Valuing the Stock Price of the Industrial Companies listed on the Nairobi Securities Exchange using the Residual Income Model

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This Research Proposal has been submitted for examination with my approval as the Supervisor.

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time series.

1. Introduction

1.1 Background of the Study

The cross-sectional variation in stock returns due to the earnings announcement has gathered extensive research (Dimitropoulos & Asteriou, 2009) (Ball & Shivakumar, 2008) (Cohen, Dey, Lys, & Sunder, 2005) (Skinner & Sloan, 2002) (Beaver, 1968) as it is the primary mechanism through which public companies provide periodic financial performance updates to investors. Although earnings are one important determinant of stock prices, there are other accounting determinants, including balance sheet values (Dechow & Sloan, 2014).

The balance sheet is an important source of information as it lists the assets (future economic benefits) and liabilities (future economic obligations) of the company. If the accounting process successfully identified all such benefits and obligations and valued them at their fair values, then the balance sheet itself would be sufficient for determining company value. The balance sheet, however, relies on amortized historical costs for many assets (e.g., property, plant and equipment) and ignores other assets altogether (e.g., internally generated intangibles). As a result, early research (Kormendi & Lipe, 1987) assumed that the balance sheet would be less relevant than the income statement for valuation (Dechow & Sloan, 2014).

One of the major catalysts for a change in thinking regarding the role of the balance sheet was the seminal paper by Ohlson (1995). Ohlson formalized the role of accounting numbers in company valuation. He suggests that a company's equity value equals its contemporary

OB 17.Accrual accounting depicts the effects of transactions, and other events and circumstances on a reporting entity's economic resources and claims in the periods in which those effects occur, even if the resulting cash receipts and payments occur in a different period. This is important because information about a reporting entity's economic resources and claims and changes in its economic resources and claims during a period provides a better basis for assessing the entity's past and future performance than information solely about cash receipts and payments during that period (Financial Accounting Standards Board, 2010).

1.2 Statement of the Problem

Despite the merits of accrual accounting based methods of valuation, the most common tool in use in the East African market is the discounted cash flow model – a cash flow approach. This is according to a survey conducted by Pricewaterhousecoopers (2015) which found that 84% of respondents who operate in East Africa use the discounted cash flow approach as their primary valuation tool (69% in Southern Africa, 61% in West Africa)[1] .

It is recognized (Feltham and Ohlson 1995) that the discounted cash flow model is just a special case of the residual income model with cash accounting for earnings and book value rather than accrual accounting (Penman S. , 2001). Therefore, this is not to say that the discounted cash flow model is not beneficial. Its wide use confirms its importance.

The gap in knowledge exists in the application of the residual income model to value market

income model and compare them to the actual market price

1.2.2 Research Questions

1. What are the values of the industrial companies listed on the Nairobi Stock Exchange?
2. What is the extent of the deviation of these intrinsic values from the quoted current market price?

1.2.3 Justification of the Study

In view of the gap in academic research of the application of the residual income model, there is a need to shed light on the models usefulness and short comings. The ideal, long term, goal of which would be to provide investors, analysts and academicians with an alternative method of equity valuation with a strong predictive ability.

2. Literature Review

An individual looking to invest their time, energy and financial resources in the stock market must inescapably pick a side in the debate as to the efficiency of markets. This debate is informed by two broad schools of thought; modern portfolio theory and fundamental analysis.

2.1 Modern Portfolio Theory

Market efficiency can exist in three forms; "Weak-form", "Semi-strong-form" and "Strong-form" with the differences revolving around the definition of the information contained by the information set θt (Jensen, 1978).

The strong- form encompasses both the weak and semi-strong forms. The strong form of efficient market hypothesis states that current market price reflects all pertinent information including everything that is known whether it is public or private (Phiri, 2015). Public information includes analyzed knowledge such as annual reports, announcements of dividends, bonuses or stock splits, prevailing interest rates and information on current rates of inflation. Therefore no group of investors has monopolistic access to information relevant to forming opinion about prices so as to make abnormal profit (Froidevaux, 2004).

