Empirical Evidence of CAPM model at Pharmaceutical Industry of DSE

By

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A Thesis Report analysis submitted to the graduate school of Management in partial fulfillment of the requirements for the degree of Masters of Business Administration

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Declaration

It is hereby declared that

1. The thesis report analysis submitted is my own original work while completing degree at BracUniversity.
2. The report does not contain material previously published or written by a third party, exceptwhere this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any otherdegree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Letter of Transmittal

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Dear Sir,

It is an honor for me that I was given the opportunity to submit the thesis paper that I have prepared from my experiences of working with CAPM model on five the Pharmaceutical Industries of DSE. I would like to convey my highest gratefulness and appreciation for your kind cooperation, leadership and guidance in accompanying and preparing my internship report. I have tried my level best to complete this case as meaningfully and correctly, as possible. I do believe that my eager determination will be apparent to you after reading the case.

Sincerely yours,

_____

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Date: Jun 23, 2021

Non-Disclosure Agreement

This agreement is made and entered into by and between DSE and the undersigned student at BRAC University …….

The Thesis Report titled "Empirical Evidence of CAPM model at Pharmaceutical Industry of DSE" has been submitted, to BRAC Business School, for partial fulfilment of the requirements for the degree of Masters of Business Administration, major in finance from BRAC University on 23th June, 2021 by Md. Tariqul Islam, ID: 18264010.The report has been accepted and may be presented to the Internship/Thesis Defense Committee for evaluation.

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Acknowledgement

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Next I would like to convey my outmost respect and gratitude to my academic supervisor Meer Sajed-Ul-Basher, without his guidance I would have not been able to make it this far and this report would have remained incomplete.

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During my last three months I have developed CAPM model on Pharmaceutical Industry of DSE, I got to meet ample of persons from a variety of backgrounds and professions both internally and externally to whom I would like to express my thankfulness for their reputed contribution in creating a memorable thesis program.

Contents

Executive Summary

This research paper focuses on the discussion of the empirical proof of CAPM model on pharmaceutical trade and concludes the speed of comeback of stock of CAPM models. The capital quality valuation model is employed as tools for the comeback. The aim this paper is to search out the speed of comeback of stock of pharmaceutical trade through capital quality valuation model. To calculate the capital asset pricing I used 2 indexes from stock exchange, DSEX and DS30.The Capital quality valuation Model (CAPM) provides a balanced linear relationship between expected returns and quality risk. The aim of this study is to analyze the risk-return relationship at intervals the CAPM framework. The survey checked out whether or not CAPM may be a sensible indicator of Bangladesh's quality price. The amount 2019-2021 has been thought-about for this. The searches at CAPM during this study well-tried that the variables we have a tendency to took square measure still a great deal alive during this place with a major correlation with stock returns.

Introduction

The stock market is an important part of our economy. It also works as an indicator of a country's economic conditions (Kimberly Amado, 2020). It is also a tool for investors to predict what might be happening in the future economic conditions. It is very crucial for investors to know risk and return of the stocks. More accurate results give them more confident on their investment and also can predict potential risk of their investment.

Capital asset pricing model is the oldest tool for calculating stock market return. Capital asset pricing model is the known for calculating return and risk of stocks. Investors had using capital asset pricing model as the only model to calculate market return beta. But in 1992, Professor Eugene Fama and Professor Kenneth French found flaw to the CAPM model and expand it by adding two risk factors to mitigate anomalies among stocks risk.

My research work will be focusing on finding the market risk and return with capital asset pricing model to find out the return of stock market using six pharmaceuticals companies in Bangladesh. The purpose of the study is to see how capital asset pricing model works for calculating stock risk and return of pharmaceutical industry.

Certainly savings can be invested in a certain amount of one type of asset but in case of uncertainty, which appears in the real world as investment, anyone must take the risk due to future uncertainty over the asset or security. Potential investors, individuals or corporations face a capital market of sufficient operation that provides a wide range of investment opportunities.

