

# **Capital Assets Pricing on KSE and Fundamental Values**

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## **ABSTRACT**

This study is conducted to test the impact of two fundamental values, depicted through financial reports, on security prices. Sample includes all nonfinancial firms listed in KSE-30 Index and covers 9 years period 2000-08. Valuation of securities done through discounting of cash flows and impact is calculated by regressing FCFE & EPS with market price. Findings suggest that on KSE investors give higher (62%) weightage to EPS and very low (9%) to FCFE while pricing securities.

## **1. Introduction**

Valuation of assets is at the heart of finance since fourth decade of twentieth century. Importance of the topic is depicted through the number of models developed by researchers for assets pricing. Assets pricing models can be classified objectively as fundamental and technical valuation models. Fundamental valuation models are those which take into account organizational performance reported through accounting numbers while assigning a value to the security. The major fundamental models include dividend discount model (Williams, 1938), abnormal earnings discount model, free cash flows discount model (Francis, et. al., 2000), economic value added and residual income model. On the other hand certain technical models (CAPM and APT) developed which are not directly using the fundamental business attributes rather focusing on relationship of security prices with other macro economic factors.

This study is conducted to test the impact of two fundamental values (FCF & EPS), depicted through financial reports, on security prices. Sample includes all nonfinancial firms listed in KSE-30 Index and covers 9 years period 2000-08. Valuation of securities done through discounting of free cash flows and impact on security prices variation is calculated by regressing FCFE & EPS with market price. Findings suggest that on KSE investors give

relatively higher (62%) weightage to EPS and very low (9%) to FCFE. These findings are very surprising to the author as accrued income has gained more weight in the eyes of investors than free cash flows while making investment decision. It could be due to any of the following reasons. First companies' cash flows are lacking patterns and huge variations exist. Second irrational behavior of investors and noise traders; and finally dominance of speculative activities in the market. Another aspect of these findings may be higher degree confidence of investors in financial reports.

## **2. Literature review**

Valuation of assets is at the heart of finance since fourth decade of twentieth century. Importance of the topic is depicted through the number of models developed by researchers for assets pricing. Assets pricing models can be classified objectively as fundamental and technical models. Fundamental models are those which take into account organizational performance reported through accounting numbers while assigning a value to the security. The major fundamental models include dividend discount model (Williams, 1938), abnormal earnings discount model Economic value added, free cash flows discount model (Francis, et. al., 2000), economic value added and residual income model. On the other hand certain technical models (CAPM and APT) developed which are not directly using the fundamental business attributes rather focusing on relationship of security prices with other macro economic factors.

William's model of dividend discount states that value of a security is the present value of expected dividends to investor discounted at risk adjusted rate of return. The focus of the model is upon cash distributed to equity holders. Empirical studies have documented that firms smooth out dividend distribution prudently hence in the days of prosperity certain amount of earnings is retained and distributed in rainy days. Consequently, dividends cannot be accepted as depiction of true earnings capacity. Dividend discount model lacks two things in depiction of true value. First that dividend is not the total cash available to share holders as certain portion of earnings is retained. Second dividend is based on accounting profit which is not true representative of earning power due to number of reasons; including earnings manipulation by management, collection risk of cash from accounts receivables, historical cost principle of accounting leads to charging of depreciation on book value ignoring the market value of

services used. The second security valuation model known as abnormal earnings discount model was introduced by Preinreich (1938) Edwards and Bell (1961) and further developed by Ohlson (1995). The model expresses equity value as a function of book values and abnormal earnings.

Free cash flows model came on surface in eighties (Jensen, 1986), (Mann, et. al., 1991), (Dhumale, 1998), (McCabe, et. al., 1997), (Wang et. al. 2009), (Francis, et. al., 2000). Jensen, (1986) defines free cash flow as the excess amount of cash after funding all projects with positive NPV discounted at relevant cost of capital. Stowe, et. al. (2002) states free cash flow to the firm is amount of cash left over after meeting the operations and necessary investment in fixed assets and working capital to match the growth requirements. Under lying assumption is that any cash left over from operations and financing of fixed assets and working capital necessary to match the growth belongs to capital providers.

*“The ratio of share price to free cash flow per share ranks among the most effective stock-picking metrics since 1990, and the trend in free cash flow is among our favorite indicators of company operating momentum”* ( Dow Theory Forecasts, July 24, 2006).

