What is the impact of elections on the valuation of selected sectors in the USA?

Focus on sectors that are affected by government spending in the period 1973-2007

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In the time we were to choose the subject for our master thesis there was heavy media coverage of the American presidential election. Even though the elections had not gotten further than the discussion of candidates, we followed them with great interest as we expected the outcome to have tremendous impact on the economic situation in the US. After discussing this topic with our supervisor we found an angle allowing us to combine finance and politics in investigating questions we had concerning the effects of election outcomes.

The master thesis is mostly written in the time period before the election in November 2008. During spring 2009 there have been minor editorial adjustments but the thesis is based on the information available in the time leading up to, and one month after, the election. Our thesis is structured around three hypotheses, introducing relevant theory before using statistical tests to find conclusions for the hypotheses.

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ABSTRACT

This thesis explores the differences in government spending increases during Democrat and Republican power in the time period 1973 to 2007. Based on these results, the thesis investigates whether these differences are reflected in the returns in the defence and healthcare sectors, and stock market in general, around elections. The thesis examines three hypotheses.

The first hypothesis explores how government partisanship affects the trends in government spending. After some preparatory tests on government spending, we test government spending increases in health care, defence and total levels. We test whether the mean and variance are different under Democrat and Republican partisanships, both for Congress and President. The most pronounced results from these tests are that the increase in government spending for all three levels is higher during Republican than Democrat Presidency. For example, defence spending increase under Republican Presidents was 4 percentage points higher than under Democrat Presidents. Our results for Congress majority seem to be inversely proportional from the tests on President Partisanship, for all tested sectors except defence. For example, increase in healthcare spending under Democrat majority in Congress is 1 percentage point higher than under Republican majority. This inverse relationship could be explained by people's tendency to elect opposing parties for executive and legislative power.

The second hypothesis tests the mean return in defence, healthcare and the stock market in general on two levels with respect to elections. First, we test whether elections in general have an effect on returns in the selected sectors. The test results on elections in general indicate that the returns have been lower after President elections compared to before President elections, and higher after than before Congress elections. When we test elections which have resulted in a change in the President partisanship, regardless of the outcome of the election, the stock market returns have on average been one point five percentage points higher in the years before elections, compared to the year after. The results of higher returns after Congress elections may imply that the chosen sectors react positively to Democrat majority in Congress, as Democrats in general have had majority in Congress for more years than Republicans.

The other level of mean testing investigates whether there is a difference in the returns before and after elections depending on which party that is elected. Testing the returns around the shift from Democrat to Republican majority in Congress show that the return in the defence index is one point seven percentage points higher the year after than before the election. When there has been a shift from a Republican to a Democrat Presidency, the mean return has been one point twenty six percent higher before the election for the same sector. These two observations are consistent with the effect of the increases in government spending advocated by the parties, and the findings in hypothesis one on changes in spending.

Thirdly, we hypothesise that due to higher uncertainty before elections, the variance should be higher before than after elections. This hypothesis is tested on the same levels as hypothesis two. Both for President Partisanship and Congress majority we found indications that variance is higher in the year before elections than the year after elections. Testing for all elections where there has been a change in President Party, the variance is three percentage points higher before the election than after. Whether there is a shift from Democrats to Republicans in power, or vice versa, makes little difference, the variance is still higher before than after, ranging from zero to two point five percentage points. In addition, the difference in variances before and after elections seems to be more pronounced for President elections than Congress elections.

The higher variance before elections, could be explained with higher degrees of uncertainty before the elections than after. The possible change in power distribution, and how this will influence future profitability before the elections, introduces a risk factor which creates volatility in the returns of the indices. However, this volatility decreases after the election outcome is known. This could be caused by the fact that opposing parties often are elected for executive and legislative power, which is known when the election results are made public. The division of power between the executive and legislative branch, eliminates Presidents and politicians in Congress' ability to unevenly distribute government spending according to their preferred ideology. This again reduces investors expectations for irregular future events, which explains why the uncertainty and thereby the volatility in the returns fall after elections.

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1. Introduction

Since the 2008 campaign for Presidency began with an intense battle for Democrat candidacy between Barack Obama and Hillary Clinton, media coverage all over the world has been extensive. Considering the fact that the USA is a superpower whose economic cycles affect the entire world, the worldwide interest for the elections is not surprising. In the US, party politics are scrutinized thoroughly, and due to differences in the parties' politics concerning business and government intervention, the financial markets in general tend to respond more positively to a Republican government than a Democrat one. Nordea Investment Management's (2008) literature on the effect elections have on the stock market shows that the S&P 500 increased with 14,9% in the years when Republicans were elected for President, versus 13,6% in the years when a Democrat was elected President.

The market's positive reaction to Republican victory in elections is often based on their corporate tax policies. Another factor of politics that should affect the business world, and therefore the valuation in the stock market, is government spending. The allocation of the national budget is of high importance for the political parties in the process of implementing their policies. Looking at present and previous policies, it may seem as though Democrats favour higher spending on for example health care than the Republicans, whereas Republicans seem to direct more of the government spending towards the defence sector. If this is the case, we would expect the valuation in the specific sectors to respond to elections in a way consistent with expectations for government spending. Furthermore, as a result of uncertainty before elections as to which party will win Congress majority or Presidency, the variance in the stock market ought to be higher before elections than after elections, no matter which party is in power.

On an overall level, this thesis investigates whether the differences in government spending policy are reflected in the returns in the defence and healthcare sectors, and stock market in general, around elections. First, we try to find differences in the spending patterns between Democrats and Republicans. Then we investigate the return response to elections in sectors assumed to be affected by government spending. The period of observation is 1973 – 2007.

