yahoo finance and State Bank of Pakistan website. This research base on cross sectional data which sample regression is applied on CAPM using data for the period from January 2003 to December 2012. The share prices and market index data have been obtained from Karachi Stock Exchange and annual reports of the companies obtained from their websites. This study focuses on individual stock not on portfolios. In order to conduct study this research base on cross sectional data which sample regression is applied on CAPM. We follow Capital Asset Pricing Model (CAPM). For these accounting variables, we match the accounting data for all fiscal year-ends in calendar year (January 2003–December 2012). Capital Asset Pricing Model (CAPM) is based on the idea that the returns of individual assets are subjective by the market itself.

CAPM Model Specification

CAPM and Fama & French Model Specification

The CAPM and Fama & French three-factor approach by performing cross-sectional regression on monthly returns against the variables in the following equation:

$$R_i - R_f = \alpha + \beta_1 (R_m - R_f) \quad (1)$$

And

$$R_i - R_f = \alpha + \beta_1 (R_m - R_f) + \beta_2 (SMB) + \beta_3 (HML) \quad (2)$$

Where

R_i = Security returns = (previous price – current price)/ previous price or $(p_1 – p_o)/ p_0$
R_m = Return on Market Portfolio = $(Index_1-Index_o)/ Index_o$
R_f = Risk free rate = T-bill rates.
$R_m – R_f$ = The excess return on a individual selected stocks.
$R_m – R_f$ = The excess return on a broad market portfolio.
SMB = The difference between the return on a portfolio of small stocks and the return on a portfolio of Big stocks (SMB).
HML = The difference between the return on a portfolio of high-book-to-market stocks and low-book-to- market stocks (HML).

The regression model is a conventional one, resulting in an alpha, Beta, R-square, adjusted R-square, F-values and T-values, and an error term for each stock. The error term is a normally distributed variable with a zero mean. We have selected fifty firms, for this study, the excess the returns of these companies are our dependent variable (Ri–Rf). R_m-R_f (Market premium), SmB (Size premium) and HmL (Value premium/(value stocks) or independent variables.

Analysis and results
Analysis of CAPM

A	t(α)	P-value	B	t(β)	P-Value	F-value	R-Square	Adjusted R-Square
0.01151	1.6289	0.1088	0.9115	9.7722	8.6897E-14	95.4960	0.6262	0.6196

P-values
P-value for α (alpha) is 0.108 we can say that parameter α (alpha) is insignificant. This value demonstrates that the model is a good model for stock valuation.

The result of the regression analysis is given in the table below. Individual excess security returns is dependent and market excess returns is our independent variable. From these result the following relationship can be established.

Security Risk Premium = α + β (Market Risk premium)
SRP = α + β (MRP)
SPR = 0.011+ 0. 0.911 MRP

From the result of regression investigation we can say that a 100% change in market returns leads to 91.1% positive change in our security returns.

R^2 is the coefficient of determination and is defined as the proportion of the total variation in dependent variable explained by the variation in independent variable. If R^2 was closed to 1 this would mean perfect correlation, whereas, if it was closed to 0, it would mean that the independent variables would not have any explanatory power on the dependant variable. The actual value determined for R^2 is 0.626 (i.e. 62.6 %) which suggests that the model is good in explaining the size effect.

In ANOVA value of regression sum of squares are greater than their residual sum of squares value signifying that the dependency between variables has a good fit.

Analysis of Fama & French three factor model

Summary output							
Regression Statistics							
Multiple R	0.863532						
R Square	0.745687						
Adjusted R Square	0.731816						
Standard Error	0.042663						
Observations	59						
ANOVA							
	Df	***SS***	***MS***	***F***	***Significance F***		
Regression	3	0.293538	0.097846	53.75638	2.31E-16		
Residual	55	0.10011	0.00182				
Total	58	0.393647					
	Coefficients	***Standard Error***	***T Stat***	***P-value***	***Lower 95%***	***Upper 95%***	***Lower 95.0%***
Intercept	1.82E-05	0.006073	0.003002	0.997616	-0.01215	0.012189	-0.01215
X Variable 1	-0.03998	0.095861	-0.41709	0.678239	-0.23209	0.152127	-0.23209
X Variable 2	-0.12084	0.022305	-5.4175	1.38E-06	-0.16554	-0.07614	-0.16554
X Variable 3	0.869834	0.080458	10.81103	3.17E-15	0.708593	1.031076	0.708593

The outcome of the regression analysis is given in the above table. Individual excess security returns is dependent and market excess returns is our independent variable. From these result the following relationship can be established.

