Dividend Policy and Market Asymmetries

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Abstract

In 2002 new regulations arrived for public companies listed in the U.S. through the Sarbanes-Oxley Act. This regulation tried to impose more transparency in financial markets, implying less asymmetric information between firms and investors. The aim of this work is to verify if the regulation had the desired impact, comparing the dividend policy of firms before and after the introduction of this regulation. Thus, admitting that firms use dividend policy to signal our perspectives to investors, due to asymmetric information between investors and firms, a greater transparency should lead to an impact in the dividend policy.

Key Words: Sarbanes-Oxley Act, Regulation, Dividends Policy, Market Asymmetries

1. Introduction

The purpose of this project is to assess if the regulation put in place brought more transparency to the markets. According to the Market Efficiency Hypothesis, the financial markets are efficient when new information disclosed to the markets is quickly and accurately reflected in the security returns. The normal process used to determine market efficiency is through an event study, as Haugen (2000) documented. However, I will study the changes in the dividend policy during a specified length of time to determine whether the Sarbanes-Oxley Act of 2002 turned this policy more transparent and brought less asymmetry between investors and firms. The literature on dividend policy is large and several studies were done with different and contradictory results regarding this subject. However, the dividend policy is an ample subject and could be approached in many different ways.

The Securities Act of 1933, was the first regulation that took place in the U.S. financial markets for the primary markets. The Sarbanes-Oxley Act of 2002 – for now on referred as Sarbox – is the most recent and important regulation for the financial markets in the U.S.A. The Sarbox consisted in reformulating the law regarding the corporate governance and accounting rules of the U.S. public companies, making those companies disclose more detailed information to investors and, therefore, protecting them. This reform was an answer to avoid the several accounting scandals that occurred, such as the known Enron and WorldCom cases, it was created *to protect investors by improving the accuracy and* *reliability of corporate disclosures made pursuant to the securities laws*[1]. This act was signed on July 30th of 2002 and is also known as Sarbox or SOX.

Foreign companies listed in the U.S. stock exchanges also had to fulfill the Sarbox requirements.[2] This law by itself was also involved in a considerable number of controversial discussions about the trade-off between the costs of losing listed companies to other non U.S. stock exchanges and the benefit of having more transparent accountability procedures.

Before the reformulation of accounting, auditing and corporate governance laws, companies had the possibility to manage the dividend policy, perhaps signaling the company in a wrong way and transmitting to investors an incorrect idea. After the enactment of the Sarbox, it was expected that markets become more transparent for U.S. and foreign firms listed in the U.S. stock exchanges. In this paper I will test if the mean dividend yield changed before and after the regulatory change.

The dividend yield is the way to measure the return in dividends for each dollar invested in a particular security. So, one investor that requires a high and stable dividend would seek a relatively high dividend yield. Campbell and Shiller (1988) also noticed that dividend-price ratio, as they called it, is also interpreted *as reflecting the outlook for dividends* and, alternatively, *as reflecting the rate at which future dividends are discounted to today's price*, or both at once. Although, these statements were in line with the expected return predictability, and the goal of this work was to determine whether the dividend yield

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[1] Source: http://www.sarbanes-oxley-forum.com/

[2] Deadlines from the fulfillment of Sarbox requirements:

- *Most public companies must meet the financial reporting and certification mandates for any end of year financial statements filed after Novermber 15th 2004 (amended from June 15th).*
- *Smaller companies and foreign companies must meet these mandates for any statements filed after 15th July 2005 (amended from April 15th).*

Source: http://www.sarbanes-oxley-forum.com/

changed through one period to another, doing a parallelism with the market asymmetries between investors and firms.

This paper purposes to analyze whether the mean dividend yield changed from one period to another. The first test to be performed is the test for differences between mean populations for an independent sample. Under the null hypothesis that the dividend yield of the Pre-Sarbox period is equal to the After-Sarbox period, it is expected that the null hypothesis would be rejected. The same test will be performed to determine whether the means are statistically equal between the Sarbox and the After-Sarbox periods. Evidence of the impact of the previous period's dividends, prices and earnings on the dividend yield was provided through a Weighted Least Squares (WLS) regression to prevent for heteroskedasticity. Serial correlation tests will be performed to get statistical results about the persistence of the dividend yield. It is expected that those variables have impact in the dividend yield since some of them are used to calculate the ratio *per si* and also because the empirical results already found by other authors showed evidence of the link between earnings and dividends.