The semi-strong form asserts that current security prices fully reflect not only past prices of the security but all available public information. This information includes both the original raw information about the economy, political news or an individual security and any publicly available analyses or projections made using the raw data (Olweny, 2012). All information contained in the company's financial statements, potential analyses of such information including news release, economic data and so forth are fully reflected by each security price. Investors will have no generally available source of information that could lead to beat the market since market prices adjust instantly to any sort of news.

positive and significant on average, but are not significantly different from returns of the rest of the week. Thus, no evidence was uncovered to support any daily seasonal patterns in the Egyptian stock market, indicating that stock market returns are consistent with the weak form of market efficiency (Aly, Seyed, & Mark, 2004). In contrast, a recent study conducted during the political crisis that caused the closure of the exchange in the beginning of 2014, rejected the weak form efficiency (Kamal, 2014). South Africa has seen more consistent evidence of weak form efficiency which has been tied to the evolving nature of its stock market with reference to the regulatory environment (Bonga-Bonga, 2012). Yet the employment of different efficiency testing models, results in conflicting results: under a linear framework the Johannesburg Stock Exchange stock indices offer support in favor of weak form market efficiency whereas when nonlinearity is accounted for, a majority of the indices violate the weak form EMH (Phiri, 2015).

Moreover, the efficiency of the Zimbabwe Stock Exchange is tested post currency reform using the daily closing prices and indices over the period 2009 to 2012. The data was then subjected to a number of tests. The results of the study provide evidence that the Zimbabwe Stock Exchange is not weak form efficient (Mazviona & Nyangara, 2013) .

Mlambo & Biekpe(2007) conducted efficiency tests for the Kenyan capital market and found it to be weak form efficient .Subsequent research conducted to test whether the local market is semi-strong efficient found the market lacking, therefore abnormal profits can be made from trading on public information such as dividend announcements (Olweny, 2012).

uses the result to determine if a security is overvalued (undervalued) relative to the market in order to make a sell (buy) decision.

Equity valuation models have been developed to specify what is to be forecasted and shows how to relate that data into the intrinsic value estimate. Three major categories can be distinguished:

1. Asset based valuation (Damodaran, 2007)
2. Relative valuation (Damodaran, 2007)
3. Absolute valuation (Damodaran, 2007)

These methods are widely used by academicians and investment practitioners. The focus of this study was on one of the methods under absolute valuation: The Residual income model. However, a description of this and the other methods are provided below to provide a clearer distinction.

a. Asset based valuation (Net assets approach)

This approach evaluates the market value of the ordinary shares of a company by adjusting the asset and liability balances on the company's balance sheet to its market value equivalents (Pratt & Niculita, 2008). Graham (1934) noticed that since the book value of an asset in the balance sheet reflects its historical cost, it might deviate significantly from market value if earning power of the asset has increased or decreased significantly since its acquisition.

The commonly accepted theoretical principle to value any financial asset is the discounted cash flow methodology (Reilly & Brown, 2009) which argues that an asset is worth its future cash flows discounted at an opportunity rate to reflect the risk of the investment.

Mathematically, the principle is expressed as follows:

$$V_0 = \sum_{n=1}^{n} \frac{CF_t}{(1+k)^t}$$

V_0 = Value of the stock in period t=o

CF_t = Cash flow generated by the asset for the owner of the asset in period t

k = Discount rate

t = Number of years over which the asset will generate cash flows to the investors

This being the general formula is distinguishable into 3 models

1. Dividend discount models (Pratt & Niculita, 2008)
2. Free cash flow discount models (Pratt & Niculita, 2008)
3. Residual income models (Pratt & Niculita, 2008)

Dividend discount models (DDM)

The most common dividend model is that of the Gordon growth model which takes the form:

$$V_0 = \frac{D_0(1+g)}{k-g}$$

V_0 = Value of the stock in period t=o

D_0 = Amount of dividend income in the period immediately past

k = Discount rate (required yield rate or total rate of return)

g = Expected constant growth rate in dividends

The practical application of this and other dividend discount models however face serious weaknesses. According to Miller and Modigliani (1961) currently observed dividends are not informative unless the pay-out policy is tied to the value generation within the company. The missing link between value creation and value distribution leads to a problem in forecasting dividends as it is difficult to forecast pay-out ratios (Froidevaux, 2004). Furthermore, the need for finite-horizon forecasting is the rationale for entertaining alternative valuation models to the dividend discount model. If one were to forecast "to infinity," one would forecast dividends, for dividends are, without controversy, the payoff to holding shares. (Penman S. , 2001).

