UNIVERSITY OF AGDER

A Study of the Relationship between U.S. Stock Market Returns and the Political Environment

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This Master's Thesis is carried out as a part of the education at the University of Agder and is therefore approved as a part of this education. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.

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ABSTRACT

This master's thesis examines the relationship between the political environment and the stock market returns. The main focus is whether there are differences in the stock market returns under different political parties, if the political environment assembles a cycle in the stock market returns and if the stock market returns can be used to predict the outcomes of reelections. There have been several studies that have found possibilities of earning abnormal returns above the market portfolio, and this is in contradiction to the Efficient Market Hypothesis. As we learnt more about this topic we found that previous studies have reached different conclusions about the relationship and that the solution to this anomaly was not yet solved. This triggered us to investigate the topic further and attribute knowledge to the existing literature. This study uses the t-test and F-test to perform analyses on data from the period of 1871 to 2012. We find that the party effect was present for the excess returns, returns were higher in the latter half of presidential periods and that stock market returns can predict the outcomes of reelections. The conclusion is that there could be a political environment that affects the stock market returns.

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1. INTRODUCTION

The topic of this master's thesis is the relationship between politics and the U.S stock market returns. A primary motivation was "The little book of stock market cycles" by Hirsch (2012) where he dedicated a chapter to how the presidential election cycle impacts the markets. He claims that presidential elections are a source of how the economy, and thus the stock market, behaves at specific points in time. Incumbent Presidents conduct low-grade decisions with respect to voters' interest in the beginning of presidential periods, and the voter friendly policies are performed before elections as to receive a higher popularity score among the voters in order to get reelected. Further he asserts that wars, recessions and bear markets are a tendency in the two first years of presidencies and that trends in the two last years are prosperous times and bull markets. From figure 1 we can see this pattern inherent in the Dow Jones Industrial Average (DJIA), where the change in the index during post-election years is much less than what it is in the preelection years. In fact, the preelection years and the election years all together has a total net market gain of 724.0% versus a gain of 273.1% in the post-election years and midterm years.
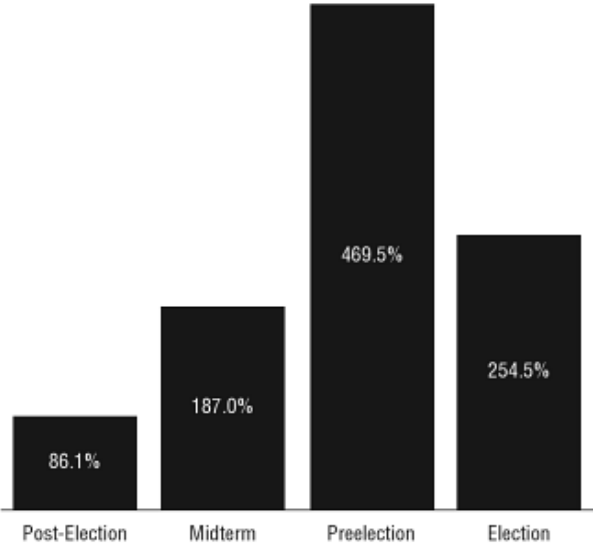

FIGURE 1: FOUR-YEAR PATTERN OF THE ANNUAL CHANGE IN DJIA, 1833-2011
(Hirsch, 2012 pp. 71)

Another point that Hirsch (2012) asserts in his book is that there are differences among the returns under Democratic and Republican Presidencies. The DJIA has had a return of 10% during Democratic Presidencies and 6.8% during Republican Presidencies. This pattern thus shows the opposite of a popular belief.

After diving deeper into the literature, we found that there was a broad array of research done regarding the topic and that there are differing views of why and how the political environment affects US stock market returns. One of the most widely researched questions is whether the stock market returns differ among the Republican and Democratic Presidents. The Republican Party has traditionally been viewed as "the party of business" and therefore believed to have the highest returns (e.g. Riley & Luksetich, 1980; Huang, 1985; Stangl and Jacobsen, 2006; Carison, 2012). However, researchers on this field have not found evidence to support this belief. The results have rather showed higher returns during Democratic Presidencies. Some studies have concluded that the returns are significantly higher under Democrats (Huang, 1985; Santa-Clara & Valkanov, 2003) while others have not found the difference to be statistically significant (Hensel & Ziemba, 1995; Johnson et al, 1999; Booth & Booth, 2003).

The first to unveil the political cycle was Nordhaus (1975). He had an opportunistic view of the political cycle in which the incumbent President used monetary policies to stimulate the macro-economy prior to elections as to get re-elected, which in turn affect the stock market returns. A partisan view of the political cycle constitutes that there are different philosophies between the Democratic Party and the Republican Party which assemble a political cycle. Such a theory is applied in the research done by Alesina and Sachs (1988). Allvine and O'Neill (1980), Huang (1985), Hensel and Ziemba (1995) and Johnson, Chittenden and Jensen (1999) found the returns in the latter half of presidential periods to be statistically significantly higher than the two former years.

The relationship between the returns during presidents' first periods and their chances of being reelected is a topic that has not been broadly researched. Prechter Jr., Goel, Parker and Lampert (2012) investigated the relationship between the incumbent president's vote margin and the prior change in the stock market, and found a positive, significant relationship between the two. This result is in accordance with the socionomic voting theory, which claims that the voters

unconsciously hold the leader responsible for their social mood, as represented by the stock market. Hirsch (2012) also looked at this relationship and found that the average annual gain when looking at the DJIA was 10.7% when the incumbent was reelected and 4.3% when the incumbent lost the reelection. However, he did not perform any statistical tests to confirm whether his findings were significant or not. Differences between the returns of the first and second periods of presidents who were in office for at least two periods have not been studied much. Booth and Booth (2003) find no significant relationship here, but the result is just briefly mentioned in their study.

As documented in the literature by researchers such as Allvine and O'Neill (1980) and Ziemba (2012) it is possible to beat the market while taking into account effects politics have on the stock market. This would be a contradiction to the Efficient Market Hypothesis (EMH) which states that stock market prices are determined on the basis of all available information and that it is not possible to predict future stock prices. If it thus exists a possibility of beating the market by using information about politics, these patterns should have vanished in accordance with the EMH as an assembled market would take advantage of this and prices would adjust accordingly. The topic is therefore highly interesting for stock market investors because of the possibilities of predicting the behavior in stock prices by examining the political environment.

The goal of this master's thesis is to revisit the empirical evidence on the differences in stock market returns under Republican and Democratic Presidencies, whether the returns in the second half of a presidential period is higher than the returns in the first half, and whether the stock market returns can be used to predict the outcomes of reelections. Several researchers have studied these topics, and one can therefore discuss the importance of further studies. However, the researchers have reached various conclusions on the politics' impact on the stock market. Because of the effect not being clear, we think it is important to continue research in this area. Many of the studies have been performed decades ago, and it will be natural to keep doing research to include new returns. The dataset that we have used when applying the tests includes data from 1871 to present and is the longest dataset available. We contribute to the existing literature by updating the data to include recent returns and by extending the testing of real returns as previous studies have focused mainly on nominal and excess returns. We also extend previous studies related to the difference between the returns of presidents who were reelected

compared to those who were not, as well as the difference between the first and second presidential periods.

This master's thesis is structured as follows:

Chapter 2 contains previous literature on the topic examined. Four categories concerning influences that politics have on US stock returns are elaborated; the party effect, the election reaction, the second half effect and the reelection effect. Chapter 3 presents the relevant theory of our study. We hereby discuss the Efficient Market Hypothesis and the relationship between politics and returns. The research methods used for this study are presented in chapter 4. The following relevant concepts are explained; regression analysis, univariate analysis, t-test and F-test. The motivation for using these research methods is also explained. The data used for this analysis are presented in chapter 5 where the sources of the data are presented and we explain how returns and inflation were computed. Chapter 6 presents the results of our analysis. The results are categorized into the party effect, the second half effect and the reelection effect. After the results of each category are presented, we discuss our findings and compare them with previous studies. Chapter 7 gives a conclusion based on our results.

2. LITERATURE REVIEW

There exist a great deal of previous literature about the influence that politics have on the return of stocks, and researchers have been puzzled by their results. Could it be possible to earn abnormal returns when taking into account different effects politics have on the stock market? If this is the case, it would be in contradiction to the Efficient Market Hypothesis.

The structure of this literature review is based on the suggestions of Jones and Banning (2009) that previous studies on this topic can be divided into three main categories; the party effect, the election reaction and the second half effect. The reelection effect is added as a fourth category.

2.1 THE PARTY EFFECT

Traditionally, there has been a popular belief that the market prefers Republican Presidents over Democratic ones, as the Republican Party has been viewed as "the party of business" (e.g. Riley & Luksetich, 1980; Huang, 1985; Stangl and Jacobsen, 2006; Carison, 2012). This belief can be referred to as "the Wall Street's Republican bias" (Niederhoffer, Gibbs & Bullock, 1970). Researchers have however not found evidence that supports this bias; several of them have rather found the returns to be higher during Democratic Presidencies. This subchapter takes a closer look at some of the studies exploring party effect on the stock market.

Huang (1985) showed a higher rate of mean return during Democratic Presidencies relative to Republican Presidencies. There was a difference that was statistically significant in four out of the six periods analyzed.

A study performed by Hensel and Ziemba (1995) investigated the returns of various assets to see whether there was a difference between Democratic and Republican Presidencies. Their results showed that the returns of small-cap stocks in the period of 1929-1993 were statistically significant higher under Democrats than under Republicans. They also examined the period from 1937 to 1992. In this period the small-cap stock returns were also higher under Democratic Presidencies, but the difference was no longer statistically significant. The authors found no statistically significant differences between the two parties when studying the returns of large-cap stocks. The study further showed that inflation was statistically significant higher under Democratic Presidencies in the period of 1929-1992. Looking at the 1937-1992 period the

difference in inflation was no longer statistically significant. The returns of bonds and T-bills were significantly higher under Republican Presidencies than under Democratic Presidencies.

Johnson, Chittenden and Jensen (1999) looked at data from January 1929 through December 1996. They found higher, though not statistically significant, returns during Democratic Presidencies by analyzing data from the large-cap stock index Standard & Poor's 500 (S&P 500)[1]. When they looked at the small-cap stock index they found statistically significantly higher returns during Democratic Presidencies. The returns were more than four times higher than the returns during Republican Presidencies. The returns for the bond-indexes were however significantly higher during Republican Presidencies and when adjusted for inflation they found that the returns to the bond-indexes actually were negative every time there were Democratic Presidents.

Booth and Booth (2003) did not find any statistically significant difference between stock returns under Democratic and Republican Presidencies for neither small nor large stocks. The returns of T-bills and long-term government and corporate bonds were significantly higher under Republicans as compared to Democrats.

Santa-Clara and Valkanov (2003) performed a study of the excess return in the stock market in the period of 1927-1998. For the value-weighted CRSP[2] index over the three-month Treasury bill rate the average excess return was 9% higher under Democratic Presidencies compared to Republican Presidencies. This was due to more than 5% higher real market returns and almost 4% lower real interest rates under Democrats. For the equal-weighted portfolio excess return was 16% higher under Democrats. The authors conducted robustness checks in order to rule out the possibility that their results were spurious. They also investigated if the difference could be explained by a difference in expected returns, which would mean that there was a "Democratic risk premium", or by a difference in unexpected returns – that the difference is due to unanticipated economic policies.

To examine this, Santa-Clara and Valkanov (2003) used three approaches. The first was to check whether the effect of political variables was just a proxy of fluctuations in the business cycle.

