

The Intrinsic & Market Value of the Common Stocks: Evidence from Palestine Exchange

Ibrahim M. Awad, PhD

Chair, Economics Department, Al-Quds University of Jerusalem, Jerusalem, Palestine,
e-mail: iawad@econ.alquds.edu; iawad00@gmail.com

Abdullah Murrar

Institute of Business & Economics, Al-Quds University of Jerusalem, Jerusalem, Palestine
e-mail: abdullah.murrar@gmail.com

Hind Ayyad

Institute of Business & Economics, Al-Quds University of Jerusalem, Jerusalem, Palestine
e-mail: hind.ayyad@gmail.com

ABSTRACT

In analogues way to the sayings "What goes around comes around" the market price of the company stock's is closely related to its performance, the more optimistic, the more the investors will be and hence willing to pay a higher price for the company's share and vice versa. Seamlessly, given that the goal of the firms is to maximize the value of the shareholders, the more the intrinsic value of the company stock, the more market value of the stock price, so that there is a positive correlation between the intrinsic and market value of a particular common stock. This is founded in the first test of this study. Ironically, the positive correlation does not always imply that the intrinsic value causes the changes in market value; that is, empirical results of the co-integration test of this paper reveals that the market value is what causes the changes in intrinsic value, meaning that stock prices in Palestine Exchange does not significantly depend on fundamentals, but rather on supply and demand forces, other things being equal.

Keywords: *Intrinsic value, Market value, Co-integration, Causality, Discount cash flow, correlation.*

1 INTRODUCTION

In ancient times – since money was first lent at interest – the discount cash flow model has been adopted, but with limitations. The main premise of this model resides in the notion that the value of dollar today will not worth its same value in future, thus it shall be rate to discount the future amount. This theory simplified the way of how the value of a particular company can be estimated by calculating the present value of total discounted amounts of cash expected to be generated over its lifetime. As a method of valuating assets it has often been opposed to and more reliable than accounting book value, which is totally based on the amount paid for the asset. After the stock market crash of 1929 however, discount cash flow analysis has been gained large popularity as a valuation method for stocks too. Irving Fisher in his 1930 book "The Theory of Interest" and William's 1938 text 'The Theory of Investment Value' first formally expressed the discount cash flow method in modern economic terms.

The discount cash flow is the most theoretically sound stock valuation method, it is called income valuation too. this method involves discounting the dividends, earnings, and other cash flows that a stock will bring to its stockholders in the foreseeable future, this in addition to its final value on disposal (William F. Sharpe, 1978). The discounted rate normally includes a risk premium which is commonly based on the capital asset pricing model.

Discount cash flow method also assumes that markets make mistakes in estimating stock value. Essentially, the current price of a particular stock is not always an accurate reflection of the value of the firm and these mistakes eventually tend to be corrected over the time. What this means is that the mistakes in estimating stock value are either underestimating or overestimating the market value of common stock. Expressed shortly, the intrinsic value may be above or lower than the market value.

It is well known that the value of a particular stock is ultimately derived from monetary income expected to be obtained through dividends or capital return at sale time; this value is so called intrinsic value (Von, 2011). Although prices in capital markets, just as in all markets, are determined by supply and demand, efficient markets theory claims that prices always reflect all relevant information; meaning that the price of a particular stock always represents its intrinsic value. In reality however, there is ample evidence that prices tend from time to time to deviate from efficiency even in most regulated markets (Froidevaux, 2004). Starting from this point, value stock investing has been emerged as one of fundamental stock investing strategies. The core of this strategy, theoretically, is as simple as find a stock trading below its intrinsic value. In essence, by using this strategy, an investor looks for stocks with healthy fundamentals – including earnings, dividends, book value, and cash flow – and waits until they are incorrectly valued by the market to make a buy decision while assuming the potential to increase their prices when the market corrects its valuation error. Value investors, in other words, search for the times in which the market becomes inefficient and assigns incorrect price to a stock. Consequently, investing based on intrinsic value totally relies on a premise opposite to efficient market theory.