Capital Asset Pricing Models (CAPMs) describe a balanced relationship between expected returns and risks in the securities market under which assumptions can be made to describe the uncertain future of securities in terms of their potential distribution moment. The most common version is the average-variant CAPM where the two moments are considered relevant. The relationship between expected return and risk is the central theme of asset value theory. Markowitz and Tobin first expressed their concerns with the problems surrounding the choice in the uncertainty. The foundation of asset pricing theory goes back to Tobin who formally demonstrated that returns on securities are not fully correlated but diversify the risk of security holding. He theorized that investors can generally avoid all kinds of risks except the risks of holding stock. The CAPM model was generally identified as a Nobel laureate for 1990. It was also created by many researchers. In general, CAPM provides a linear relationship between expected returns and the risks associated with assets. The inconsistencies in the average return of CAPM indicate that a multifactor version of the International CAPM or Arbitrage Pricing Theory (APT) may provide a better description of the average return if the asset price is reasonable. Eugene Famawas the first reported study in the U.S. of lumbar relationships as

predicted by CAPM. They were 0 from 1946-55 and 1956-686 respectively. Reported as a statistic for the coefficient between 0 to 1. Evidence of a strong positive linear relationship between risk and return in Australia.Arif and Johnson found a strong linear relationship in the Singapore stock market, thus suggesting that portfolio risk and earnings are positive and linear. And the variation coefficient can both identify two useful variables to predict the expected asset return: default and word spread, depending on the financial environment established by Michael. He showed that the CAPM model is a good description of portfolio repayment based on size and market equity to book. The relationship between beta and average returns disappeared during the period 1963-1990. They found that there was a general positive correlation between average returns and beta in the pre-1999 period; No significant relationship was found between 1963-1990. Fama L Al 1 also used the model to explain industry income taxes. Gupta and Sanjay 1 L6 reported a relationship between expected returns and property risk disappearing between 1919 and 1919. He saw the CAPM model as a good indicator of asset value, but he Has concluded that CAPM does not show any linear (non-linear) risk-return relationship, probably due to volatility and a relatively more regulated Indian capital market. Different types of capital asset value models have been extensively tested for developed capital markets such as the United States, Europe and Australia and to a lesser extent for developed capital markets. It is useless to say that despite the existence of an organized capital market for a long time. Very few experiments have been done due to several differences between advanced capital markets and developers The validity of Western theories in Bangladesh's capital markets is questionable. There are economic and institutional differences, variations related to size, liquidity conditions, disclosure requirements, consolidation of financial systems, and so on. So the inspiration for the research is to produce comparative test results within the CAPM framework of developing capital markets like Bangladesh. The aim of this study is to test the applicability of the model to describe the risk-return relationship in the capital market of Bangladesh.

Literature Review

After the introduction of modern portfolio theory in 1592 by Harry Markowitz. Many researchers worked on their own different theories to find reasons for additional market returns. According to Markowitz's Modern Portfolio Theory, (1952). The security risk can be reduced by diversifying the portfolio and the portfolio risk can be calculated through the expected return (average) and standard deviation (variance) of different portfolios (black and consciousness). There has always been a controversial opinion about the asset price model as to the reason for the return of a share. Sharp (1964) and Lintner (1965) established the Capital Asset Pricing Model (CAPM model); Since then to this day the CAPM model has been widely used as the key theory for determining the cost and asset value of equities (Chowdhury, 2017). CAPM calculates that the return of any asset has a direct forward relationship considering both the risk-free asset and the risky premium asset the relationship asset risk premium is defined by both market risk premium and asset beta. The risk and return to CAPM is straightforward.

According to CAPM is shown below-

$E(R) = Rf + \beta\,(RM - Rf)$

Where,

Rf = risk-free rate of return

(RM) = expected market rate of return

β = sensitivity of the asset's to the market return

(R) = asset's the expected rate of return to the market return

CAPM was a groundbreaking model in the history of finance, many empirical studies were conducted which in turn challenged the validity of the CAPM Model itself.