Empirical studies have proven the performance of free cash flow discounting model reliable. Kaplan & Ruback (1995), documented that discounted cash flow method provides reliable estimates of security value. In their study they found only 10% difference between (Median) value calculated through discounting cash flow and market value. Brown (1996), recommends the free cash flow method for assessing the past and future earnings power of real property assets. Arzak (1996), concluded that FCF method should be avoided while valuing levered firm as it can lead to significant error. For valuation of securities free cash flows are also used in comparison of other valuation methods. Shrieves et. al., (2001), argues that free cash flows and Economic value added are same theoretically and found no difference at conceptual level. Francis et. al., (2000), documented that abnormal earnings value estimates are more accurate than FCF estimates. In their study FCF estimates mean difference was (-31.5%) while for abnormal earnings it was (-20%). Apart from valuation free cash flows are also helpful in portfolio construction. Hackel, et. al., (1994), documented that an investment strategy based on free cash flows can consistently outperform market portfolio and other bench marks. Jokipii & Vahamaa, (2006), tested the free cash flow anomaly in Finnish institutional settings

and documented that large-capitalization companies with positive free cash flows outperformed the market index during period of 1992-2006.

Free cash flows provide an opportunity to management to spend money for their personal gains ignoring the corporate objectives. Jensen, (1986) develop a theory known as free cash flow and agency cost argues that firms with free cash flows have to pay agency cost as managers invest in non profitable projects including diversified businesses to increase their control over resources and secure the jobs and rewards. As a remedial measure he further argued that introduction of debt and going private, mitigates agency cost associated with free cash flows. Lehn, et. al., (1989), concluded with a larger sample of 263 firms going private covering eight years period from 1980-87, that a significant relationship exists in undistributed cash flows and decision to go private. These findings are in line with Jensen's cash flow theory. Mann & Sicherman (1991), state that shareholders of firms with free cash flows fear that managers will misuse and invest in projects with -ve NPV. They further documented that bonding of cash flow through debt issue is helpful in creating a check on managers. Brush, et. al. (2000), concluded that *"firms with free cash flow gain less from sales growth than firms without free cash flow"*

Chen, et. al., (2001), rejected the Jensen free cash flow theory and supported the investment opportunity hypothesis in assessing the stock market reaction to announcement of cross border Investment. They concluded that firms with favorable investment opportunities got positive response from market and vice versa. Chung, et. al. (2003) found positive relationship between FCF and discretionary accruals leading to earnings management in low growth companies on a larger sample of 22,576 company years. As a remedial action they suggested the quality audit and institutional investors.

Free cash flows are valuable tool to judge the management performance. These cannot be manipulated like accounting numbers. These are free from risk of default unlike accounting profits based on accruals. Free cash flows ensure the liquidity of underlying firm and depict the ability of firm to service capital providers. Valuation through free cash flows is much reliable than accounting profits. Dividend discount valuation is also free from number of issues relating to accounting profits however as whole profit is not distributed through dividends hence the model has inherent limitation to predict the partial value of equity. This limitation is removed

through discounting of free cash flows as the model includes the total distributable cash to capital providers.

### 3. Purpose and Methodology

This study is an attempt to test the performance of free cash flow discounting model of equity valuation and to document impact of free cash flows to equity (FCFE) and earnings per share (EPS) in local institutional frame work. To my knowledge it is the first study of its nature in local security market. Earlier studies e.g. (Attia, 2009), (Hanif & Bhatti, 2010) on security valuation is done through technical models. Free cash flow method can be an ideal valuation method in countries like Pakistan where accounting and auditing profession is not much stronger in comparison with industrially advanced countries. Chances of earnings manipulation are very high through accruals management and transactions structuring as the corporate governance institutions are weaker.

This study follows the free cash flow model given by Stowe, Robinson, Pinto and Mcleavey (2002).

$$Firm\ Value = \sum_{n=1}^{\infty} \frac{FCFE_0(1+g)^n}{(Ke-g)^n} \quad (1)$$

Free cash flows to equity are calculated as under

$$FCFE = NI + NC + I - CE - \nabla WC + \nabla LD \quad (2)$$

Where by:-

**FCFE** is free cash flow to the equity; **KE** is the cost of equity

**g** is the growth component; **NI** is net income to common equity holders

**NC** is non cash expenses booked in income statement

**I** is interest expenses  $\times$  (1-tax rate); **CE** is investment in capital expenditures and

**$\nabla WC$**  is investment in working capital;  **$\nabla LD$**  is increase/ decrease in long term debts

**Ke** is calculated through following equation

$$KE = EPS / MPS \quad (3)$$

EPS is earnings per share and MPS is market price per share. This study is conducted on historical data. I have used the five years average of cost of capital (**KE**) as discounting factor. After calculation of FCFE as per equation 2, I discounted cash flows for nine years (2000-08) and calculated firm value as at January 1, 2000. Once the value of the firm is

determined, Value per share is calculated by dividing upon number of shares outstanding. After calculation of intrinsic value a comparison is made with the market price to conclude about the performance of model. Data for fundamentals is used from balance sheet analysis prepared by state bank of Pakistan and historical prices from KSE website for the period under review. Sample size includes all nonfinancial firms listed in KSE-30 index a representative of the market. As at June 17, 2010, KSE-30 covers 17% of market, with a value of Rs; 454.838 billion.

