

Impact of Economic Value Added Dynamics on Stock Prices Fact or Fallacy: New Evidence from Nested Panel Analysis

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Abstract

The present scholarship examines the robustness of EVA in Pakistan and information content while controlling prior research ignored firm-specific factors towards excess stock returns. The design of this research used panel data analysis whereby relevant, incremental information content and event analysis of EVA and conventional accounting performance measure via share prices is done by employing nested panel data analysis for 70 non-financial PSX listed companies from 13 industries for a study period of 2006-2015. Against prior research, EVA doesn't add to the incremental information content of the model. Moreover asymmetric results were revealed using nested and separate regression analysis. This study is aimed to benefit stakeholders in the context of prudent investment choice. This study identifies ROA as the most important financial performance metric for local investor's decision making. However firm-specific characteristics like financial leverage, liquidity, and firm size also play a pivotal role.

Key Words

EVA, Financial Leverage, Firm Size, Liquidity, Traditional Accounting Measures, Stock Returns.

JEL Classification: G 31, G32, M 41

Introduction

The pursuit of abnormal profits is the dream of every investor. Shareholders of firms are keen about business profitability enhancement reflected by enhanced stock prices (Warrad & Box, 2015). Prior research on Pakistani capital market has found it to be inefficient which means as emerging market information takes time to be processed (Haroon, 2012; Suleman, Hamid, Shah, Akkash, & Shahid, 2010). Hence an investor can exploit excess returns in Pakistani capital markets by using financial performance information.

Therefore, a variety of surrogates has been employed so far to realize this dream. Most prominent surrogates (predictors) of excess returns realization are financial performance measures bifurcated as conventional bookkeeping metrics besides value measures respectively. Researchers have two schools of thoughts; one who advocate supremacy of EVA as an economic output evaluator towards explaining stock returns (Bao & Bao, 1998; Kumar & Sharma, 2011; Stern, Stewart, & Chew, 1995) while others prefer traditional accounting-based performance measures (Chen & Dodd, 1997; Kumar & Sharma, 2011). Moreover, each firm possesses heterogeneity and idiosyncrasy, and thus firm-specific factors akin to size, liquidity, and leverage need to be inculcated for a robust financial performance analysis unfortunately ignored in prior research studies in this context. Therefore, this study incarcerates them. Further stock prices reflect all available information in efficient capital markets so testing market efficiency is helpful in investment decisions.

Literature Review

The following section gives an excerpt of prior research literature relevant to the variables of this study.

Economic Value Added (EVA) and Traditional Financial Performance Measures

Previous researches reflect little efficacy of EVA with reference to income-based output metric in elucidating stock returns. The major reason for this could be the idiosyncratic factors of a particular firm. Ismail (2006) studied 2252 firm-year data of UK and used pooled analysis for investigating the comparative and differential explanatory capacity of conventional and value-based metrics in elucidating share prices. The results showed that NOPAT and earnings after taxes are superior to EVA. Altaf (2016) examined the claim of Stern Stewart & Company about the dominance of EVA[®] above orthodox bookkeeping based performance metrics in predicting stock returns. This research study chose 325 Indian companies from manufacturing and services sector and after employing univariate and multivariate regression analyses empirical evidence substantiates operating profit's dominance over EVA in terms of relationship with share returns.

In a study, 59 companies out of KSE 100 Index were empirically examined for a sample period 2006-2010 to reveal that EVA is significant financial metric to explain stock returns and it is significant at a level less than 10%. (Siddique & Sarwar, 2014). Kumar & Sharma (2011) analyzed 873 non-financial Indian firms to examine preeminence of EVA as a business output gauge in comparison to conventional accounting-based performance measures by using panel OLS to examine differential and individual predictive capacity for market value-added.

Firm Size, Liquidity, and Leverage

An important but ignored factor of a business is the firm size (Li & Zhu, 2015). Since EVA doesn't take into consideration size differences (Hansen & Mowen., 1997). Starting from Banz (1981) reported 0.4% excess market-adjusted returns for smaller US stocks. Another study on 556 US firms equity returns during 1963-1977 testified excess returns of 1.77% on small size firms over their larger counterparts (Reinganum, 1981). Investor recognition hypothesis posits higher returns for small stocks because of investors ignorance and lack of information (Merton, 1987). Later on, the 3-factor model presented by Fama & French (1995) incorporated the firm size effect as a formal component of the asset pricing model cementing the claims of prior researchers.