Free Cash Flow Discount Models

The first specification of this model is the *operating free cash flow,* which is generally described as cash flows after direct costs (cost of goods, selling and administration expenses) and before

Residual Income Model (RIM)

Ohlson (1995) noted, valuation theory indicates that investors should value future dividends. Because dividends can be inferred from the excess of accounting earnings over the change in the book value of equity, Ohlson suggested a recasting of the traditional dividend valuation model in terms of future accounting earnings and book values. The resulting expression indicates that company equity value is equal to the sum of the current book value of common equity plus the present value of all future residual income, where residual income is a linear combination of future abnormal earnings and book values discounted back to the current period (Dechow & Sloan, 2014).

The intuition behind it is that a company's stock price is driven by its generation of new wealth minus a charge for the use of capital (debt and equity). This new wealth is above the normal growth from previous wealth, unaffected by dividend policy and defined at any levels of actual earnings depending on what the market perceives as the normal earnings levels if capital grows at a certain expected rate (Higgins, 2009).

Empirically, residual income can be defined as accounting net income (NI) less a charge for equity capital equal to the cost of equity capital (r_e) times the beginning of period book value of equity BV_{t-1} (AAA Financial Accounting Standards Committee, 2001):

Define $x_t^a = x_t - r_t bv_{t-1}$, termed 'abnormal earnings', to denote earnings minus a charge for the use of capital (4)

From (3) and (4):

$$d_t = x_t^a - bv_t + (1 + r_t) * bv_{t-1} \quad (5)$$

Rewriting equation (1):

$$P_t = [d_t] + \frac{1}{1+r_t}[d_{t+1}] + \frac{1}{(1+r_t)^2}[d_{t+2}] + \frac{1}{(1+r_t)^3}[d_{t+3}] + \cdots$$

Using equation (5) to replace d_t, d_{t+1}, d_{t+2} …, in equation 1 to get:

$$P_t = bv_{t-1} + \sum_{k=0}^{\infty}(1 + r_t)^{-k}[x_{t+k}^a] \quad (6)$$

provided that $\frac{bv_{t+n}}{(1+r_t)^n} \rightarrow 0$

Equation (6) serves as the theoretical Residual Income Model, which equates company value to the previous book value and the present value of company current and future abnormal earnings.

accounting earnings techniques consistently outperform cash flow techniques over alternative forecast horizons. Their analysis concludes that the primary superiority of earnings techniques occurs for two reasons. First, the free cash flow technique expenses the anticipated investment, while the earnings approach capitalizes it. Second, the earnings technique recognizes non-cash (accrual) value changes. These two features of the earnings technique "bring the future forward in time". Thus in estimating the value of a company the earnings forecasts requires a shorter horizon vis-a-vis free cash flows (Penman & Sougiannis, 1998). Subsequent research by Francis et al (2000) compared the reliability of value estimates from the discounted dividend model, the discounted free cash flow model, and the discounted abnormal earnings model (also known as the residual income model). The findings were that the abnormal earnings value estimated were more accurate and explain more of the variation in the security prices than do free cash flow or dividend value estimates.

In contrast, (Cupertino, Costa, Coelho, & Menezes, 2005) found that the cash flow approach presented the best accuracy and explanatory power, having the current price as the parameter of comparison.