I conducted three regression tests. First between FCFE and market price. Second regression test was administered between EPS and market price. Third regression test conducted among FCFE, EPS (independent variables) and market price (dependent variable) to document the combined effect of these fundamentals on market price. Following equations were tested

$$MPS = \beta_0 + \beta_1 (FCFE) + \epsilon \quad (4)$$

$$MPS = \beta_0 + \beta_1 (EPS) + \epsilon \quad (5)$$

Substituting equation (4) into (5) we got:-

$$MPS = \beta_0 + \beta_1 (FCFE) + \beta_2 (EPS) + \epsilon \quad (6)$$

Free Cash flows have at least three advantages over other valuation models; first the method talks about the cash which is real concern of investors. Second; the method account for investment required in working capital and fixed assets. Third; unlike earnings cash flows cannot be managed. Empirical studies (Baralexis, 1989), (Beasley, 1996), (Beatty, 2002), (Beneish, 1999, 2001), (Blake, et. al., 1996), (Breton, et. al., 1995), (Teoh, et. al., 1998), (wang, et. al., 2008), (Iqbal, et. al., 2009), documented that managers have succeeded in managing the earnings and concealing the true financial position in spite of all safeguards in the form of conventional accounting standards, principles and conventions. Empirical studies have also documented that cash flows contain incremental information over earnings to explain variation in stock returns (Livnat, et. al., 1990; Ali, 1994; and Kallunki, et. al., 1998) [cited by Jokipii, et. al., 2006]

#### 4. Results & Discussion

During research process it is found that valuation through discounting of FCFE could not be achieved as no pattern of cash flows exist in majority of sample companies. Due to mixed cash flows compound growth could not be calculated. Descriptive statistics of FCFEs are displayed in table 1. Average capital expenditures are more than depreciation depicting arrangements for growth in firms under considerations. Positive figure of working capital changes also support the hypothesis of growth in firms under review. Range between net income figure is Rs; 64,253 million although very high however range between FCFE is Rs; 102,257 million displays more variation in comparison with net income.

Table 1. Descriptive statistics (Rs in millions)

Description	Net income	Capital Expenditure	Depreciation	LT	Working Capital	FCFE
Mean value	4161	924	812	70	952	4144
Highest value	57268*	20213	5955	13623	45622	89633*
Lowest value	(6985)	(29970)	0	(9880)	(10922)	(12624)

\*significant

Regression results are presented in table 2. As per table 2 impact of cash flows on price is only 9% while of EPS is 62% much better than FCFE. It shows investors are basing their decision on EPS and ignoring FCFE. Value of multiple  $R$  is also very low with FCFE and significant with EPS. Also in case of FCFE value of intercept (137.4) and value of standard error (135.3) is very high while coefficient of FCFE (-0.001074) is negative, hence  $[Y = a \pm bx \pm \epsilon]$   $[Y = 137.4 - 0.001074x + 135.3]$  lesser or negligible prediction power. In case of EPS value of intercept [57.62] is relatively low and value of standard error [106.4] is also relatively low while coefficient of EPS [4.3] is positive, hence  $[Y = a \pm bx \pm \epsilon]$   $[Y = 57.62 + 4.3x + 106.4]$  better prediction power in comparison of FCFE. In case of  $F$  statistics value under FCFE is negative hence absolutely insignificant. While value of  $F$  statistics (9.4) under EPS is much better than any bench mark (2), hence significant.

Table 2. Summary of Results of regression

Description	FCFE Price	EPS Price	Multiple Regression
R <sup>2</sup>	0.09107*	0.62126**	0.62279**
Multiple R	0.00829	0.38596**	0.38787**
F value	1.17106	88.0013	44.0383
T statistics	-1.0821*	9.38090***	[-0.657][ 9.284]***
P value	0.28104	0.00000000000000016	[0.52][0.00000000000000029]

\*\*\* Significant at 5% confidence. \*\* Significant value \* Insignificant

## 5. Conclusion

Results of the study show that on KSE investors are giving negligible weight to free cash flows to equity (FCFE) while making investment decisions. FCFE explains only 9% variation in stock prices with an insignificant T statistics. These findings would be surprising to many including this author. Following could be possible reasons. Indiscipline in cash management of corporations as found during research process i.e. lack of cash flow patterns and inability to even calculate compound growth. Second; irrational behavior of investors and presence of noise traders. Third; higher rate of speculative transactions in the market. Earnings per share (EPS) displayed a strong positive relationship (62%) with market prices for the sample period under review. Market rates EPS higher than FCFE surprisingly. Although earnings can be manipulated and economic reality of firm can be distorted, which is not the case with cash flows, still investors' confidence in EPS shows higher degree of reliability on accounting and auditing profession in Pakistan.

Future research area includes valuation through cash flows with a larger sample and longer duration. Also need to test the valuation through FCFF, dividend discount model and residual income to determine the role of fundamentals in asset pricing on KSE.



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