Leverage means magnification of returns by use of constant charge. Hence the linkage of financial performance and leverage is undeniable. Modigliani & Miller (1958) flagged direction for contemporary capital structure theory punch line of these propositions were the value of the company and total cost of capital behavior under three cases ranging from the irrelevance of debt-equity mix, 100% debt to the ideal blend of debt and equity which maximizes corporate worth and curtail the required rate of return.

Trade-off Theory suggests firms should equilibrium the tax shield with the costs associated with insolvency (Kraus & Litzenberger, 1973). Agency cost Theory of free cash flow proposed by Jensen (1986) favors leverage. Once ample surplus cash is at the discretion of management it gives rise to shirking, conflict of goal congruence and tempts management to prioritize self-interest and perks rather than shareholder wealth maximization. The remedy of this agency problem is debt financing which shares the monitoring costs in the shape of debt indentures and debt covenants.

Signaling Theory Information Asymmetry Theory favors leverage contrary to the Modigliani and Miller assumption of symmetric information which is unrealistic here the difference of information among the insiders and outsiders is recognized. Pecking order theory posits firms choose unappropriated income then obligation and offer ordinary shares as the last option (Myers & Majluf, 1984).

In this study, liquidity refers to operating liquidity which is the lifeblood of any organization. Liquidity is defined as nearness to cash. Operating liquidity is the core area of working capital hence also quoted as working capital management policy in finance literature. Operating liquidity major components include the amount of cash and equivalents, receivables and inventories reflected in financial statements. Influential theories like exchange Kraus & Litzenberger (1973) and pecking order theory by Myers & Majluf (1984) have interesting connotations for researchers as trade-off theory advocates inverse association of liquidity and profitability while pecking order theory purports direct relation of liquidity and returns.

Hypotheses of the Study

On the basis of the literature discussed, the following hypotheses are synthesized.

- H1:** The comparative explanatory capacity of EVA is loftier to conventional accounting metrics (*ROA, ROE, EBIT, EPS, CFO and NI*) as well as firm-specific factors (*SIZE, LEV and LIQUIDITY*) in elucidating price of the share.
- H2:** Differential explanatory capacity of EVA is advanced compared to traditional accounting measures (*ROA, ROE, EBIT, EPS, CFO, and NI*) as well as firm-specific factors (*SIZE, LEV and LIQUIDITY*) in elucidating stock prices.

- H3:** EVA has a significant positive association with share prices.
- H4:** Firm Size has a significant negative association with share prices.
- H5:** Liquidity has a significant positive association with share prices.
- H6:** Leverage has a significant negative association with share prices.
- H7:** Traditional accounting measures have a significant positive association with share prices.
- H8:** No significant mean excess returns and growing mean excess gains are realized considering earnings announcements/EVA as a financial event

Methodology

The research sample is ought to be a reflection of population ie PSX listed firms. Only non-financial firms were chosen from a total of 561 listed firms. Moreover, PSX consists of firms from 35 different sectors both financial and non-financial which accommodates all industries of the Pakistani economy. For this research precise removal of listed firms was done to arrive at the research sample. As mentioned above the deletion corresponded with the exclusion of financial sector firms because of their different financial reporting and capital structure. The research population included 7 closed-end mutual funds, 20 commercial banks, 28 investment companies, 10 leasing companies, 31 modarba companies and 23 miscellaneous totaling 109 financial companies leaving 452 non-financial firms behind. Out of 452 non-financial firms, 39 had financial year ended 30th September, 4 firms had year ended 1 firm had November 30th, 31st March and 48 on 31st December. Since the research delimits selection of only those companies having financial year ended on June 30th choosing 6 to 10 highest market capitalization firms from 13 different non- financial sectors, and thus we were left with 360 companies. However, most of these firms were either delisted or had missing data issues, therefore, the ultimate data set shrank to 70 companies. In this research target elaborate value addition effect, corporate size, debt and nearness to cash on stock returns of 10 sectors comprising 70 companies' data of PSX during 2005-2006 to 2014-2015. For this study data was acquired from published yearly reports of respective companies. Moreover, the data was analyzed using EVIEWS 9 and STATA 14 which are specialized econometric software.