Choi et al. (2006) reported that accrual earnings are more value relevant than cash flows in the growth stage, but in the decline stage, cash flows are more value relevant than earnings. In contrast, Kwon (2009) found evidence that book value and cash flows provide more explanatory power in stock market prices than book value and earnings suggesting that cash flows can be a

capture value over a finite time horizon. This adjusts the formula to take the form:

$$P_t = bv_{t-1} + \sum_{k=0}^{n}(1 + r_t)^{-k}[x^a_{t+k}] + V_t \qquad (7)$$

This states that the stock price equals the sum of previous book value, the capitalization of a finite stream of abnormal earnings, and V_t, the capitalization of "other information".

The term V_t should be thought of as capturing all non-accounting information used for valuation. It highlights the limitations of transaction-based accounting in determining share prices, because while prices can adjust immediately to new information about the company's current and/or future profitability, generally accepted accounting principles primarily capture the value relevance of new information through transactions (Higgins, 2009).

3.1 Research Design

Residual Income Model Regression

Re-expressing equation (7) as a cross-sectional and time-series regression equation:

$$P_t = \beta_0 + \beta_1 bv_{t-1} + \sum_{k=0}^{n}\beta_{k+2}x^a_{t+k} + v_t \qquad (8)$$

$k = 0, 1, 2\ldots$ n; t=1 … T

$$x^a_t = x_t - r_t bv_{t-1}$$

where n is the finite number of periods in the horizon over which price can be well approximated based on accounting values, t is the number of [illegible]

maturity (Higgins, 2009).

In applying the model to value the share price of 2016 (one term of abnormal earnings), the number of the periods (n) in equation (8) is set to 0. When more terms are used in order to forecast the following years price (n>0) more fundamental information can be captured through analyst forecasts. However errors in modelling are at risk of occurring if far future periods are used because forecasts will tend to be inaccurate and/or unavailable.

The historical data is dated from 2005 to 2016 which shall go into estimating the model parameters. Such that:

$$P_t = \beta_0 + \beta_1 bv_{t-1} + \beta_2 x_t^a + v_t \qquad (9)$$

$$t = 1,\ldots,11$$

$$x_t^a = x_t - r_t bv_{t-1}$$

Two sets of regression will be carried out, the first assumes that the regression error (v_t) is white noise (henceforth termed as Naive Regression) whereas the second will address the issue of serial correlation, also called autocorrelation.

For the regressions to produce reliable results, v_t must have a normal zero-mean distribution and meet the statistical regression assumptions. However, the regression assumptions are often not met, due to strong serial correlation in v_t. Serial correlation arises when a variable is correlated

be the respective company websites and the Capital Markets Authority Database.

The book values must be greater than zero to be included.

The book value is computed as (total assets-total liabilities-preferred stock)/number of ordinary shares

The number of ordinary shares is adjusted for stock splits and dividends. Following this adjustment, for a company that has stock split in any given year, its number of shares is reported assuming the split happens in all years in its history

The price will be that at the end of the reporting period for the respective company

b. Earnings per share forecasts shall be obtained from multiple sources (brokerages, asset management companies, market analysts). The weighted average of which will be computed and used as the forecasted value.

   Underlying the use of earning's forecasts is the idea that analyst earnings forecasts are essential signals of firm valuation.

c. Treasury bill rates for government securities which are market yields on treasury securities at 1 year constant maturity.
d. Only Industrial companies are included

   As of January 2016 they are

   <u>Manufacturing and Allied</u>

   - ✓ British American Tobacco

- Athi River Mining
- ✓ Bamburi Cement
- ✓ East African Portland Cement

Kenya Orchards has a negative book value

Flame Tree Group is a newly listed company

A Baumann Co. has had its shares barred from trading for the last 15 years. Furthermore it doesn't provide detailed information on its financial statements

B.O.C Gases and Carbacid Investments were suspended from trading between 2005 and 2009

4. Results and Findings

Athi River Mining

Naive Regression

Source	SS	df	MS	Number of obs =	12
				F(2, 9) =	2.31
Model	8096.11156	2	4048.05578	Prob > F =	0.1555
Residual	15805.5707	9	1756.17453	R-squared =	0.3387
				Adj R-squared =	0.1918
Total	23901.6823	11	2172.88021	Root MSE =	41.907