In practices, however, intrinsic value is an “elusive concept” and the exact determination of stock’s intrinsic value is rather than complex, in the same time, this concept offers the only logical approach to evaluating the relative attractiveness of investments and business (Graham et al., 2008).

Thus, the key question remains is how to determine the intrinsic value. Indeed, there are many ways to calculating this value, where each gives different results. For some researchers, even if there is agreement on how to calculate intrinsic value, there would be a conflict on the input parameters for calculations (Graham et al., 2008). One of the universal fundamental principles, however, is that a stock always worth the amount of all future cash flows discounted at an opportunity rate that reflects the risk of the investment and this fundamental principle is valid all the time; a valuation model that best transmitted this principle into practice would be the most adhered (Froidevaux, 2004). Discounted cash flow (DCF) as we proposed at the beginning of this paper is on the top of these models. DCF recognizes that a stock represents an ownership interest in a business and its value shall be related to the returns that investors expect (Graham et al., 2008).

The overall objective of this paper is to explore the correlation between the intrinsic value (IV) and (MV) market value of common stocks by apply the DCF model on all listed stocks in Palestine Exchange (PEX) during a given period of time, in addition to that, is to explore which variable causes the other though testing the causality between intrinsic value and market value of common stocks variables.

However, this study attempts to explain some clarifications as, does the intrinsic value of common stock have positive or negative correlation with the market value? And what does this mean? On the other hand, which variable causes other to change? i.e. does the intrinsic value lead change in market value or vice versa?

1.2 Study Hypothesis

In fact, since we can always turn calculations involving measures such as return or other various indexes into an intrinsic value in terms of dollars, it makes sense to translate these calculations that evaluate the worth of a stock i.e. intrinsic value into dollar amount.

Comparative this value with market value of stock shall generate the results that expected to suggest that:

Null-Hypotheses 1: The market value of common stock hasn’t direct relationship with the intrinsic value of common stock in Palestine Exchange.

Alternative-Hypothesis 1: The market value of common stock has direct relationship with the intrinsic value of common stock in Palestine Exchange.

Null-Hypotheses 2: The market value of common stock does not cause the intrinsic value of common stock in Palestine Exchange.

Alternative-Hypothesis 2: The market value of common stock does cause the intrinsic value of common stock in Palestine Exchange.

2 PREVIOUS RESEARCH

Many researchers & financiers studied the relationship between the market value of common stock & intrinsic value using different statistical & economic techniques.

(Abbad & Obeidat, 2011) studied the relationship between the intrinsic value of common stock i.e. the dependent variable and the entire growth rate dividends, cost of capital i.e. independent variables, the findings of this study was positively relationship & statistically significant between the intrinsic value of common stocks that traded in ASE for period between (1997 and up to 2006) and the dividend growth rate, so, the higher dividends growth rate of the company, the more intrinsic value of the common stock, other things being constant.

The researcher concluded that the study results showed that the relationship between the growth rate of dividends consistent and matched with the hypotheses of the study itself.

Froidevaux (2004) discussed the fundamental equity valuation as stock selection based on the discounting cash flow model, the study tested the model's ability to differentiate between underpriced- and overpriced stocks in the US market for a period from 1993-2002.

An investment strategy buying undervalued stocks as identified by the model i.e. discount cash flow generated as an annual return of 27.57% over the ten year testing period compared to the benchmark return which was 19.47% and the returns of a portfolio of overvalued stocks as identified by the model of only 6.26%. the thesis concluded therefore that a discounted cash flow valuation model can identify and exploit systematic mispricing in the stock market for the US market.

As we figure out in this paper, there are many ways to explore & calculate the intrinsic value of common stock, with different parameters, the researcher can receive different results and numbers.

Buffett makes this clear when he said: "Two people looking at the same set of facts" it will almost inevitably come up with at least slightly different intrinsic value figures.