Variables Description

<i>SR</i>	=	Annual stock return
<i>CFO</i>	=	operating cash flows
<i>ROE</i>	=	Return on equity
<i>ROA</i>	=	Return on Assets
<i>EBIT</i>	=	Earnings before interest and taxes
<i>NI</i>	=	Net profit after tax
<i>EPS</i>	=	Earnings per share
<i>Firm Size</i>	=	Log of Total Assets
<i>LIQ</i>	=	Liquidity means Current Assets / Current Liabilities
<i>LEV</i>	=	Leverage means Debt/Total Assets
<i>EVA = (NOPAT - WACC) × Invested Capital.</i>		

Where

$$\begin{aligned}
 NOPAT &= EBIT(1 - Tax\ rate) \\
 WACC &= W_e K_e + W_d K_d(1 - Tax\ rate) \\
 Invested\ Capital &= Total\ Assets - Non\ Interest\ bearing\ Current\ Liabilities \\
 K_e &= R_f + \beta(R_m - R_f) + \varepsilon \\
 \beta &= \left(\frac{\sigma_{KSE100\ \&\ Stock}}{\sigma^2_{KSE100}} \right)
 \end{aligned}$$

Econometric Models

Following two approaches are employed to the robustness of EVA dynamics in explaining stock prices drifts.

Information Content Analysis Approach

Panel data analysis is employed for estimation. The statistics acquired from audited published yearly reports of respective companies and FSA (Financial Statement Analysis) reports of SBP. The methodology of prior researches to investigate the comparative and differential predictive capability of EVA in contrast to other conventional bookkeeping performance measures towards stock returns is used as follows (Ismail, 2006; U. A. Khan, Aleemi, & Qureshi, 2016; Kumar & Sharma, 2011). First, the comparative explanatory power of EVA besides supplementary traditional bookkeeping based performance measures is examined as below

$$SR_{it} = \alpha_{it} + \beta_1 EVA_{it} + \epsilon_{it} \quad (1)$$

$$SR_{it} = \alpha_{it} + \beta_1 SIZE_{it} + \epsilon_{it} \quad (2)$$

$$SR_{it} = \alpha_{it} + \beta_1 LEV_{it} + \epsilon_{it} \quad (3)$$

$$SR_{it} = \alpha_{it} + \beta_1 LIQ_{it} + \epsilon_{it} \quad (4)$$

$$SR_{it} = \alpha_{it} + \beta_1 ROA_{it} + \epsilon_{it} \quad (5)$$

$$SR_{it} = \alpha_{it} + \beta_1 ROE_{it} + \epsilon_{it} \quad (6)$$

$$SR_{it} = \alpha_{it} + \beta_1 EPS_{it} + \epsilon_{it} \quad (7)$$

$$SR_{it} = \alpha_{it} + \beta_1 CFO_{it} + \epsilon_{it} \quad (8)$$

$$SR_{it} = \alpha_{it} + \beta_1 EBIT_{it} + \epsilon_{it} \quad (9)$$

$$SR_{it} = \alpha_{it} + \beta_1 NI_{it} + \epsilon_{it} \quad (10)$$

Onwards the differential explanatory capacity of EVA by traditional bookkeeping methods in terms of explaining excess stock returns for fifteen days is tested as follows:

$$SR_{it} = \alpha_{it} + \beta_1 ROA_{it} + \beta_2 ROE_{it} + \beta_3 EPS_{it} + \beta_4 EBIT_{it} + \beta_5 NI_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 LIQ_{it} \quad (11)$$

$$SR_{it} = \alpha_{it} + \beta_1 EVA_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 LIQ_{it} + \beta_5 ROA_{it} + \beta_6 ROE_{it} + \beta_7 EPS_{it} + \beta_8 EBIT_{it} + \beta_9 NI_{it} \quad (12)$$

