

# Net Stock Issue Effect on Karachi Stock Exchange

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## ABSTRACT

*Asset pricing models have been source of interest since many years with respect to their efficiency in predicting asset returns. CAPM is among first such models which provided a coherent framework to this question, and is still been treated as a puzzle. Ever since its presentation, a number of researchers have tried to test it and over the years it has been demonstrated through empirical evidence that there are a number of factors outside its framework, which are also significantly contributing towards returns estimation. This study aim to test the CAPM model in light of one such factor i.e. Net Stock Issue, which empirically has been demonstrated to result in low returns. We are using KSE all index data with 904 firms from July 1993 to June 2010. The data for variables have been taken from Thomson Reuters DataStream with monthly returns, number of shares outstanding (NOSH) and market values of each firm. We have further constructed pentile portfolios on the basis of Net Stock Issue and subsequently computed equally weighted and value weighted returns of these portfolios. Using Generalized Method of Moments (GMM) we have tested these portfolio returns for significant difference from CAPM based returns. We have been able to demonstrate that the Net Stock Issue is not a significant predictor of assets returns and CAPM has also been found to be not explaining the returns pattern in KSE.*

**Keywords:** CAPM, Net Stock Issue, GMM, Market Anomalies.

## INTRODUCTION

Investment theory has largely been used to explain the decision making by investors for a number of investment objectives. This theory includes portfolio theory, capital asset pricing model (CAPM), arbitrage pricing theory, rational pricing and efficient market hypothesis. Among these, the portfolio theory presented by Markowitz is intended to increase the expected return of portfolio for a given level of portfolio risk. Whereas this theory among other assumptions is also dependent on Capital Markets theory and Efficient Market Hypothesis (EMH) with one of the fundamental assumptions being, the markets are efficient i.e. the market prices and returns in turn, reflect all the information related to investment as it is available to all the investors in Market. Therefore, investment strategy based on the predicted returns behavior is not possible as each day market prices will reflect information available on the day. While CAPM assumes the returns based on inherent risk as measured by Mean Variance Model or CAPM Beta (Fama and French, 2008) is predictable. However, basic assumptions of CAPM and EMH are found to be not robust because some factors and events like Value, B/P ratio, Profitability, Net Stock Issue, Stock Repurchases and Stocks with low market capitalization result in predictability of stock returns (Banz, 1981; Chan, Hamao & Lakonishok, 1991; Ikenberry, Lakonishok, Vermaelen, 1995). As these factors help define returns pattern outside mean variance framework, thus rejecting EMH and CAPM, they are known as asset pricing anomalies.

The net stock issue as a predictive factor in stock returns is considered an anomaly in terms of EMH and CAPM as with the net stock issue the relationship of return has been found to be negative thus predictable. Sehgal & Pandey (2013) studied this asset pricing anomaly using

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BSE500 stock data and found it to be consistent with empirical evidence. The study was based on size, value (price to book Value), momentum and net stock issue as anomalous factors using Fama-Macbeth regression model. They were able to report strong and negative issue effect on returns.

Net stock issue is composed of two independent events i.e. issuance of stocks as initial public offering (IPO) or seasoned equity offering (SEO) and stock repurchases. Both the events individually and collectively have resulted in returns which are not possible to be explained with CAPM model. Spiess and Affleck-Graves (1995) in their study have reported lower returns on initial public offering or seasoned equity offering, three to five years after issues, while Peyer and Vermaelen (2009) in their study of open market repurchases have reported superior and long term returns during 1991-2001 period, supporting the empirical evidence.

Traditionally, firms have engaged in buying back the stocks either to support undervalued stocks or distribute excessive cash among shareholders and sometimes it is related to boosting earnings per share (EPS). Grullon and Ikenberry (2000) has however, rejected the notion that it is to boost earnings per share. They argue that stock buybacks have better uses and serves two purposes: i) from managerial perspective they are tax-efficient means of returning excess capital to shareholders rather than excess cash, as stock buybacks are taxed as capital gains with preferential tax treatment and ii) they are used as signals to investors, that the firm is undervalued, encouraging investors to invest in these stocks. However, Chen et al. (2012) has reported that the firm may use Signaling Theory to mislead the market with stock buybacks as a false signal to increase the market prices in order to let the firm insiders sell their stocks at favorable prices. A third reason of stock buybacks has also been identified in empirical research as reduction in Agency Cost as Oswald and Young (2008) report the distribution of capital prevents of wastage of free cash flows by managers, cash flow distribution results on lack of growth in such firms. Empirical evidence has also been able to relate the stock buybacks with reduced systematic risk resulting in reduced cost of capital for such firms, based on free cash flow hypothesis presented by Jensen (1988) resulting in spoilage of capital by managers.