(Sarikhani & Ebrahimi, 2011) tested the residual income model for prediction the common stock prices and applied that to Tehran Stock Exchange for a sample size of 87 companies listed in this financial market, the study showed a significant relationship between the current stock price and calculated price by use of a residual income model.

Many financial researchers and practitioners concluded that the intrinsic & market value go together with positive relationship, but does the intrinsic value consider as a leader variable of market value of common stock i.e. does the intrinsic value of common stock cause the change in market value? Shall they have positive relationship to conclude that one variable cause the other?

(Farsio & Fazel, 2008) interested to study the inflation data to predict the stock price, the study employed data from 1950 and up to 2007 using simple regression and Granger causality tests, the paper showed that while the relationship may be negative at times, at other times, inflation and stock prices may move in the same direction.

3 METHODOLOGY, DATA, AND ECONOMETRIC MODELS

This study undertakes two methods to examine its two main hypotheses. First, a method of Discounted Cash Flow Model was used to calculate the companies' intrinsic value so as to investigate the direct relationship between MV and IV, this model is widely used in microfinance (Comeau and Zambrano, 2009). Second, econometric models were used to examine the causal relations relationship between MV and IV to the companies listed in the PEX.

3.1 Data, Intrinsic and Market Value

DCF model can include balance sheet value, future business earnings and earnings growth. The factors that affect the value of business in DCF model are: book value, current free cash flow & earnings, business growth rate, and terminal value

It only makes sense to calculate the intrinsic value for the companies that are traded in the financial market. We will apply this model to calculate the intrinsic value of all listing companies that are traded in the PEX.

The PEX was incorporated in early 1995; it was fully automated upon establishment. Currently, there are 45 listed companies with market capitalization of about \$ 2.8 billion across five main economic sectors; banking and financial services, insurance, investments, industry, and services.

However, the selected sample of this study is daily data (i.e. five days a week) of common stocks in the PEX, with taking into consideration all traded companies in the PEX were chosen from January 1st, 2010 – March 31st, 2011, which is sufficient for investigating the study hypotheses. Added to this, high frequency data of daily data can meet higher degree of precision.

All companies always present a balance sheet and income statement, further to cash flow statements as quarterly, semi annually and per annum. However, we selected all companies listed in the PEX for five quarters over this period. However, the study sample was chosen based on information availability, paying attention to the stability of the PEX. The political situation was the most appropriate to be examined over this period. Thus, the fluctuations of the stock prices tend to be at the minimum level.

However, we applied the intrinsic value technique which simply equals: Book Value + Future Earnings at Growth Stage + Terminal Value (Graham et al., 2008; and Froidevaux, 2004). Accordingly, $\text{Book Value} + E(0) \frac{x(1-xn)}{(1-x)} + E(0) \frac{xn}{(1-y)}$, Where: $x=(1+g)/(1+d)$, and $y=(1+t)/(1+d)$

Parameters:

$E(0)$ – current earnings

g – growth rate

d – discount rate

t – growth rate at terminal state

n – number of years at the growth rate of g

If the growth rate is equal to terminal rate, which means that the company is growing at a constant rate forever, $x=y$ in the above equation, which then becomes

$$\begin{aligned} \text{Intrinsic Value} &= \text{Book Value} + E(0) \frac{x(1-xn)}{(1-x)} + E(0) \frac{xn}{(1-x)} \\ &= \text{Book Value} + E(0) \frac{x}{(1-x)} \end{aligned}$$

When a given investor purchases a company's stock, he/she becomes a fractional owner of the business. If the company is liquidated after a given of time, the investors always are entitled to what the company owns net of its debt. This part is called shareholder's equity.

A lot of companies have an item called goodwill, which may come from the past acquisitions of the company. This part may not worth anything at the time of liquidation. Therefore, we use tangible book rather than the book for the book value calculation.