To perform the tests proposed, prices, dividends and earnings are used for the S&P 500 index. The expectations for the first test were confirmed, suggesting that the Sarbox Act brought transparency to financial markets. For the second test the same applies, since in some way all variables have impact on the explanation of the dividend yield.

The rest of this article is organized as follows: section 2 presents the literature review, section 3 describes the data and the methodology used, section 4 explains the empirical results while section 5 ends with a summary and conclusions.

2. Literature Review

A large literature has been developed in order to test the market efficiency hypothesis on the financial markets under the three known forms: weak, semi-strong and strong. Some examples of these three forms are very well documented by Haugen (2000). Most of it was centered in event studies that tried to explore the semi-strong market efficiency hypothesis, i.e., tried to capture the impact of historical and current released information to the markets.

Inside traders try to exploit the inefficiencies of the market using privileged information to beat the market leading ultimately to more efficient stock prices' behavior. Fishman and Hagerty (1992) found that insider trading has adverse effects, such as detecting traders that acquire private information, skewing the information from the general traders to the informed traders.

Bhattacharya and Daouk (2002) compared the insider trading behavior and the cost of equity in different countries. Most countries were subjected to laws that do not allow for insider trading. However, not all those countries could enforce the law. They found that the simple establishment of insider trading laws is not sufficient to lower the cost of equity, but the *enforcement* of such trading laws is empirically far more significant.

Several event studies were done regarding the impact of stock splits, dividend policies and earnings growth on the value of the firms. Lintner (1965) studied the changes of dividend policy and concluded that the increase in dividends is more due to management belief of earning permanent increase than to a signaling effect.

Earlier, Miller and Modigliani (1961) have found initial evidence that the signaling effect of the dividend policy leads to the ability of increasing the future earnings and the stock price change, mainly because of the information that dividend transmits to investors, as corroborated by several later studies like Bhattacharya (1979) and John and Williams (1985). However, the idea that dividends are related to earning power is not so strongly supported by Nissim and Ziv (2001) and Benartzi, Michaely, and Thaler (1997). Instead, they argue that dividend changes have a modest and positive impact in excess returns that are related to the systematic risk and profitability in the next two years subsequent to dividend changes that one company faces. Grullon, Michaely, Swaminathan (2002) concluded the same, but found additionally that investors may interpret dividend changes as "good" or "bad" news.

The effect of the regulation in the market efficiency was studied by John J. Binder (1985) who argued that tests with stock price data are more powerful than those with accounting data since they (1) are more accurate, (2) provide greater number of observations and (3) measure better the isolate company-specific effect through specified models of expected returns. However, he found some limitations in his sample that could lead to some biases, such as: (1) the regulatory announcements can be anticipated and therefore the company can apply these regulations early; (2) the same industry can have positive or negative abnormal returns regarding their market capitalization; (3) one industry can benefit more of the regulatory change; and (4) under certain circumstances one can not know if the abnormal returns are cause by regulation or other industry-specific shock..

When performing an event study, one should be very careful with the methodology used in order to avoid biases referred in the estimates. John J. Binder (1998) points some problems in market model methodology, namely the dependence and/or the heteroskedasticity of the abnormal returns which can introduce bias in the event studied. The heteroskedasticity problem arose due to a variance of abnormal returns during an event - especially in the event date - were not constant. To solve these problems, he proposes to eliminate cross-sectional dependence by combining securities experiencing the event in the same calendar month in a portfolio.

Regarding the Sarbanes-Oxley Act of 2002, few studies were done comparing the market asymmetries before and after this regulation. The existing few focused on the *accounting* impact of this regulatory change, rather than on the impact in the market transparency. Thus, this study will hopefully help filling the existing gap in the literature concerning the impact of the dividend yield ratio in the transparency of the markets before and after the Sarbanes-Oxley Act.