Security Risk Premium = α + β1 (SMB) + β2 (HML) + β3 (Rm-Rf)
SRP = α + β (MRP)
SPR = 1.82E-05 + (-0.03998) (SMB) + (-0.12084) (HML) + (0.869834) (Rm-Rf)
SPR = 1.82E-05 - 0.03998 (SMB) - 0.12084 (HML) + 0.869834 (Rm-Rf)

From the outcome of regression analysis we can say that a 100% in small minus big firms returns leads to 3.99 % negative change in our security returns.

Cent percent change in high minus large book to market ratios firms returns leads to 12.08 % negative change in our security returns.

Cent percent change in market excess returns leads to 86.89 % positive change in our security returns.

R^2 is the coefficient of determination, and is defined as the proportion of the total variation in dependent variable. If R^2 was close to 1 this would mean perfect correlation, where as if it was close to 0, it would mean that the independent variables would not have any explanatory power on the dependant variable. The actual value determined for R^2=0.745 (i.e 74.5

%), which suggests that the model is good in explaining the size effect.

In ANOVA value of regression sum of squares are greater than their residual sum of squares value signifying that the dependency between variables has a good fit.

P-values

P-value for α (alpha) is 0.99 we can say that parameter **α** (alpha) is significant.

	α	t(α)	P-value	B	t(β)	P-Value	F-value	R-Square	Adjusted R-Square
Intercept	1.82E-05	0.9976	0.9976				2.31E-16	0.7456	0.7318
X-1 SMB				-0.0399	0.678239	0.678239			
X-2 HML				-0.1208	1.38E-06	1.38E-06			
X-3(Rm – Rf)				0.8698	3.17E-15	3.17E-15			