The other anomaly making up net stock issue i.e. stock issue, in any form is also found to anomalous in empirical research. A 'New Puzzle Issue' has been reported by Loughran and Ritter in their (1998) and (2005) study, where firms involved in IPO or Seasoned Equity Offering during 1970 to 1990, underperformed as compared to the benchmark portfolio of firms controlled on the basis of size, B/M ratio and some more firm related characteristics. The magnitude of this effect can be judged from their observed finding that an investor in firms issuing the security had to invest 44% more than the non-issuing firms.

Bayless and Jay (2007) had observed similar affect related to stock issue. They however argued that their findings are consistent with Schultz, P. (2003) findings about pseudo market timings. As per Schultz (2003) Pseudo Market Timing hypothesis, he argues that the post stock issue underperformance is may be a statistical illusion due to the clustering of IPOs after a period of unusually high abnormal returns for a number of previous IPO firms, where the manager have no understanding of timing option, as the abnormal returns associated are not predictable for ex-post IPO's. As a result of this pseudo market timing, the probability of observing long-run underperformance ex-post event time may far exceed 50 percent.

As far as the net stock issues is concerned, this anomaly results in the negative relation between change in equity and future stock returns over long run, though a similar effect has also been reported in short run. The fact has been captured by Ikenberry, Lakonishok, and

Vermaelen (1995) that the future returns were reported to be high as compared to firms with stock repurchases and opposite affect was observed with low return after issuance of stocks (Loughran and Ritter 1995). While exploring the net stock issue, Daniel and Titman (2006) and, Pontiff and Woodgate (2008) show that there is a negative relation between net stock issues and equity returns. Loughran and Ritter (2003), in a recent review of this literature hypothesizes that this relation arises because firms issue new securities when they are temporarily overvalued and repurchase securities when they are temporarily undervalued by the capital markets. Baker and Wurgler (2004) reports, firms initiate dividends, when the shares of existing payers are trading at a premium as compared to those of nonpayers, and dividends are omitted when payers are trading at a discount. Papanastasopoulos et. al. (2006) has provided a new behavioral explanation for the net stock issues anomaly by examining its relation with the accrual (retained earnings) anomaly. In particular, using a comprehensive measure of the net amount of cash related to equity financing activities (dividends plus stock repurchases minus stock issues), they show that the net stock issues anomaly is largely subsumed by the accounting anomaly on retained earnings and suggest that it arises from investor's limited attention on discretionary decisions by management. On the other hand, Eckbo, Masulis and Norli (2000) and Eckbo and Norli (2005) argue that issuing firms are assumed as less risky by investors and hence are priced to yield lower expected returns.

As compared to other anomalies like size, value, momentum, dividend effect, this anomaly is comparatively less researched and new. The size effect was first reported by Banz (1981), while Basu, S. (1977) tossed the findings of value effect, that P/E ratio is also showing explanatory power against the systematic risk as dictated by CAPM. While Jagdeesh and Titman presented the finance literature with Momentum effect which is based on the stock returns behavior in term of momentum maintained by returns in 1993 The Dividend policy effect was explored way back in 1961 by Miller and Modigliani in their work on impact of dividend policy on stock valuation. Loughran and Ritter (1995) laid the foundation of Net Stock Issue anomaly with subsequent studies by Daniel and Titman (2006) and Pontiff and Woodgate (2008) citing negative relation between net stock issues and average returns. While earlier work by Dann (1981), Rosenfeld (1981), Vermaelen (1981), Ikenberry (1995), Lakonishok, and Vermaelen (1990) covered stock buybacks and returns after stock issues as a separate phenomenon.

## **METHODOLOGY**

### **Data**

The population of the study is all listed firms in Karachi Stock Exchange from July 1993 to June 2010 comprising of dead or alive 904 firms. We have used monthly data for all variables.

The total returns index have been used to estimate the monthly returns because this is considered as robust approach and it frees us from the non-synchronous trading bias, apart from issues of adjusting the dividends, stock splits in computing returns. All the stock, listed and de-listed for any reason, have been used, to control for the survivorship bias as Grinblatt and Titman (1989), Brown and Goetzman (1995) has reported an upward bias in average returns of the portfolio because of surviving firms. Apart from this, care has been taken to control the delisting bias as well, using Dimsen et al. (2003) and Soars and Stark (2009) methodology, as it creates the survivorship effect.