Where SR_{it} means the annual stock return of financial year-end on i^{th} stock for during t , ROA_{it} means percentage earnings on asset of i^{th} stock for during t , ROE_{it} means percentage earnings on equity of i^{th} stock for during t , EPS_{it} means Earnings per share after taxes of i^{th} stock during t , $EBIT_{it}$ means Earnings before interest and taxes of i^{th} stock for during t , NI_{it} means NOPAT of i^{th} stock during t , EVA_{it} means Economic Value added of i^{th} stock for during t , $SIZE_{it}$ means total assets of i^{th} stock for during t , LEV_{it} means financial leverage of i^{th} stock for during t , LIQ_{it} means liquidity of i^{th} stock for during t , $\beta_1, \beta_2, \beta_3, \dots, \beta_9$ are the coefficients.

Relative Information Content Analysis

Relative information content analysis is a technique of univariate regression analysis to study the descriptive influence of all the exogenous variables used in study individually by running separate regressions for each independent variable and then comparing the R^2 respectively following previous established research literature (Biddle, Bowen, & Wallace, 1997; Khan, Aleemi, & Qureshi, 2016; Sharma & Kumar, 2010; Worthington & West, 2004).

Table 1. Nested Relative Information Content Analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	SR	SR	SR	SR	SR	SR	SR	SR	SR	SR
EVA	0.000 (0.000)									
Firm Size		0.140** (0.056)								
Leverage			-0.014 (0.010)							
Liquidity				0.008 (0.008)						

ROA					0.009***					
					(0.002)					
ROE						0.002***				
						(0.001)				
EPS							0.004***			
							(0.001)			
CFO								0.000		
								(0.000)		
EBIT									0.000	
									(0.000)	
NI										0.000
										(0.000)
_cons	0.027	2.159**	0.033	0.016	-0.023	0.012	-0.003	0.054*	0.024	0.020
	(0.029)	(0.851)	(0.034)	(0.032)	(0.032)	(0.030)	(0.030)	(0.033)	(0.030)	(0.030)
Obs.	518	519	493	519	520	520	519	441	510	500
R-squared	0.002	0.013	0.004	0.002	0.030	0.014	0.021	0.000	0.002	0.000

Standard errors are in parenthesis

*** p<0.01, ** p<0.05, * p<0.1

The above-mentioned summary of empirical findings rejects H3, H7, and H8 while accepts H1, H2, H4, H5, and H6 and nested results reveal that R² return on asset (ROA) is 0.030 > R² earnings per share (EPS) is 0.021 highly significant at 1 % level = R² return on equity (ROE) is 0.014 highly significant at 1 % level > R² firm size is 0.013 and highly significant at 1 % level > R² of economic value added (EVA) insignificant 0.002 level = R² of liquidity is 0.02 significant = R² of leverage is 0.02 but insignificant at a 10 % level of significance. Moreover, R² of cash flows from operations (CFO) is 0.000 but insignificant = R² net income (NI) is 0.000 nonetheless insignificant. Hence ROA is the most superior gauge to explain share returns for the selected sample and time followed by EPS then ROE, thereafter firm size. However, EBIT, liquidity, and leverage respectively Though EVA along NI and CFO failed to reveal any predictive capability towards stock returns

Incremental Information Content Analysis

En route for investigating the incremental information content of Economic Value Added multivariate panel data regression analysis is used in model 10 and model 11 whereby model 10 excludes only EVA from the rest of the predictor variables ie. Conventional economic performance metrics like ROA, ROE, LEV, LIQ, EBIT, NI and then the difference of R squared is analyzed as follows

Table 2. Nested Incremental Information Content Analysis

	(1)	(2)
	Returns	Returns
<i>EVA</i>	0.000 (0.000)	
<i>Firmsize</i>	-0.017 (0.018)	-0.017 (0.018)
<i>Leverage</i>	-0.009 (0.013)	-0.009 (0.013)
<i>Liquidity</i>	0.001 (0.008)	0.001 (0.008)
<i>Return on Assets</i>	0.008** (0.004)	0.008** (0.004)
<i>Return on Equity</i>	0.000 (0.001)	0.000 (0.001)