Table 1

Firms	A	t(α)	P-value	B	t(β)	P-Value	F-value	R-Square	Adj. R-Square
GADT	(0.0132)	(0.9368)	0.3529	0.8769	4.7116	0.0000	22.1990	0.2839	0.2711
BNWM	(0.0012)	(0.0687)	0.9455	0.4891	2.1378	0.0369	4.5702	0.0755	0.0589
IBFL	0.0043	0.2240	0.8235	0.8704	3.4820	0.0010	12.1243	0.1780	0.1633
ACPL	0.0155	1.0082	0.3176	0.5653	2.7794	0.0074	7.7251	0.1194	0.1039
BWCL	(0.0011)	(0.0621)	0.9507	0.9824	4.2281	0.0001	17.8772	0.2388	0.2254
CHCC	(0.0037)	(0.1554)	0.8771	0.7393	2.3795	0.0207	5.6618	0.0904	0.0744
DGKC	(0.0033)	(0.2695)	0.7885	1.1812	7.3606	0.0000	54.1782	0.4873	0.4783
FCCL	(0.0135)	(0.6292)	0.5317	1.1780	4.1478	0.0001	17.2038	0.2318	0.2184
LUCK	0.0365	1.1748	0.2450	1.7337	4.2266	0.0001	17.8638	0.2386	0.2253
MLCF	(0.0122)	(0.7332)	0.4664	1.0638	4.8387	0.0000	23.4128	0.2912	0.2787
PHMP	0.0706	1.0524	0.2971	1.7654	1.9932	0.0510	3.9728	0.0652	0.0488
PAKT	0.0073	0.2899	0.7730	0.9642	2.8979	0.0053	8.3976	0.1284	0.1131
ATRL	0.0256	0.6296	0.5314	1.5114	2.8160	0.0067	7.9300	0.1221	0.1067
NRL	0.0050	0.1782	0.8592	1.2962	3.5124	0.0009	12.3372	0.1779	0.1635
PRL	(0.0029)	(0.1328)	0.8948	1.1524	4.0678	0.0001	16.5469	0.2250	0.2114
KESC	(0.0374)	(1.2986)	0.1993	1.0265	2.7035	0.0090	7.3088	0.1137	0.0981
PSO	(0.0122)	(1.5478)	0.1272	0.8555	8.2128	0.0000	67.4504	0.5420	0.5340
SHELL	(0.0063)	(0.4596)	0.6475	0.7160	3.9666	0.0002	15.7343	0.2163	0.2026
SNGP	(0.0357)	(1.7096)	0.0928	0.9678	3.5126	0.0009	12.3385	0.1779	0.1635
SSGC	(0.0224)	(1.7910)	0.0786	0.9806	5.9503	0.0000	35.4056	0.3832	0.3723
MARI	0.0294	0.7889	0.4334	1.5628	3.1721	0.0024	10.0623	0.1500	0.1351
OGDC	(0.0121)	(0.9783)	0.3320	1.1414	6.9870	0.0000	48.8185	0.4613	0.4519
POL	(0.0166)	(1.0980)	0.2768	1.2797	6.4208	0.0000	41.2264	0.4197	0.4095
INIL	0.0021	0.0983	0.9220	0.6645	2.3335	0.0232	5.4450	0.0872	0.0712
AGTL	0.0061	0.4900	0.6260	0.6897	4.1874	0.0001	17.5344	0.2353	0.2218
ATLH	0.0126	0.6783	0.5004	0.5582	2.2786	0.0265	5.1921	0.0835	0.0674
HCAR	(0.0256)	(1.2029)	0.2340	1.4541	5.1777	0.0000	26.8081	0.3199	0.3079
INDU	0.0050	0.3860	0.7009	1.0219	5.9912	0.0000	35.8945	0.3864	0.3756
MTL	0.0010	0.0810	0.9358	0.4009	2.4932	0.0156	6.2161	0.0983	0.0825
PSMC	0.0086	0.5372	0.5932	0.8492	4.0044	0.0002	16.0349	0.2196	0.2059
ENGRO	(0.0018)	(0.2305)	0.8185	0.6512	6.2928	0.0000	39.5991	0.4099	0.3996
FFBL	(0.0009)	(0.0781)	0.9381	0.8881	5.9969	0.0000	35.9630	0.3869	0.3761
FFC	(0.0084)	(0.9780)	0.3322	0.4615	4.0548	0.0002	16.4417	0.2239	0.2103
PKGS	0.0064	0.5771	0.5661	0.5798	3.9336	0.0002	15.4735	0.2135	0.1997
BATA	0.0597	1.0882	0.2811	0.8630	1.1915	0.2384	1.4196	0.0243	0.0072
NESTLE	0.0993	0.6786	0.5001	2.2801	1.1802	0.2428	1.3929	0.0239	0.0067
ULEVER	(0.0025)	(0.4358)	0.6647	0.3124	4.0530	0.0002	16.4271	0.2237	0.2101
GHGL	0.0007	0.0501	0.9602	0.3908	2.1885	0.0327	4.7895	0.0775	0.0613
ABOT	(0.0001)	(0.0051)	0.9960	0.5750	3.1269	0.0028	9.7774	0.1464	0.1314
ICI	(0.0044)	(0.3747)	0.7093	1.0469	6.7370	0.0000	45.3877	0.4433	0.4335
SIEM	0.0168	1.0934	0.2788	0.5431	2.6744	0.0098	7.1523	0.1115	0.0959
THAL	0.0237	1.2325	0.2228	0.6396	2.5239	0.0144	6.3702	0.1005	0.0847
NML	(0.0019)	(0.1283)	0.8983	1.5866	7.9490	0.0000	63.1868	0.5257	0.5174
COLG	0.0464	1.6660	0.1012	0.1830	0.4976	0.6207	0.2476	0.0043	(0.0131)
PSEL	0.0341	1.4767	0.1453	0.7291	2.3935	0.0200	5.7289	0.0913	0.0754
LOTPTA	(0.0329)	(2.7178)	0.0087	1.0551	6.5988	0.0000	43.5441	0.4331	0.4231
KOHE	(0.0268)	(1.5267)	0.1324	0.4445	1.9180	0.0601	3.6788	0.0606	0.0441
HUBC	(0.0217)	(2.5080)	0.0150	0.6147	5.3825	0.0000	28.9711	0.3370	0.3254
GATI	0.0036	0.1484	0.8826	0.4630	1.4654	0.1483	2.1475	0.0363	0.0194
DREL	0.0309	0.8563	0.3954	0.8412	1.7643	0.0830	3.1128	0.0518	0.0351
PNSC	0.0123	0.5272	0.6001	1.6017	5.1842	0.0000	26.8761	0.3204	0.3085
Firms									
GADT	0.011511	1.628914	0.108846	0.911531	9.772208	8.6897E-14	95.49605835	0.626219847	0.619662301
BNWM									
IBFL									