Objectives

The main purpose of this paper shall be focusing to capital assets pricing model to find out the rate of return of stocks gives more accurate results e. g. less riskier results with empirical evidence.

Methodology

In this research I will most be focusing on secondary methods. This research is mostly based on data analysis so there is not much to get from primary ways.

The methods that I will be conducting are

- **Collection of data sample**: Most of data I will be collecting from Dhaka stock exchange website. DSE website is precise and accurate about stock price. I will also be using various foreign websites to find more accurate price of the stocks.
- **Building a portfolio**: Secondly I will construct a portfolio with selected company. I will be taking about half of giant and popular companies and half of small and growth companies.

- **Defining variables**: I will extract the weekly closing data of these selected companies and compare it with market indexes. To find out Beta of stock need to calculate the beta co-efficient each price of the stock with market closing prices.

- **Models**: To find the excess return on stock I will be exclusively using capital asset pricing model(CAPM) to calculate stock systematic risk and expected return of the stock.

Data

Sample has been gathered from month to month stocks closing price of six individual companies from pharmaceutical industry for 2 years from 2019 to 2021. These are Renata, Beximco, Square, Acme, Wata chemicals and Silva pharmaceuticals. The Market indexes I used in the project isDsex and Ds30. Monthly data has also been collected from these two indexes. Two yeas monthly data is collected from Dsex and Ds30.

Portfolio construction

We used the stocks of seven cement companies listed on the Dhaka Stock Exchange; the returns of these stocks were used as the dependent variable of the study; as the dependent variable of this study, the excess return is calculated based on the risk-free return, which will have 6 pharmaceutical companies with different sizes and book value to equity ratio combinations are put together. The company size is calculated based on the company's market value. Then came the first three companies (Renata, Beximco, and Square).They are considered large companies, and the last three (ACME, Wata Chemicals and Silva pharmaceuticals) are considered medium and small companies. On the other hand, book value is the difference between total assets and total assets. Value companies are called value companies, and companies with a low ratio of market value to book value are called growth companies. First, three companies, (Renata, Beximco, and Square) are considered valuable, and the last three companies (ACME, Wata Chemicals and Silva pharmaceuticals) are considered for this study, thus forming a portfolio for this study learning. Examples include large and growing companies, large companies with added value and scale, small growing and large companies, and small companies with added value and scale.

Variables

In all cases, All the market indexes is used as the independent variable and all the companies monthly stock price has been used as dependent variable to find regression analysis. The average weighted return of each investment portfolio is calculated by subtracting the risk-free interest rate from the monthly average return of the investment portfolio. For the CAPM model, the only independent variable is the market. Risk premium In Fama's French three-factor model, there are

two additional independent factors, namely the size premium and the market risk premium (BM). To calculate market performance, we looked at two different scenarios, DSEX and DS30.

CAPM's assumption

CAPM and its estimates are the means of estimating the expected return on capital instruments (exclusively represented by common stock). CAPM's initial estimates include, firstly, that investors are trying to maximize economic benefits and that they will behave rationally by avoiding risk. Third, the model accepts unlimited amounts and assumptions at a risk-free rate, and this concept is essential for adopting an arbitration process that leads to market equilibrium. Fourth, the information is available in the market for all investors at the same time and it will prevent any investor from making unusual returns as all the information is reflected in the stock price. Fifth, CAPM assumes that there will be no spending for any taxes or transactions, the absence of this assumption means that market liquidity will be affected and prices will behave in a volatile trend. After all, not all investors invest in the same single period to give a comparable return on all securities, which is an investment return over a period of more than three months, for example, cannot be compared with a return of more than 12 months. Even if these assumptions seem unrealistic and lead to historical criticism, the CAPM model is still important, as these assumptions stem from the implications behind these assumptions.

CAPM and stock valuation

It is necessary to determine the cost of capital for valuation of shares or to determine the rate of interest required on equity capital. Retaining the cost of equity capital reflects the degree of risk or uncertainty about future benefits. CAPM provides an alternative way to determine the expected or required rate of capital gain through which future benefits will be discounted (equity valuation). Efficient application of assessment models requires appropriate determination of discount rates.