In figure 1.1, which depicts government spending in the financial years 2004-2007, it is obvious why the healthcare and defence sectors are such important parts of election

campaigns: not only are they topics on which the two parties have different views, they are also decidedly the sectors in which the larger bulk of government spending is allocated. The large amounts spent should influence the valuation of the companies in these sectors, which is why we find it interesting to test the effect of elections on these sectors.

Figure 1.1 Congress spending split
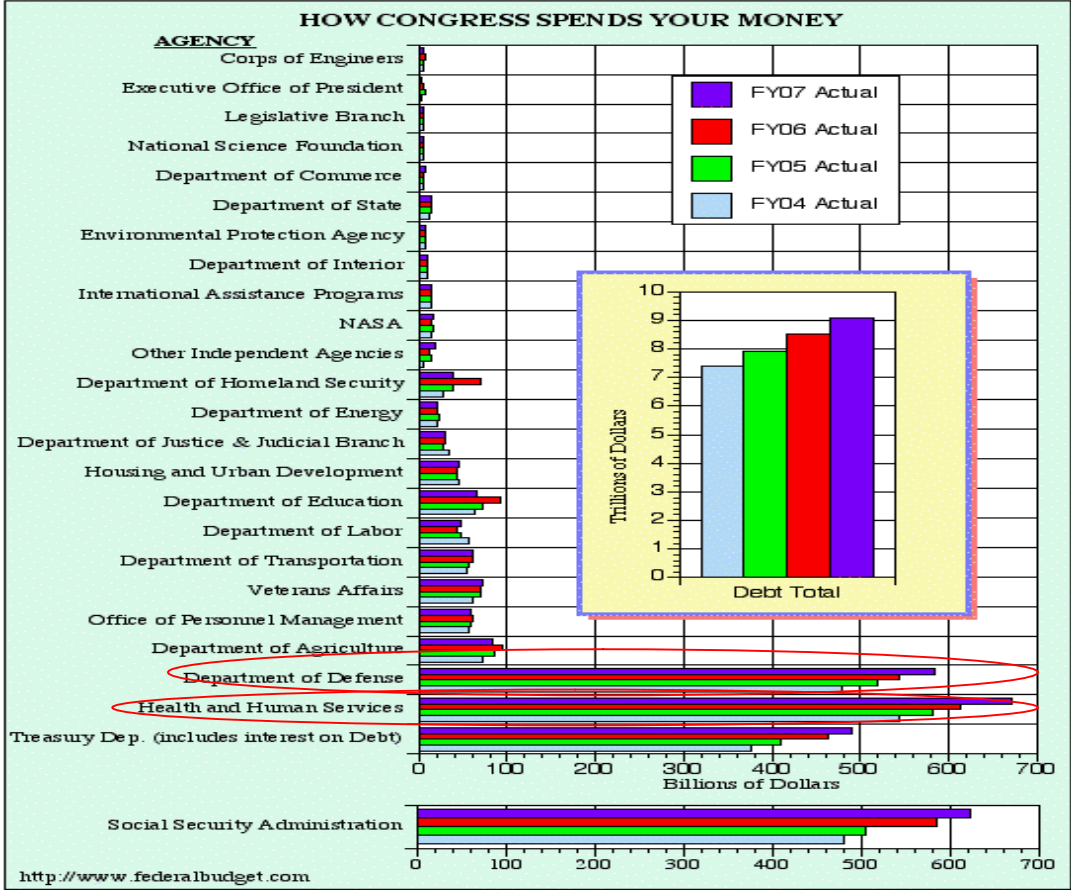
The hypotheses in this thesis are based on a combination of our own expectations, common perceptions of US party politics, and existing literature and theory on the subject of elections and valuation. First, we expected to find evidence that with Democrat majority in Congress, or Democrat Presidents in office, government spending in the Healthcare sector should increase more than when a Republican government is elected. In addition, we expect that government spending on the Defence sector increases more when Republicans have Congressional majority or President Partisanship, compared to under Democrat dominance. The results indicate that the government spending in all sectors on average increases 2,6 percentage points more during Republican President Partisanship. The highest difference is found in defence spending, where a Republican President increases on average the spending

with 4 percentage points more than a Democratic President. As for Congress, average increases in spending for healthcare and total spending are about 0,5 percentage points higher for Democrat majority, whereas the average increase in spending on defence is 2,21 percentage points higher for Republican majority in Congress.

The results are opposite for healthcare spending and total spending when testing partisanship for Presidency and majority in Congress. This could be a result of the fact that the public often hedge the risk by electing executive and legislative power from different parties at the same points in time. Increases in Defence spending, on the other hand, are higher under both Republican Presidency and Republican majority in Congress.

Leblang and Mukharjee (2005) find that average returns are lower in the stock market under Democratic partisanship. In addition to testing the stock market return, we have used indices for the healthcare and defence sector in order to see whether the results are different when isolating sectors that are likely to be affected by government spending. Looking at valuation measured by the returns on indices, we predict that the mean returns in the healthcare sector will be higher under a Democrat than a Republican Congress and Presidency party because of differences in spending or expectations. Furthermore, we expected mean return in the defence sector to be higher during Republican compared to during Democrat partisanship. We expected the effects of Presidency and Congress majority to be the same, and that the results should be possible to measure around elections rather than inauguration due to expectation based pricing.

Our results indicate that returns are higher before than after President elections, no matter whether Republicans or Democrats win the elections. Only when a Republican President has been elected, independent of previous President Partisanship, the healthcare return is 1 percentage point higher the year after the election than the year before. For all shifts in Presidency tested in one group, the general stock market return is 1,5 percentage points higher before the election than after. For Congress elections, it seems that mean returns are higher after elections. However, defence returns when there has been shift from a Republican to a Democrat majority in Congress are higher before than after the election, implying that the valuation of the defence sector reacts negatively when the Congress majority shifts from Republican to Democratic. When the shift is in the opposite direction, the defence return is

1,76 percentage points higher after a there has been elected a Republican majority after a Democrat majority. The stock market index is consequently higher after elections than before. In particular, the difference is high when there has been a shift from Democrat to Republican majority.

