Does Growth Sustainability Affect Stock Value? An Empirical Investigation in Indian Banking Sector

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ABSTRACT: To satisfy the investor's desire to quick returns, companies had to often trade-off their sustainability and long term growth. The growth rate of a company has the quickest impact on true value of a stock. The paper tried to study how the growth sustainability (using ROE and retention ratio) affects the intrinsic value of a stock and its deviation from the market value. The paper is divided into two segments. The first part deals with financial relationship between Discounted Cash Flow, P/E Multiplier and Market Value. In the second part the paper uses econometric tools to study the short run association between the variables. The comprehensive empirical work aims at identifying the over-pricing or the under-pricing of the stocks at different phases of growth rates. Econometric tools like ADF, VAR, Grangers Causality and Dynamic OLS is used. Findings of the present work show the divergence between this estimated true and market value of stocks is not significant (at 5% significance level) for the banks that follow steady growth sustainability. Thus the paper concludes at testing the impact of growth sustainability on correct market mechanism of the stock pricing.

Key words: Growth Sustainability, Intrinsic Value, Market Value, Over Pricing, Over pricing, VAR, Dynamic OLS, Granger's Causality Test

1. INTRODUCTION

Sustainability being the buzzing term in today's business world leaves stock trading no singular. Pressing the pulse of the investors who expect short term quick returns, firms also focus on short term growth rather than long run sustainable growth (Pandey, 2009). This leads to adopt over leverage in capital structure and may end in financial distress of the company**.** When growth rate exceeds sustainable growth rate it leads to requirement of additional fund and implementation of a financial strategy to meet the requirement. Unfortunately in this process what they ignore is the basic fact that today's growth sustainability ensures positive return for tomorrow. The common mistake they make is getting carried away by short term high growth rate of the company than growth sustainability. This common investment blunder affects adversely their return as this rapid growth for a short term is averaged in long run. But, investors' willingness to pay more for the companies makes the stocks overpriced (Ohloson, 1995). However, at present Indian Business environment has realised this logic and according to a survey conducted by

Economics Times (Rana & Majumdar, 2016) around one third i.e. 33% companies are aiming at achieving growth sustainability in order to provide positive returns to the stock holders in long run. In this paper it is tried to study how the growth sustainability (using ROE and retention ratio) affects the true or fundamental value of a stock. The paper is divided into two segments. The first part deals with financial relationship between Discounted Cash Flow, P/E Multiplier and Market Value. In the second part the paper uses econometric tools for robustness of the finding.

2. LITERATURE REVIEW

Though assessment of stock valuation is frequently cited by stock traders yet what they ignore is simple financial and mathematical approaches for value evaluation. As a result the whole valuation concept becomes complex and the actual value deviates from the calculated ones. In this process what one investor should not ignore is no method in this context is error free. The major factor that affects the fitness of the model is predicting the cash flows to future (Fernadez, 2008) and we often forget that future is uncertain. So, logically correct models also fail to capture the true market mechanism of a particular stock.

In this context Erik Lie and Heidi J. Lie (2008) used several valuation models that include asset value multiple, EBITDA multiples, P/E multiples and Sales Multiples. Their findings show out of these valuation models asset value multiple model generates better result than P/E multiple and Sales multiple. They identified many factors are contributing to this robustness of the above valuation model and that include company capitalisation, market share, past record of profitability and goodwill etc. Apart from it some studies suggest a simple valuation model performs better than a complex one. Sometimes combined one is more effective as it is able to capture both economic and accounting features of the sample stock (Vardavaki & Mylonakis, 2007). Models like linear equity valuation, regression based valuation models that have explanatory power are some examples in this context. This type of models has already provided good results in food and drug industries in many countries.

Another valuation model that is recently used is Market based valuation ratios (Sheridan et al , 2008). It is used as an alternative to DCF models and works on the principle of comparing business houses with one another. It considers the forecasting of cash flows to two stages i.e. 1-3 years and 3-10 years. In both the ways the terminal value is calculated and the result is compared with the market pulse. Being a hybrid model this one is gradually gaining its market among the finance practitioners around the globe. EBITDA multiples and P/E are used to estimate the terminal value. A different type of experiment is done by Sylvain Marsat and Benjamin Williams (2008) that examines whether price has any impact on assessment of fundamental value of a firm. The experiment is done by taking three groups of students. To the first group no price was provided, to the second group manipulated price (i.e. overvalued) and to the third group true price of the firm was

provided. The result was whatever the price is; it has clear impact on assessment of fundamental value of the firm.