3. Data & Methodology

Daily dividends per share, *daily earnings per share* and *daily closing prices* were collected for the S&P 500 Index from the Bloomberg screens for the length of time from January of 2000 to December of 2008. The S&P 500 index was chosen as a good sample in terms of market capitalization and specifications. The stocks represented in S&P 500 Index are those of the largest public held companies listed in the New York Stock Exchange (NYSE) and NASDAQ.

To determine the Dividend Yield for each day, the calculation was performed as:

$$Div\_Yield_t = \frac{Div_t}{\Pr ices_t} \quad (1)$$

Div_t and $Price_t$ are the dividends and prices per share for each period t of the S&P 500 Index, respectively. 2262 daily dividend yields were calculated for the S&P 500 index for the length of time since January 2000 to December 2008. To determine whether the Sarbox had impact on the dividend yield is important to get a measure to value it. Therefore, it is important to know if the dividend yield increased or decreased after the implementation of the regulation put in place and if the change was statistically significant. To calculate some values and determine the significance of this analysis, I will determine the arithmetic average for the daily dividend yield for each of the following periods: (*i*) Pre-Sarbox, (*ii*) Sarbox and (*iii*) After-Sarbox periods through the subsequent formula:

$$\overline{Div\_Yield_{Period}} = \frac{1}{N}\sum_{t=1}^{n} Div\_Yield_t \qquad (2)$$

The periods were divided as follows:

(i) Pre-Sarbox period: this period is prior to the Sarbox. It captures the mean dividend yield of the index prior to regulatory changes. Observations since January 2000 to July 30th 2002 were included, as this last date is when Sarbox was enacted;

(ii) Sarbox Period: this period covers the mean dividend yield during the transition period to all aggregated firms represented in the S&P 500 Index. The data range ends on July 15th 2005, as the last deadline for foreign firms to fulfill the requirements; and

(iii) After-Sarbox period: this period gathers dividend yields after the transition period, i.e., since July 18th 2005 to December 2008. The goal is to compare if the mean dividend yield is statistically equal between the two periods described above and this one.

To evaluate whether the Sarbox brought transparency to the market or not, the criteria used was the statistical significance of the change of the mean dividend yield before and after the Sarbanes-Oxley Act of 2002. To determine if the change in the means between both periods had meaning, a test of differences between population means for independent samples was constructed under the null hypothesis that the means of the Pre-Sarbox vs. After- Sarbox and Sarbox vs. After-Sarbox periods are equal. Ayres, Cloyed, and Robinson (2002) also used this test across no-dividends and high-dividend firms for dividend yields among other variables. Assuming that the dividend yield has an asymptotically normal distribution, it was defined as the following test:

$$H_0: \mu_x = \mu_y$$

$$H_1: \mu_x \neq \mu_y$$

Where μ_x represents the Pre-Sarbox period, μ_y represents the After-Sarbox period for the first test; and μ_x represents the Sarbox period, μ_y represents the After-Sarbox period for the second test. I tested if there is a statistical significant difference between the mean dividend yields for both periods. To test whether the null hypothesis is statistically significant or not, the usual Student's t test is not the most accurate one in this case, as Fermat, Schbert, Einstein, and Behrens-Fisher (2002) stated, since the underlying assumption of heteroskedasticity is violated. Clearly, the variances of both periods are not equal. There are two relevant tests in this case: (1) the Satterthwaite-Welch t-test and (2) the Welch F-test. Both tests are adaptations of the Student's t-test and ANova F-test, respectively, assuming that the two samples have possibly unequal variances.

Using the Satterthwaite-Welch t-test,

$$t = \frac{\mu_x - \mu_y}{\sqrt{\frac{\sigma_x^2}{n_x} + \frac{\sigma_y^2}{n_y}}} \tag{3}$$

To calculate the degrees of freedom associated with this estimation, the Welch-Satterthwaite equation is used:

$$v = \frac{\left(\frac{\sigma_x^2}{n_x} + \frac{\sigma_y^2}{n_y}\right)^2}{\frac{\sigma_x^4}{n_x^2 \cdot (n_x - 1)} + \frac{\sigma_y^4}{n_y^2 \cdot (n_y - 1)}} \tag{4}$$