The current earnings amount is a value which can be calculated as sales and other business transactions that impact income and expense are recorded. Its balance equals income minus cost of sales and expenses, the current earning may be appreciated if the sales or income of the company increased and the expenses decreased. of course, this will lead the overall growth in the company and the growth rate is $\frac{(\text{current value} - \text{past value})}{(\text{past value})}$.

The term terminal value is often associated as a salvage value (residual value). The residual value needs to be predicted. In principle, The Terminal Value of a business is the present value at a future point in time of all future cash flows when we expect a stable growth rate forever, so that we consider the terminal growth rate to be the inflation rate.

The best known pricing model in finance is the Capital Asset Pricing Model, which relates the discount rate for any cash-flow to its "Beta". The Beta measures the "systematic risk" of an uncertain future cash-flow the beta in Palestine Exchange is 0.73 as per the published studies.

The Capital Asset Pricing Model enables us to derive a real discount rate from Beta, so that we used the following equation (Ben, 2010)

$$\text{Discount rate} = \text{Risk free} + \text{Beta} * \text{Risk Premium} - \text{Risk Free}$$

In this study, we utilized this technique for all the companies that are traded in the PEX, in order to calculate the intrinsic value quarterly. Afterwards, we get the average market prices of each quarter for each company, and then compare it with the calculated intrinsic value.

However, the average market price for the next quarter and intrinsic value for the current quarter to test whether the Palestinian investor and the market price adjust based on the published financial report. Accordingly, we

used panel data for all the companies that are traded in PEX. In other words, we calculated the quarterly average market price for the five quarters which considered as the most stabilized political condition to compare them with the calculated intrinsic value. Also, it is worthy to address that we are interested in quarter lag, since all the companies traded in the PEX always publish financial reports quarterly. Consequently, the investor can take a look over the published financial reports during the next quarter.

3.2 Investigating Causal Relations by Econometric Techniques

In order to examine hypothesis 2, the study undertakes the methodology suggested by Engel and Granger (Engel and Granger, 1987). The study undertakes an econometric model to denote the relationship between intrinsic value (IV) and market value (MV) under examination.

$$MV_t = \beta_0 + \beta_1 IV_t + \varepsilon_t \quad (1)$$

where MV_t is intrinsic value at time t , IV_t represents market value at time t , and ε_t is the error term.

3.2.1 Unit-Root Analysis

The Unit-root tests are used to determine whether the time series is stationary or non-stationary. A series is said to be daily stationary if the mean and autocovariances of the series do not depend on time; any series whose mean and variance change over time is known as non-stationary (Hatanaka, 2003).

3.2.2 The Augmented Dickey-Fuller Test

After the optimal number of lags for all possible cases is determined, an Augmented Dickey-Fuller (ADF) test is applied to all series under examination. The ADF test equation is:

$$\Delta MV_t = \beta_1 + \beta_2 t + \pi MV_{t-1} + \sum_{j=1}^k \gamma_j \Delta MV_{t-j} + u_t \quad (2)$$

where MV_t is the series under examination (i) at time t , and u_t is the error term, this identification is also applicable for IV_t .

Now according to McLeod and Hipel (1978) we can reformulate the test regression (2) with three different combinations:

$$\Delta MV_t = \beta_1 + \beta_2 t + \pi MV_{t-1} + \sum_{j=1}^k \gamma_j \Delta MV_{t-j} + u_{1t} \quad (3)$$

$$\Delta MV_t = \beta_1 + \pi MV_{t-1} + \sum_{j=1}^k \gamma_j MV_j \Delta MV_{t-j} + u_{2t} \quad (4)$$

$$\Delta MV_t = \pi MV_{t-1} + \sum_{j=1}^k \gamma_j MV_j \Delta MV_{t-j} + u_{3t} \quad (5)$$

The Augmented Dickey-Fuller (ADF) test for the pair of hypotheses $H_0 : \pi = 0$ versus $H_1 : \pi < 0$ is based on the t-statistic of the coefficient π from an OLS estimation of equations (3), (4), and (5) (Fuller, 1976).