<i>Earnings per share</i>	0.002 (0.001)	0.002 (0.001)
<i>CFO</i>	-0.000 (0.000)	-0.000 (0.000)
<i>EBIT</i>	0.000 (0.000)	0.000 (0.000)
<i>NI</i>	-0.000 (0.000)	-0.000 (0.000)
_CONS	0.238 (0.274)	0.238 (0.273)
OBS.	387	389
R-SQUARED	0.039	0.039

Standard Errors Are In Parenthesis

**** P<0.01, ** P<0.05, * P<0.1*

The nested panel regression incremental content information analysis shows only ROA to be highly significant at a 95 % confidence interval. Nonetheless the R-squared of both models as the same value of 0.039. Since there is no improvement in R-squared by adding EVA thus H₂ Rejected.

Event Analysis Approach

Consistent with prior research study of Ferguson, Rentzler, & Yu (2005) impact of EVA (earnings announcement day) financial event day t_0 is empirically tested using Event study to detect any statistically significant excess stock returns. This study uses an estimation window of pre 90 days (t_{-90}) and post 90 days (t_{+90}) around event day (t_0) to compute expected returns using market model then these returns are statistically compared using t-test by creating 15 days window of pre 7 days (t_{-7}) and post 7 days (t_{+7}) around event day (t_0). Below mentioned is the mathematical demonstration of the event methodology adopted.

Empirical Findings of Event Analysis

The following table and related explanation shed light on the event analysis empirical findings.

1-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Day-7	358	-.0031	.22235	.01175
Day-6	358	.0119	.20768	.01098
Day-5	357	.0038	.20171	.01068
Day-4	356	-.0031	.17157	.00909
Day-3	356	.0110	.18563	.00984
Day-2	356	.0029	.14421	.00764
Day-1	355	.0057	.19651	.01043
Event Day	355	.0013	.20685	.01098
Day+1	354	-.0095	.30448	.01618
Day+2	354	.0078	.20208	.01074
Day+3	353	.0025	.20032	.01066
Day+4	352	-.0010	.16798	.00895
Day+5	352	-.0021	.19528	.01041
Day+6	351	-.0328	.52508	.02803
Day+7	346	.0082	.19272	.01036

1-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Day-7	-.264	357	.792	-.00310	-.0262	.0200
Day-6	1.084	357	.279	.01190	-.0097	.0335
Day-5	.354	356	.723	.00378	-.0172	.0248
Day-4	-.337	355	.737	-.00306	-.0209	.0148
Day-3	1.113	355	.266	.01096	-.0084	.0303
Day-2	.379	355	.705	.00289	-.0121	.0179
Day-1	.551	354	.582	.00575	-.0148	.0263
Event Day	.115	354	.908	.00127	-.0203	.0229
Day+1	-.590	353	.556	-.00955	-.0414	.0223
Day+2	.729	353	.467	.00782	-.0133	.0289
Day+3	.231	352	.817	.00246	-.0185	.0234
Day+4	-.108	351	.914	-.00097	-.0186	.0166
Day+5	-.204	351	.839	-.00212	-.0226	.0184
Day+6	-1.170	350	.243	-.03278	-.0879	.0223
Day+7	.795	345	.427	.00824	-.0121	.0286

AARS CAARS of Study Sample

	AARS	t -stats	CAARS	t -stats
Day-7	-0.0033493	-0.264	-0.0068547	-0.264
Day-6	0.0116296	1.084	0.023315	1.084
Day-5	0.0036357	0.354	0.0072743	0.354
Day-4	-0.0030018	-0.337	-0.0060112	-0.337
Day-3	0.0110257	1.113	0.022106	1.113
Day-2	0.0027531	0.379	0.0055187	0.379
Day-1	0.0056988	0.551	0.0113147	0.551
Event Day	0.0013927	0.115	0.0028442	0.115
Day+1	-0.0095332	-0.59	-0.0189787	-0.59
Day+2	0.0076	0.729	0.0154131	0.729
Day+3	0.002135	0.231	0.0043192	0.231
Day+4	-0.0009955	-0.108	-0.0019699	-0.108
Day+5	-0.0021184	-0.204	-0.0043874	-0.204
Day+6	-0.0327803	-1.17	-0.0658919	-1.17
Day+7	0.0082415	0.795	0.0163444	0.795