Using the Welch F-test,

$$F^* = \sum_{g=1}^{G} \frac{w_g \left(\bar{x}_g - \bar{x}^*\right)^2 / (G-1)}{1 + \frac{2(G-2)}{G^2 - 1} \sum_{g=1}^{G} \frac{(1-h_g)^2}{n_g - 1}} \text{ [3]} \tag{5}$$

The numerator of the adjusted statistic is the weighted between group mean squares and the denominator is the weighted within group mean squares. Under the null hypothesis of equal means but possibly unequal variances, F* has an approximate F-function with (G-1, DF*) degrees of freedom, where:

$$DF^* = \frac{(G^2 - 1)}{3 \cdot \sum_{g=1}^{G} \frac{(1-h_g)^2}{n_g - 1}} \text{ [4]} \tag{6}$$

[3] Where :

(1) $w_g = n_g / \sigma_g^2$, where σ_g^2 is the sample variance is subgroup g;

(2) $h_g = w_g \Big/ \left(\sum_{g=1}^{G} w_k \right)$,where h_g is the anormalized weight;

(3) $\bar{x}^* = \sum h_k \cdot \bar{x}_g$, where $\bar{x}^*$ is the weighted grand mean.

The subgroups designated are the Pre-Sarbox vs. After-Sarbox, or Sarbox vs. After-Sarbox periods this notation is only used for simplification.

There is another approach to determine some empirical results as done by the volatility of the dividend yield through the same periods of time, following the next formula:

$$\sigma(Div\_Yield_t) = \sqrt{\frac{1}{N}\sum_{t=1}^{N}\left(Div\_Yield_t - \overline{Div\_Yield_t}\right)^2} \qquad (7)$$

Applying the tests of equality for variances, the Levene test strongly suggested that the variances differ across periods.

In addition, multiple regressions were performed to determine if the sample in focus has the same empirical results as other studies done before, such as Miller and Modigliani (1961), in the dividends and earnings field. Using an Weighted Least Squares (WLS) regression,

$$Div\_Yield_t = \alpha_0 + \sum_{i=1}^{n}\alpha_i \cdot Div_{t-1} + \sum_{i=1}^{m}\beta_i \cdot Ear_{t-1} + \sum_{i=1}^{g}\gamma_i \cdot S\&P\_\Pr ice_{t-1} + Time_t + \mu_t \qquad (8)$$

where,

- α_0, α_i, β_i and γ_i are the intercept and the slopes, respectively, of the linear relationship between the dividend yield and the different independent variables;
- Div_Yield_t is the dividend yield for period t;
- Div_{t-1} is the dividends of the previous periods;
- Ear_{t-1} is the earnings of the previous periods;
- $S\&P\_Prices_{t-1}$ is the prices of the S&P 500 index of the previous periods;
- $Time_t$ is variable that explains the persistence of dividend yield;
- μ_t is the zero-mean error term;

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[4] Because the test is only performed for two subgroups, the Pre-Sarbox vs. After-Sarbox period, or the Sarbox vs. After-Sarbox periods, the G=2.

The WLS regression was also chosen because it is more efficient and the variance estimator is consistent under the assumption of heteroskedasticity rather than the usual Ordinary Least Squares (OLS) model. If the OLS model was used instead of the WLS, the estimated standard error would be wrong. Therefore, the Student t-Statistic and F-Statistic tests would not be the appropriated ones and the OLS estimator would no longer be BLUE[5]. Thus, the WLS model leads to new t and F-Statistics that have t and F distributions. Further tests on serial correlation of residuals were also performed to avoid major errors on the estimators.

For daily observations, it is important to account for day-of-the-week effects and month-of-the-year effects; hence these tests were performed regarding the overall sample.

4. Empirical Results

The statistical tests analyzed in this section, show that both comparisons between dividend yield means of Pre-Sarbox vs. After-Sarbox and Sarbox vs. After-Sarbox periods changed after the implementation of the regulation.