Third, we expected variance in general to be higher before than after elections, due to uncertainty of outcome before elections. However, when the election results in a shift to or from Republican Majority in Congress or a Republican President, we expected that the variance ought to be bigger when Republicans are in power, regardless of whether this is before or after the elections. This would be consistent with Leblang and Mukharjee's (2005) results that average volatility is higher under Republican Partisanship compared to Democrat Partisanship. On the other hand, our hypothesis differs from the research of Bialkowski et al (2006), where they find elevated volatility for approximately two weeks after election date. Bialkowski et al (2006) also point out that when the political orientation of the government changes the elevated volatility can last for a longer period of time, as the newly elected authorities issue new pronouncements and change the direction of public policy.

Our test results indicate that variance is higher before than after elections. In addition, most of these test results are significant on a 5% significance level, especially when testing President elections. When there is a shift from a Democratic to a Republican President, and a Republican President is elected independent on previous Presidency, there is a large decrease in defence variance. This decrease is respectively 3,4 and 2,5 percentage points. When it comes to Congress elections when Republicans are the elected majority, the variance drop after the election is also highest for defence, with a reduction of 2 percentage points. The stock market in general has significant reactions to all types of Congress elections.

2. Theory
2.1 Politics and history

Balance of powers

The foundations of the United States federal government are the Declaration of Independence of 1776 and the Constitution of 1789. The Declaration states that the United States is an independent political entity and the Constitution forms the basic structure for the federal government. "The separation of powers" is at the heart of the Constitution, and means that the power is spread between three institutions of government - the executive, the legislative and the judiciary. Executive power is held by the President, who is to enforce laws. Legislative power lies with the Congress, consisting of House of Representatives and the Senate, who makes the laws. The Judicial branch is the courts, who interpret the laws (Supreme Court, 2008). Since the American Civil War, American politics has been dominated by two parties, the Democratic Party and the Republican Party. The two - party domination in American politics will be emphasised throughout this thesis.

The President is the head of state and the government, as well as being commander-in-chief of the military and chief diplomat for the USA. President elections might therefore have a greater effect on the valuation of the defence sector than Congress elections. The President presides over the executive branch of the federal government, which implies that he has constitutional power to manage national affairs and may issue executive orders to affect internal policies. The President may sign or veto legislation passed by Congress and has the power to recommend measures to Congress. The Congress may overrun a Presidential veto but only by achieving a two-thirds majority, also called a super – majority, in both the Senate and the House of Representatives.

In Article 1 of the US constitution, all legislative power is vested in the Congress. The legislative power is vested in the two chambers of Congress, the House of Representatives and the Senate. Any law must be approved in both houses in order to be accepted. The power over the military lies with the President, who is commander in chief, but only Congress can declare war. However, a war need not be declared in order to start military action. Vietnam, Iraq and the Persian Gulf are examples of Congress approved military actions even though no formal declaration of war has been made. Korea in 1950 is an example of a conflict that was

engaged in by the President without Congress authorization (Myrick & Bradley, 2003). This may further strengthen the impact President elections have on the valuation of the defence sector.

When testing for differences in means and variances before and after Congress and President Elections, there are bigger differences when testing President Elections compared with Congress Elections- independent on the test observations and the time perspective. These results contradict the research of Nordea Investment management (2008), where they find that Congress elections tend to have more impact on financial markets than Presidents.

Elections in the USA; an outline of the system

The President and Vice President are elected quadrennially (the count beginning with the year 1792) indirectly through the Electoral College on the Election Day. The Election Day is the first Tuesday after the first Monday in November. Voters cast votes for electors, rather than directly on the candidates. The Electoral College consists of 538 popularly elected, a number that equals the total memberships of both Houses of Congress (435 Representatives and 100 Senators) (Library of Congress, 2008). These representatives formally select the President and the Vice President. Formally, the electors can vote for any candidate, but it rarely happens that they vote for a candidate they have not been designated to vote for. The most popular method to select electors is referred to as "the winner takes it all". Electoral candidates announce which Presidential candidate they will vote for in January of the election year, and campaign throughout the year. The electoral candidates who win the most votes in their respective states, will represent the states in the Presidential election. This implies that a time period of one year before and one year after the election should be a sufficient measurement for capturing the possible effect the President elections have on returns.

A President must have majority among the electors to be chosen, meaning that the candidate needs 270 electoral votes. The final judge of the electors is the Congress. Should no Presidential candidate win the majority of the electoral votes, the choice is referred to the House of Representatives.

Representatives in House and the Senate in the Congress are elected directly through popular state votes (House.gov, 2008). The idea behind having two divided chambers representing the

people is that it will secure that decisions go through two authorities, thereby serving as a safety net. More specifically, the House is supposed to represent the people more closely. This is due to the fact that the members of the House are elected by and represent limited groups of citizens living in small geographically defined districts within each state. Since the representatives in House are elected every other year, they are constantly running for election, ensuring close contact with their local constituents as they have to be constantly aware of their needs and opinions. This again means that they can better advocate local cases in Washington. Since House representatives are constantly running for election, we find it appropriate to measure the effects elections for House have on selected sectors on a one year before and one year after basis.

The minimum age for members of the House is 25, while it is 30 for Senators (Senate.gov, 2008). The purpose of this is that members of Senate are elected to consider more long term effects of legislation and practice a more mature, thoughtful and deeply deliberative approach. In other words, Senators are supposed to focus more on how bills would affect the nation as a whole as opposed to how a bill affects local people. Furthermore, Senators are elected for six – year terms and thereby remain somewhat insulated from the people. This again prevents Senators being tempted vote according to the short – term objectives that are popular in public opinion. Passing bills through Senate takes longer time than passing bills passed through House, as Senate often bring up points not considered in House. Bills passed through House are therefore often turned down in Senate. In this thesis, House and Senate will be treated as one, and the elections will be measured every two years. This is done due to the fact that House is elected every other year, as well as one third of the Senate being up for election every two years. The Congress election every other year is therefore assumed to capture possible effects on returns in the selected sectors.