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[1] S&P 500 is a stock index that measures the large-cap U.S. equities market of the 500 leading companies in the U.S. economy, (Standard & Poor Indices, 2013).
[2] Center for Research in Security Prices (CRSP)

Controlling for different macroeconomic variables made their results even stronger, which implies that the political variables do have an effect on the stock market. When decomposing the returns into expected and unexpected returns, they found that the market appears to be positively surprised by the policies of the Democrats, and this leads to the difference in realized returns. The study found no significant evidence that the difference in returns is due to stock price changes concentrated around the election dates, but rather that stock prices develop gradually during the presidential terms. It was also investigated whether the difference could be explained by higher risk under Democratic Presidencies, but the result was that volatility was higher under Republicans.

Santa-Clara and Valkanov (2003) recognized the possibility that their results could be a product of data mining. They used the Bonferroni approach to address this possible problem, where one revises the confidence level of the tests with the number of hypotheses tested. This resulted in some of the hypotheses not being significant anymore. The approach thus clearly reduced the power of the conducted tests.

The results of Santa-Clara and Valkanov (2003) were further investigated by Powell, Shi, Smith and Whaley (2007). They questioned whether the explanatory variable of the study might be persistent, meaning that it is highly autocorrelated. This would lead to a downward-biased standard error which could indicate a significant relation that does not exist. Powell et al. (2007) conducted a similar analysis as Santa-Clara and Valkanov of the monthly return differentials. Their results showed high first-order autocorrelation in the independent variable, which could imply spurious regression results. In order to correct possible misleading inference from persistence and data mining, the authors simulated critical cutoff values for the t-statistics, the coefficient estimates and the adjusted R^2. They found evidence that suggested that the differences in returns between Democratic and Republican Presidencies were spurious, and that data mining could be a problem. Similar results were shown for tests including data from 1856 to 1998. Powell et al. (2007) therefore concluded that the differences in returns between the two presidential parties were insignificant.

Jones and Banning (2009) found results that were quite different from most studies on the topic, as they did not find much evidence of a relationship between the stock market returns and politics. The study is based on daily and monthly returns from the DJIA during the period of

1986-2000. Their results showed no statistically significant differences in the returns between Republican and Democratic Presidents or between Republican and Democratic majority in the US Senate and the US House of Representatives. The authors further found no evidence of difference in stock market returns based on different combinations of partisan control of the presidency and the congress. Their tests produced the same results when controlling for macroeconomic variables. A correlation matrix showed that growth in real Gross Domestic Product (GDP) was positively correlated with stock market returns, while inflation was negatively correlated with market returns. Jones and Banning (2009) also discovered that the Democrats were associated with higher GDP growth while the Republicans were associated with lower inflation.

Jones and Banning (2009) also analyzed the impact of the number of successive presidential periods that had a Democratic or Republican President, before there was a change in partisan control. They found significantly negative results for the third periods, as well as marginally significant results for third to fifth periods combined. The same results applied when controlling for GDP growth and inflation. The R^2 measures were however lower than 0.01 for all these regressions, which implies that not much of the variation in stock market returns that can be attributed to the number of successive presidential periods in office. The results were not statistically significant when eliminating President Hoover's term, which is considered an extreme outlier.

Sy and Zaman (2011) analyzed data from 1926 to 2007 and formed ten portfolios based on firm size. They found that there was statistically significant higher presidential premium differential in the portfolio with the smallest firms (22.36 %) as well as a tendency of higher returns in the other portfolios under Democratic Presidencies. They also used the CAPM and conducted a regression analysis to find the abnormal return differentials, like Santa-Clara and Valkanov (2003) did in their research. Sy and Zaman (2011) found that the presidential premium differential of 22.36% in the portfolio with the smallest firms consisted of a 9.83% abnormal presidential premium during Democratic Presidencies and that the presidential puzzle thus could not be explained by market risk alone by using the CAPM for the small size firm portfolios.

Sy and Zaman (2011) extended the research by Santa-Clara and Valkanov (2003), which used the CAPM with a constant market beta, by implementing a market beta that was allowed to vary

across presidencies. They found statistically significant higher market betas in all the portfolios except the one with the largest firms during Democratic Presidencies. Due to this, the abnormal presidential returns were no longer statistically significant with the reason being a higher market risk premium. However, for the portfolio with the smallest firms it was still economically significant.

They also looked at whether there would be a link between the presidential premium and the size and value effect (Sy & Zaman, 2011). Therefore, they complemented the CAPM (with a market beta that was allowed to vary) with the Fama-French's three-factor pricing model. The results were then no longer statistically significant among the abnormal returns, thus when the firm, size and value effects were accounted for there were no abnormal presidential returns.

A decomposition of the abnormal presidential premium differential of 22.36% in the portfolio with the smallest firms showed that it consisted of a 7.39% market premium, 11.37% size premium and 0.67% value premium, thus they were left with an abnormal presidential premium of 2.93% (Sy & Zaman, 2011). These results suggest that the presidential premium for the small size firms could be explained by the size of the firms and the market. They present two potential theories of why the abnormal presidential premium exists. The first theory was that the small size firms benefit from the Democratic policies including tax breaks, government contracts and policies. The second theory was that small firms have a greater exposure to risk when there are Democratic Presidencies and thus higher returns than larger firms due to a compensation for risk. During Democratic Presidencies about 70% of the changes in monetary policies have been expansive. In contrast, the Republican Party is in favor of restrictive policies and during Republican Presidencies almost 60% of the changes in monetary policies have been contractive. They therefore investigated whether the size effect would be present in both political harmony[3] and political gridlock[4] periods. The results are that the size effect is only present during Democratic harmony, when there is Republican harmony or political gridlock there are no evidence that implies a difference in return among the large and small businesses.

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[3] Political harmony is when the same party controls the White House, the House of Representatives and the Senate (Sy & Zaman, 2011).
[4] Political gridlocks are when at least one of the legislative bodies is controlled by a different party than the others (Sy & Zaman, 2011).

Expansive policies lead to a higher rate of inflation, which often is followed by a downturn in the economy that affects the small businesses (Sy & Zaman, 2011). The higher inflation when there are Democratic harmonies thus leads to a higher required return among the investors due to a higher default risk. The results they get are that the size effect is no longer significant once default risk is included, and that the size factor, SMB (small stocks minus large stocks returns of portfolios with same book-to-market ratio), is really a measure of the higher default risk premium during Democratic harmony. Their conclusion is that the presidential abnormal return could not be explained by Democrats favoring small size firms once default risk is accounted for as the size effect vanishes. The abnormal presidential return could be explained by higher systematic default risk during Democratic Presidencies.

Ziemba (2013) found that small stocks had much higher average returns under Democrats as compared to Republicans during the period of 1929-2010. The difference was however not statistically significant for the period of 1936-1997, eliminating the crash of 1929 and the years following the Depression. He found no significant differences in the returns of large cap stocks between Republican and Democratic Presidencies. For the 1929-1997 period inflation was statistically significant higher during Democratic Presidencies. Looking at the 1937-1997 period the difference was however not statistically significant. The returns of all fixed income and cash were significantly higher during Republicans compared to those of Democrats.

2.2 THE ELECTION REACTION

There has also been performed several studies examining the stock market movements surrounding the elections. This is closely related to the previous subchapter, as the intention in most studies is to see how the market reacts to the news of an elected Republican or Democratic President.

Niederhoffer, Gibbs and Bullock (1970) performed a study of the market movements surrounding the Republican and Democratic nominal conventions and the Election Day to see if the data corresponded to the traditional Wall Street view that the market has a preference for Republicans. Their results showed that the DJIA has risen far more often after a Republican victory than after a Democratic victory. The average change the day after a Republican has won was 1.12%, compared to -0.81% after a Democrat has won. Similar differences were shown for

the week and month following the election. The data regarding the conventions showed that the market tends to rise between the two conventions when a Republican victory appears to be likely. Conversely, it tends to drop when it appears likely that the Democratic candidate will win. Their results were thus in accord with the Wall Street's Republican bias. However, they found no long-term pattern to justify the bias.

Riley and Luksetich (1980) investigated some of the Wall Street folklore around the stock price changes surrounding Presidential elections. The folklore includes the following statements:

- The market prefers Republicans
- The market does not like uncertainty
- The loss of an incumbent will lead to a decline of the market

Riley and Luksetich (1980) analyzed data from the period of 1900 to 1976, with the focus on 20 subperiods before and after elections. They used daily closing prices for the DJIA and examined the 17-week and 21-month periods surrounding presidential elections, using the single factor model developed by Fama. Their results showed that DJIA increased by 0.02 percent per day on average for the 20 21-month periods. The average serial correlation was 0.12, with positive serial correlation for 17 of the 20 periods. The coefficients were significant for 10 of the elections. This indicates a low degree of dependency between changes in logarithmic prices. Residual analysis was also conducted. The average residual was at its lowest point 24 trading days before the elections, and reached its maximum 12 trading days after election. It thus appears that to be true that the market dislikes uncertainty, as it rises after the election outcome is revealed. The residuals were positive before the election when a Democrat wins, and negative in the days after the elections. Before a Republican victory, the residuals were mixed. After the election, the residuals were strongly positive. This is consistent with the assertion that the market prefers Republicans over Democrats. After a loss of the incumbent party the residuals were negative, which gives some support to the last assertion of the Wall Street folklore.

Since the serial correlation and residual analysis only gave a weak indication of price dependency, Riley and Luksetich (1980) employed seven different trading rules to see whether the price dependency was enough to make a trading profit. The trading rules were based on the results from the residual analysis as well as the traditional Wall Street folklore. They all yielded

positive gross return during the period of 1900-1976, but two of them yielded negative gross return during the period of 1944-1976. Because of the limited number of observations, the trading rules were not subjected to the normally used data-splitting procedure. For this reason, they should only be considered as an indication of the possible earnings an investor could have made if he or she had known the outcomes of Riley and Luksetich's (1980) analysis.

The possible trading profit during periods surrounding election dates suggests that risk should be higher in these periods compared to similar nonelection periods (Riley and Lusetich, 1980). An analysis of the risk showed that the variability was significantly higher in periods surrounding elections with Republican victories than the variability surrounding Democratic victories. The variability was also much higher during election years as compared to nonelection years.

2.3 THE SECOND HALF EFFECT

Many researchers have discovered a pattern in the market movements during the four years of a presidential term. This is often referred to as the presidential cycle (Allvine & O'Neill, 1980; Stovall, 1992; Booth & Booth, 2003) or the political-economic cycle (Herbst & Slinkman, 1984).

Nordhaus (1975) was the first to discover a cycle during the presidential period by using a model of macro-economic policy. He looked at nine different countries, the US being one of them, in the period of 1947 to 1972. The pattern he found in his data was that at the beginning of a presidential period the unemployment rate would be increased by the party in power by contractive monetary policy which leads to lower inflation. Prior to an election, the incumbent party would lower the unemployment rate with expansive policy whereas the inflation would only increase after the election due to a slow adjustment. This would result in both a low unemployment rate as well as low inflation before an election which is preferred by the voters. This cycle is pronounced in the elections of 1948, 1952 and 1956 in the U.S. The two periods that does not match this pattern is the periods of 1960 and 1968, but this was also periods where the incumbent party was not reelected. He thereby found a pattern where it could look as though political parties manipulated the economy as to get reelected.

Allvine and O'Neill (1980) tested a trading strategy that included buying stocks on the last trading day of October two years before election and selling them in October the year after election. This strategy produced higher returns than a buy and hold strategy, which is in

contradiction to the Efficient Market Hypothesis. It should not be possible to use a trading strategy to earn higher return than a strategy of buy and hold in an efficient market, meaning that there should be no pattern in the market and that the swings in stock prices should be random.