Other practical uses of CAPM

Although CAPM is difficult to implement, the model can be effective in:

1. Determine the return required for a risky investment

2. Assessment of assets using CAPM permits to select appropriate active investment strategies if wrong value assets are present.

3. Reaching the capital market equilibrium, where (re-rf) = β (rm-rf), will increase the liquidity of the market.

4. Determine the degree of market efficiency by minimizing any arbitration opportunity using fast process

Result

CAPM Model with Dsex and DS30

Renata

Market Index	Beta
Dsex	0.07
Ds30	0.14

The systematic risk or the volatility of stock is very low compare to the overall market. Beta is equal to 1 is considered equal to the market. However both market index Dsex and Ds30 is lower than 1. Its represent price volatility of Renata stock is extremely safe but price movement is very low.

Beximco

Market Index	Beta
Dsex	0.06
Ds30	0.12

Again the systematic risk or the volatility of stock is very low compare to the overall market. Beta is equal to 1 is considered equal to the market. However both market index Dsex and Ds30 is lower than 1. Its represent price volatility of Beximco stock is extremely safe but price movement is very low. Investors who want to invest in that stock will have to wait for a long time to watch some changes in the price.

Square

Market Index	Beta
Dsex	0.02
Ds30	0.04

The beta or the systematic risk is very low compare to the overall market. Beta is equal to 1 is considered equal to the market. Square beta against both market index Dsex and Ds30 is lower than 1. They are 0.02 and 0.04. Its represent price volatility of Square stock is very safe but also theprice changes is very low. Investors who want to invest in that stock will have to wait for a long time to watch some changes in the price.

Acme

Market Index	Beta
Dsex	0.01
Ds30	0.01

The beta or the systematic risk is none to low compare to the overall market. Beta is equal to 1 is considered equal to the market. Acme beta against both market index Dsex and Ds30 is lower than 1. They are 0.01 and 0.01. Its represent price volatility of Acme stock is very safe but also theprice volatility is unnoticeable. Investors who want to invest in that stock will have to wait for a long time to watch some changes in the price. Low beta also represents Acme stock is considered far less volatile than other stock in the market.

Wata Chemicals

Market Index	Beta
Dsex	-0.01
Ds30	-0.03

The beta or the systematic risk is oposite direction compare to the overall market. Beta is equal to 1 is considered equal to the market. Wata chemicals beta is negetive both market index Dsex and Ds30 is lower than 1. They are -0.01 and -0.03. Its represent price volatility of Wata chemicals stock is moving oposite direction of the market and also the price volatility is unnoticeable. Investors who want to invest in that stock will have to wait for a long time to watch some changes in the price. It can be an opportunity for the inverstors who want to diversify the portfolio. Low beta also represents Wata chemicals stock is considered far less volatile than other stock in the market.

Silva Pharmaceuticals Limited

Market Index	Beta
Dsex	0.000659
Ds30	0.000946

The beta or the systematic risk is none to very low compare to the overall market. Beta is equal to 1 is considered equal to the market. Silva Pharmaceuticals Limited beta is extremely low compare to the both market index Dsex and Ds30 is lower than 1. They are 0.000659and 0.000946. Its represent price volatility of Wata chemicals stock is moving oposite direction of the market and also the price volatility is unnoticeable. Investors who want to invest in that stock will have to wait for a long time to watch some changes in the price. It can be an opportunity for the inverstors who want to diversify the portfolio. Low beta also represents Wata chemicals stock is considered far less volatile than other stock in the market.

CAPM result with Dsex and Ds30 index

Company name	Dsex	Ds30
Renata	0.506	0.543
Beximco	0.505	0.537
Square	0.501	0.511
Acme	0.509	0.531
Wata chemicals	0.497	0.489
Silva Pharmacuticals	0.499	0.499

The expected rate of return for 6 individual company is very similar to one another. The economic condition for bangladesh is not very favorable for two years. Sttock market is constantly losing. Despite having difficult situation pharmaceutical companies are doing well compare to other industries. We can see about 0.50% increase in monthly return with Dsex and Ds30 which is considered a decent amount of increase.