At first glance one can see that the mean dividend yield between the Pre-Sarbox to the After-Sarbox period had changed from 1.21 to 2.05, respectively, expectations being that the null hypothesis would be rejected. The same occurs between the Sarbox and the After-Sarbox periods from 1.66 to 2.05, however the change is smaller in this case. Table 1[6]

[5] BLUE stands for Best Linear Unbiased Estimator.
[6] All tables and figures mentioned are presented in appendix.

despites the descriptive statistics. The statistical tests helped to determine the significance of the mean change.

The statistical tests performed for the differences between mean populations for independent samples and unequal variances, in this case equality tests between the Pre-Sarbox vs. After-Sarbox and Sarbox vs. After-Sarbox dividend yield means, suggested that the null hypothesis is strongly rejected. Analyzing the Welch F-test for the jointly hypothesis, the Pre-Sarbox differs from the After-Sarbox mean in excess of 3310.695 (three decimal places) with a P-value associated of nearly 0.0000 (0.00%). Regarding the Satterthwaite-Welch t-test, the results lead to the same conclusion since the means of both periods differ in shortage of approximately -57.5386 (four decimal places), also with a P-value near to 0.0000 (0.00%). Table 2 gathers the results of this test. Regarding the same test performed between the Sarbox and After-Sarbox periods, the results lead to the same conclusion as the previous one, however the values are fairly smaller. For the Welch F-test the Sarbox differs from the After-Sarbox mean in excess of 641.3437 (four decimal places), but the P-value associated with remains nearly of 0.0000 (0.00%). In the case of the Satterthwaite-Welch t-test the means differs in shortage of -25.3248 (four decimal places), also with a P-value near to 0.0000 (0.00%).

For both tests the null hypothesis is strongly rejected, meaning that the mean dividend yield changed between one period to the other were significant. The results obtained corroborate with the research question in focus, suggesting that the Sarbox Act brought more transparency to the financial markets, removing asymmetries between firms and investors. Even though, it is important to notice that further external factors to the regulation could have a huge impact on this results. Analyzing the dividend yield during the length of time considered, we can see that the ratio increased in the mid-2007. This increase was due to the decrease of the prices of the S&P 500 accompanied by a continuous increase of dividends per share. Recalling the economic history, at that time the subprime crisis arrived to the U.S. financial markets in which almost all U.S. stock exchanges felt the impact in the security prices. The late reversal on the dividends per share trend could be related to the reluctance of managers to reduce dividends, as Lintner (1965) suggested.

Figure 1 despites the great volatility of the S&P 500 prices during the sample period, which had a major impact on the dividend yield ratio, in addition with the positive trend of the dividends per share. Shiller (1981) referred the popular discussion about the stock prices indexes volatility in general and argued that this variability could not be attributed to the changes in dividends, given that the information disclosed to the markets are not so often. Therefore, these prices volatility affect the dividend yield.[7] These results strongly support a crisis scenario, complying with the explanation of the reverse trend in the S&P 500 prices. In such a scenario, investors could take advantage of market volatility as the expected returns increases.

A different group of tests were performed regarding the impact of previous period dividends, prices and earnings on the dividend yield at time *t*. It was expected that all variables had impact, accordingly with evidence provided by the existing literature on this field. This estimation was performed until one year before, in other words the periods in focus were 3, 6, 9 and 12 months behind, corresponding to approximately 60, 120, 180 and 240 business days. These periods are consistent with quarterly ex-dividend dates of major U.S. firms.

[7] By measuring the volatility of the dividend yield on (1) Pre-Sarbox, (2) Sarbox and (3) After-Sarbox periods, the result showed that was a notorious change from 11.69% to 40.52% in the standard deviation from the Pre-Sarbox to the After-Sarbox periods, supported by tests of equality for variances.

The 6th month homologue period dividend seem to be statistically insignificant to explain the dividend yield at 1% significance level, with a test statistic (t-stat) of -2.3052 (four decimal places), with a P-value associated of 0.0213 (2.13%). Dividends of 9 months before period are also statistically insignificant at 5% significance level, corresponding to a t-stat of 1.7547 (four decimal places) and with a P-value associated of 0.0795 (7.95%). Regarding the earnings impact, only the one year homologue period is strongly statistically insignificant, with a t-stat of -0.4005 (four decimal places) and a P-value associated of 0.6888 (68.88%). In what concerns prices impact, the previous 60 days period seem to be statistically insignificant at 5% significance level, corresponding to a t-stat of 1.7498 (four decimal places) and with a P-value associated of 0.0803 (8.03%). In addition, prices of the homologue 9 months period is statistically insignificant with a t-stat of 1.3336 (four decimal places) and a P-value associated of 0.1825 (18.25%). The remaining variables all seem statistical significance in the explanation of the dividend yield of time *t*.