President and Congress majority 1973 – 2008

Figure 2.1.1 Overview of Presidents 1973 - 2008

Presidents 1973 - 2008			
President #	**Year**	**Name**	**Party**
37	1973	Richard Nixon	Republican
38	1974	Gerald Ford	Republican
39	1977	Jimmy Carter	Democrat
40	1981	Ronald Regan	Republican
41	1989	George H.W Bush	Republican
42	1993	Bill Clinton	Democrat
43	2001	George Bush	Republican
44	2008	Barack Obama	Democrat

Figure 2.1.2 Overview of Congress majority 1973 - 2009

Congress 1973 - 2008		
Congress #	**Year**	**Majority Party**
93	1973 - 1975	Democrat
94	1975 - 1977	Democrat
95	1977 - 1979	Democrat
96	1979 - 1981	Democrat
97	1981 - 1983	Democrat
98	1983 - 1985	Democrat
99	1985 - 1987	Democrat
100	1987 - 1989	Democrat
101	1989 - 1991	Democrat
102	1991 - 1993	Democrat
103	1993 - 1995	Democrat
104	1995 - 1997	Republican
105	1997 - 1999	Republican
106	1999 - 2001	Republican
107	2001 - 2003	Republican
108	2003 - 2005	Republican
109	2005 - 2007	Democrat
110	2007 - 2009	Democrat

(Senate.gov, 2008) (House.gov, 2008) (The White House, 2008)

Comparison of the Democrats and the Republicans

When looking at the general differences between the policies of the Republicans and the Democrats, it is natural to look at the ideologies on which the two parties base their politics.

Republicans generally base their politics on ideas such as Neo-conservatism, Classical liberalism and social conservatism. In short, they;

- Favour the freedom of the individual, and a government to protect the rights of people to make their own decisions. Free markets, limited welfare and traditional cultural values are key issues, and a limited government is sufficient to control people, as it is believed that human rationality will control people more efficiently than an overly regulative government.

- The Neo-conservatism in the US is partial to a proactive approach to international issues, as they believe that this is the best way to protect national interest. (GOP.com, 2008). This can be illustrated by the interference in Iraq, Afghanistan, and the Gulf War (Myrick & Bradley, 2003).

- Believe in a safety net for the poor, but oppose a universal welfare system. They believe that the private sector would be more effective in helping the poor than the government, and advocate personal/employer based insurance, and Medicare for the elderly and Medicaid for the poor. In general they are for limited eligibility and benefits to encourage welfare recipients to finding jobs. (GOP.com, 2008).

- When it comes to economics, the Republican Party is for supply side economics-achieving growth by encouraging production through lowering marginal taxes. The Republican Party has a long history of advocating tax cuts.

The Democratic Party have built their party on the basis of Modern American liberalism, and Social Liberalism. In short, they;

- They expect government to supply services in education, healthcare, work- and welfare. In addition they expect the government to supply rules and regulations to control business and finance.

- Historically, have opposed unregulated business and finance, and favoured progressive income taxes.

- In international issues, Democrats favour multilateralism. In other words, they prefer issues of foreign policy to be solved through international institutions like the UN. (Democrats.org, 2008)

In light of these differences, we can develop hypotheses concerning government spending in the US. First of all, as the Republicans seem to favour private solutions on healthcare, it might be expected that their spending on healthcare, compared to that of the Democrats who advocate a universal welfare system, is lower. Furthermore, their idea that international conflicts should be solved unilaterally might indicate a higher spending on defence under Republicans.

2.2 Macroeconomic theory

The components of the economy, Circular Flow and IS-LM

The circular flow model illustrates how money, goods and services flow in the economy between firms, households and government. According to Keynesian theory, government can stimulate the economy through for example taxes and government spending. Reducing taxes or increasing government spending will typically stimulate the demand through income effects for consumers. This increase in demand will again affect total output (GDP), industry earnings, and should thereby have an impact on the valuation of the affected companies (Gärtner, 2006).

Effects of changes in policies in the economy can be illustrated by the IS-LM model, with the national account equation as a starting point.

The IS – LM model explains how GDP and nominal interest rates are affected by monetary and fiscal policy in a closed economy with unemployment. The time horizon of the model is short term, 0 – 3 years, and assumes that prices are sticky. The model could be used to present shifts in the economy with a fixed or a flexible exchange rate regime. After the collapse of the international exchange system Bretton Woods in 1971, the value of the dollar has mainly been decided by market forces and the model will therefore show the effect of shifts with a flexible exchange system.

The IS -LM model consists of two components, the IS and the LM-curve. The IS-curve shows the relationship between production and services, and the equation gives all combinations of interest rate and production which gives equilibrium in the markets for goods and services.

The LM-curve, on the other hand, gives the combinations of interest rate and production which gives equilibrium in the money market. The variables used in the model are defined in table 2.2.1.