Our data also includes the Excess Returns for constructing the portfolios. For this we have used yield one month Karachi Interbank Offer Rate (KIBOR) as a proxy for risk free rate and value weighted return on the KSE All index has been used as proxy for the return on the





$$R_t^x = \alpha + \beta F_t + \varepsilon_t, \dots\dots\dots(6)$$

$$E(\varepsilon_t) = 0 \text{ and } Cov(f_t, \varepsilon_t) \quad t=1, \dots, T$$

Where  $R_t^x$  is the 5 x 1 vector containing excess returns of the pentile portfolios,  $\alpha$  is the 5 x 1 vector containing the intercepts of the model,  $\beta_i$  the 5 x k dimension matrix of portfolios returns sensitive to the market risk factors and  $f_t$  contains the excess market returns. Thus equation (3.2) can be written as:

$$\begin{pmatrix} R_{1,t} \\ \vdots \\ R_{5,t} \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \vdots \\ \alpha_5 \end{pmatrix} + \begin{pmatrix} \beta_{11} & \dots & \beta_{1,k} \\ \vdots & \ddots & \vdots \\ \beta_{5,1} & \dots & \beta_{5,k} \end{pmatrix} \begin{pmatrix} f_{1,t} \\ \vdots \\ f_{k,t} \end{pmatrix} + \begin{pmatrix} \varepsilon_{1,t} \\ \vdots \\ \varepsilon_{5,t} \end{pmatrix} \dots\dots\dots(7)$$

Where  $E(\varepsilon_t)=0$  and  $Cov(f_t, \varepsilon_t)=0$

If ' $\theta$ ' denotes the set of unknown parameters [ $\alpha \beta$ ]. The GMM estimator of ' $\theta$ ' minimizes to the following quadratic form:

$$g(\theta)^T W g(\theta), \text{ where } g(\theta) = \left(\frac{1}{T}\right) \sum_{t=1}^T Z_t(\theta) \dots\dots\dots(8)$$

The GMM moment's condition are defined at the true values of  $\alpha$  and  $\beta$  as,

$$Z_t(\theta) = \begin{bmatrix} (R_t^x - \alpha - \beta f_t) \\ (R_t^x - \alpha - \beta f_t) \otimes [f_t] \end{bmatrix} \dots\dots\dots(9)$$

Where, 'W' is the consistent estimator of the weighting matrix and; while Newey and West's (1987) procedure has been used to handle the issue of autocorrelation and heteroscedasticity in data. The efficiency of  $f_t$  suggests that the estimates of the ' $\alpha$ ' should not be different from 'Zero' if the returns model CAPM assumptions. Thus, our time series data of excess returns and Net Stock Issue factor  $[R_t^x, f_t]_{t=1}^T$ , the alpha of expected returns of the CAPM model are estimated using GMM and followed by the construction of the Wald test based on null hypothesis:

$$H_0 : \alpha_i = 0 \quad \text{for } i=1,2,3,\dots,5 \dots\dots\dots(10)$$

Wald test lets us know whether an asset pricing model can explain the time series behavior of the risk factors and analyses the joint significance of all the intercepts or pricing errors. This test is equivalent to test employed by the Gibbson et al. (1989) (GRS) test under the null hypothesis. Cochran (2005) has shown standard Wald statistics for the joint test of significance of pricing error with following equation:

$$WaldStatistics = T[1 + C]^{-1} \hat{\alpha} \hat{\Gamma}^{-1} \hat{\alpha} : \chi_{N-K}^2 \dots\dots\dots(11)$$

## Empirical Analysis

The Average NSI figures reported in Table-I signify that the NSI is a meaning full sorting criterion for creating portfolios as we observe a significant variation in standardized NSI across the five portfolios. However, the returns and corresponding CAPM Beta show an inconsistent trend as against CAPM assumptions, for full sample and two sub-samples in Table-I. Where P1-P5 spread strategy results are also found to be insignificant for sample and two sub-sample periods 1993-2002 and 2002-2010. However, the empirical evidence of low and significant returns after NSI, has been contested by FU et. al. (2002); who describe the impact as either due to bad model specification, market inefficiency or market timing hypothesis. Thus, insignificance results are in line with their findings.