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]

Total	18753.5665	11	1704.66966	Root MSE	= 39.507

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-1.755944	2.680873	-0.65	0.529	-7.820499	4.308611
aeps	25.89293	13.14331	1.97	0.080	-3.839305	55.62517
_cons	87.48691	28.85184	3.03	0.014	22.21952	152.7543
rho	.3292427					

Durbin-Watson statistic (original) 1.197951
Durbin-Watson statistic (transformed) 1.609574

Bamburi Cement

Naive Regression

Source	SS	df	MS		
Model	50.3946634	2	25.1973317	Number of obs	= 12
Residual	9004.60534	9	1000.5117	F(2, 9)	= 0.03
Total	9055	11	823.181818	Prob > F	= 0.9752
				R-squared	= 0.0056
				Adj R-squared	= -0.2154
				Root MSE	= 31.631

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]

Total	21162.5602	11	1923.86911	Root MSE	=	28.068

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-.1741447	.293596	-0.59	0.568	-.8383049	.4900155
aeps	-1.877557	1.942688	-0.97	0.359	-6.272222	2.517107
_cons	193.1907	24.02843	8.04	0.000	138.8347	247.5468
rho	-.4484332					

Durbin-Watson statistic (original) 2.631218
Durbin-Watson statistic (transformed) 2.274609

British American Tobacco Kenya

Naive Regression

Source	SS	df	MS	Number of obs	=	12
				F(2, 9)	=	48.39
Model	885668.673	2	442834.337	Prob > F	=	0.0000
Residual	82364.9933	9	9151.66592	R-squared	=	0.9149
				Adj R-squared	=	0.8960
Total	968033.667	11	88003.0606	Root MSE	=	95.664

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	10.38292	5.202246	2.00	0.077	-1.385374	22.15122
aeps	9.061902	7.950282	1.14	0.284	-8.922886	27.04669

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	9.582043	5.551838	1.73	0.118	-2.977087	22.14117
aeps	9.745382	8.374137	1.16	0.274	-9.198233	28.689
_cons	-322.1475	181.6485	-1.77	0.110	-733.065	88.76991
rho	.1860821					

Durbin-Watson statistic (original) 1.534149
Durbin-Watson statistic (transformed) 1.756707

Car and General

Naive Regression

Source	SS	df	MS
Model	367.07386	2	183.53693
Residual	1225.62743	9	136.180826
Total	1592.70129	11	144.791027

Number of obs	= 12
F(2, 9)	= 1.35
Prob > F	= 0.3076
R-squared	= 0.2305
Adj R-squared	= 0.0595
Root MSE	= 11.67

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	.3109546	.3203905	0.97	0.357	-.4138192	1.035728
aeps	2.744844	1.727786	1.59	0.147	-1.163678	6.653366
_cons	13.43063	20.29597	0.66	0.525	-32.48205	59.34331

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	.3835626	.3237342	1.18	0.266	-.348775	1.1159
aeps	2.728359	1.694787	1.61	0.142	-1.105516	6.562233
_cons	9.608846	20.04498	0.48	0.643	-35.73604	54.95374
rho	.3270622					

Durbin-Watson statistic (original) 1.379424
Durbin-Watson statistic (transformed) 1.758894

Crown Paints Limited

Naive Regression

Source	SS	df	MS
Model	449.051259	2	224.525629
Residual	986.323741	9	109.591527
Total	1435.375	11	130.488636

Number of obs	= 12
F(2, 9)	= 2.05
Prob > F	= 0.1848
R-squared	= 0.3128
Adj R-squared	= 0.1601
Root MSE	= 10.469

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-.1355822	.3680462	-0.37	0.721	-.9681605	.6969961
aeps	-4.446198	2.842071	-1.56	0.152	-10.87541	1.983014
_cons	40.99384	13.63976	3.01	0.015	10.13856	71.84911