Table 2.2.1 Overview of variables in the IS-LM model

Y= Output (GDP)
c= Marginal propensity to consume
t= Tax
C= Consumption
G =Government spending
NX= Net exports
I= Private investments
b= Investment sensitivity to changes in the interest rate
i= Interest rate
k= Income sensitivity
h= Interest rate sensitivity
P= Price level
TR= Transfer from the government
R= Ep^w/P, the real competitiveness
Pw= Price level international goods
E= Number of domestic currency per international currency
m= income elasticity of net export
N= $x_2 + m_2$
M^d= Money demand
M^s= Money supply

From the national account equation we derive the IS - curve;

Y = C+ I+ G+ NX

C = C + c((1-t)Y + TR)

I = I + bi

IM = IM + mY – m_2R where 0 < m < c(1-t) and m_2 > 0

EX = EX + xY^w + x_2R where x_2 > 0

NX = EX- IM, which gives NX = NX + nR – mY

The IS equation is found by solving for Y (production) as a function of i (interest rate) and for the exogenously given variables (terms with bars on);

$$IS: \quad Y = \frac{1}{1 - c(1 - t) + m}[\overline{C} + c\overline{TR} + \overline{G} + \overline{NX} + n\overline{R} + \overline{I} - bi]$$

The LM – curve is derived from the equilibrium between the money supply and demand;

$M^d = P\,(kY - hi)$

$M^s = M$

Equilibrium in the money market: $M/P = kY - hi$

If this equation is solved for i as a function of Y, the LM – curve is represented by the following equation:

$$LM: \quad i = \frac{kY}{h} - \frac{\overline{M}}{h\overline{P}}$$

Combing these to equations gives equilibrium in the product and service market and the money market as could be seen in figure 2.2.1. The equilibrium solution gives the prevailing interest rate and production.

$$Y^\circ = \frac{1}{1 - c(1-t) + m + b\frac{k}{h}}\left[\overline{C} + c\overline{TR} + \overline{G} + \overline{NX} + n\overline{R} + \overline{I} + \frac{b\overline{M}}{h\overline{P}}\right]$$

$$i^\circ = \frac{k}{h}Y^\circ - \frac{\overline{M}}{h\overline{P}}$$

Figure 2.2.2 IS-LM model
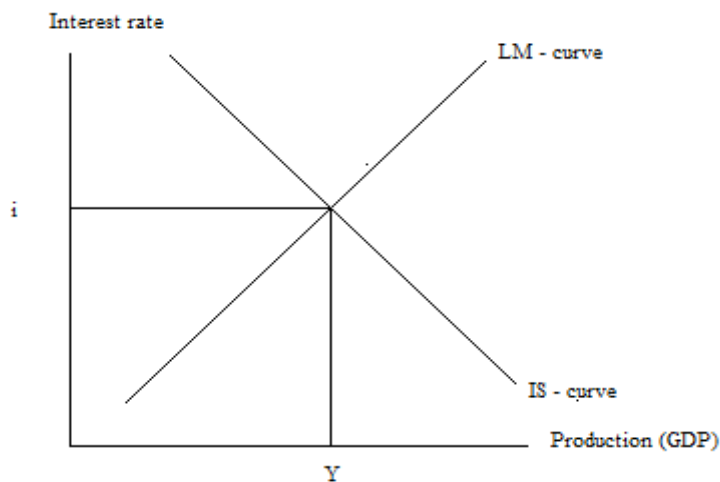
In the IS – LM model both fiscal and monetary policy affect the output. Fiscal policy tools are government spending, taxes and investment activities and affect the economy through the IS-curve. Monetary policy affects the money supply in the economy, through the LM - curve. Since the focus in this paper is on government spending, we will not discuss changes in the LM- curve in this section. Expansionary fiscal policy, could be executed either by decreasing taxes or increasing government spending, and will result in an outward shift in the IS – curve. This shift in the IS- curve will increase the production in the economy. Contractive fiscal policy will have the opposite effect on the economy. The slope of the IS depends on the variables in the equation.

The main part of expansionary fiscal policy we wish to explore is changes in government spending. Increases in government spending shifts the IS curve out to the right by the full Keynesian multiplier effect, $1/ (c(1\text{-}t) + m + b(k/h))$, multiplied by the change in government spending. However, due to the upward sloping LM – curve, the change in output, Y, will be less than the Keynesian multiplier effect. Even though increased government spending might crowd out private investments and consumption, the overall effect tends to be an increase in GDP (Silber, 1970).

Figure 2.2.3 IS-LM model with a positive shift in the IS-curve
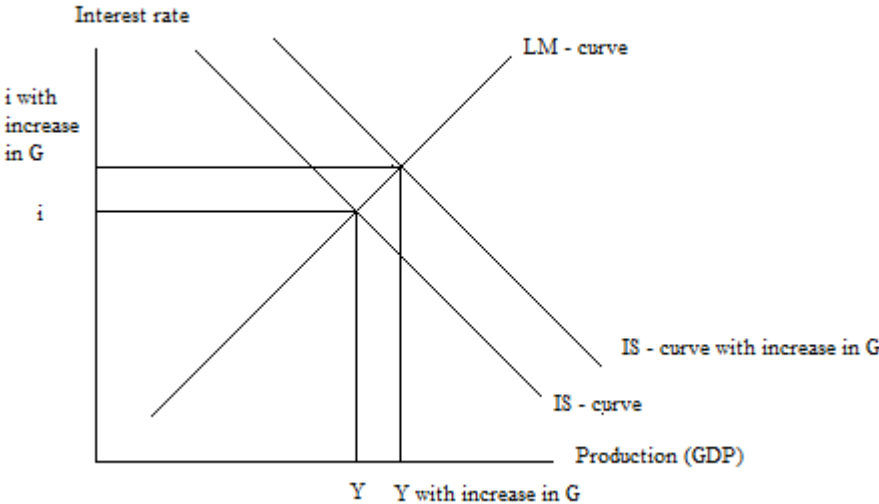
The IS- curve will also have a positive shift if there is an increase in investments, exports or a decrease in taxes, the shift shown in figure 2.2.2. The price level abroad compared to the domestic price level will also affect the IS – curve through how much goods and services are demanded internationally. The effect of the shifts depend on the slope of the LM – curve*. If

*The slope of the LM curve depends on the ratio of the income sensitivity of M^d (k) to the interest sensitivity of M^d (h). LM is steep when k is high and h is low and flat when the opposite occurs. The combination of high sensitivity to income and low sensitivity to interest rate implies that the interest rate increase must be large to restore equilibrium in the economy if output increases.