**Table-I**  
**Performance and Statistics of pentile portfolios constructed on the basis of**  
**Net Stock Issue for All Sample i.e. July 1993 – June 2010**

	<i>P1</i>	<i>P2</i>	<i>P3</i>	<i>P4</i>	<i>P5</i>	<i>P1-P5</i>	<i>t-test</i>
Average NSI	-0.010	0.003	0.011	0.061	0.407	-0.417	-37.54
EW returns (% p.a.)	46.19	3.57	4.20	3.10	6.42	39.77	0.96
VW Returns (% p.a)	1.40	6.53	11.93	1.85	1.01	0.39	0.045
MV (Rs.M)	897.60	1016.20	829.65	1492.75	1479.80	-582.20	-5.98
CAPM Beta	0.90	0.92	1.0	1.10	1.3	0.40	5.21

**Performance and Statistics of pentile portfolios constructed on the basis of**  
**Net Stock Issue for sub-sample-I i.e. July 1993 – June 2002**

	<i>P1</i>	<i>P2</i>	<i>P3</i>	<i>P4</i>	<i>P5</i>	<i>P1-P5</i>	<i>t-test</i>
Average NSI	-0.020	0.004	0.013	0.072	0.419	-0.421	-23.541
EW returns (% p.a.)	-0.06	1.94	2.97	3.10	2.83	-2.891	1.365
VW Returns (% p.a)	-2.93	-6.49	4.33	-0.74	-7.21	4.284	0.369
MV (Rs.M)	513.97	644.59	458.37	474.18	473.91	40.063	12.679
CAPM Beta	0.90	0.92	1.0	1.10	1.30	0.40	5.21

**Performance and Statistics of pentile portfolios constructed on the basis of**  
**Net Stock Issue for sub-sample-II i.e. July 2002 – June 2010**

	<i>P1</i>	<i>P2</i>	<i>P3</i>	<i>P4</i>	<i>P5</i>	<i>P1-P5</i>	<i>t-test</i>
Average NSI	-0.020	0.002	0.009	0.049	0.391	-0.411	-0.462
EW returns (% p.a.)	97.14	5.31	5.64	3.03	10.43	86.714	1.025
VW Returns (% p.a)	6.72	21.46	20.74	5.40	10.47	-3.752	-0.313
MV (Rs.M)	1320.16	1422.30	1237.56	2614.04	2589.36	-1269.203	-7.597

This table reports the characteristics of pentilene stock issue portfolios during the period July 2002- June 2010. The portfolios were constructed using all shares listed on the KSE since June 1993 are sorted at month t in ascending order according to their net stock issue (NSI) values estimated through a rolling window of 60 monthly observations in order to assign to five portfolios. P1 is the pentile portfolio containing the stocks with the least and possibly most negative estimates of NSI and P5 contains the highest and most positive NSI. For the calculation of the excess returns of these portfolios month t+1 (i.e. post ranking returns) have been used. P1-P5 is the spread between portfolio P1 and portfolio P5. All portfolios are rebalanced monthly. EW returns represent the annualized average monthly returns of EW portfolios. VW returns represent the annualized average monthly returns of VW portfolios. MV represents the average market value of the shares in each portfolio (in Pak Rs.). CAPM beta is the full sample beta estimate of the value-weighted portfolio returns. The last column reports values for t-tests referring to the null hypothesis of no difference in means between portfolios P1 and P5 characteristics.

We have also analyzed the abnormal time series performance of NSI based pentile portfolios, using CAPM for estimating Jensen Alpha in Table-II.

**Table-II**  
**Alpha of EW NSI Portfolio**

	<i>p1</i>	<i>p2</i>	<i>p3</i>	<i>p4</i>	<i>p5</i>	<i>p1-p5</i>	<i>chi-square</i>
<b>Panel A: Full Sample July 1993 - June 2010</b>							
CAPM Alpha (% p.a.)	42.88	2.55	3.18	2.21	5.49	37.39	8.59
t-stats	1.00	1.09	1.07	1.01	2.05	0.92	0.13
<b>Panel B: Sub Sample-I July 1993 - June 2002</b>							
CAPM Alpha (% p.a.)	0.04	2.03	3.04	3.19	2.90	-2.86	4.25
t-stats	-0.31	-0.60	0.50	-0.04	-0.67	0.38	0.51
<b>Panel C - Sub Sample-II July 2002 - June 2010</b>							
CAPM Alpha (% p.a.)	6.99	0.24	0.22	0.11	0.64	6.35	4.53
t-stats	0.89	1.00	0.68	0.57	1.40	0.86	0.48