Movement in one variable usually leads to movement in another variable. This raises the question 'by how much'. If the relationship is quantifiable then the error can be further reduced. Econometric tools can help in measuring not only the direction of the relation but also magnitude of the same. Vector Autoregressive Model developed by Sims in 1980 generates a dynamic simultaneous equation system is one of the most extensively used econometric tools while analyzing time series data (Dhakal et al, 1993, Yang, 2003, Khalid & Kawai, 2003). Zouaoui et al , 2020 tested the above and succeeded too. Mere existence of VAR associationship does not necessitate a cause and effect relationship between variables. Granger's causality test is actively used in financial market research to analyse the nature of relationship. Dastgir et al in 2019 used the technique to study 'the causal relationship between Bitcoin attention and Bitcoin returns'. Al-Yahyaee in the same year used the method for testing cause and effect relation between 'returns in the US and GIPSI stock markets'. Torun et al in 2020 used it to study The root and future prices have a causal relationship with several times. Kyshakevych, Prykarpatsky, and Mazharov (2019) used the tool for analysing 'profitability and efficiency in Ukrainian banking sector'. Based on successful implementation of the tool in similar study like ours the current paper uses it in analyzing data from Indian banking sector. When it comes to checking the magnitude of relationship (Kao et al, 1998) between the model generated values and market traded ones, OLS has proved its robustness.

3. OBJECTIVE

Does the growth sustainability really affect the true value of stocks? If so then to what extent. These are the background queries that this present paper tries to address through the following objectives.

- To assess the fundamental values of the sample stocks
- To examine the role of growth sustainability on the deviation between estimated value and market price
- To study the dynamic behavior of sample data using econometric tool.

4. DATA & RESEARCH METHODOLOGY

Market Index for Financial Service sector has been used as the sample size of the present paper that consists of 20 stocks. But, comparing the trend of regular dividend policy of the above sample firms, data filtered reduced the number to 14. For a thorough analysis 5 years time frame has been considered i.e. from 2015 to 2020. So, secondary data sources are used and analysed. As the principal aim of the paper is to check the impact of growth sustainability on true value of the stocks, GGM & MVAM using P/E are to be used in the paper. The following points are carefully analysed for use of the models.

a. In order to calculate cost of equity, Capital Asset Pricing Model (CAPM) is adopted and market price method is rejected as the later one assumes the market price as the correct one.

b. For estimation of growth rate, retention ratio by the firm and its ROE are considered.

c. Dividend for year 1 is forecasted using the growth rate discussed above.

d. P/E ratios and EPS are collected from CMIE database for the above mentioned time period.

e. A t-test at 5% significance level is conducted between the estimated values and their respected market prices

5. HYPOTHESIS

$H_1$1: The evaluated intrinsic values and their respective market values are different

$H_0$1: The evaluated intrinsic values and their respective market values are same

6. DATA INTERPRETATION

To study the stationarity of the data the paper used ADF unit root test [Table 3]. At level the data did not satisfy the unit root test. Augmented Dickey Fuller test using level data from 2014 to 2018, when observed showed existence of unit root or stationarity. The variables were converted to their first difference to check the stationarity. Subsequently, two out of three variables which are Discounted Cash Flow and P/E attained stationarity. But Market Value became stationary at second difference. Since the variables were stationary at I(1) and I(2) Vector Auto-regression Model was used.

Vector Auto-regression Model shows three statistics Standard errors, Probability and t-statistics [Table 4]. The table shows that DCF with a lag of one period has a significant long run relation or otherwise influences the market value (ρ=0.0012) and P/E (ρ=0.0017). DCF also has significant long run relation with one period lag of itself (ρ=0.0012). But with lag of two periods DCF does not influence other two variables but only itself. Market value does not have long run relation with DCF or P/E. But P/E with lag of one period has a significant long run relation with market value (ρ=0.0079) and DCF (ρ=0.0063) and with itself without lag (ρ=0.0129). Thus it can be concluded from the VAR model that market value is significantly influenced by DCF(-1) and P/E(-1), rejecting null hypothesis.