At first they looked at whether the stock prices were random by analyzing data from the S&P 400[5] using spectral analysis. They found a statistically significant 208 week cycle as well as pattern of a cycle every fourth year. Afterwards they looked at the four-year cycle in stock prices relative to the four-year presidential periods. The results for years 1948 through 1978 were that the annual returns were 0.6% in the first year, 0.7% in the second year, 22.1% in the third year and 9.2% in the last year of the periods, thus implying a relationship among the presidential cycle and stock returns. Bailey (1978) asserted that the systematical controlling of macroeconomic policies started with Kennedy in the 1960s. Allvine and O'Neill (1980) therefor split the analysis into two time periods, the first was from 1948 through 1960 and the second from 1961 through 1978. They then found a difference of returns of the subperiods in the two time periods. From 1948-1960 the first year returns were 4.4%, the second year returns were 27.2%, the third year had returns of 22.7% and four year returns of 3.5%. In the periods of 1961-1978 there were returns of 3.6% in the first year, -15.2% in the second year, 21.7% in the third year and 15% in the fourth years. This implies that the economic policies applied during presidential periods in the time period between 1961 and 1978 is more fitted to the election, meaning that the president expand the economy prior to an election to get reelected.

They then executed a basic trading strategy in which they changed from stocks to T-bills relative to the presidential cycle in the stock prices. They buy stocks for $1000 at the end of October in year two of a presidential period, and sell them at the end of October in the year prior to the presidential election. First they employed the basic trading strategy on data from 1948-1978, - in this period the buy and hold strategy was superior to the basic trading strategy. When they executed the trading strategy in the time period from 1960-1978, the return was 2.08% with the buy and hold strategy and 5.39% with the basic trading strategy. As an explanation of the higher return during the period of 1960-1978 when they used the basic trading strategy they pointed out that the trend component in the stock prices was smaller in this time period relative to the previous and due to the fact that Bailey (1978) had pointed out about an increase in

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[5] Index measuring the performance of mid-size companies (Standard & Poor Indices, 2013)

macroeconomic influence by politics since the 1960s. As the trend growth of stock prices was almost zero in the years from 1966-1978 they also executed the strategy here, which resulted in a 0.38% return per year with the buy and hold strategy and a 5.94% return with the basic trading strategy. The basic trading strategy would thus have higher returns than the buy and hold strategy after 1960 which would be in contradiction to the Efficient Market Hypothesis.

Herbst and Slinkman (1984) analyzed month-end stock market prices in the period of 1926-1977 in order to find evidence of political-economic cycles. They looked at both 24-month and 48-month cycles, and investigated whether the phase and amplitude of the cycles could be attributable to election-year effects. The cycles should peak around the election dates in November in appropriate years in order to be seen as political-economic cycles. They further expected the public expectations of the outcome of government policies to be manifested in the stock market. The direction of causality is however not clear, as it is possible that the stock market both is influenced by and influence the electorate.

The results from fitting cycles of 48-months and 24-months to the month-end data show that the four-year cycle reaches maximum amplitude in the middle of December in election years (Herbst & Slinkman, 1984). For the two-year cycle maximum amplitude is reached in July the year after election. A Bartel's test is conducted for both periods in order to determine whether the cycles are genuine. For the 48-month cycle the test gives less than 0.004 percent chance that the cycle is the result of random influence. The probability that the 24-month cycle is due to random factors is less than 0.013 percent. The amplitude of the two-year cycle is only 40 percent of the amplitude of the four-year cycle. This indicates that the 24-month cycle is far less important. Divided into non-overlapping segments, the data shows far more consistency of the phase for the 48-month cycle.

The authors further conduct t-tests to check the statistical reliability of their results (Herbst & Slinkman, 1984). The null hypothesis of equal means cannot be rejected for the 48-month cycle, but it is rejected for the 24-month cycle. They therefore conclude that there is strong evidence of a 48-month political-economic cycle. There is also evidence that there exists a 24-month cycle, but since the peaks are quite far away from the election dates, it should not be called a political cycle.

Huang (1985) analyzed data from 1832 to 1979 and found statistically significant evidence that the common stock returns in the first two years and the last two years of a presidential period varied, as the returns were higher in the last two years of a presidential period than the two former years. He also showed that there was a difference in the two periods both during Republican Presidencies as well as Democratic Presidencies and that the disparity was higher during Democratic Presidencies. The evidence was not as strong when he looked at four year cycles. He thereby presented results which showed that there is a pattern in the common stock market return which is in contradiction to the Efficient Market Hypothesis. His results also suggested that there was an increasing difference in the later years of his data, and thus that the influence politics had on the economy was growing.

Alesina and Sachs (1988) provide evidence for the partisan view of macroeconomic policy, and suggest this could be a cause of the existence of the cycle. Nordhaus (1975) showed in his research a political business cycle where the Democratic Party and the Republican Party shared a common behavior in the cycle, and that they had incentives to manipulate the economy in order to get reelected. Alesina and Sachs (1988) provide evidence that there is a partisan behavior that results in different macroeconomic outcomes. In the last half of presidential periods, the average rate of growth in Gross National Product (GNP) seems to be the same among the two parties. However, under Democratic Presidencies they found a higher growth rate in GNP during the first half of presidencies than the latter half and during Republican Presidencies the growth rate in GNP was less in the two first years than during the last half of presidential periods. They also found a difference among the parties in money growth. These results are in favor of a partisan view of the influence that policy has on macroeconomic outcomes, where the different parties have different political goals.

Correlations between Presidential approval percentages and price/earnings ratios have been used to predict stock market trends for many years (Stovall, 1992). The market's trust in the President can give a picture of the underlying economic conditions, which is important for the stock price determination. The correlation is however not perfect. Historically, equities have not performed very well during the first two years of a presidential term. The performance has been better for the last two years. Stovall explains this simplistically by the Federal Reserve Board usually being "at their "tightest" during the early quarters and at their "most accommodating" during the later

quarters of the four-year cycle" (Stovall 1992, p. 7). The market has however performed well during the period right after Presidential elections. A possible explanation of "the Quadrennial Market Cycle" is that the market initially shows enthusiasm for the new president, and next follows a period of disappointment. The market then rises again, either because it appears likely that a popular president will be reelected or that an unpopular president will have to leave office.

Hensel and Ziemba (1995) found that for both small- and large-cap stocks, returns were significantly higher in the last two years of a presidential term compared to the first two years. This held for both Democratic and Republican Presidencies, and is consistent with the hypothesis that presidents choose favorable economic policies in the last part of their term in order to increase their chances of reelection. There was little difference of the returns of fixed-income investments between the first and last two years of presidential terms.
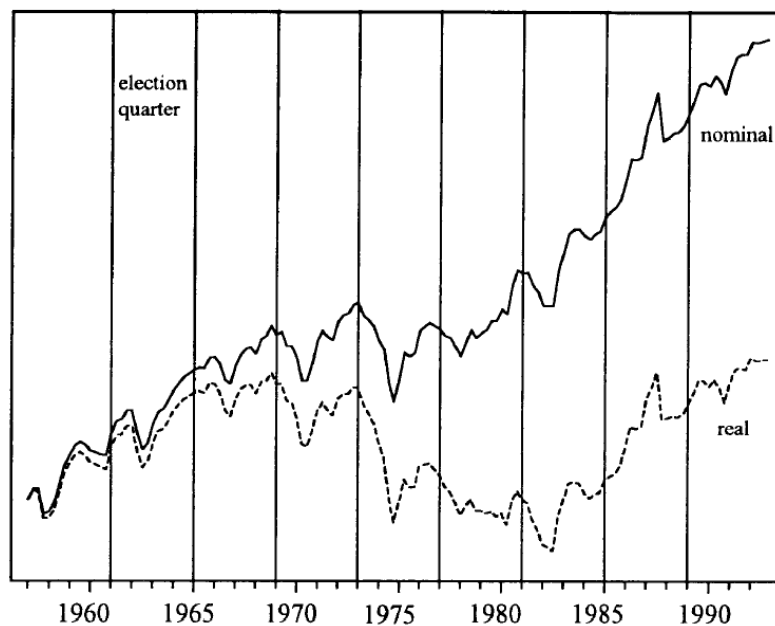
FIGURE 2: NOMINAL AND REAL U.S. INDUSTRIAL SHARE PRICES
(Gärtner & Wellershoff 1995, pp. 338)

Figure 1 depicts the nominal and real U.S. Industrial Share prices over the period 1957-1994. The figure indicates that the development of the share prices follows a four-year pattern for both nominal and real prices, with a declining market during the first two years of presidential terms, and an increase in prices during the last two years (Gärtner & Wellershoff, 1995). A regression

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analysis supported this, finding that there was a statistically significant relationship between stock returns and variations in the election dummy variable. Gärtner and Wellershoff (1995) found that the stock prices declined at a quarterly rate of 1.73 percent during the first 7 quarters, increased by 0.45 percent during the next quarter and then increased by 2.63 percent during the following quarters. The election cycle remained significant when testing for various specifications of the estimation equation and for different estimation errors. It was also robust when presumed relevant macroeconomic variables and policy instruments were included.

Gärtner and Wellershoff (1995) performed tests for five different stock indexes: S&P 500, S&P 500 including dividends, NASDAQ, the DJIA and a small-capitalization stock index. The four-year cycles were found significant and almost identical for all of the indexes. The election cycle was found significant under both Democratic and Republican Presidencies, and the coefficient estimates was not significantly different between the two parties. The data was further divided into fourteen subperiods. Eleven of these periods had coefficients significantly different from zero, which suggests that the election cycle is persistent over time. Five investment strategies based on the findings regarding the election cycle were shown to earn significant profits. The returns greatly exceeded transaction costs and were too high to be considered to be a risk premium.

Johnsen, Chittenden and Jensen (1999) looked at if there could be a difference in the returns during political cycles, and they found that in the second half of the presidential period there was a higher return than in the first half using data from the S&P 500. The results were statistically significant using a Wilcoxon test, which is a non-parametric test, though not statistically significant when a parametric t-test was conducted. The significance was higher under Democrats. The results were not statistically significant when they looked at small-stock returns and returns on bonds, though the tendency was higher returns in the second half of the period for the small-stocks and higher returns in the first half of the period for the debt market indexes.

Booth and Booth (2003) investigated whether the presidential cycle could be just a reflection of the traditional business cycle. Data from the period of 1803 to 1996 was examined, as well as subperiods with data from 1926-1996 and 1946-1996. For the whole period, the average annual returns of the large-stock portfolio were nearly twice as large for the last two years of presidential terms compared to the first two years. The returns were more than twice as large for

the two subperiods, with the difference being largest for the small-stock portfolio. The differences in returns were statistically significant for monthly, quarterly and annual return series. This thus implies that a presidential cycle does exist.

Booth and Booth (2003) included the dividend to price ratio (D/P), term spread (TERM) and default spread (DEF) in their analysis to see whether these proxies of business conditions could explain the variations in returns. They first performed a regression analysis of the annual, quarterly and monthly returns of T-bills and bonds, and the results showed no significant difference in returns between the first and last two years of presidential periods. The difference between D/P, TERM and DEF for the first and second half of the presidential periods was also not significant. Further, the business conditions were regressed on the excess returns of the large stock portfolio, and they were all found to exhibit explanatory power on the returns. The coefficients and t-statistics of the business cycle variables remained significant for both large and small stock returns when a dummy variable of the presidential effect was included. This implies that the presidential effect is not just a proxy of the business cycle, but has an explanatory power on the returns.