Market Index	Porfolio return
Dsex	37.7%
Ds30	51.86%

Portfolio return using 6 stock is very lucrative for the investors. I use equal weight for each stock which is about 16.66. the result is quite different from one index to another. Since Dsex is older and consists of large industries the portfolio return is relative low. On the other hand Ds30 is consists of 30 companies that they are growing companies so the market return of Ds30 is relatively higher. The portfolio return for Dsex is 37.7% and Ds30 51.86%

Conclusion

The purpose of this article is to use CAPM model to analyze the excess return of the portfolio, and then describe the performance of pharmaceutical companies in Bangladesh. The results show that the CAPM in different indexes generates different result. Result also shows that indexes with newer companies or growing companies have better chance to get more return in the investment. Data collected from May 2019 to May 2021 of six individual companies. This study shows that the beta market risk premium of the pharmaceuticals industry on the Dhaka Exchange is close to way below than 1, which has a not perfect linear relationship and the stocks is moving at very slower rate than the actual market. CAPM model because the model is more complex and requires more data input. Further study the effectiveness of these two models for investors in Bangladesh.

References

1. *Retrieve from https://www.investing.com/indices/dhaka-stock-exchange-broad-historical-data*

2. Retrieve from https://www.investing.com/indices/dhaka-stock-exchange-30

3. Retrieve fromhttps://www.dsebd.org/

4.Retrieve fromhttps://dsebd.org/dseX_share.php

5.Retrieve fromhttps://www.investing.com/indices/dhaka-stock-exchange-broad

6.Retrieve fromhttps://dsebd.org/dse30_share.php

7.Retrieve fromhttps://corporatefinanceinstitute.com/resources/knowledge/finance/systematic-risk/

8.Retrieve fromTobin, J., 1958. Liquidity preference as behavior towards risk. The Review of Economic Studies, 67: 65-86

9.Retrieve fromFama, E.F. and J. McBeth, 1973. Risk, return and equilibrium: Empirical tests. J. Political Econ., 71: 607-636.

10.Retrieve from Sharpe, W. (1964). Capital asset prices: a theory of market equilibrium under conditions of risk. Journal of Finance, 19, 425-442.

Appendix

Renata

Closing Price(tk)	DSEX price	DS30 Price
1169.9	5,421.62	1,929.09
1168.5	5,138.79	1,827.90
1192.1	5,095.77	1,800.05
1194.3	4,947.63	1,759.96
1234.1	4,682.90	1,627.74
1281.1	4,731.43	1,647.70
1289	4,452.93	1,513.34
1153.3	4,469.65	1,524.04
1067.7	4,480.22	1,492.37
1085.5	4,008.28	1,330.83
1072.4	4,008.28	1,330.83
1062.9	4,060.44	1,365.37
1048.3	3,989.08	1,340.98
1026.2	4,214.42	1,420.63
1026.2	4,879.14	1,699.54
1042.6	4,963.29	1,695.99
1167.7	4,846.10	1,680.13
1151.3	4,866.84	1,687.40
1165.1	5,402.06	1,963.96
1123.8	5,649.86	2,160.39
1170.5	5,404.79	2,056.83
1167.3	5,278.16	1,994.40
1173.6	5,479.61	2,110.91

Regression

Dsex

SUMMARY OUTPUT

Regression Statistics	
Multiple F	0.484678
R Square	0.234913
Adjusted I	0.200137
Standard E	72.21534
Observati	24

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	35227.21	35227.21	6.754907	0.016381
Residual	22	114731.2	5215.055		
Total	23	149958.4			

	Coefficients	*ndard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	810.0009	130.5851	6.202857	3.04E-06	539.1839	1080.818	539.1839	1080.818
X Variable	0.069494	0.026738	2.59902	0.016381	0.014042	0.124946	0.014042	0.124946