Granger's causality test results show presence of both way cause and effect relation between market value and P/E (ρ=0.0562 and 0.1214) [Table 5]. But at the same time the result also shows lack of both way cause and effect relation between other pairs of variables.

Finally Panel Dynamic Least Squares (DOLS) result [Table 6] show DCF having a significantly negative linear relation with market value (coef: -0.292963) and P/E having a significantly positive linear relation with market value (coef: 1.242292).

7. CONCLUSION

Estimation of fundamental value of stocks is simply based on cash flows and profitability. The term profitability in other words can be substituted for the growth rate of the firm. If perpetuality is the aim of a company, it cannot avoid growth sustainability from this goal. Growth sustainability has direct impact of "Should be value" of a stock. The GGM and MVAM used in the present study for assessment of this true value are perhaps the most logically grounded models to catch the underlying intrinsic values of the sample firms as the determinants like earnings, risk, return & growth rate are the principal components used by them. The statistical tool (t-test at 5% significance level) used to gauge the deviation also supports the above discussion by showing significant results in almost all stocks. That can be interpreted that investors prefer earnings growth rate more than cash flow growth rate and as a result market prices of the stocks are not correctly following the intrinsic values. As a last word the paper concludes that sustainable growth rate (GGM) provides more accurate result than short term growth rate (P/E Ratio Model). So, investors should not get carried away by the short run volatile growth rate of the stocks as in long run it averages to the normal growth rate and would be more beneficial for investment strategies.

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Appendix:

Table 1: Comparison of calculated fundamental value and market price from year 1 to 5

	Y1			Y2			Y3			Y4			Y5		
Banks	D-value	P/E-value	M-value	D-value	P/E-value	M-value	D-value	P/E-value	M-value	D-value	P/E-value	M-value	D-value	P/E-value	M-value
Bank 1	1213	1309	1493	1677	1702	1782	528	534	550	515	542	534	541	561	523
Bank 2	1341	1456	1444	2119	2202	2281	4121	4550	4350	7431	7544	7642	1198	1243	1212
Bank 3	589	539	578	1004	913	950	1621	1902	1825	2356	2412	2510	5119	5113	5002
Bank 4	31	33	30	63	72	56	57	63	65	99	106	103	238	251	240
Bank 5	620	618	612	843	821	813	985	1131	1002	1182	1255	1249	1678	1692	1720
Bank 6	758	765	760	996	1103	1056	1067	1202	1167	1389	1392	1320	1723	1742	1718
Bank 7	857	871	860	1393	1498	1420	289	306	301	238	251	245	312	307	298
Bank 8	49	52	51	145	156	132	173	196	194	287	315	302	617	628	596
Bank 9	661	649	657	903	953	935	716	721	705	766	794	774	1023	1013	991
Bank 10	261	264	259	267	271	248	289	291	272	328	341	331	387	391	402
Bank 11	112	117	115	301	288	260	237	231	250	219	228	223	92	99	112
Bank 12	148	161	151	317	321	305	294	302	271	241	253	223	191	182	174
Bank 13	587	602	599	861	893	887	883	923	917	1321	1365	1298	1042	1051	1033
Bank 14	1480	1489	1500	2378	2403	2400	312	323	288	231	241	227	314	321	309

Source: Authors own calculation

Table 2: Result of t-test in DCF Model

Company Name	DCF Model	P/E Model
	t-value	t-value
Bank 1	-.479	.324
Bank 2	-.402	.824
Bank 3	.601	-.632
Bank 4	***1.228****	***2.443****

Bank 5	-.501	.879
Bank 6	.712	.991
Bank 7	***1.446****	***2.311****
Bank 8	.982	.887
Bank 9	-.681	-2.01
Bank 10	.887	***1.883****
Bank 11	***1.98****	***1.89****
Bank 12	.687	***1.82****
Bank 13	.541	.884
Bank 14	***2.991***	***2.441****