There difference not statistically significant in returns between first and second presidential periods of incumbent presidents (Booth & Booth, 2003). The difference between large stock returns of the first and last two years of presidential periods was statistically significant only during Democratic presidencies. The difference was not significant during Republican presidencies. For small stocks, the difference was only significant under Republicans. The presidential cycle effect was not found for the fixed-income returns.

Beyer, Jensen and Johnson (2006) analyzed data from 1949 to 2004 to look at the possible impact political gridlocks had on equity returns and bond returns. For the equity returns they sorted the firms in ten portfolios based on firm size. During political gridlock it is not the same political party in the Senate, U.S. House of Representatives and presidency. In political harmony the same party is in majority in all the legislative bodies. It is more difficult to go through with a legislative change during gridlock than during political harmony. A common perception of the market has been that the returns have been higher and less volatile during periods of gridlock because of a lower level of legislative changes. They find that the returns are higher and less

volatile during periods of political harmony and that the small-company premium is only present during political harmony.

Wong and McAleer (2009) used data from 1965 through 2003 from the S&P 500 whereas they use the exponential GARCH intervention model to avoid the problems with time dependence and conditional heteroscedasticity. They research whether there is any presidential cycle in US stock prices due to presidential elections. The result is a pattern of a four-year cycle. The stock index fell in the first two years of a presidential period reaching a bottom in the second year and thereafter rising in the two last years of the presidential period with a high in either year three or four. They also see that the presidential cycle is the most dominant among the cycles inherent in the stock market. They find statistically significant presidential election cycles, where the stock prices decreased in the second years and increased in the third years of presidential periods. This result was statistically significant both during Democratic as well as Republican Presidencies, though there was a higher significance during Republican Presidencies. They therefore suggest that there has been more policy manipulation in order to get reelected during Republican Presidencies in contrast to Democratic Presidencies. They also state that if the market is efficient, there would be no cycles in the stock prices as they would disappear once the investors are aware of it and they suggest that the cycle could exist because the investors might not know that the cycle is there.

Wong and McAleer (2009) found that if there was political gridlock there would be no equity premium to the portfolio with the smallest firms. There would however be a premium only if there was political harmony with a premium differential of 22.38% for the portfolio with the smallest firms. There were statistically significant differences among the returns of the five portfolios with the smallest firms. Legislative changes could therefore be said to be positive for the small size firms, as their returns are higher in political harmonies. They found the opposite results when they analyzed the bond returns, it performed better during periods of gridlock which could be explained by higher interest rate and capital appreciation.

Jones and Banning (2009) found no significant "second-half" effect. They extended the testing of the second-half effect by dividing the second halves into the different numbers of successive presidential periods by the Democrats or Republicans. They then compared the first and second halves for each period. The only statistically significant difference was found within the first

period, but the explanatory power was quite low. The overall second-half effect was however not statistically significant.

Ziemba (2013) found that the mean returns for small and large cap stocks were much higher for the last two years of presidential terms than for the first two years, for both Republican and Democratic Presidencies. There was little difference between the returns of fixed income in the first and last two years of the presidential terms.

2.4 THE REELECTION EFFECT

This subchapter takes a look at articles studying whether the stock market returns can predict the outcome of reelections. The topic examines whether incumbent presidents have a higher chance of being reelected if returns are high during their first period in office.

Booth and Booth (2003) found no statistically significant difference between the returns of first and second presidential periods.

Prechter Jr., Goel, Parker and Lampert (2012) performed an analysis on whether the stock market returns and economic variables like GDP, inflation and unemployment can be used to predict the outcomes of reelections. They found a significant positive relationship between the vote margin of the incumbent and the net percentage change in the stock market during the years before a reelection bid. This relationship was strongest for the 3-year period preceding reelection bids, but it was also significant for the 1-, 2- and 4-year periods prior to a reelection bid. When the incumbent does not run for reelections, they found no such relationship. The results of this study were in accordance with Prechter's socionomic theory. This theory claims that the stock market reflects the social mood of the voters, and that the social mood has a large impact on the outcomes of reelections. Furthermore, according to this theory, voters unconsciously hold the leader responsible for their mood. Therefore, it is hypothesized that a rising stock market (positive social mood) will increase the incumbent's chances of reelection, while a declining stock market (negative social mood) will decrease the chances of reelection for the incumbent. Precther et al. (2012) conducted several tests with results in accordance with these hypotheses. They also found a strong relationship between large stock price increases and landslide victories, and between large negative stock price movements and landslide losses.

Supporters of the economic voting theory claim that it is changes in economic variables that lead to changes in other social variables, like stock market trends, election outcomes and public mood (e.g. Fair, 1996). Prechter Jr. et al. (2012) investigated three of the economic variables that are often assumed to cause changes in social variables; GDP, inflation and unemployment. Their results showed that GDP can be a statistically significant predictor of voting results, but this relationship is weaker than that between the stock market and reelection outcomes. They further found neither unemployment nor inflation to be significant predictors of voting results.

3. THE EFFICIENT MARKET HYPOTHESIS AND THE RELATIONSHIP BETWEEN THE POLITICS AND RETURNS

A definition of the Efficient Market Hypothesis (EMH) was stated by Fama (1970) as "A market in which prices always "fully reflect" all available information". The theory was claimed as early as in 1889 though the term "efficient market" was not used. (Gibson 1889):

".... and when these shares become publicly known in an open market, the value which they there acquire may be regarded as the judgment of the best intelligence concerning them."

Cuthbertson and Nitzsche (2004) explain an efficient market as one in which the prices and returns are determined by supply and demand in a competitive market consisting of rational investors. When new relevant information arrives, the investors will within seconds adjust the stock price according to the new information and no one would thus be able to beat the market and earn abnormal returns on average. Furthermore it is only new information that could change the prices of stocks, it is not possible to predict news that are to come in the future and it should thus not be possible to predict the future stock prices according to the EMH.

Fama (1970) divided the EMH into three forms; the weak form, the semi-strong form and the strong form. The reasoning for doing this was to detect a level of information in which the hypothesis pro an EMH would be untrue, thus the differences among the three forms are the information available. Under the weak form of the EMH the stock prices reflect only information from past prices, under the semi-strong form the stock prices exhibit all publicly available information and under the strong form all information are reflected in the stock prices, even inside information. The only form in which the hypothesis seems to shatter is that of the strong form in which there are certain exemptions of some investors that have more information relative to the others, such as corporate insiders and specialists. Fama claims that even though there are exemptions the EMH would be a reality for most of the investors.

The EMH had a well stature some decades ago but evidence against the hypothesis have been indicated a number of times. As Cutbertson and Nitzsche states: "under the EMH, investment analysts cannot "pick winners" by using publicly available information and therefore "active" investment managers are wasteful". They also claim that if the EMH would be true, then the

market portfolio with a buy and hold strategy would be preferred by a risk-averse investor, neither would it be possible to choose a stock that would outperform the market without altering the risk. So how come there are people that repeatedly earn returns above the market and why should one pay investment managers vast money to assemble a portfolio?

An anomaly to the EMH would thus be if there is a possibility to beat the market. Allvine and O'Neill (1980) test the EMH by comparing a trading strategy where one buy stocks on the last trading day of October two years before election and selling them in October the year after election. This strategy produced higher returns than a buy and hold strategy, which is in contradiction to the Efficient Market Hypothesis. It should not be possible to use a trading strategy to earn higher return than a strategy of buy and hold in an efficient market, meaning that there should be no pattern in the market and that the swings in stock prices should be random.

Research done by Ziemba (2013) shows that there are patterns in the stock returns which makes it possible to beat the market. He found statistically significant higher returns during Democratic Presidencies for small cap companies and statistically significant higher returns in bonds during Republican Presidencies. The differences in large cap returns under Democratic and Republican Presidencies were not statistically significant. Ziemba performed two investment strategies based on presidential party effects. The first was to only invest in small cap stocks during Democratic Presidencies and only in large cap stocks during Republican Presidencies. The second was to invest only in small cap stocks during Democratic Presidencies and only in bonds during Republican Presidencies. As a benchmark he used the 60/40 stock bond pension fund rule.

He looked at an investment of $1 in 1947 and the value of this investment in 2010. He found that the small cap/bond strategy with an initial investment of $1 produced a value of $5910.8, the small cap/large cap strategy with an initial investment of $1 produced a value of 6349.5 and that the 60/40 stock bond pension fund rule strategy with an initial investment of $1 produced a value of $312.5. An initial investment of $1 in large caps produced a value of $1043.5 and an initial investment of $1 in small caps produced a value of $4327.6. The small cap/large cap strategy was thus the strategy that performed the best and the small cap/bond strategy the second best. Ziemba thereby showed that there is a possibility of beating the market by using a presidential party based investment strategy, which would be a contradiction to the EMH.

4. METHODOLOGY

In this part we will describe the research methods used in this master's thesis. Most of the previous studies on our topic have used either a univariate analysis (e.g. Niederhoffer et al, 1970; Hensel & Ziemba, 1995; Johnson et al, 1999) or a regression analysis (e.g. Riley & Luksetich, 1980; Stangl & Jacoksen, 2007; Powell et al, 2007). Regression analysis is a statistical method used to estimate the relationship between variables, and involves finding an equation that best fits the data (Mendenhall & Sincich, 2012). A version of regression analysis that is frequently used is ordinary least squares (OLS), which is a method used to fit a line to the data (Brooks, 2002). OLS involves squaring the vertical distance from each data point to the line, and then minimize the total sum of the squared areas. The regression analysis often includes the use of dummy variables, which are qualitative variables normally specified to take on the value of zero or one (Brooks, 2002).

4.1 UNIVARIATE ANALYSIS

The analysis conducted in this study is a univariate analysis. This involves analyzing one variable at a time (Bryman & Bell, 2003), as we have done by looking at nominal return, real return, inflation, excess return and risk-free interest rate separately. The data for each variable have been sorted into groups based on different criteria including which party that has the presidency and whether the data are from the first or last two years of presidential terms. We have then used the analysis tools in Microsoft Excel to compute the means and variances for each group, and subsequently performed t-tests and F-tests to see whether there exist any differences between the groups.

4.2 T-TEST

A t-test can be performed to see whether the means of two independent samples are statistically significant different (Hair et al, 2007). The t-test determines the probability that the observed difference in sample means is true. If the test gives a p-value that is below the chosen level of significance, the null hypothesis of equal means is rejected. It will then not be likely that the difference has occurred only by chance.

The t-test is based on an assumption of normally distributed returns (Triola, 2008). It employs the t-distribution in order to test the hypotheses (Hair et al, 2007). This is a bell-shaped, symmetrical distribution that has a standard deviation of one, and the mean is zero.

The t-statistic is given by:

$$t = \frac{\overline{\mu_1} - \overline{\mu_2}}{\sqrt{\frac{\overline{\sigma_1}^2}{n_1} + \frac{\overline{\sigma_2}^2}{n_2}}}$$

The degrees of freedom are calculated by the following formula:

$$d.f. = \frac{(\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2})^2}{\frac{(\frac{\sigma_1^2}{n_1})^2}{n_1 - 1} + \frac{(\frac{\sigma_2^2}{n_2})^2}{n_2 - 1}}$$

The t-tests conducted in this study are two-tailed tests, and they are based on the following hypotheses:

$$H_0: \bar{\mu}_1 = \bar{\mu}_2$$

$$H_1: \bar{\mu}_1 \neq \bar{\mu}_2$$

where $\bar{\mu}_1$ represents the mean of sample one and $\bar{\mu}_2$ represents the mean of sample two. When a two-tailed test is applied, the significance level is equally divided between the two extreme regions. The critical region for a right-tailed test lies in the extreme right region. Thus, the use of two-tailed tests leads to a p-value twice as high as the p-value for right-tailed tests, and the method might lead us to fail to reject a null hypothesis that would be rejected by the use of one-sided p-values. We therefore choose to also consider the right-tailed p-values for each test, which are based on the following hypotheses:

$$H_0: \bar{\mu}_1 \leq \bar{\mu}_2$$

$$H_1: \bar{\mu}_1 > \bar{\mu}_2$$

4.3 F-TEST

The F-test can be applied to test whether the difference in variances between two samples is significant. The basis of an F-test is the F distribution. This distribution is unsymmetrical and skewed to the right, the values are positive and it exists a different distribution for every pair of degrees of freedom for the denominator and the numerator (Triola, 2008). If the p-value obtained from the test lies below the significance level, the null hypothesis of equal variances is rejected (Triola, 2008).