the LM - curve is almost vertical, which is the case when the economy is close to full employment, there will be hardly any effect of expansive fiscal policy. On the other hand, if the economy is in a credit crunch, the LM - curve is nearly horizontal, and the effects of expansionary fiscal policy will be substantial. This particular phenomenon is discussed in more detail in section 9, Postscript, figure 9.2

The AD –AS model explains the relationship between the price level and production in an economy. The AD – curve is a result of the IS – LM model, and shows equilibrium solutions between the GDP and the price level according to aggregated demand. The AS curve shows what the economy is willing to supply at various combinations of price level and production. When the IS curve or LM curve have positive shifts, the AD curve shifts correspondingly, reflecting that a higher activity level arising from an increase in aggregated demand imposes a higher price level in the economy. This shift is illustrated in figure 2.2.3.

Figure 2.2.4 AD-AS model with a positive shift in the AD-curve
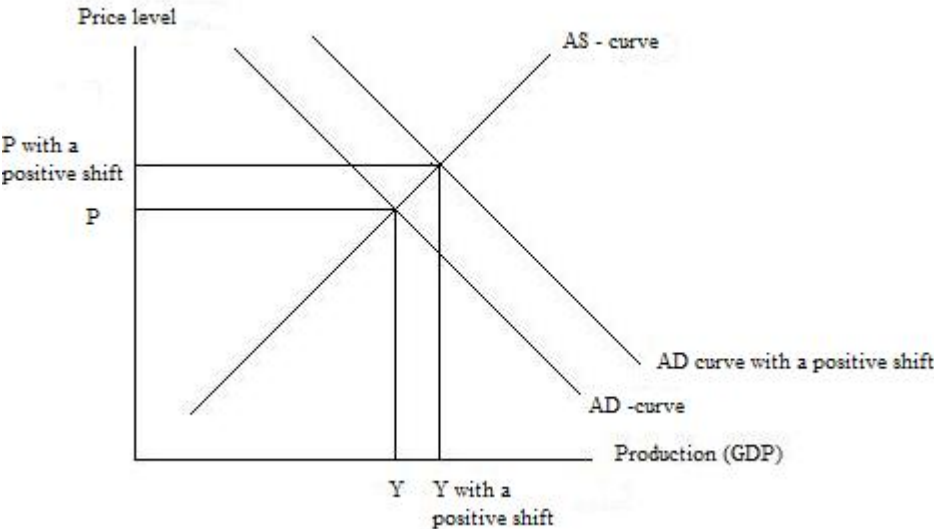
When the effect of increased government spending is to be measured, it is important to clarify whether the G_t change is temporary or permanent. With temporary changes in G_t, the households and firms do not necessarily anticipate any changes in the future values of G_t. This could imply that changes in G_t are not incorporated in valuations measurement. The most empirically illustrative example of how temporary changes affect the economy is according to Barro (1993) wars. The United States have been involved in many conflicts during the 20th

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and 21st century, such as Bosnian Conflict in 1994 – 1995 and Operation Enduring Freedom Afghanistan. In "The Economics of Public Spending", Miles, Myles and Preston (2003) present empirical evidence that the defence sector is the most volatile in terms spending as percentage of GDP over time. This corresponds with the data we found on government spending from 1973 until today. It is reasonable to believe that government spending on defence is not necessarily driven by the political party, but rather by the world stability. Valuation within this sector might vary more with conflicts, than decisions by politicians since these often are temporarily. Furthermore, Miles et al. (2003) have empirically found that healthcare, education and pension all have positive trends from 1900 until today; *"The most marked rises have come from social spending on items like health, education and pension."* Most years there are real increases in spending in these sectors, and there is a chance that a constant growth in spending is already incorporated in the prices, and that government spending must increase even more to achieve an effect.

Another question concerning the effects of changes in government spending is whether the markets trust the promises made by candidates during campaigns, and whether they are perceived as trustworthy when they are in office. This might be affected by the existence of policy rules. Kydland and Prescott (1977) argue that "a discretionary policy for which policymakers select the best action, given the current situation, will not typically result in the social objective function being maximized. Rather, by relying on some policy rules, economic performance can be improved." With rational actors, the outcome of earlier election is remembered, and it will therefore be difficult to convince voters that the actions made on short term are convincing if the government in election is not committed to actions by rules.

According to Barro (1993), an increase in G_t will have effects both on the utility of the consumers as well as public and private consumption. Companies affected by the increased government spending may also be positively affected through additional sales to the government. It is also possible that their sales are negatively affected through decreased spending by the private sector. We assume that the increase in the public spending is higher than the decrease in private spending. For example, the decrease in private spending could result from a reduced need to buy health insurances, since health reforms might diminish the demand for this. Private consumption is believed to decrease with 0,2 – 0,4 with every extra unit of government purchase (Barro 1993). Even though private consumption decreases with

government spending, the private production increases with G_t. The coefficient is positive, but less than one, taking into account the effect of diminishing marginal productivity. The net result of increased government spending on economic activity is positive. There are therefore reasons to believe that government spending differences can affect the valuation.

Government spending, G_t, must be financed through the real value of taxes and increase in money supply minus real value of transfer payments (Barro, 1993). This gives the following equation; $G_t = T_t/P_t + ((M_t-M_{t-1})/P_t) - (V_t/P_t)$ Taxes are assumed to be lump sum. Lump sum taxes are considered to be fixed taxes. Lump sum taxes are independent of the individuals decisions and do not distort economic decisions. In real life, taxes have distorting effects. Progressive taxes will eventually make people substitute work for activities that lower their taxes (leisure). Distortionary taxes therefore implies that the positive shift in the aggregate demand curve due to an increase in government spending will partly be eliminated by a negative shift in the aggregate demand curve due to tax effects. In this paper we exclude the effect G_t has on taxation in our discussions.