Table 2: Regression Result of Fama French 3-factor model

Companies	α	t(α)	P-value	B	t(β)	P-Value	F-value	R-Square	Adjusted R-Square
Big Firms									
PSO	(0.012)	(1.548)	0.127	0.855	8.213	0.000	67.450	0.542	0.534
FFC	(0.008)	(0.978)	0.332	0.461	4.055	0.000	16.442	0.224	0.210
HUBC	(0.022)	(2.508)	0.015	0.615	5.382	0.000	28.971	0.337	0.325
POL	(0.011)	(0.795)	0.430	1.241	6.712	0.000	45.047	0.441	0.432
SNGP	(0.011)	(0.795)	0.430	1.241	6.712	0.000	45.047	0.441	0.432
FFBL	(0.001)	(0.078)	0.938	0.888	5.997	0.000	35.963	0.387	0.376
NESTLE	0.099	0.679	0.500	2.280	1.180	0.243	1.393	0.024	0.007
KSEC	(0.025)	(1.372)	0.175	1.167	4.902	0.000	24.026	0.297	0.284
NRL	0.003	0.181	0.857	0.973	4.156	0.000	17.275	0.233	0.219
ENGRO	(0.002)	(0.231)	0.819	0.651	6.293	0.000	39.599	0.410	0.400
ULEVER	(0.003)	(0.436)	0.665	0.312	4.053	0.000	16.427	0.224	0.210
LOTPTA	(0.033)	(2.718)	0.009	1.055	6.599	0.000	43.544	0.433	0.423
SHELL	(0.018)	(1.463)	0.149	0.642	4.023	0.000	16.182	0.221	0.207
SSGC	(0.021)	(1.680)	0.098	1.248	7.517	0.000	56.512	0.498	0.489
PAKT	0.010	0.541	0.591	1.091	4.612	0.000	21.274	0.272	0.259
Small Firms									
PSEL	0.0341	1.4767	0.1453	0.7291	2.3935	0.0200	5.7289	0.0913	0.0754
CHCC	(0.0110)	(0.4685)	0.6412	(0.7386)	(2.3782)	0.0208	5.6557	0.0903	0.0743
SIEM	0.0168	1.0934	0.2788	0.5431	2.6744	0.0098	7.1523	0.1115	0.0959
ACPL	0.0155	1.0082	0.3176	0.5653	2.7794	0.0074	7.7251	0.1194	0.1039
PRL	(0.0083)	(0.3760)	0.7083	1.0873	3.7210	0.0005	13.8462	0.1954	0.1813
ATRL	(0.0044)	(0.2082)	0.8358	1.3554	4.8116	0.0000	23.1519	0.2889	0.2764
MARI	0.0092	0.4812	0.6322	0.9865	3.9093	0.0002	15.2824	0.2114	0.1976
COLG	0.0464	1.6660	0.1012	0.1830	0.4976	0.6207	0.2476	0.0043	(0.0131)
HCAR	(0.0256)	(1.2029)	0.2340	1.4541	5.1777	0.0000	26.8081	0.3199	0.3079
MTL	0.0010	0.0810	0.9358	0.4009	2.4932	0.0156	6.2161	0.0983	0.0825
GHGL	0.0007	0.0501	0.9602	0.3908	2.1885	0.0327	4.7895	0.0775	0.0613
GADT	(0.0149)	(1.0759)	0.2865	0.8970	4.9092	0.0000	24.1005	0.2972	0.2848
THAL	0.0237	1.2325	0.2228	0.6396	2.5239	0.0144	6.3702	0.1005	0.0847
BATA	0.0597	1.0882	0.2811	0.8630	1.1915	0.2384	1.4196	0.0243	0.0072
BNWM	(0.0056)	(0.3260)	0.7456	0.5430	2.3830	0.0205	5.6788	0.0906	0.0746
High B/M									