Ds30

SUMMARY OUTPUT

Regression Statistics	
Multiple F	0.464918
R Square	0.216149
Adjusted I	0.180519
Standard E	73.09555
Observati	24

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	32413.32	32413.32	6.066548	0.022075
Residual	22	117545.1	5342.959		
Total	23	149958.4			

	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	910.8035	97.14053	9.376143	3.85E-09	709.3464	1112.261	709.3464	1112.261
X Variable	0.137834	0.055961	2.463036	0.022075	0.021778	0.253891	0.021778	0.253891

Beximco

Closing Price	DSEX price	DS30 Price
80	5,421.62	1,929.09
79.5	5,138.79	1,827.90
82.3	5,095.77	1,800.05
82.3	4,947.63	1,759.96
82.8	4,682.90	1,627.74
83.3	4,731.43	1,647.70
77.5	4,452.93	1,513.34
78.1	4,469.65	1,524.04
61.4	4,480.22	1,492.37
73.5	4,008.28	1,330.83
66.7	4,008.28	1,330.83
61.8	4,060.44	1,365.37
64.8	3,989.08	1,340.98
63.4	4,214.42	1,420.63
69.9	4,879.14	1,699.54
95.2	4,963.29	1,695.99
124.8	4,846.10	1,680.13
114.4	4,866.84	1,687.40
133.8	5,402.06	1,963.96
140.5	5,649.86	2,160.39
176.5	5,404.79	2,056.83
149.7	5,278.16	1,994.40
191.7	5,479.61	2,110.91
178.1	5,990.98	2,205.81

Regression

Dsex

SUMMARY OUTPUT

Regression Statistics	
Multiple F	0.77671
R Square	0.603278
Adjusted I	0.585245
Standard E	26.07553
Observati	24

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	22746.8	22746.8	33.45445	8.08E-06
Residual	22	14958.54	679.9335		
Total	23	37705.34			

	Coefficients	*ndard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	-170.481	47.15171	-3.61559	0.001533	-268.268	-72.6948	-268.268	-72.6948
X Variable	0.055843	0.009655	5.783982	8.08E-06	0.03582	0.075865	0.03582	0.075865

Ds30

SUMMARY OUTPUT

Regression Statistics	
Multiple F	0.834776
R Square	0.696851
Adjusted I	0.683072
Standard I	22.79387
Observati	24

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	26275.01	26275.01	50.57158	3.93E-07
Residual	22	11430.33	519.5607		
Total	23	37705.34			

	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	-112.361	30.29198	-3.70927	0.001222	-175.183	-49.5395	-175.183	-49.5395
X Variable	0.124099	0.017451	7.11137	3.93E-07	0.087908	0.160289	0.087908	0.160289

Square

Closing Price	DSEX price	DS30 Price
257.6	5,421.62	1,929.09
257.4	5,138.79	1,827.90
258.2	5,095.77	1,800.05
251	4,947.63	1,759.96
243.9	4,682.90	1,627.74
241.8	4,731.43	1,647.70
240.8	4,452.93	1,513.34
190	4,469.65	1,524.04
171.9	4,480.22	1,492.37
197.6	4,008.28	1,330.83
179.8	4,008.28	1,330.83
184.9	4,060.44	1,365.37
184.4	3,989.08	1,340.98
172.5	4,214.42	1,420.63
180.7	4,879.14	1,699.54
205.3	4,963.29	1,695.99
215.9	4,846.10	1,680.13
205.5	4,866.84	1,687.40
202.6	5,402.06	1,963.96
197	5,649.86	2,160.39
234.4	5,404.79	2,056.83
225.9	5,278.16	1,994.40
216	5,479.61	2,110.91
199.8	5,990.98	2,205.81