Support of the elimination of the financing effects could also be found within the Ricardian equivalence. The Ricardian equivalence proposition, also known as the Ricardian equivalence, suggests that it does not matter whether a government finances government spending with debt or a tax increase, the total level of demand in an economy will be the same. Both debt and taxes imply that the public will be taxed, either today through taxes or later through issuing debt. Ricardo argues that if the government issues debt, rational taxpayers know that they will experience higher taxes later and therefore save in order to pay future tax rise. According to Ricardo, this extra saving by consumers will offset the extra spending by the government and the overall demand remains unchanged. However, taxpayers are subjected to a fiscal illusion which distorts their decision. Fiscal illusion asserts that when government expenditures are not fully observed by the taxpayers, the cost of government is perceived to be less expensive than it actually is, and thereby lowering the saving rate accordingly to the increased debt (Barro, 1974). Empirical research rejects Ricardian equivalence in its pure form, although some studies have found Ricardian effects on saving behaviour.

The Ricardian equivalence and Ricardian equivalence proposition contrasts Keynes' theory, which suggests that spending financed through issuing debt has a greater effect on demand than taxation. In Keynesian models, a multiplier effect means that fiscal policy, far from being impotent, has a geared effect on demand, with a one pound increase in deficit spending increasing demand by more than one pound (Gärtner, 2006). Ricardian equivalence discusses the matter of the government's timing of financing (deficits or taxes), and concludes that demand will not be affected by increases in government spending. Barro, and other neoclassical economists, however, would agree that government spending has a certain effect on output. In this thesis, we have looked for evidence of expected Keynesian effects reflected in the valuation of companies.

Government spending components

Government spending is generally classified in three groups: government consumption, which basically means purchases for use today, government investment, which is spending to achieve benefits in the future, and transfer payments such as welfare which are simply transfers of money, not purchases. We will be focusing on government consumption and investments as these are most likely to have a direct effect on equity markets. This is due to the fact that they are directly traceable to companies, and therefore should affect expectations more.

Government spending can also be classified in levels as to where the money is spent, and on which level the decisions are made- on a federal, state or local level. When referring to government spending, we will be focusing on spending on a federal level, where most of the money is allocated, and where most of the budgeting decisions relevant for the chosen sectors are made. The main spending sectors we focus on are defence and healthcare, as well as the stock market in general.

Growth in government spending

According to the article *"Government Growth in the United States"* (Lewis-Beck and Rice, 1985), government size is a result of public policies. There exist three public policy processes which could explain the underlying factors of the government growth on a general level. These three are showed in the theoretical framework in figure two. This model is a hybrid model, combining mass-group-elite interactions with Democratic institutions.

Figure 2.2.5 Framework for explaining government growth

THEORETICAL FRAMEWORK FOR EXPLAINING GOVERNMENT GROWTH
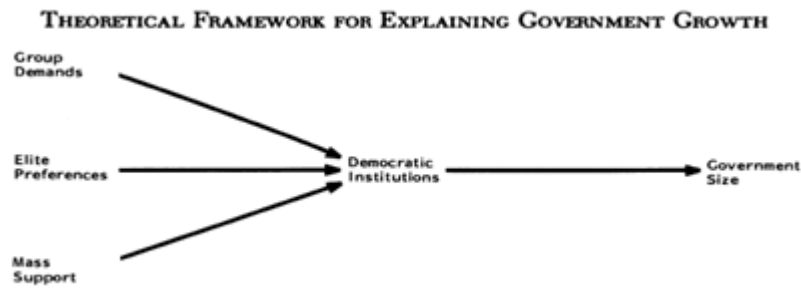
Demand from the public, concerning for example more focus on education or defence, is input into the political system, as shown in figure 2.2.4. This input is again transformed into public policy output through Democratic institutions since the politicians, especially representatives in House, must put weight on the publics' wishes to get elected. There could therefore be causality between the elected government and government spending. This is so because Democratic politicians often increase government spending as a response to pressures of group demands, elite preferences and mass support. The pressure from these groups could be a result of lobbying. These groups vary in levels of interest, knowledge and distance to power. The demand from these groups varies with their ideological point of view. For example, the supporters of the Democrats will have other preferences concerning the distribution of the government budget than supporters of the Republican Party. In addition to demand from various groups among the inhabitants of a country, also international affairs will have an impact on the government spending. Differences in political parties' public policies could thereby explain the size of the government spending (Lewis-Beck and Rice, 1985).

Growth in government spending could also be explained by supply- side and cost accounting factors in addition to demand side factors previously explained (Lindauer and Velenchik, 1992).

Overview of government growth in the United States

The public sector has expanded during the twentieth century. In 1870, worldwide average government spending was about 8% of GDP, but has steadily increased to about 40% today. The share of government spending varies across countries, and is higher in European countries than in the US (Barro, 1993). Much of this growth in government spending reflects increased spending on wages and supplies used in the public sector. With the public sector as

a significant customer for certain sectors, government spending is likely to influence companies' earnings (and thereby valuation) within these sectors.

For the US the government spending level in percent of GDP is currently around 35%. The largest irregular increases can be traced to armed conflicts in which the US has been involved, and are therefore temporary. There are, however, variations of minor size which seem to be caused by other factors than wars, some of them possibly due to shifts in government.

The distribution of government spending in the United States has also changed over time. Measured by percentage of GDP, defence spending has on average decreased since the 1950s while the social security, Medicare and Medicaid have increased. Healthcare spending as percentage of GDP is expected to continue its historical upward trend.