The F-statistic is given by:

$$F = \frac{\overline{\sigma_1}^2}{\overline{\sigma_2}^2}$$

The test statistic has an F-distribution with n-1 and m-1 degrees of freedom.

The F-tests conducted in this study are based on the following hypotheses:

$$H_0: \sigma^2{}_1 = \sigma^2{}_2$$

$$H_1: \sigma^2{}_1 \neq \sigma^2{}_2$$

where $\sigma^2{}_1$ represents the variance of sample one and $\sigma^2{}_2$ represents the variance of sample two.

5. DATA

5.1 COLLECTION OF DATA

This subchapter shows where the stock market data and the risk-free rate data are from.

5.1.1 STOCK MARKET DATA

This study uses stock market data collected by Robert Shiller (2013). The dataset consists of monthly stock price, earnings and dividends data as well as the consumer price index (CPI) from January 1871 to present. We have analyzed data up to December 2012.

The dividend and earnings data from 1871-1926 were from Cowles and associates. After 1926, these data were based on four-quarter totals from S&P 500. All data were interpolated to monthly data. The monthly stock price data were computed as averages from daily closing prices. The CPI data before 1913 were from the CPI Warren and Pearson's price index. After 1913, the CPI data were taken from the U.S Bureau of Labor Statistics.

5.1.2 RISK-FREE RATE

The risk-free rate data are collected by Amit Goyal (2011) and updated to 2012 by our supervisor Valeri Zakamouline. The data after 1920 are the Treasury-bill rate (Welch & Goyal, 2008). The data before 1920 were estimated based on commercial paper rates for New York City, as there did not exist risk-free short-term debt at that time.

5.2 PROCESSING THE DATA

In this subchapter the formulas used for calculation of nominal and real return, inflation and excess return are presented.

5.2.1 MONTHLY NOMINAL RETURN

The monthly nominal return is calculated by the use of the following formula:

$$r_{nom} = \frac{P_n - P_{n-1} + D_n}{P_{n-1}}$$

where P represents the nominal month-end stock price and D represents the nominal monthly dividend.

5.2.2 MONTHLY REAL RETURN

The monthly real return is calculated by the use of the following formula:

$$r_{real} = \frac{P_{r_n} - P_{r_{n-1}} + D_{r_n}}{P_{r_{n-1}}}$$

where P_r represents the real month-end stock price and D_r represents the real monthly dividend.

5.2.3 INFLATION

The formula for the monthly inflation is as follows:

$$I_n = \frac{CPI_n}{CPI_{n-1}} - 1$$

where CPI represents the month-end consumer price index.

5.2.4 EXCESS RETURN

The monthly excess return is calculated as follows:

$$r_{excess} = r_{nom} - r_{free}$$

where r_{free} is the risk free interest rate.

6. RESULTS AND DISCUSSION

This chapter presents the results of the analysis, and the results are discussed and compared to the results of previous studies. As explained in chapter 4, we have used F-tests to examine whether the variances of two samples differ. However, the tables in this chapter will present the standard deviations of the samples instead of the variances, as we find it natural to use this measure for the discussion of our results.

6.1 THE PARTY EFFECT

This subchapter presents the results from the tests related to the party effect, as well as a discussion of our results.

6.1.1 RESULTS

TABLE 1: RETURNS DURING REPUBLICAN VS. DEMOCRATIC PRESIDENCIES

	Republicans	Democrats	P-value, two-sided	P-value, one-sided
Panel A: Nominal Returns				
Mean	0.70%	0.92%	0.27	0.13
Standard deviation	4.24%	3.92%	0.02**	
Panel B: Real Returns				
Mean	0.62%	0.62%	0.99	0.50
Standard deviation	4.30%	3.92%	0.01***	
Panel C: Inflation				
Mean	0.09%	0.30%	0.00***	0.00***
Standard deviation	1.15%	0.92%	0.00***	
Panel D: Excess Returns				
Mean	0.34%	0.68%	0.09*	0.04**
Standard deviation	4.25%	3.94%	0.03**	
Panel E: Risk-free rate				
Mean	0.36%	0.24%	0.00***	0.00***
Standard deviation	0.20%	0.21%	0.02**	

The second column of table 1 reports the sample mean and standard deviation of monthly nominal returns, real returns, inflation, excess returns and risk-free rate during Republican Presidencies. Column three gives the means and standard deviations during the Democratic Presidencies. The fourth column gives the two-sided p-values obtained from the t-test where we compare the means, and the two-sided p-values from the F-test used to compare the variances. The one-sided p-values from the t-test are presented in column five. All data are from the period of 1871 to 2012.
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 1 gives the results of testing whether the average returns under Republican Presidents differ from the average returns under Democratic Presidents. It also gives the results of testing whether the variance differ under the two political parties.

From panel A we see that the average monthly nominal return under Democrats is 0.92%. This is 0.22 percentage points higher than the 0.70% average return under Republicans. The t-test however shows that the difference is not statistically significant, and the null hypothesis of equal means cannot be rejected for either the one-sided or the two-sided test. The null hypothesis of equal variances is rejected at the 5% level. The difference in variance is thus statistically significant.

The differences in monthly real returns are tested in panel B. The average monthly real returns are 0.62% under both Republican and Democratic Presidencies, and the null hypothesis of equal means is not rejected. There is no evidence that the real returns differ under the two political parties. This goes for both the two-sided and the one-sided test. The difference in the variances is statistically at the 1% level.

Panel C gives the results related to inflation. The average monthly inflation under Republicans is 0.09% compared to 0.30% under Democrats. The t-test shows that the difference is statistically significant at the 1% level for the two-sided as well as the one-sided test. The null hypothesis of equal means is thus rejected. The difference in variances is statistically significant at the 1% level.

From panel D we see that the average monthly excess return is 0.34% under Republican Presidents, and 0.68% under Democratic Presidents. The difference is statistically significant at the 1% level, and the null hypothesis of equal means is rejected. This holds for both the two-sided and the one-sided test. For the variances, the difference is statistically significant at the 5% level.

The results regarding the risk-free rate are presented in panel E. We see that the average risk-free rate is 0.36% during Republican Presidencies compared to 0.24% during Democratic Presidencies. The risk-free rate is thus 0.12 percentage points higher under Republicans, and the difference is statistically significant at the 1% level for both the two-sided and the one-sided test.

The null hypothesis of equal means is therefore rejected. The variances are significantly different at the 5% level.

6.1.2 DISCUSSION

The results presented above showed that the nominal monthly returns were higher during Democratic Presidencies, but the difference was not statistically significant. Previous studies have, as shown in the second chapter, reached various conclusions to whether there exists a difference in returns between the Democratic and Republican Presidencies. Huang (1985) found statistically significantly higher returns during Democratic Presidencies. However, the data of this study was from 1929 to 1980, and the Wall Street Crash of 1929 and the subsequent depression were thus included. These are years that yielded very low returns, and the Republican President Hoover was in office from 1929 to 1933. As Huang's time span was shorter than ours, the returns of these years will have a relatively higher impact on the total means than for our study, and this might be the reason that he reached a different conclusion.

Johnson, Chittenden and Jensen (1999) found higher returns during Democratic Presidencies when analyzing data from the S&P 500, but the difference was not significant. Hensel and Ziemba (1995) and Booth and Booth (2003) found that the difference was not statistically significant between the two parties when looking at large cap stocks. Ziemba (2013) reached the same conclusion. Most of the studies examined thus reach the same conclusion as this; there is no statistically significant difference in nominal returns between Republican and Democratic Presidencies for large cap stocks. The slightly higher average return under the Democrats cannot be explained as a compensation for risk, as the volatility is statistically significantly higher under the Republicans.

Neither this study nor any of the previous studies examined find any evidence that supports the Wall Street's Republican bias. The average return appears to be somewhat higher during Democratic Presidencies, but we do not find strong enough evidence to reject the null hypothesis of equal means. It is also possible that the difference we found can be an effect of various macroeconomic factors, as this study has not taken that into account.

The inflation was statistically significantly higher under Democratic Presidencies, and this result thus confirms the findings of Hensel and Ziemba (1995) Jones and Banning (2009) and Ziemba

(2013). The studies of Hensel and Ziemba (1995) and Ziemba (2013) however did not find a significant difference when excluding the years from 1929 to 1936. Jones and Banning (2009) found that market returns are negatively correlated with inflation. Since Republican Presidents are associated with lower inflation, we would expect the returns under Republicans to be higher. This is however not the case. Jones and Banning (2009) further found that the Democrats were associated with higher GDP growth, which is positively correlated with stock market returns. As we have not included GDP in our analysis, we do not know whether this would have been the case for our study. It is however a possibility that high GDP growth is the reason for the slightly higher nominal returns under the Democratic Presidencies, and that this more than outweighs negative impact from the high inflation.

The volatility is significantly higher during Republican Presidencies, and we would thus expect the average real return to be higher under Republicans as a compensation for higher risk. However, the monthly real returns were almost identical under both Republican and Democratic Presidencies. The difference in real returns have not been widely researched before, as most previous studies have only examined nominal and excess returns. Santa-Clara and Valkanov (2003) however found that the difference in excess returns was partly due to higher average real returns during Democratic Presidencies. The reason that their result differs from ours might be due to the use of different data, as they analyze returns from a value-weighted and equal-weighted portfolio. The real returns from the S&P 500 have, as far as we can see, not been analyzed before.

When comparing the nominal and real returns for both parties, we observe a difference of 0.08 percentage points for the Republicans and 0.30 percentage points for the Democrats. This result is in accordance with our expectations based on the findings related to inflation. The real returns are adjusted for inflation, and since the Democratic Presidencies have experienced a significantly higher inflation, it is natural implication that the difference between nominal and real return should be larger than for the Republicans.

Examining the risk-free rate reveals that the Republican Presidencies have experienced a statistically significantly higher risk-free rate. We thus confirm the results of Santa-Clara and Valkanov (2003).

Looking at the average monthly excess returns we observe that it is significantly higher during Democratic Presidencies. This confirms the results of Santa-Clara and Valkanov (2003), which found that the value-weighted excess return was economically and statistically significantly higher under Democratic Presidencies. The higher excess returns under Democrats can be partly due to a risk premium, as the Democrats have experienced a statistically significantly higher volatility. The statistically significantly higher excess return under Democrats can further be explained by looking at the results regarding inflation and risk-free rate, as the Democratic Presidents have experienced statistically significantly higher inflation as well as statistically significantly lower risk-free rate. These are two factors that will increase the excess return.

6.2 THE SECOND HALF EFFECT

This section includes the results from the tests with regard to the second half effect as well as a discussion and a retrospective glance at previous literature where we compare the results with earlier studies.