GADT	(0.01005)	(0.42428)	0.67296	0.94330	3.01698	0.00381	9.10218	0.13770	0.12257
MLCF	(0.00789)	(0.41595)	0.67901	0.95300	3.80508	0.00035	14.47860	0.20256	0.18857
NML	0.01304	0.31521	0.75375	1.62546	2.97575	0.00428	8.85507	0.13446	0.11928
DGKC	0.00287	0.16798	0.86720	1.06340	4.70939	0.00002	22.17838	0.28011	0.26748
KOHE	0.03401	1.95237	0.05581	(0.09477)	(3.43497)	0.00111	11.79899	0.17150	0.15696
BNWM	0.01547	0.74843	0.45728	(0.05264)	(1.60780)	0.11340	2.58503	0.04338	0.02660
PKGS	0.02978	2.08378	0.04167	(0.09321)	(4.11818)	0.00012	16.95943	0.22931	0.21579
HUBC	(0.00658)	(0.57173)	0.56975	(0.09321)	(4.11818)	0.00012	1.05013	0.01809	0.00086
LOTPTA	(0.00879)	(0.57197)	0.56959	0.27166	11.16157	0.00000	124.58062	0.68609	0.68058
PRL	0.03173	1.28397	0.20435	(0.06650)	(1.69914)	0.09475	2.88707	0.04821	0.03151
IBFL	0.03096	1.47790	0.14494	(0.05273)	(1.58927)	0.11753	2.52578	0.04243	0.02563
HCAR	0.01248	0.44211	0.66008	0.11100	2.48376	0.01596	6.16906	0.09766	0.08183
CHCC	0.00629	0.34078	.73452	0.13529	4.62482	0.00002	21.38895	0.27286	0.26010
GATI	0.01361	0.50463	0.61576	0.22094	5.17351	0.00000	26.76524	0.31953	0.30759
NRL	0.06384	1.19662	0.23641	(0.13851)	(1.63935)	0.10665	2.68748	0.04503	0.02827
Low B/M									
INDU	(0.0101)	(0.4243)	0.6730	0.9433	3.0170	0.0038	9.1022	0.1377	0.1226
PSO	(0.0122)	(1.5478)	0.1272	0.8555	8.2128	0.0000	67.4504	0.5420	0.5340
POL	(0.0138)	(0.7560)	0.4528	1.2622	5.2299	0.0000	27.3521	0.3243	0.3124
ATRL	0.0395	0.8644	0.3910	1.2670	2.0984	0.0403	4.4034	0.0717	0.0554
FFBL	0.0057	0.3072	0.7598	0.7776	3.1961	0.0023	10.2150	0.1520	0.1371
INIL	0.0057	0.1873	0.8521	0.7810	1.9602	0.0549	3.8426	0.0632	0.0467
FFC	(0.0075)	(0.8331)	0.4083	0.4214	3.5522	0.0008	12.6183	0.1812	0.1669
ABOT	(0.0000)	(0.0020)	0.9984	0.6106	3.0046	0.0039	9.0275	0.1367	0.1216
KESC	(0.0359)	(1.2024)	0.2342	1.0716	2.7168	0.0087	7.3809	0.1146	0.0991
COLG	0.0740	1.1934	0.2376	0.04382	0.5352	0.5946	0.2864	0.0050	(0.0125)
PHMP	0.2536	0.7228	0.4728	4.2260	0.9125	0.3653	0.8327	0.0144	(0.0029)
PSEL	0.0563	1.1737	0.2454	0.8823	1.3938	0.1688	1.9426	0.0330	0.0160
	0.0071	0.2835	0.7778	0.7823	2.3622	0.0216	5.5799	0.0892	0.0732
	0.1315	0.8647	0.3908	2.6333	1.3119	0.1948	1.7210	0.0293	0.0123
	0.0009	0.0664	0.9473	0.3049	1.7780	0.0807	3.1614	0.0525	0.0359