The variable time has a positive impact in the dividend yield, since it is statistically significant with a t-stat of 29.5925 (four decimal places) and a P-value associated near to 0.0000 (0.00%). This variable was employed because the model is non-stationary, as the time is passing the dividend yield tends to slightly increase.

Moreover, when we analyze residuals serial correlation through the Durbin-Watson statistic, one should notice that there is positive serial correlation, as expected. This result is explained, once again, by the persistence of the dividend yield.[8] Serial correlation problems in the time-series models are usually viewed as the most important problem, because of the larger impact in the standard errors and in the efficiency of estimators. It is difficult to

[8] To get a more accurate result, a Breusch-Godfrey Serial Correlation LM test was performed, confirming the result with a t*R-squared test of 1730.99 (two decimal places), with a Chi-Squared Probability associated near to 0.0000 (0.00%).

control this problem when we study persistent variables in the model. Thus, the results could not be robust anymore.

It is also important to account for dummies with such a high frequency data. For the day-of-the-week effect the results did not provide any pattern in which dividend yield is statistically different between business days. However, when we analyze the month-of-the-year effects, August and September seem to have a negative impact in the dividend yield at 10% significance level. October, November and December are the months with a greater dividend yield. The reason behind these results can be the high propensity of firms to increase the dividends in the end of the year.

5. Summary and Conclusions

The aim of this work was to show the positive impact of the Sarbanes-Oxley Act on market transparency in financial markets, through the dividend yield. The tests performed that suggested these results were tests of equality between dividend yield means of different periods. To perform these tests, three blocks of periods were created in order to guarantee the separation of the effect of the regulatory change in dividend yields.

As dividend polices usually convey information to investors, the dividend yield behavior was studied in order to understand whether or not the information asymmetry has been reduced due to the impact of the Sarbanes-Oxley Act. Two main tests for mean equality were conducted using different periods: the first compared the change in mean dividend yield between the Pre-Sarbox vs. After-Sarbox periods; the second compared the Sarbox vs. After-Sarbox periods. Both tests suggested that the Sarbox had a positive impact on dividend yields due to the mean dividend yield change between one period and another.

However, it is important to argue that these results could be influenced by external factors that were not taken into account in this analysis. Thus, using the same methodology as the mean tests, volatility was measured to explain part of the dividend yield increased.

Further tests were done to analyze the impact of dividends, earnings and prices of previous periods on the explanation of the dividend yield. The results obtained supported the expectations that all variables explained the dividend yield, confirming some known empirical evidence presented in other literatures. However, is important to emphasize that the variable is serial correlated, leading to less robust estimators. This result is expected, as the dividend yield is a quite persistent variable - the dividend yield of today, would be the dividend yield of tomorrow. When studying for month-of-the-year effects, the results provided evidence that the dividend yield is greater on the last months of the year, probably due to high propensity of firms to increase dividends.

Succinctly, regulations seem to have an important impact in the transparency of markets, since it enforces firms to disclose more information to financial markets. The results obtained confirmed that the Sarbanes-Oxley Act had an important contribution to avoid market asymmetries.

6. Appendix

Table 1 – Descriptive Statistics

	OVERALL_SAMPLE	PRE_SARBOX	SARBOX	AFTER_SARBOX
Mean	1.684460	1.209101	1.658364	2.047035
Median	1.672622	1.201941	1.610594	1.862015
Maximum	4.015815	1.558914	2.089353	4.015815
Minimum	1.004484	1.004484	1.376338	1.723382
Std. Dev.	0.438912	0.117439	0.187021	0.406976
Skewness	1.302743	0.278052	0.758173	2.176345
Kurtosis	6.439179	2.305961	2.329075	7.580563
Jarque-Bera	1754.606	20.53155	87.86766	1450.698
Probability	0.000000	0.000035	0.000000	0.000000
Sum	3810.249	753.2701	1271.965	1785.014
Sum Sq. Dev.	435.5667	8.578555	26.79232	144.2633
Observations	2262	623	767	872