3.2.3 Co-integration test

In order to investigate the long term causal relationship between MV and IV, Co-integration model will be utilized. The purpose of the co-integration test is to determine whether a group of non-stationary series is co-integrated or not (Engle and Granger, 1987). For the purposes of this study, the Engel-Granger two step methods are utilized to investigate the existence or nonexistence of co-integration. Toward that end, the long run relationship is estimated for equation 1 and the regression residuals are saved as regression residuals.

3.2.4 Granger Causality Test

The Granger test (1969) is to see how much of the current y can be explained by a past value of x and then to see whether adding lagged value can improve the explanation. y is said to be Granger-caused by x if x helps in

the prediction of y , or equivalently if the coefficients on the lagged x 's are statistically significant. Note that two-way causation is frequently the case; x Granger causes y and y Granger causes x . In other words, IV Granger causes MV and MV Granger causes IV .

In this step the examining of the relationship by the traditional Granger causality test is simply to give an indicator of the relationship. Here it must be noted that the Granger causality test was run on $I(0)$ series, so as to test the hypothesis regarding whether ΔMV helps predict ΔIV . This is done by a simple F-test. The causality relationship can be evaluated as follows:

$$\Delta MV_t = \sum_{j=1}^m \alpha_{2j} \Delta IV_{t-j} + \sum_{j=1}^m \beta_{2j} \Delta MV_{t-j} + \varepsilon_{2t} \quad (6)$$

$$\Delta IV_t = \sum_{j=1}^m \alpha_{1j} \Delta IV_{t-j} + \sum_{j=1}^m \beta_{1j} \Delta MV_{t-j} + \varepsilon_{1t} \quad (7)$$

In this case, $H_0: \beta_{1j} = 0, j = 1, 2, \dots, n$, and $H_0: \alpha_{2j} = 0, j = 1, 2, \dots, n$.

If the H_0 is accepted, it means that there is no causal relationship between MV and IV .

3.2.4 Error Correction Model (ECM)

If we conclude co-integration in relation 1 we estimate the Error Correction Model (ECM). Basically, we estimate the following system of equations:

$$\Delta MV_t = \alpha_0 + \alpha_1 e_{t-1} + \sum_{i=1}^m \lambda_{12} (i) \Delta IV_{t-i} + \sum_{i=1}^m \lambda_{12} (i) \Delta IV_{t-1} + \varepsilon^y_t \quad (8)$$

$$\Delta IV_t = \alpha_0 + \alpha_1 e_{t-1} + \sum_{i=1}^m \lambda_{21} (i) \Delta MV_{t-1} + \sum_{i=1}^m \lambda_{22} (i) \Delta IV_{t-1} + \varepsilon^x_t \quad (9)$$

The most important outcomes from the Error Correction Model (ECM) are the α_0 parameters, which help us to conclude whether there is a one or two sided relationship between MV and IV .

4 EMPIRICAL RESULTS

In this study we have used time series data type for the quarterly average of daily market value of common stock prices to test the co-integration between the market value variable and calculated intrinsic value variable. As mentioned before, the period under examination extends from January 2010 through March 2011, with 180 observations in total. Figure 1 shows the relationship between the Intrinsic Value & Market Value.

4.1 Augmented Dickey-Fuller test results

If the statistical characteristics -mean and variance- of the series are constant over time, then the series is said to be stationary process (no unit root). Otherwise, the series is described as being non-stationary i.e. the mean and variance are not constant over time (it has a random walk). However, it necessary to transform a time series from non-stationary into stationary for applying the causality test.

We test the hypotheses that the series is

H_0 : Non-Stationary

H_1 : Stationary

The data shows that the series under examination once is sufficient to achieve stationary. It is clear that the null hypothesis i.e. non stationary shall be rejected for all series at the 5% level of significance as shown in Table 1. However, this result opens the possibility of applying the co-integration analysis between the intrinsic value and market value of common stock.