6.2.1 RESULTS

TABLE 2: FIRST TWO YEARS VS. LAST TWO YEARS OF PRESIDENTIAL PERIODS

	Year 1&2	Year 3&4	P-value, two-sided	P-value, one-sided
Panel A: Nominal Returns				
Mean	0.62%	0.97%	0.08*	0.04**
Standard deviation	4.07%	4.15%	0.58	
Panel B: Real Returns				
Mean	0.46%	0.78%	0.11	0.06*
Standard deviation	4.17%	4.12%	0.72	
Panel C: Inflation				
Mean	0.17%	0.19%	0.69	0.35
Standard deviation	1.13%	0.01%	0.00***	
Panel D: Excess Returns				
Mean	0.30%	0.66%	0.07*	0.03**
Standard deviation	4.09%	4.15%	0.69	

The second column of table 2 is a presentation of the means of monthly nominal returns, real returns, inflation, excess returns and the standard deviations of the averages in the first two years of presidential periods. The third column is a presentation of the means and standard deviations in the last two years of presidential periods. The fourth column is a presentation of the p-values from two-sided t-tests where we test if the means of the variables are equal as well as the p-values from F-tests where we test if the variances are equal. The fifth column shows the p-values from one-sided t-tests where we test if the means of the variables are equal. The data ranges from 1871 to 2012.
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 2 is a presentation of the means and standard deviations of monthly nominal returns, monthly real returns, monthly inflation and monthly excess returns during the two first years of presidential periods and during the two last years of presidential periods.

Panel A shows that the average of monthly nominal returns is 0.62% in the first two years and 0.97% in the last two years of presidential periods. The average is thus 0.35 percentage points higher in the second half of presidential periods. The difference is statistically significant at a level of 10% with a two-sided t-test and at a level of 5% with a one-sided t-test and the null

hypothesis of equal means is thus rejected. The variances of the averages are not significantly different, and we thus keep the null hypothesis of equal variances.

Panel B shows that the average of monthly real returns is 0.46% in the first two years and 0.78% in the last two years of presidential periods, with 0.32 percentage points higher average in the second half of presidential periods. The difference is not statistically significant with a two-sided t-test but is statistically significant with a one-sided t-test at a level of 10%. The variances of the averages are not significantly different and we keep the null hypothesis of equal variances.

Panel C shows that the average of monthly inflation is 0.17% in the first two years of presidential periods and 0.19% in the last two years of presidential periods. Thus the average monthly inflation was 0.02 percentage points higher in the second half of presidential periods, but this was not statistically significant. The difference of the average variances is statistically significant at a level of 1% hence the null hypothesis of equal variances is rejected.

Panel D shows that the average of monthly excess returns was 0.30% in the first two years and 0.66% in the last two years of presidential periods there was thus a 0.36 percentage points difference as the inflation was higher in the two last years of presidential periods. The difference is statistically significant at the 10% level using a two-sided t-test and at a level of 5% when a one-sided t-test was used. The difference in variances of the averages is not statistically significant.

TABLE 3: REPUBLICANS VS. DEMOCRATS FIRST TWO YEARS OF PRESIDENTIAL PERIODS

	Republicans	Democrats	P-value, two-sided	P-value, one-sided
Panel A: Nominal Returns				
Mean	0.57%	0.69%	0.68	0.34
Standard deviation	3.81%	4.40%	0.00**	
Panel B: Real Returns				
Mean	0.49%	0.42%	0.80	0.40
Standard deviation	3.95%	4.44%	0.02**	
Panel C: Inflation				
Mean	0.09%	0.27%	0.01**	0.01*
Standard deviation	1.20%	1.03	0.00***	
Panel D: Excess Returns				
Mean	0.17%	0.47%	0.31	0.16
Standard deviation	3.83%	4.42%	0.00***	

The second column of table 3 is a presentation of the means of monthly nominal returns, real returns, inflation, excess returns and the standard deviations of the averages in the first two years under Republican Presidencies. The third column is a presentation of the means and standard deviations in the first two years under Democratic Presidencies. The fourth column is a presentation of the p-values from two-sided t-tests where we test if the means of the variables are equal as well as the p-values from F-tests where we test if the variances are equal. The fifth column shows the p-values from one-sided t-tests where we test if the means of the variables are equal. The data ranges from 1871-2012.
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 3 is a presentation of the means and standard deviations of monthly nominal returns, monthly real returns, monthly inflation and monthly excess returns of Republican Presidencies and Democratic Presidencies in the first two years of presidential periods

From panel A we see that the average of monthly nominal returns in the first two years of presidential periods is 0.57% during Republican Presidencies and 0.69% during Democratic Presidencies, thus they differ with 0.12 percentage points higher average during Democratic Presidencies. The difference is however not statistically significant. The variances of the averages are different and statistically significant at a level of 5%.

In panel B the average of monthly real returns in the first two years of presidential periods is 0.49% during Republican Presidencies and 0.42% during Democratic Presidencies. There is thus a higher average of 0.07 percentage points during Republican Presidencies in the first two years, but this is not statistically significant. The variances of the averages are different and statistically significant at a level of 5%, thus we reject the null hypothesis of equal variances.

From Panel C we can see that the average of monthly inflation in the first two years of presidential periods is 0.09% during Republican Presidencies and 0.27% during Democratic Presidencies. There is thus a higher average during Democratic Presidencies of 0.18 percentage points and this difference is statistically significant at a level of 5% with a two-sided test and at a level of 10% with a one-sided test, thus we reject the null hypothesis of equal means. The variances of the averages are statistically significant different at a level of 1%, and we reject the null hypothesis.

Panel D shows that the average of monthly excess returns in the first half of presidential periods is 0.17% during Republican presidencies and 0.47% during Democratic Presidencies. Thus, the average of monthly excess returns is 0.3 percentage points higher under Democratic Presidencies. This difference is not statistically significant. The difference between the variances of the averages is statistically significant a level of 1%.

TABLE 4: REPUBLICANS VS. DEMOCRATS LAST TWO YEARS OF PRESIDENTIAL PERIODS

	Republicans	Democrats	P-value, two-sided	P-value, one-sided
Panel A: Nominal Returns				
Mean	0.83%	1.16%	0.23	0.11
Standard deviation	4.62%	3.37%	0.00***	
Panel B: Real Returns				
Mean	0.75%	0.83%	0.76	0.38
Standard deviation	4.61%	3.31%	0.00***	
Panel C: Inflation				
Mean	0.09%	0.33%	0.00***	0.00***
Standard deviation	1.10%	0.80%	0.00***	
Panel D: Excess Returns				
Mean	0.49%	0.89%	0.15	0.07*
Standard deviation	4.62%	3.38%	0.00***	

The second column of table 4 is a presentation of the means of monthly nominal returns, real returns, inflation, excess returns and the standard deviations of the averages in the last two years under Republican Presidencies. The third column is a presentation of the means and standard deviations in the last two years under Democratic Presidencies. The fourth column is a presentation of the p-values from two-sided t-tests where we test if the means of the variables are equal as well as the p-values from F-tests where we test if the variances are equal. The fifth column shows the p-values from one-sided t-tests where we test if the means of the variables are equal. The data ranges from 1871-2012.
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 4 is a presentation of the monthly nominal returns, monthly real returns, monthly inflation and monthly excess returns between Republican presidencies and Democratic presidencies during the last two years of presidential periods.

Panel A shows that in the last two years of presidential periods the average of monthly nominal returns is 0.83% during Republican Presidencies and 1.16% during Democratic Presidencies, with 0.33 percentage points higher average during Democratic administrations. The difference is not statistically significant, and thus we keep the null hypothesis of equal means. The difference of the variances of the averages is statistically significant at a level of 1% and we reject the null hypothesis of equal means.

Panel B shows that the average of monthly real returns in the last two years of presidential periods is 0.75% during Republican Presidencies and 0.83% during Democratic Presidencies. The average during Democratic Presidencies in the second half of presidential periods is 0.08 percentage points higher than what it is during Republican Presidencies. The difference is not statistically significant and we keep the null hypothesis of equal means. The variances of the averages are statistically significant different at a level of 1% and we reject the null hypothesis of equal variances.

Panel C shows that the average of monthly inflation in the last two years of presidential periods is 0.09% during Republican Presidencies and 0.33% Democratic Presidencies, there is thus a difference of 0.24 percentage points as the monthly inflation have been higher under Democratic Presidencies. The difference is statistically significant at a level of 1% with both a one-sided t-test and a two-sided t-test. The variances of the averages are statistically significant different at a level of 1% and we reject the null hypothesis of equal variances.

From panel D we see that the average excess return is 0.49% during Republican Presidencies and 0.89% during Democratic Presidencies in the last two years of presidential periods. Hence, there is a higher average excess return of 0.4 percentage points during Democratic Presidencies. This difference is not statistically significant. The difference between the variances of the averages is statistically significant at a level of 1%, and we reject the null hypothesis of equal variances.

TABLE 5: FIRST TWO YEARS VS. LAST TWO YEARS DURING REPUBLICAN PRESIDENCIES

	Year 1&2	Year 3&4	P-value, two-sided	P-value, one-sided
Panel A: Nominal Returns				
Mean	0.57%	0.83%	0.33	0.17
Standard deviation	3.81%	4.62%	0.00***	
Panel B: Real Returns				
Mean	0.49%	0.75%	0.35	0.18
Standard deviation	3.95%	4.61%	0.00***	
Panel C: Inflation				
Mean	0.09%	0.09%	1.00	0.50
Standard deviation	1.20%	1.10%	0.06*	
Panel D: Excess Returns				
Mean	0.17%	0.49%	0.23	0.12
Standard deviation	3.83%	4.62%	0.00***	

The second column of table 5 is a presentation of the means of monthly nominal returns, real returns, inflation, excess returns and the standard deviations of the averages in the first two years of Republican Presidencies. The third column is a presentation of the means and standard deviations in the last two years under Republican Presidencies. The fourth column is a presentation of the p-values from the two-sided t-tests where we test if the means of the variables are equal as well as the p-values from the F-tests where we test if the variances are equal. The fifth column shows the p-values from one-sided t-tests where we test if the means of the variables are equal. The data ranges from 1871-2012.
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 5 shows the means and standard deviations of monthly nominal returns, monthly real returns, monthly inflation and monthly excess returns in the first two years and last two years of presidential periods during Republican Presidencies.

Panel A shows that the average of monthly nominal returns is 0.57% in the first two years and 0.83% in the last two years during Republican Presidencies, with a higher average monthly nominal return of 0.26 percentage points in the last two years. The difference is not statistically significant, hence we keep the null hypothesis of equal means. The variances of the averages are statistically significant different at a level of 1% and thus we reject the null hypothesis of equal variances.

Panel B shows that the average of real returns is 0.49% in the first half of presidential periods and 0.75% in the last half of presidential periods during Republican Presidencies, with a higher average of 0.26 percentage points in the second half of the period. The difference is not statistically significant, and we keep the null hypothesis of equal means. The averages of the

variances are different and statistically significant at a level of 1%, and we reject the null hypothesis of equal variances.

Panel C shows that average of monthly inflation in both the first two years and the last two years of presidential periods is equal during Republican Presidencies, with an average of 0.09%. Thus we keep the null hypothesis of equal means. The variances of the averages are statistically significant different at a level of 10% and we reject the null hypothesis of equal means.

Panel D shows that the average monthly excess return is 0.17% in the first two years and 0.49% in the last two years during Republican Presidencies, with a higher average monthly excess return in the last two years of Republican Presidencies of 0.32 percentage points. The difference is not statistically significant and we keep the null hypothesis of equal means. The variances of the averages are statistically significant different at a level of 1% and we reject the null hypothesis of equal variances.