Figure 1: Dividend Yield, Dividends and S&P 500 Prices

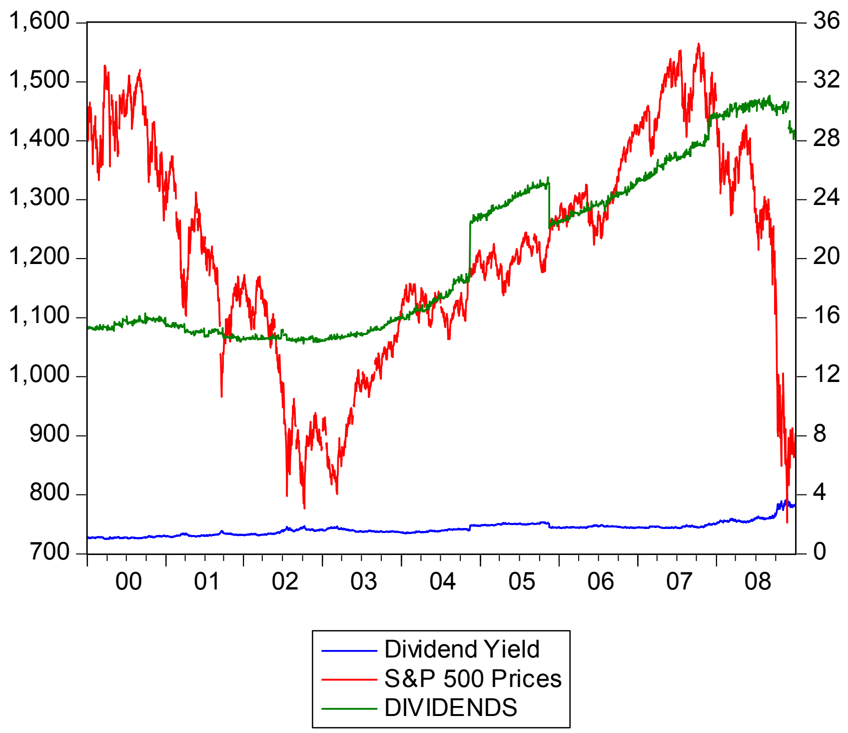

Table 2 – Test for equality of means between Pre-Sarbox and After-Sarbox period

Test for Equality of Means Between Series
Date: 05/20/09 Time: 02:13
Sample: 1 2262
Included observations: 2262

Method	df	Value	Probability
t-test	1493	-49.92290	0.0000
Satterthwaite-Welch t-test*	**1065.593**	**-57.53864**	**0.0000**
Anova F-test	(1, 1493)	2492.296	0.0000
Welch F-test*	**(1, 1065.59)**	**3310.695**	**0.0000**

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between	1	255.1421	255.1421
Within	1493	152.8419	0.102372
Total	1494	407.9840	0.273082

Category Statistics

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
PRE_SARBOX	623	1.209101	0.117439	0.004705
AFTER_SARBOX	872	2.047035	0.406976	0.013782
All	1495	1.697849	0.522572	0.013515

Table 3 – Test for equality of means between Sarbox and After-Sarbox period

Test for Equality of Means Between Series
Date: 05/21/09 Time: 20:08
Sample: 1 2262
Included observations: 2262

Method	df	Value	Probability
t-test	1637	-24.28868	0.0000
Satterthwaite-Welch t-test*	**1257.044**	**-25.32477**	**0.0000**
Anova F-test	(1, 1637)	589.9399	0.0000
Welch F-test*	**(1, 1257.04)**	**641.3437**	**0.0000**

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between	1	61.64480	61.64480
Within	1637	171.0556	0.104493
Total	1638	232.7004	0.142064

Category Statistics

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
SARBOX	767	1.658364	0.187021	0.006753
AFTER_SARBOX	872	2.047035	0.406976	0.013782
All	1639	1.865149	0.376913	0.009310