Discussion

Keeping in view of the relative information content analysis EVA has no significant relation with stock returns because in Pakistan Public limited company's follow International Financial Reporting Standards and Companies Act 2017 both of which don't require mandatory disclosure of EVA in annual audited financial reports nor investors have awareness of this value-based financial performance measure these are in conformance to preceding research (Altaf, 2016; Ismail, 2006). Rather results show the superiority of traditional accounting measures especially a highly significant positive impact of ROA on share prices which supports prior outcomes of (Burton, Lauridsen, & Obel, 2002; Nakhaei, 2013). Firm size has a negative and highly significant relation at a 1 % level of significance

with stock returns this empirical results are in line with Investor recognition hypothesis which posits higher returns for small stocks because of investors ignorance and lack of information (Merton, 1987) and investor overreaction hypothesis too supports the notion of small firm size premium on the premise of lower expectations from small firms leads to surprising lucrative returns (Lakonishok, Shleifer, & Vishny, 1994). Moreover, reasons for this may be too big to monitor, agency costs, conflict of interest as well as these findings are in line with previous researchers (Li & Zhu, 2015; Paulson & Townsend, 2004). Leverage reveals highly significant negative relation with stock returns which shows firms dislike borrowing which supports Pecking order Theory that sheds light on the ranking of financing options because of transaction costs where companies prefer internally generated funds in shape of retained earnings before knocking at the door of external financiers for debt. Furthermore because of the high cost of debt financing these days as well as bankruptcy and financial distress costs these findings are in line with prior studies (Giroud, Mueller, Stomper, & Westerkamp, 2012; Henry Kimathi, 2015). The study sample reveals investor confidence in traditional accounting-based financial performance measures like ROE and EPS but indifference towards working capital management policy is quite interesting as liquidity has a positive relation with stock returns but insignificant contrary to prior research (Abuzayed, 2012; Padachi, 2006).

Moreover, Event study results of all studied companies showed insignificant results as the t-Value in all sectors is less than ± 1.96 . It is, therefore; established here lies the absence of any empirically substantial association among stock prices with EVA. The market reaction to EVA is not consistent with signaling hypotheses that EVA announcements provide valuable information to market and investors revised their portfolio accordingly. We may also conclude yet share prices of study sample reflect all the available information hence the Pakistani capital market is efficient. EVA is a value-based performance evaluation contrary to conventional bookkeeping metrics; however, it has no or less impact on prices of shares in case of Pakistan Stock Market. One of the reasons of insignificant results might be investors less awareness about EVA.

Conclusion

As we have conducted information content along with Event study analysis of value-based and conventional bookkeeping based metrics whereby the statistical outcomes refuted the claim of EVA advocates of its dominance over conventional performance methods for non-financial Pakistan Stock Exchange (PSX) listed firms. However, an interesting empirical finding of the asymmetry in EVA information content results whereby the significance of EVA reflected by incremental information content analysis yet asymmetric behavior as per the results of relative information content invites further research. Moreover, inclusion of company pertinent characteristics such as firm size, ROE and EPS enhanced the explanatory power of model towards stock returns. Furthermore, leverage reflects an inverse insignificant relation with stock returns but in line with theory due to tight economic climate cost of borrowing has risen besides the bankruptcy and financial miseries alleviate the problem also in line with the seminal work of Hamada (1972) as leverage enhances the systematic risk and required rate of return by the common stockholder as well as these findings are in line with pecking order theory of capital structure. Nevertheless, liquidity showed an insignificant with stock prices implying Pakistani investors are indifferent towards working capital management policy. In Pakistani capital markets traditional accounting-based measures are superior performance indicators and their robustness is empirically tested so they can serve well for management and other stakeholders to watch their relevant benefit i.e. from management point of view corporate profitability and from other stakeholders like creditors, suppliers and employees its financial soundness and ability to honor obligations as they become due.

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