TABLE 6: FIRST TWO YEARS VS. LAST TWO YEARS DURING DEMOCRATIC PRESIDENCIES

	Year 1&2	Year 3&4	P-value, two-sided	P-value, one-sided
Panel A: Nominal Returns				
Mean	0.69%	1.16%	0.11	0.05*
Standard deviation	4.40%	3.37%	0.00***	
Panel B: Real Returns				
Mean	0.42%	0.83%	0.16	0.08*
Standard deviation	4.44%	3.31%	0.00***	
Panel C: Inflation				
Mean	0.27%	0.33%	0.44	0.22
Standard deviation	1.03%	0.80%	0.00***	
Panel D: Excess Returns				
Mean	0.47%	0.89%	0.15	0.07*
Standard deviation	4.42%	3.38%	0.00***	

The second column of table 6 is a presentation of the means of monthly nominal returns, real returns, inflation, excess returns and the variances of the standard deviations in the first two years of Democratic Presidencies. The third column is a presentation of the means and variances in the last two years under Democratic Presidencies. The fourth column is a presentation of the p-values from two-sided t-tests where we test if the means of the variables are equal as well as the p-values from F-tests where we test if the variances are equal. The fifth column shows the p-values from one-sided t-tests where we test if the means of the variables are equal. The data ranges from 1871-2012.
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 6 shows the means and standard deviations of monthly nominal returns, monthly real returns, monthly inflation and monthly excess returns in the two first years and last two years of presidential periods during Democratic Presidencies.

Panel A shows that the monthly average return is 0.67% in the first two years and 1.16% in the last two years under Democratic Presidencies, with a higher average of 0.49 percentage points in the last two years. The difference is not statistically significant when a two-sided t-test is used but is statistically significant at a level of 10% when a one-sided t-test is conducted. The difference of the variances of the averages is statistically significant at a level of 1%, hence we reject the null hypothesis of equal variances.

Panel B shows that the average of monthly real returns in the first two years of presidential periods is 0.42% and 0.83% in the two last years during Democratic Presidencies, with a 0.41 percentage points higher average in the two last years. The difference is not statistically significant when a two-sided t-test is conducted, but is statistically significant at a level of 10% with a one-sided t-test. The variances of the averages are different and statistically significant at a level of 1%, hence we reject the null hypothesis of equal variances.

Panel C shows that the average of monthly inflation is 0.27% in the first two years and 0.33% in the last two years during Democratic Presidencies, with a difference of 0.06 percentage points higher average in the last two years. The difference is not statistically significant, and we keep the null hypothesis of equal means. The null hypothesis of equal variances is rejected at a level of 1%, thus the difference of the variances is a statistically significant.

Panel D shows that the average excess return is 0.47% in the first two years and 0.89% in the last two years during Democratic Presidencies, with 0.42 percentage points higher average in the two last years. The difference is not statistically significant with a two-sided t-test, but is statistical significant at a level of 10% when a one-sided t-test is conducted. The null hypothesis of equal variances is rejected at a level of 1%, hence the difference is statistically significant between the variances of the averages.

6.2.2 DISCUSSION

From table 2 panel A, the average of nominal returns is statistically significantly higher in the second half of presidential periods which confirms the results of previous studies. There could thus exist a political cycle that influences the stock market returns.

A political cycle has been found by numerous researchers such as Nordhaus (1975), Allvine and O'Neill (1980), Herbst and Slinkman (1984), Huang (1985), Alesina and Sachs (1988), Stovall (1992), Hensel and Ziemba (1995), Gärtner and Wellershoff (1995), Johnson, Chittenden and Jensen (1999), Booth and Booth (2003), and Wong and McAleer (2009). However, a cycle was not found by Jones and Banning (2009).

Our result is consistent with the findings of Allvine and O'Neill (1980) and Huang (1985), that also found stock market returns in the first two years and last two years of presidential periods that were different, with the returns being higher in the two last years. Johnson, Chittenden and Jensen (1999) found the difference in annual nominal returns between the first and second half of presidential periods statistically significant using a non-parametric Wilcoxon test. The difference was however not statistically significant when they used a parametric t-test. Their analysis is executed using annual nominal returns of the S&P 500 from 1929 to 1996. The result with regard to the t-test is thus different from our results. The reasoning for this could be that our analysis uses data for a longer time interval (1871-2012), additionally we use monthly nominal returns instead of annual nominal returns thus our results should be more accurate. Booth and Booth (2003) find statistically significant higher returns in the second half of presidential periods using annual data, quarterly data as well as monthly data for large cap stocks using t-tests.

The volatility of nominal returns is higher in the two last years of presidential periods, but the difference between the first two years and last two years is not statistically significant. The higher nominal returns in the latter half of presidential periods could thus be due to different causes than risk. The standard deviation was statistically significantly higher in the latter half under Republican Presidencies and statistically significantly higher in the first half under Democratic Presidencies, thus the volatility of nominal returns varies in the first and second half of presidential periods between the two parties.

The real returns are statistically significantly higher in the latter half of presidential periods at a level of 10% when a one-sided t-test is used. The real returns are adjusted for inflation, and thus the cycle exists independently of the price level. To our knowledge, the real returns have only been analyzed in one research done by Gärtner and Wellershoff (1995) that found the real stock prices to drop by a quarterly rate of 1.73% in the first seven quarters, grow by 0.45% for one quarter, increase at a quarterly rate of 2.63% the next seven quarters and in the quarter before an election the stock returns grew by 0.45%. They thus found a similar behavior in the cycle when analyzing real returns as we did, where the real returns are higher in the latter half of presidential periods. The difference in volatility is not statistically significant between the two periods, and the risk is thus not the cause of the higher returns in the latter half of presidential periods. In fact the volatility is a little higher in the first half of the periods. The volatility of real returns is statistically significantly higher in the first half under Democratic Presidencies and statistically significantly higher in the latter half under Republican Presidencies.

Our results show that excess returns have been statistically significantly higher in the latter half of presidential periods. There has been a difference in excess returns between Democratic and Republican Presidencies in the latter half that is statistically significant, where it is 0.4 percentage points higher under Democrats and where the volatility is statistically significantly higher under Republicans. The difference in excess returns is not statistically significant between Republican and Democratic Presidencies in the first two years, though the volatility is statistically significantly higher during Democrats in this period. As far as we know, these results have not been elaborated in previous research. The results show that it is possible to "beat the market" without altering the risk, which is a contradiction to the EMH.

There are primarily two models of the phenomenon of a political cycle; the monetary opportunistic model and the monetary partisan model (Drazen, 2002). The opportunistic monetary model claims that a political cycle exists because the incumbent political party manipulates the economy as to get reelected (Drazen, 2002). This is what Nordhaus (1975) reasons for. The partisan monetary theory claims that it exists a partisan cycle where different political parties have different objectives with regard to macroeconomic outcomes (Drazen, 2002). This is the reasoning in the paper of Alesina and Sachs (1988).

Nordhaus (1975) found a pattern in which he claimed that the political parties manipulated the economy as to get reelected. The incumbent party would increase the unemployment rate after elections with contractive monetary policy so that the inflation would decrease. Directly before an election the incumbent party would decrease the unemployment rate by expansive politics, the increase of inflation that would lead to a recession would be lagged to after the election due to slow adjustments. The objective of this would be to win voters that have preferences for low employment rates and low inflation. This would thus explain why there are higher returns in the second half of presidential periods with an opportunistic view.

Drazen (2002) points out some factors to this framework that is questionable with regards to the theory. First of all the model has an assumption that the monetary policy is controlled by the President, which it is not because it is controlled by the independent Federal Reserve. However, he claims it is possible that the President could have *some* influence to the decisions of the Federal Reserve. This could be due to political pressure or indirect control by pressuring the Federal Reserve to react to decisions made by the President (Alesina and Sachs, 1988). Another objection claimed by Drazen (2002) is that the voters are irrational. After voters have experienced this sort of policy manipulating several times they should, as rational voters, understand that the upswing in the economy is followed by a downswing after the election and instead penalize the party that "fools" the voters.

Nordhaus (1975) claims that the two parties have the same behavior while manipulating the economy with monetary policies. Our results indicates that there is a different behavior of monetary policies between the two parties as there is a difference in the inflation and thus monetary policy that is statistically significant between the two parties. In addition, the difference of inflation in the first and latter half of presidential periods is not statistically significant. These would be contradictions to the opportunistic theory of the political cycle.

A partisan monetary model is that of Alesina and Sachs (1988). The assimilation of the model is that the Democratic Party and the Republican Party have different preferences with regard to the inflation/money growth target and an output growth target which the parties can control by monetary policy. They also make an assumption that the President has indirect or direct influence of the control of monetary policy made by the Federal Reserve. The voters are rational

in the sense that they know the objectives of the respective parties, and vote for the party that maximizes their utility.

Rational expectations are incorporated in the model so that the expected level of monetary policy/inflation before an election is the weighted average of the expected policies during the two different administrations if they were elected. Due to a difference of the parties' objectives there is going to be a "surprise" after the election in the level of monetary policy/inflation because the expected level also included the effect of the other party that did not win the election. The "surprise" of monetary policy/inflation or the uncertainty of election outcome is the only factor that affects the real variables, if the voters had full information of the election outcome there would be no effect on the real variables and thus no cycle.

Drazen (2002) explain that in the first half of presidential periods one would get the "surprise" effect where if the Democratic Party with expansive politics would be elected there would be a surprise of a higher inflation than expected leading to a lower unemployment rate than the trend level. If the Republican Party with less expansive politics were to win the election there would be a surprise of lower inflation than expected and a higher unemployment rate than the trend, thus a recession. In the second half of presidential periods the effect on real variables would not be present because the outcomes of the incumbent Presidents' policies are known.

Alesina and Sachs (1988) reject the null hypothesis of equal macroeconomic outcomes during Democratic Presidencies and Republican Presidencies as they find that Democratic Presidencies is more engaged in an output target rather than with an inflation target in contrast to their counterpart. They also find the real variables being more influenced by new policies at the beginning of presidencies. The results are thus in support of a partisan theory.

Our results show that the averages of monthly inflation are statistically significantly higher under Democratic Presidencies than Republican Presidencies. The hypotheses of equal means are thus rejected in both periods and this could show that there is a difference in the monetary policies performed by the respective parties. The averages of the real returns are also different and statistically significant in the two periods. These results could thus be in favor of a partisan theory of the political cycle where the political parties have different objectives regarding their monetary policies and where the real variables is affected only in the first half of presidencies.

6.3 THE REELECTION EFFECT

In this chapter, the data has been categorized into presidential periods according to the following criteria:

Period 1_n: Presidents who wanted to be reelected, but was not.

Period 1_r: Presidents who wanted to be reelected, and was.

Period 2: Presidents' second period in office.

Period 3: Presidents' third period in office.

When categorizing the presidential periods, we chose two alternative ways of dealing with the periods of President Franklin D. Roosevelt. Roosevelt sat as President from 1933 to his death in 1945, and was thus reelected three times. It can be discussed whether his first three periods should be categorized as 1_r, as he ran for reelection all of these periods and won, or if they should be categorized as period 1_r, 2 and 3. We have chosen to analyze both alternatives, since we do not know if these two approaches will lead to different conclusions.

6.3.1 RESULTS

TABLE 7: RETURNS DURING PERIOD 1_N VS. PERIOD 1_R

	Period 1_n	Period 1_r	P-value, two-sided	P-value, one-sided
Panel A: Roosevelt's periods set as period 1-2-3				
Mean	0.00%	0.83%	0.01**	0.01***
Standard deviation	5.25%	3.80%	0.00***	
Panel B: Roosevelt's periods set as period 1-1-1				
Mean	0.00%	0.76%	0.02**	0.01***
Standard deviation	5.25%	3.99%	0.00***	

The second column presents the sample means and standard deviations for the excess returns during the periods of presidents who wanted to be reelected, but was not. Column three reports the means and standard deviations for the first periods of presidents who were subsequently reelected. The fourth column gives the two-sided p-values obtained from the t-test where we compare the means, and the two-sided p-values from the F-test used to compare the variances. The one-sided p-values from the t-test are presented in column five. All data are from the period of 1871 to 2012.
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 7 gives the results of the tests regarding whether it exists a difference in monthly excess returns between the periods of presidents who subsequently was reelected and the presidents who, even though they wanted to, was not reelected.