Regression

Dsex

SUMMARY OUTPUT								
Regression Statistics								
Multiple F	0.413789							
R Square	0.171222							
Adjusted I	0.13355							
Standard E	26.85827							
Observati	24							
ANOVA								
	df	*SS*	*MS*	*F*	*gnificance F*			
Regressio	1	3278.677	3278.677	4.545092	0.044426			
Residual	22	15870.06	721.3665					
Total	23	19148.74						
	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	110.2414	48.56711	2.269877	0.033362	9.519334	210.9634	9.519334	210.9634
X Variable	0.021201	0.009945	2.131922	0.044426	0.000577	0.041825	0.000577	0.041825

Ds30

SUMMARY OUTPUT

Regression Statistics	
Multiple F	0.393882
R Square	0.155143
Adjusted I	0.11674
Standard E	27.11755
Observati	24

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	2970.79	2970.79	4.039905	0.056856
Residual	22	16177.95	735.3613		
Total	23	19148.74			

	Coefficients	*ndard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	141.5459	36.03794	3.927691	0.000719	66.80776	216.284	66.80776	216.284
X Variable	0.041728	0.020761	2.009951	0.056856	-0.00133	0.084784	-0.00133	0.084784

Acme

Closing Price	DSEX price	DS30 Price
74.1	5,421.62	1,929.09
72.9	5,138.79	1,827.90
73	5,095.77	1,800.05
75.8	4,947.63	1,759.96
70.6	4,682.90	1,627.74
72.2	4,731.43	1,647.70
59.1	4,452.93	1,513.34
59.2	4,469.65	1,524.04
58.2	4,480.22	1,492.37
66.2	4,008.28	1,330.83
59.3	4,008.28	1,330.83
63.8	4,060.44	1,365.37
63.8	3,989.08	1,340.98
60.7	4,214.42	1,420.63
63.3	4,879.14	1,699.54
68.9	4,963.29	1,695.99
77.5	4,846.10	1,680.13
69.8	4,866.84	1,687.40
68	5,402.06	1,963.96
68.5	5,649.86	2,160.39
75.9	5,404.79	2,056.83
68.7	5,278.16	1,994.40
70.7	5,479.61	2,110.91
67.5	5,990.98	2,205.81

Regression

Dsex

SUMMARY OUTPUT

Regression Statistics	
Multiple F	0.571557
R Square	0.326677
Adjusted I	0.296072
Standard E	4.87954
Observati	24

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	254.1417	254.1417	10.67378	0.003527
Residual	22	523.8179	23.80991		
Total	23	777.9596			

	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	39.17791	8.823545	4.440155	0.000206	20.879	57.47682	20.879	57.47682
X Variable	0.005903	0.001807	3.267075	0.003527	0.002156	0.009649	0.002156	0.009649

Ds30

SUMMARY OUTPUT								
Regression Statistics								
Multiple F	0.566057							
R Square	0.32042							
Adjusted I	0.28953							
Standard E	4.902159							
Observati	24							
ANOVA								
	df	*SS*	*MS*	*F*	*gnificance F*			
Regressio	1	249.2741	249.2741	10.37295	0.003935			
Residual	22	528.6855	24.03116					
Total	23	777.9596						
	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	47.08776	6.514737	7.227883	3.05E-07	33.57702	60.5985	33.57702	60.5985
X Variable	0.012087	0.003753	3.220707	0.003935	0.004304	0.019871	0.004304	0.019871

Wata Chemicals

Closing price	DSEX price	DS30 Price
469.7	5,421.62	1,929.09
488.2	5,138.79	1,827.90
417.8	5,095.77	1,800.05
489.3	4,947.63	1,759.96
548.4	4,682.90	1,627.74
640.4	4,731.43	1,647.70
497.6	4,452.93	1,513.34
386.8	4,469.65	1,524.04
342	4,480.22	1,492.37
365.6	4,008.28	1,330.83
311.4	4,008.28	1,330.83
306.8	4,060.44	1,365.37
306.8	3,989.08	1,340.98
306.8	4,214.42	1,420.63
317.6	4,879.14	1,699.54
325.7	4,963.29	1,695.99
351.4	4,846.10	1,680.13
326.1	4,866.84	1,687.40
306.8	5,402.06	1,963.96
310.3	5,649.86	2,160.39
306.8	5,404.79	2,056.83
306.8	5,278.16	1,994.40
306.8	5,479.61	2,110.91
306.8	5,990.98	2,205.81