	A	t(α)	P-value	B	t(β)	P-Value	F-value	R-Square	Adjusted R-Square
Intercept	1.82E-05	0.997616	0.997616				2.31E-16	0.745687	0.731816
X Variable 1				-0.03998	0.678239	0.678239			
X Variable 2				-0.12084	1.38E-06	1.38E-06			
X Variable 3				0.869834	3.17E-15	3.17E-15			

Regression outcome

Table-1 shows regression result for fifty companies, which are listed in Karachi stock exchange. First we calculate average monthly returns from stock price. Using CAPM approach calculating parameters, R-square and P-values through simple regression, we are tracing the significance and insignificance of parameters through P-value, in table – 1, out of fifty regression results there are five companies alphas (α) are insignificant and the rest are significant. CAPM approach strongly relies on alpha (α), but here out of fifty companies forty becomes significant and the rest is insignificant.

R-square = 0.62, means that 62.6 % variation in stock returns are due to explain variable and the rest are unknown.

Table – 2 shows the regression result of Fama & French approach, taking two extra independent variables and one dependent variable. Arrangements are taking place on the bases of size premium (SMB) and book to market equity premium (BML), thirty companies are taking on the basis of size risk premium (SMB) and thirty companies are on the basis of book to market equity premium (HML).

Shows six companies alphas (α) are insignificant and the rest are significant.

This result seems to same as CAPM result, both models are good to predict companies stock's return which are listed on Karachi stock exchange.

R-square = 74.5 %, means that 74.5 variation in stock returns are due to explain variable and the rest is unknown, as compare to CAPM its good.

Regression result predicts, that the three factor model has good descriptive power because the model significant are trace here when α is insignificant, and the calculation are made that all models are good, we can use these interchangeably. Different researches were conducted on the performance of CAPM and Fama & French stock valuation models, most of the studies recommended that Fama & French three factor model perform better than CAPM; our dilemma is observing that these models (CAPM and Fama & French) are same in performance; these models have the capability to outperform market.

Conclusion

In this study, we scrutinize the effectiveness and performance of the two asset-pricing models CAPM and Fama & French three factor models applied to company's stocks listed on Karachi stock exchange. Fama & French three-factor model, which contains a market factor, size premium and book to market equity premium. Although Fama & French (1998) provide evidence for the international version of the model (i.e. when the factors are global), many practitioners and academics use a domestic version of this asset pricing model. Moreover, Griffin (2002) shows that the domestic three - factors model clearly outperforms the global model for the US, Japan, Canada and the UK. We are taking a sample of fifty Pakistani companies the result given us a clue that models which we are taking, have performed better.

Three accounting variables, size premium, book-to-market equity premium and market premium, enable us to capture the average returns over the period. CAPM and Fama & French three-factors models are correct to serve as proxy for risk. These models can be used as benchmark for portfolio performance evaluation by fund managers and investors. Fund managers and investors can evaluate their portfolios by comparing their portfolio returns to the benchmark model with similar size, book-to-market equity characteristics. If their portfolio returns are higher than the benchmark, they are able to outperform the market.

Fama & French locate the position of empirically un-explained elements of Sharp's CAPM, which have a little empirical evidence for implication. But our result shows that CAPM, Fama & French three actors model have good descriptive power.

Here we are taking fifty company's monthly average returns and three independent variables; calculate parameters, P-values and R-Squar through simple regression. The result showed that these models are performing well to calculate companies stock's returns listed on Karachi stock exchange, for the entire study period January 2003 till December 2012.

We are here comparing models on the basis of parameter α (alpha), if α (alpha) is insignificant the model is said to be correct. Tables at last show that six alphas for Fama & French 3 - factor model, five for CAPM model are insignificant, indicates that the two models performing well, and explanatory power of these models are probable.

The hypothesis which we have selected, that Fama & French three factors modes has better explanatory power than CAPM, come to fails. We have to checked the performance of asset valuation models (CAPM and Fama & French) by choosing fifty companies, listed on Karachi stock exchange, Our study proved that both stocks valuation models perform well, both have good explanatory power to forecast stock's return of companies listed on KSE (Karachi stock exchange). Therefore the hypothesis that Fama & French has better descriptive power than CAPM fails.

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