Table 4 – Impact of dividends, earnings and prices on the dividend yield

Dependent Variable: DIVIDEND_YIELD
Method: Least Squares
Date: 05/31/09 Time: 18:10
Sample (adjusted): 12/14/2000 12/31/2008
Included observations: 2022 after adjustments
Weighting series: H

	Coefficient	Std. Error	t-Statistic	Prob.
C	1.066551	0.026496	40.25317	0.0000
DIVIDENDS(-60)	0.082492	0.004270	19.31911	0.0000
DIVIDENDS(-120)	-0.012032	0.005220	-2.305198	0.0213
DIVIDENDS(-180)	0.009253	0.005273	1.754689	0.0795
DIVIDENDS(-240)	0.011412	0.004166	2.739065	0.0062
EARNINGS(-60)	-0.059441	0.002633	-22.57154	0.0000
EARNINGS(-120)	0.055795	0.005190	10.75115	0.0000
EARNINGS(-180)	-0.059915	0.005603	-10.69428	0.0000
EARNINGS(-240)	-0.001367	0.003414	-0.400506	0.6888
S_P_500_PRICES(-60)	9.40E-05	5.37E-05	1.749809	0.0803
S_P_500_PRICES(-120)	0.000265	5.20E-05	5.095211	0.0000
S_P_500_PRICES(-180)	7.05E-05	5.29E-05	1.333641	0.1825
S_P_500_PRICES(-240)	0.000860	4.86E-05	17.69035	0.0000
TIME	0.001139	3.85E-05	29.59253	0.0000

Weighted Statistics

R-squared	0.917289	Mean dependent var	1.749950
Adjusted R-squared	0.916753	S.D. dependent var	0.529243
S.E. of regression	0.131262	Akaike info criterion	-1.216342
Sum squared resid	34.59729	Schwarz criterion	-1.177487
Log likelihood	1243.722	Hannan-Quinn criter.	-1.202083
F-statistic	1713.019	Durbin-Watson stat	0.168000
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.903894	Mean dependent var	1.754993
Adjusted R-squared	0.903271	S.D. dependent var	0.410331
S.E. of regression	0.127618	Sum squared resid	32.70290
Durbin-Watson stat	0.143589		

Table 5 – Month-of-the-Year Effect

Dependent Variable: DIVIDEND_YIELD
Method: Least Squares
Date: 06/06/09 Time: 23:51
Sample: 1/03/2000 12/31/2008
Included observations: 2262
Weighting series: H

	Coefficient	Std. Error	t-Statistic	Prob.
C	1.748113	0.013667	127.9094	0.0000
DIVIDENDS	0.088900	0.000385	231.0637	0.0000
S_P_500_PRICES	-0.001544	1.12E-05	-138.0299	0.0000
FEB	-0.000344	0.009679	-0.035543	0.9716
MAR	-0.002770	0.009375	-0.295478	0.7677
APR	-0.009732	0.009541	-1.019952	0.3079
MAY	-0.007851	0.009507	-0.825818	0.4090
JUN	-0.011403	0.009532	-1.196361	0.2317
JUL	-0.012834	0.009420	-1.362419	0.1732
AUG	-0.015781	0.009311	-1.694927	0.0902
SEP	-0.016885	0.009522	-1.773252	0.0763
OCT	0.022446	0.009198	2.440340	0.0148
NOV	0.049899	0.009455	5.277339	0.0000
DEC	0.046378	0.009400	4.933756	0.0000

Weighted Statistics

R-squared	0.963028	Mean dependent var	1.690972
Adjusted R-squared	0.962815	S.D. dependent var	0.574866
S.E. of regression	0.090888	Akaike info criterion	-1.952197
Sum squared resid	18.57008	Schwarz criterion	-1.916770
Log likelihood	2221.935	Hannan-Quinn criter.	-1.939270
F-statistic	4504.257	Durbin-Watson stat	0.059735
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.959771	Mean dependent var	1.684460
Adjusted R-squared	0.959538	S.D. dependent var	0.438912
S.E. of regression	0.088288	Sum squared resid	17.52259
Durbin-Watson stat	0.034496		

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