4.2 Co-integration analysis

The next step is to perform the Engle-Granger two step procedures for testing co-integration. We have tested the bivariate relationship between the intrinsic value and market value variable. As we addressed in this paper, the

first step is to run regression and save the regression residual, then test whether the residuals are stationary using again the standard ADF test. If we are able to reject the null hypothesis about the unit root, i.e. the residuals are stationary; we can conclude that the variables are co-integrated. This is what actually appeared, where it is clear that we can reject the null hypothesis.

4.3 The Error-Correction Model

Here since we concluded from the previous test, i.e. the co-integration test that the two series are co-integrated as per Table 4, then there should be Granger causation at least in one direction.

4.4 Traditional Granger Causality test

In this step we use the Granger Causality test to check the causal relationship between time series. The traditional Granger Causality test uses the F-test. To that end we run equations and evaluate the causality by the standard F-test procedure.

However, the results of the first test can be best summarized as there is positive relationship between the Market Value and Intrinsic Value, this also can be shown through the graph bellow. On the other hand, the adjusted R-squared is 0.41238 meaning that intrinsic value explains about 41 % of the market value of common stock as per Table 5 reported.

The second test results indicate based on the probability values reported in Table 3, the hypothesis that Market Value doesn't granger cause Intrinsic Value will be rejected, but the hypothesis said that Intrinsic Value doesn't Granger Cause Market Value will be accepted. Therefore, it appears that Granger Casualty runs one way, from Intrinsic Value to Market Value, but not in the other direction.

5 CONCLUSIONS & POLICY IMPLICATIONS

Two types of tests we have made, the first one is the causal relationship between the market value and intrinsic value using the time series data, and the second test is the causality between the two variables as per formulations. To the best of my knowledge this study is likely to be the first in Palestine that has highlighted these financial issues.

From an econometric point of view, the positive correlation between intrinsic value and market value tells that the increase in one variable will lead to an increment in the other variable. This was the result of this study based on the results of the empirical results, so that we rejected the null hypothesis which means the market value of common stock has direct relationship with the intrinsic value of common stock in Palestine Exchange. Given this fact, the correlation test will not be able to figure out which variable causes the change. To overcome this limitation in correlation test, a second test, so called causality test, has been approached. Within the boundaries of PEX, using the casualty test, it has found that the market value is what derives the change in intrinsic value, meaning that rejecting the null hypotheses, which means the market value of common stock cause the intrinsic value of common stock in Palestine Exchange".

In essence, the traditional theory around this topic says that the increase in intrinsic value will lead to increase in market value of the company. In other words, the more profit generated by the company, the more growth and maximization in value. In addition, the increase in book value all will lead the market value of the company to increase, which is a contradictory with finance theory and other results in other previous studies.

Although the empirical results indicated that the Palestinian investors review such company published financial reporting, the results also showed that the market value causes the intrinsic value to change but not otherwise. In other words, the investor determines the stock price based factors other than fundamentals and there is no clear evidence on using published financial reports related to stock prices to estimate the intrinsic value; or simply, based on demand and supply without consideration to intrinsic value.

It anchors our belief that, the reader of this study should consider the limitations of this study before coming to any implication. Firstly, this study has limited to the Palestine Exchange with limited of period in time. Secondly, the Engle-Granger two-stage estimation procedure was utilized for the purposes of this study; however some authors are uncomfortable with the two-stage approach since any mistake introduced in the first step is carried forward in the next step which is one of the weaknesses that limit the applicability of the Engle-Granger two-step procedure.

On the one hand, this study is likely to provide a practical advice and significant information on the causal relationship between intrinsic value and market value in the PEX, so that policymakers are encouraged to make use of these empirical results and take them into consideration for improved the PEX's performance. On the other hand, the tenor of findings of this study is to shed light on practice reality for companies with different sectors in question. Accordingly, this study can pave the way to conduct further research to include other financial markets.