Source: Authors own calculation

Table 3: Panel unit root test Summary

Series: DCF				
Automatic selection of maximum lags				
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	5.48741	1.0000	14	56
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	15.5918	0.9715	14	56
PP - Fisher Chi-square	16.2813	0.9615	14	56

Series: D(DCF)				
Automatic selection of maximum lags				
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.76758	0.0000	14	42
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	59.7196	0.0004	14	42
PP - Fisher Chi-square	59.1736	0.0005	14	42

Series: P/E				
Automatic selection of maximum lags				
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	5.05651	1.0000	14	56
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	15.8379	0.9682	14	56
PP - Fisher Chi-square	16.5473	0.9570	14	56

Series: D(P/E)				
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-19.5153	0.0000	14	42
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	66.1575	0.0001	14	42
PP - Fisher Chi-square	70.9990	0.0000	14	42

Series: D(MV)				
Automatic selection of maximum lags				
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4562.96	0.0000	14	42
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	30.1927	0.3541	14	56
PP - Fisher Chi-square	31.1831	0.3090	14	56

Series: D(MV,2)				
Automatic selection of maximum lags				
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2185.74	0.0000	14	28
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	65.6588	0.0001	14	28
PP - Fisher Chi-square	59.9121	0.0002	13	26

** Probabilities for Fisher tests are computed using an asymptotic Chi

Source: Authors own calculation

Table 4: Vector Auto regression Estimates

Vector Auto regression Estimates Standard errors in ( ) Probability in { } & t-statistics in [ ] * Significant at 5 percent level			
	MV	DCF	P/E
DCF(-1)	-12.32525 (3.50517) [-3.51630] {0.0012}*	-12.03599 (3.41277) [-3.52675] {0.0012}*	-12.20162 (3.58866) [-3.40005] {0.0017}*
DCF(-2)	-7.672802] (4.09173) [-1.87520] {0.0691}	-8.291206 (3.98387) [-2.08119] {0.0448}*	-7.687165 (4.18919) [-1.83500] {0.0750}
MV(-1)	2.384704 (4.93685) [0.48304] {0.6321}	2.038752 (4.80671) [0.42415] {0.6741}	2.751046 (5.05444) [0.54428] {0.5897}
MV(-2)	6.194243 (3.72319) [1.66369] {0.1051}	6.130740 (3.62504) [1.69122] {0.0997}	6.112180 (3.81187) [1.60346] {0.1178}

P/E(-1)	9.984487 (3.54125) [2.81948] {0.0079}*	10.01108 (3.44790) [2.90353] {0.0063}*	9.496335 (3.62560) [2.61925] {0.0129}*
P/E(-2)	1.164321 (3.62170) [0.32149] {0.7498}	1.841949 (3.52622) [0.52236] {0.6047}	1.260990 (3.70796) [0.34008] {0.7358}
C	499.8247 (239.104) [2.09041] {0.0439}*	497.6023 (232.801) [2.13746] {0.0396}*	527.5314 (244.799) [2.15496] {0.0381}*

Source: Authors own calculation

Table 5: Pairwise Granger Causality Tests with Lags: 2, and 42 Observation

Null Hypothesis:	F-Statistic	Prob.
MV does not Granger Cause DCF	7.85024	0.0014*
DCF does not Granger Cause MV	7.13663	0.0024*
P/E does not Granger Cause DCF	11.3835	0.0001*
DCF does not Granger Cause P/E	8.79347	0.0008*
P/E does not Granger Cause MV	3.11414	0.0562
MV does not Granger Cause P/E	2.23345	0.1214

***** Significant at 5 percent level, H_0 is accepted

Source: Authors own calculation

Table 6: Panel Dynamic Least Squares (DOLS)

Dependent Variable: MV Panel method: Grouped estimation Long-run variances (Bartlett kernel, Newey-West fixed bandwidth) used for individual coefficient covariances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DCF	-0.292963	9.97E-11	-2.94E+09	0.0000
P/E	1.242292	8.93E-11	1.39E+10	0.0000

Source: Authors own calculation