Regression

Dsex

SUMMARY OUTPUT								
Regression Statistics								
Multiple F	0.049449							
R Square	0.002445							
Adjusted I	-0.0429							
Standard E	97.0149							
Observati	24							
ANOVA								
	df	*SS*	*MS*	*F*	*gnificance F*			
Regressio	1	507.5513	507.5513	0.053927	0.818513			
Residual	22	207061.6	9411.891					
Total	23	207569.2						
	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	417.2572	175.4295	2.378489	0.026491	53.43861	781.0758	53.43861	781.0758
X Variable	-0.00834	0.035921	-0.23222	0.818513	-0.08284	0.066153	-0.08284	0.066153

Ds30

SUMMARY OUTPUT

Regression Statistics	
Multiple F	0.097408
R Square	0.009488
Adjusted I	-0.03553
Standard I	96.67181
Observati	24

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	1969.497	1969.497	0.210744	0.650688
Residual	22	205599.7	9345.439		
Total	23	207569.2			

	Coefficients	*ndard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	435.0569	128.4723	3.386388	0.002656	168.6217	701.4921	168.6217	701.4921
X Variable	-0.03398	0.074011	-0.45907	0.650688	-0.18747	0.119513	-0.18747	0.119513

Silva Pharmaceutical

Closing Price	DSEX price	DS30 Price
25.2	5,421.62	1,929.09
23.2	5,138.79	1,827.90
20.9	5,095.77	1,800.05
22.4	4,947.63	1,759.96
17.3	4,682.90	1,627.74
17	4,731.43	1,647.70
16	4,452.93	1,513.34
16.9	4,469.65	1,524.04
15.4	4,480.22	1,492.37
18.7	4,008.28	1,330.83
18.7	4,008.28	1,330.83
19.3	4,060.44	1,365.37
19.7	3,989.08	1,340.98
18.3	4,214.42	1,420.63
18.3	4,879.14	1,699.54
23.3	4,963.29	1,695.99
21	4,846.10	1,680.13
18.9	4,866.84	1,687.40
18.3	5,402.06	1,963.96
18.3	5,649.86	2,160.39
18.3	5,404.79	2,056.83
18.3	5,278.16	1,994.40
18.3	5,479.61	2,110.91
16.3	5,990.98	2,205.81

Regression

Dsex

SUMMARY OUTPUT								
Regression Statistics								
Multiple F	0.151273							
R Square	0.022883							
Adjusted I	-0.02153							
Standard I	2.478136							
Observati	24							
ANOVA								
	df	*SS*	*MS*	*F*	*gnificance F*			
Regressio	1	3.164083	3.164083	0.515226	0.480439			
Residual	22	135.1055	6.141159					
Total	23	138.2696						
	Coefficients	*ndard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	15.89986	4.48115	3.548165	0.001803	6.606523	25.19319	6.606523	25.19319
X Variable	0.000659	0.000918	0.717792	0.480439	-0.00124	0.002561	-0.00124	0.002561

Ds30

SUMMARY OUTPUT								
Regression Statistics								
Multiple F	0.105119							
R Square	0.01105							
Adjusted I	-0.0339							
Standard E	2.493097							
Observati	24							
ANOVA								
	df	*SS*	*MS*	*F*	*gnificance F*			
Regressio	1	1.527873	1.527873	0.245815	0.624954			
Residual	22	136.7417	6.215532					
Total	23	138.2696						
	Coefficients	*ndard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	17.47265	3.313208	5.273634	2.72E-05	10.60147	24.34382	10.60147	24.34382
X Variable	0.000946	0.001909	0.495798	0.624954	-0.00301	0.004905	-0.00301	0.004905