REFERENCES

1. Abbad J. and Obeidat S. (2010), Determinants of the Intrinsic Value of Common Stocks and the Application of Industrial Companies in the ASE, *European Journal of Economics, Finance and Administrative Sciences*.
2. Alatiqi S. and Shokoofeh F. (2008), Can Money Supply Predict Stock Prices?, *Journal for Economic Educators*, 8(2).
3. Ben M. (2010), Discount Cash flow Analysis, *Investopedia*.
4. Buffett W., Connors R. (2010), Principles from the Sage of Omaha, New Jersey: John Wiley & son, Inc.
5. Comeau J. and Zambrano E. (2009), Incorporating Uncertainty into Discounted Cash Flow Equity Valuations, Outstanding Senior Project Awards, Orfalea College of Business, California Polytechnic State University, Fall 2009
6. Engle, R. F., and Granger, C. W. J. (1987). Co-Integration and Error-Correction: Representation, Estimation, and Testing. *Econometrica*. Vol.55, pp. 251-276.
7. Fisher I. (1930), *The Theory of Interest*, New York: Macmillan.
8. Froidevaux P. S (2004), *Fundamental Equity Valuation: Stock Selection Based on Discounted Cash Flow*, PhD thesis, Faculty of Economics and Social Sciences, University of Fribourg, Switzerland.
9. Fuller, W.A. (1976), *Introduction to Statistical Time Series*, Wiley, New
10. Graham B., Dodd D., and Buffett W. (2008), *Security Analysis: Sixth Edition*, Foreword by Warren Buffett (Security Analysis Prior Editions), McGraw-Hill.
11. Hatanaka, M. (2003). *Time Series Based Econometrics: Unit Root and Co-Integration*. New York, USA: Oxford University Press, pp. 40-44.
12. Mcleod, A.I., and Hipel, K.W. (1978). Preservation of the Rescaled Adjusted Range: A reassessment of the Hurst Phenomenon. *Water Resource Research*. Vol.14, pp.491-508.
13. Sarikhani M. and Ebrahimi F. (2012), An empirical evaluation of using the residual income model for prediction of stock price, *African Journal of Business Management* Vol. 6(5) pp. 2043-2047,8 February, 2012.
14. William S. (1978), *Investments*, Prentice-Hall.
15. Williams J. B. (1997), *The Theory of Investment Value*, Fraser Publishing Company, York.

Tables & Graphs:

Table 1: Augmented Dickey-Fuller test statistic

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.23830	0.0000
Test critical values:	1% level	-3.467205	
	5% level	-2.877636	
	10% level	-2.575430	

Table 2: Traditional Granger Causality test of Intrinsic & Market value

Null Hypothesis	Lag	t- Value	P- Value
Market Value doesn't Granger Cause Intrinsic Value	36	2.36685	0.00099
Intrinsic Value doesn't Granger Cause Market Value	36	0.87196	0.66854

Table 3: The correlation matrix between the Market & Intrinsic Value

	Intrinsic value	Market Value
Intrinsic Value	1.000000	0.644719
Market Value	0.644719	1.000000

Table 4: Unrestricted Co integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	.05 Critical Value	Prob.**
None *	0.243941	75.37136	15.49471	0.0000
At most 1 *	0.140202	26.43515	3.841466	0.0000

Trace test indicates 2 co integrating eq. n(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug. – Michelis. (1999) p-values

Table 5: Equation Estimation, “Dependant Variable IV”

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MV	5.186612	0.460930	11.25250	0.0000
C	-2.435031	0.877037	-2.776428	0.0061
R-squared	0.415663	Mean dependent var.		5.333894
Adjusted R-squared	0.412380	S.D. dependent var.		9.465941
S.E. of regression	7.256247	Akaike info criterion		6.812652
Sum squared residual	9372.256	Schwarz criterion		6.848129
Log likelihood	-611.1386	F-statistic		126.6187
Durbin-Watson stat	2.012692	Prob.(F-statistic)		0.000000

Graph 1: the relationship between the Intrinsic Value & Market Value