Panel A gives the results when President Roosevelt's periods are set as period 1_r, 2 and 3. The average monthly excess return for presidents who subsequently was not reelected was 0.00%. For presidents who were subsequently reelected the average return was 0.83%. The difference is statistically significant at the 5% level for the two-sided test. For the one-sided test, the difference is statistically significant at the 1% level. Hence, we reject the null hypothesis of equal means. The difference in variances was statistically significant at the 1% level.

In the results from panel B, President Roosevelt's periods are all set as period 1_r. The average monthly excess return for presidents who were not reelected is still 0.00%, while for period 1_r the mean is now 0.076%. This means that the difference has decreased by 0.07 percentage points. The difference is still statistically significant at the 5% level for the two-sided test, and at the 1% level for the one-sided test. The variances are still significantly different at the 1% level. Thus, the different categorization of Roosevelt's periods does not alter our conclusions.

TABLE 8: RETURNS DURING PERIOD 1_R VS. PERIOD 2

	Period 1_r	Period 2	P-value, two-sided	P-value, one-sided
Panel A: Roosevelt's periods set as period 1-2-3				
Mean	0.83%	0.42%	0.07*	0.04**
Standard deviation	3.80%	3.87%	0.64	
Panel B: Roosevelt's periods set as period 1-1-1				
Mean	0.76%	0.50%	0.23	0.11
Standard deviation	3.99%	3.54%	0.00***	

The second column reports the sample means and standard deviations for the excess returns during the first periods of presidents who were in office for at least two consecutive periods. Colum three gives the means and standard deviations for the presidents' second periods. The fourth column gives the two-sided p-values obtained from the t-test where we compare the means, and the two-sided p-values from the F-test used to compare the variances. The one-sided p-values from the t-test are presented in column five. All data are from the period of 1871 to 2012.
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 8 gives the results of testing whether there is a difference between the first and second period of Presidents who were in office for at least two periods.

When Roosevelt's periods are set as period 1_r, 2 and 3, the average monthly excess return for period 1 is 0.83%. The average monthly excess return for period 2 is 0.42%. This implies a difference between the two periods of 0.41 percentage points, and the difference is statistically significant at the 10% level for the two-sided test. For the one-sided test, the difference is statistically significant at the 5% level. We thus reject the null hypothesis of equal means. The difference between the variances is not statistically significant.

When President Roosevelt's periods are set as period 1_r, the average monthly excess return for period 1 is 0.76%. The average monthly excess return for period 2 is 0.50%. The difference of 0.26 percentage points is not statistically significant for either the one-sided or the two-sided test. We observe that this alternative way of categorizing President Roosevelt's periods leads to a different conclusion. The difference in variances is now statistically significant at the 1% level.

In the following, the differences between period 1_r and period 2 are analyzed separately for the Republican and Democratic Presidents.

TABLE 9: PERIOD 1_R VS. PERIOD 2 DURING REPUBLICAN PRESIDENCIES

	Period 1_r	Period 2	P-value, two-sided	P-value, one-sided
Mean	0.60%	0.40%	0.500	0.25
Standard deviation	3.52%	3.61%	0.66	

The second column reports the sample mean and standard deviations for the excess returns during the first periods of Republican Presidents who were in office for at least two consecutive periods. Colum three gives the mean and standard deviation for the Republican Presidents' second periods. The fourth column gives the two-sided p-values obtained from the t-test where we compare the means, and the two-sided p-values from the F-test used to compare the variances. The one-sided p-value from the t-test are presented in column five. All data are from the period of 1871 to 2012.
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 9 gives the results of the tests regarding differences between period 1_r and period 2 for the Republican Presidents. Since President Roosevelt was a Democratic President, it is not necessary to take into account how his periods are categorized.

The average monthly excess return during period 1_r is 0.60%. For period 2 the average monthly excess return is 0.40%. The difference of 0.20 percentage points is not statistically significant for either the one-sided or the two-sided test. The null hypothesis of equal means is thus not rejected, as there are no statistical evidence that the returns under period 1_r differs from the ones under period 2 for the Republican presidents. The difference in variance is not statistically significant.

TABLE 10: PERIOD 1_R VS. PERIOD 2 DURING DEMOCRATIC PRESIDENCIES

	Period 1_r	Period 2	P-value, two-sided	P-value, one-sided
Panel A: Roosevelt's periods set as period 1-2-3				
Mean	1.11%	0.43%	0.06*	0.03**
Standard deviation	4.10%	4.17%	0.78	
Panel B: Roosevelt's periods set as period 1-1-1				
Mean	0.91%	0.63%	0.40	0.20
Standard deviation	4.37%	3.45%	0.00***	

The second column reports the sample means and standard deviations for the excess returns during the first periods of Democratic Presidents who were in office for at least two consecutive periods. Colum three gives the means and standard deviations for the Democratic Presidents' second periods. The fourth column gives the two-sided p-values obtained from the t-test where we compare the means, and the two-sided p-values from the F-test used to compare the variances. The one-sided p-values from the t-test are presented in column five. All data are from the period of 1871 to 2012.
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

The differences between period 1_r and period 2 for the Democratic Presidents are analyzed in table 10. When Roosevelt's periods are set as period 1_r, 2 and 3, the average monthly excess return is 1.11% for period 1_r and 0.43% for period 2. This implies a difference of 0.67 percentage points and it is statistically significant at the 10% level. For the two-sided test, the difference is statistically significant at the 5% level. The null hypothesis of equal means is thus rejected. The difference in variances is not statistically significant.

When Roosevelt's periods are set as period 1_r, the average monthly excess return is 0.91% for period 1_r and 0.63% for period 2. The difference of 0.28 percentage points is not statistically significant and the null hypothesis cannot be rejected. This result holds for both the one-sided and the two-sided test. The alternative categorization thus leads to a different conclusion, as we do not find evidence that the returns differ between the two periods. The variance is significantly different at the 1% level.

6.3.2 DISCUSSION

The results presented above show that the average monthly excess returns for presidents who ran for reelection and won are statistically significantly higher than the returns for presidents who did not win the reelection. The difference is significant for both alternative ways of categorizing President Roosevelt's periods. Prechter et al (2012) found similar results when studying the movements in the stock market the years preceding an election. They found a statistically significant relationship between the net percentage change in the stock market and the vote margins of the incumbent. The volatility is statistically significantly higher during the periods of presidents who were not reelected. Therefore, the difference cannot be explained as a compensation for higher risk during the periods of presidents who were reelected.

The result of higher returns under presidents who were reelected is consistent with the socionomic voting theory. This theory claims that the social mood of the voters, represented by the stock market, is a strong regulator of the outcomes of reelections (Prechter et al 2012). The reason for this is that the voters either credit or blame the leader for the social mood. Thus, when stock market has shown a positive trend, incumbent presidents face a higher chance of reelection than when the stock market has been declining. In our study, the difference in returns between incumbent presidents who won and those who did not is statistically significant at the 5% level. It thus seems that the market looses its faith in presidents sitting in periods with low stock market returns, and wants to see a change in power. When returns are high the voters are more positive to the incumbent, and are more likely to vote for this president.

When comparing the first and second presidential periods, we find a statistically significant difference when President Roosevelt's periods are set as period 1, 2 and 3. This is consistent with the results of Booth and Booth (2003), which studied data from 1946 to 1996. The volatility is slightly higher during period 2, but the difference between the two periods is not statistically significant. Hence, the difference in returns is not due to a higher risk premium.

The reason for the observed difference might be that presidents who want to run for reelection choose policies that are positive for the stock market in order to increase their chances of reelections. After World War II, there has been a limit of two periods for presidents in the United States. In fact, the only president to stay in office for more than two periods during the time

period examined in this study is President Roosevelt. The incentive to stimulate the economy will therefore be smaller in their second presidential period.

However, when President Roosevelt's periods are all set as period 1_r, the difference is no longer statistically significant. This can indicate that the stock market returns was not an important predictor of the outcomes of the three reelections he ran. Further, we see that the volatility is now statistically significantly higher during period 1_r, and the average return of the period has decreased. It is thus clear that the returns during Roosevelt's periods were characterized by low returns and high volatility.

When examining the difference between the first and second presidential terms for Republican Presidents, we find that the average return is higher during the first period, but this difference is not statistically significant. The volatility is slightly higher during period 2. The difference is however not statistically significant, and cannot be used to explain the difference in returns.

For the Democratic Presidents, the average return during period 1_r is statistically significantly higher when setting Roosevelt's periods as period 1_r, 2 and 3. Examining the volatility does not give an explanation for this, as the standard deviation is higher, though not statistically significantly higher, during period 2. The statistical significance of this difference however vanishes when the periods are set as period 1_r. The volatility is now statistically significantly higher during period 1_r, and the average for the period is lower.

7. CONCLUSION

This master's thesis has examined the relationship between U.S. stock market returns and various aspects of the political environment. Specifically, we have examined the party effect, the second half effect and the reelection effect. The analysis is performed with data from the period of 1871 to 2012. We have conducted t-tests in order to see whether the means of two samples are significantly different, and F-tests have been conducted to compare the variances of two samples.

When examining the party effect we find that the average monthly nominal returns are higher during Democratic Presidencies, but the difference is not statistically significant. This confirms the findings of Johnson et al (1999), Hensel and Ziemba (1995), Booth and Booth (2003) and Ziemba (2013). We find no evidence that the real returns differ between the two parties, which is a result that has not been widely investigated, as previous studies have mainly looked at nominal returns and excess returns. We further find the inflation to be significantly higher during Democratic Presidencies, which is consistent with the results of previous studies. The excess return is significantly higher during Democratic Presidencies, a result that confirms that of Santa-Clara and Valkanov (2003). When examining the risk-free rate, we find that it is significantly higher during Republican Presidencies. The significantly higher excess return under Democrats can therefore be explained by higher inflation and lower risk-free rate. All of our results regarding the party effect thus go against the popular belief that the stock market performs better under Republicans.

We confirm the existence of the second half effect where the returns are statistically significant higher in the latter half of presidential periods, a phenomenon that is well documented in the literature. The real returns were higher in the second half of presidential periods which means that the second half effect consists even if one adjust for inflation and it persists independently of the price level. The inflation was found to be statistically significant higher in the two last years during Democratic Presidencies and there were no differences among the two periods under Republican Presidencies. The excess returns are statistically significant higher in the second half of presidencies which is due to statistically significant higher excess returns under Democratic Presidencies in the second period. This is a contribution to the literature, as we could not find other literature that had analyzed the excess returns in relation to the political cycle.

The reelection effect is a field where not many previous studies have been performed. Our analysis reveals that the excess return under presidents who ran for reelection and won has been significantly higher than the returns of presidents who did not win the reelection. The stock market returns can thus be used to predict the outcomes of reelections. When comparing the returns of the first and second period for presidents who were in office for at least two periods, we find that returns have been significantly higher during the first period.

We see that several of our results are in contradiction to the EMH. There are possibilities of beating the market by using trading strategies where one takes into account the excess returns in the latter half of presidential periods and the excess returns under Democratic Presidencies. Further, is possible to earn abnormal returns when taking in to account the excess returns in the first presidential period. The market should have seen this possibility and the possibilities of earning excess returns should have vanished by the EMH.

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