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-.139198	.3813008	-0.37	0.723	-1.00176	.7233645
aeps	-4.212665	2.780697	-1.51	0.164	-10.50304	2.077708
_cons	41.14269	14.11163	2.92	0.017	9.219966	73.06542
rho	.0698811					

Durbin-Watson statistic (original) 1.798650
Durbin-Watson statistic (transformed) 1.938498

East African Breweries Limited

Naive Regression

Source	SS	df	MS
Model	35453.5647	2	17726.7824
Residual	18735.4353	9	2081.71503
Total	54189	11	4926.27273

Number of obs	= 12
F(2, 9)	= 8.52
Prob > F	= 0.0084
R-squared	= 0.6543
Adj R-squared	= 0.5774
Root MSE	= 45.626

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-6.289754	1.680155	-3.74	0.005	-10.09053	-2.488978
aeps	11.29949	9.442053	1.20	0.262	-10.05991	32.6589

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-4.481537	1.72788	-2.59	0.029	-8.390274	-.5728008
aeps	3.033236	8.114989	0.37	0.717	-15.32415	21.39062
_cons	290.5285	95.71509	3.04	0.014	74.00593	507.0511
rho	.6688651					

Durbin-Watson statistic (original) 1.101660
Durbin-Watson statistic (transformed) 1.729412

East African Cables

Naive Regression

Source	SS	df	MS
Model	9158.98996	2	4579.49498
Residual	5021.78004	9	557.97556
Total	14180.77	11	1289.16091

Number of obs	= 12
F(2, 9)	= 8.21
Prob > F	= 0.0094
R-squared	= 0.6459
Adj R-squared	= 0.5672
Root MSE	= 23.622

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-8.896667	2.241	-3.97	0.003	-13.96616	-3.827172
aeps	-12.75412	8.031593	-1.59	0.147	-30.92285	5.414602
_cons	110.9206	22.75864	4.87	0.001	59.437	162.4043

Total	14449.8386	11	1313.62169	Root MSE	= 23.206

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-8.758724	2.019153	-4.34	0.002	-13.32637	-4.191083
aeps	-13.45864	7.466305	-1.80	0.105	-30.34859	3.431319
_cons	109.8647	20.84033	5.27	0.001	62.72056	157.0087
rho	-.1602984					

Durbin-Watson statistic (original) 1.699468
Durbin-Watson statistic (transformed) 1.467393

East African Portland Cement Company

Naive Regression

Source	SS	df	MS	Number of obs	= 12
				F(2, 9)	= 12.64
Model	7443.13226	2	3721.56613	Prob > F	= 0.0024
Residual	2650.7844	9	294.5316	R-squared	= 0.7374
				Adj R-squared	= 0.6790
Total	10093.9167	11	917.628788	Root MSE	= 17.162

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-.0991265	.3402457	-0.29	0.777	-.8688158	.6705628
aeps	3.718089	1.023554	3.63	0.005	1.40265	6.033529

Total	10217.4095	11	1474.30994	Root MSE	= 15.834

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-.2739502	.2736423	-1.00	0.343	-.8929721	.3450717
aeps	3.324494	.8216129	4.05	0.003	1.465876	5.183112
_cons	107.2733	13.52022	7.93	0.000	76.68838	137.8581
rho	-.4200386					

Durbin-Watson statistic (original) 2.523350
Durbin-Watson statistic (transformed) 2.183738

Mumias Sugar Company

Naive Regression

Source	SS	df	MS	Number of obs	=	12
				F(2, 9)	=	4.74
Model	1654.37121	2	827.185604	Prob > F	=	0.0392
Residual	1569.86608	9	174.429565	R-squared	=	0.5131
				Adj R-squared	=	0.4049
Total	3224.23729	11	293.112481	Root MSE	=	13.207

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	1.857979	1.439929	1.29	0.229	-1.399367	5.115325
aeps	4.434265	2.415493	1.84	0.100	-1.029961	9.898491
cons	1.290734	13.41336	0.10	0.925	-29.05239	31.63386