Above results provides the time series risk adjusted analysis of the five EW portfolios for all sample and two sub-samples. Even after adjusting for the net stock issue effect the returns computed earlier for spread strategy of P1-P5 remain intact i.e. 39.77% (t-value 0.96) as compared to CAPM risk adjusted premium of 37.39% (t-value 0.92). In both cases the spread is close and insignificant. This signifies that the Net stock does not significantly affect the portfolio returns in Karachi Stock Market and is not an effective investment strategy. Furthermore, Wald test for estimating joint significance of alpha's of the estimated five portfolios have also been found to be insignificant, which signifies that the Net Stock Issue effect is not significantly present in Karachi Stock Exchange thus Net Stock Issue based portfolio cannot be used to earn abnormal returns in KSE. Sub-sample portfolios premium spread for P5-P1 investment strategy of EW returns has been found to be -2.81 with t-value of 1.365 and 86.71 with t-value of 1.025 against the risk adjusted CAPM of -2.86 with t-values of 0.38 and 6.35 with t-value of 0.86. The results also are in line with all sample results for sub-sample-I as the results are in same range but for sub-sample-II there has been wide difference between two samples results, however, both results have been found to be insignificant. The Wald test for confirming the joint significance of alpha was also found to be insignificant, confirming earlier findings of overall sample results that Net Stock Issue effect in KSE is not significantly present.

Similar analysis has also been performed for a sample of VW returns of five portfolios as follows:

**Table-III**  
**Alphas of VW NSI Portfolio**

	<i>p1</i>	<i>p2</i>	<i>p3</i>	<i>p4</i>	<i>p5</i>	<i>p1-p5</i>	<i>chi-square</i>
<b>Panel A: Full Sample July 1993 - June 2010</b>							
CAPM Alpha (% p.a.)	-3.17	0.70	7.84	-3.42	-3.41	0.23	2.18
t-stats	-0.46	0.11	1.20	-0.53	-0.50	0.03	0.82
<b>Panel B: Sub Sample-I July 1993 - June 2002</b>							
CAPM Alpha (% p.a.)	-2.54	-6.01	4.59	-0.36	-6.88	4.35	1.17
t-stats	-0.31	-0.60	0.50	-0.04	-0.67	0.38	0.95
<b>Panel C - Sub Sample-II July 2002 - June 2010</b>							
CAPM Alpha (% p.a.)	-4.52	7.06	7.17	-10.74	-2.14	-2.38	3.12
t-stats	-0.38	0.84	0.78	-1.26	-0.24	-0.18	0.68

The risk adjusted analysis reveals the return premium of VW P5-P1 investment strategy as 0.39% with t-values of 0.045, as against 0.23% risk adjusted returns with t-values of 0.03, as to be insignificant. Pentile portfolios' Jensen alpha coefficients also show similar inconsistent trend as of portfolio returns and they were also found to be insignificant for all five portfolios. The joint significance of the five alpha's using Wald test was also found to be insignificant. Further analysis for two sub-samples for July 1993-June 2002 and July 2002-June 2010 reveal similar trend in Jensen Alpha coefficients like inconsistent average premia reported for five portfolios. The joint significance of alphas for sub-samples was also found to be insignificant, suggesting the absence of Net Stock issue and confirming that the CAPM does defines the returns as per classical approach i.e. systematic risk dictates the return premia.

## CONCLUSION

We have studied the Net Stock Issue anomaly as suggested by Sehgal & Panday (2013), Chen et. al. (2012) to test the robustness of CAPM in Karachi stock market. Contrary to the international evidence, we report that the investment strategy based on this anomaly is not significantly possible and CAPM holds true with respect to KSE as against the empirical evidence that the CAPM is a poor estimator of the asset returns, as suggested by Fama and French (2008), Banz (1981); Chan, Hamao & Lakonishok (1991); Ikenberry, Lakonishok, Vermaelen, 1995. The reason of such finding can be attributed to absence of understanding of such anomalies in Pakistani's investors due to overall lack of stock market and financial literacy among general investors (World Bank, June 2012), where in Pakistan only 12% of the population was found to using formal financial products.

Fu et.al. (2002) has suggested that the Fama and French evidence could be based on inefficient market or model mis-specification, which means the KSE is an efficient market and the model used in this study was robust in nature. Alternatively, we can explain Mayer and Majluf (1985) perspective as well that the issuance effect is negative while buyback effect is positive because market perceives the issuance as overpricing on part of managers while buyback results from under price estimation on part of the management's perception. While they argue that there is a gap between managers and investors information and the announcement does not eliminate such difference. However, this study further confirm the net stock issue can be used as one of the sorting criteria for portfolio's but not as an overall investment strategy in Pakistan, while covariance risk i.e. Beta, is a robust measure of risk in KSE, as alpha

computed using NSI based strategy were found to be insignificant. But on the other hand we are also reporting that the beta has failed to explain the EW and VW portfolio returns which should have been high for higher beta values and low against low beta values, as against an inconsistent trend against the mean-variance theorem of CAPM.

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