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	1.686928	1.462829	1.15	0.279	-1.62222	4.996076
aeps	4.507252	2.543012	1.77	0.110	-1.245441	10.25994
_cons	2.824	13.69313	0.21	0.841	-28.15202	33.80002
rho	.069591					

Durbin-Watson statistic (original) 1.866650
Durbin-Watson statistic (transformed) 1.966091

Sameer Africa

Naive Regression

Source	SS	df	MS
Model	213.971468	2	106.985734
Residual	330.306032	9	36.7006703
Total	544.2775	11	49.4797727

Number of obs	= 12
F(2, 9)	= 2.92
Prob > F	= 0.1057
R-squared	= 0.3931
Adj R-squared	= 0.2583
Root MSE	= 6.0581

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	-.1995176	3.216473	-0.06	0.952	-7.475684	7.076649
aeps	10.51103	7.14449	1.47	0.175	-5.650927	26.67299
_cons	15.03397	23.32641	0.64	0.535	-37.73403	67.80196

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	1.781407	2.65102	0.67	0.518	-4.215616	7.77843
aeps	11.14673	5.547875	2.01	0.075	-1.403433	23.6969
_cons	.379443	20.63282	0.02	0.986	-46.29524	47.05412
rho	.5966465					

Durbin-Watson statistic (original) 0.789384
Durbin-Watson statistic (transformed) 1.325971

Unga Group

Naive Regression

Source	SS	df	MS
Model	830.294574	2	415.147287
Residual	630.169592	9	70.0188436
Total	1460.46417	11	132.76947

Number of obs = 12
F(2, 9) = 5.93
Prob > F = 0.0228
R-squared = 0.5685
Adj R-squared = 0.4726
Root MSE = 8.3677

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	.6016204	.2116803	2.84	0.019	.1227664	1.080474
aeps	-3.307697	2.833501	-1.17	0.273	-9.71752	3.102126
_cons	-9.500584	9.806256	-0.97	0.358	-31.68388	12.68271

p	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
bv	.5176363	.271534	1.91	0.089	-.0966162	1.131889
aeps	-2.298567	2.612769	-0.88	0.402	-8.20906	3.611927
_cons	-4.805309	13.05215	-0.37	0.721	-34.33133	24.72071
rho	.430557					

Durbin-Watson statistic (original) 1.213063
Durbin-Watson statistic (transformed) 1.491815

Share Price computed vs Current Share price

COMPANY	COMPUTED SHARE PRICE (KSHS)	ACTUAL SHARE PRICE AS OF 13TH DECEMBER 2016	% DEVIATION
Athi River Mining	11.50	25	-117%
Bamburi Cement	167.65	156	7%
BAT Kenya	952	840	12%
Car and General	31.70	27	15%
Crown Paints	34.40	42.25	-23%
EABL	251	238	5%
East African Cables	23.65	6.15	74%
EAPCC	45	22.50	50%
Mumias Sugar	-6.50	1.35	121%
Sameer Africa	14.40	2.95	80%
Unga Group	34	33	3%

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6. Appendix

List of Respondents in Pricewaterhousecooper's (2015) survey

• African Capital Alliance	• Business Connexion	Deutsche Bank Group	JP Morgan	PROPARCO
• Acorn Private Equity	• BDO	• DMH Associates Ltd	• Kagiso Tiso Holdings	• PSG Capital
• Activa	• BPCE Group	• Emerging Capital Partners	• KPMG	• Remgro
• African Alliance	• Bravura	• Ernst & Young	• Lafarge Group	• Riscura Consulting
• African Finance Corporation	• Bridge Capital	• FBN Capital	• LeadCapital Plc	• Rand Merchant Bank
• Afrinvest West Africa	• Brimstone	• Fusion Investment Management	• MCB Capital Markets	• Rogers & Co
• Akuo Energy	• Cadiz	• Gamma Civic	• Nedbank	• Sanlam

		Corporation	Corporation	
• Alteo Limited	• Constance Group	• International Financial Services	• Pivot	• Swicorp • UAC Nigeria Plc
• Anglo American	• Deloitte	• Java Capital	• PwC Corporate Finance	• Transcend Capital