2.3 Valuation theory

Discounted Cash Flow valuation

A common way of valuing a business is to use the Discounted Cash Flow (DCF) model. According to this theory, the (implicit) value of a company's equity can be derived from the present value of future free cash flows to equity (FCFE) in that company. The FCFE can be found by adjusting operating income by adding the effects on debt and other non-equity claims. The general approach is:

FCFE = Net Income – (Cap. Expenditures – Depreciation) – Change in non-cash working

capital + Net debt issued

The Net Income is calculated in the following way:

	Revenues
-	Operating expenses
=	Operating income
-	Financial Expenses
-	Taxes
=	Net Income

The value of equity can be calculated by calculating the present value of the future cash flows to equity using the following formula:

$$\text{Value of equity} = \sum_{t=1}^{t=n} = FCFE_t / (1 + k_e)^t$$

Where k_e = required return on equity from the Capital Asset Pricing Model (CAPM). The value of equity divided by the number of shares (assuming no difference between preferred and ordinary shares) will provide an estimate of the value of each share, which will be reflected in the price at the stock exchange (and in the calculation of the relevant indices).

The link between government spending and DCF

When the government increases the spending in a sector, revenues in that sector will increase as discussed in section 2.2 on macroeconomics. This can take effect either directly through purchases in the sector, or indirectly by being spent with the sector's customers. Either way it increases demand in the sector. For a company in said sector, the increased revenues may affect the FCFE through the Net Income. If increased government spending increases the revenues in a company more than the operating costs, the Net Income will increase, ceteris paribus. Thereby the expected future cash flows from the firm should rise, and so should the price of the equity of that firm.

Another way government policy can affect the price of a company's equity is by reducing the tax rate. The tax rate for corporations is a highly debated issue in politics, and in general, the Republicans have wanted lower corporate tax rates than have the Democrats. In light of this, combined with the FCFE model, it might be fair to assume that businesses are higher priced when a Republican majority holds Congress.

Linking DCF to indices

The purpose of this paper is to examine whether the election of a party has an effect of the valuation of specific sectors. The idea is that when a specific party tends to spend more in a certain sector, the valuation of that sector ought to show some response to an election.

When spending is increased in a sector, this should affect the companies whose Net Income increases, and through this the valuation of the company. Since the indices are composed of the price of several shares in the sector, the price index should increase as the price of the shares increases.

Expectations and valuation

Expectations have for years been emphasized by economists in a broad range of problems (Cragg and Malkiel, 1980). In macroeconomic theories such as the AS – AD model and inflation targeting, expectations and how they are formed play an active role in the modelling. Especially when it comes to the valuation of shares, expectations are important. "The price of a share is and the anticipated future returns are determined primarily by investors' current expectations about the future values of variables that measure the relevant aspects of corporation's performance and profitability" (Cragg and Malkiel, 1980). Modern financial literature emphasizes the link between anticipated risk and return. This has resulted in mean – variance analysis. The most common measurements for risk within financial markets are standard deviation, variance and beta. The measure for expectation in this paper will primarily be mean and standard deviation. Analysts worldwide dedicate much time to study various indices, company prospects, investors' expectations and macroeconomic events to forecast the right price of a share. It is generally accepted that investors' expectations are an important factor in valuation and especially when it comes to discounting future events.

The problem with expectations is that they easily can be influence by biases and also be affected by inter - temporal decisions. In this paper we will assume that expectations are formed rationally, and will therefore not correct for inter – temporal decisions by using hyperbolic discounting.

3. Hypotheses

In this thesis we use the statistical program Minitab 15, software which has been proven to be robust and deliver statistically significant results. Descriptive statistics techniques are used to arrange, summarize, and present data so that one can create meaningful interpretations of data material, for example in a scatter plot.

Hypothesis testing makes use of statistics to determine whether there is probability to believe that a given hypothesis is true, using experimental data. The hypothesis testing process in this thesis consists of two steps;

1. Formulation of the null hypothesis, H_0 and the alternative hypothesis, H_1. In hypothesis testing one assumes that the null hypothesis is true until otherwise is proven.
2. Compare the P-value to chosen significance level, α. If $P \leq \alpha$, the null hypothesis is rejected and the alternative hypothesis is considered statistically valid.

Hypothesis testing could be conducted either as a one - or two tailed test. A one tailed test is used when one is certain that the difference in means goes one way, either greater than or less than: $H_0: \mu_0 = \mu_1$, $H_1: \mu_0 < \mu_1$ or $H_1: \mu_0 > \mu_1$

A two tailed test is used when the alternative hypothesis states that the means are not equal to the value stated in the null hypothesis: $H_0: \mu_0 = \mu_1$ and $H_1: \mu_0 \neq \mu_1$

Both one and two tailed hypothesis testing will be used in this thesis. The tests used for each hypothesis will be explained in more detail in the following section.

3.1 Hypothesis One; Change in spending

Spending patterns differ between Republican and Democrat majority in Congress and President Partisanship. The mean change in government spending on healthcare increases more during Democrat Congress majority and President Partisanship than during Republican partisanship. The mean change in government spending on Defence increases more during Republican Congress majority and President Partisanship than during Democrat partisanship. For testing this hypothesis we have used one sample- tests. The one sample t- test displays descriptive statistics such as the mean, standard deviation, number of observations and standard error mean for a given data set. Our data sets are yearly government spending increases during Republican and Democrat majority.

One sample t- tests are considered descriptive tests, and do not clarify whether the differences in means are statistically significant. However, they give indications as to the differences in mean and standard deviation, as well as confidence intervals that can be useful for determining whether a significant difference might exist. A non parametric test, Wilcoxon Rank Sum, is used as a robustness check in the robustness section as a supplement to the one sample t- test.

Before testing hypothesis one, we will have a section with preparatory tests to get an overview of the government spending in general, both in nominal and real values, scatterplots of the increased spending shaded for power differences, scatterplots of indices against increased spending, also shaded for power differences, and the growth in spending against returns.

To test the correlation between the growth in government spending and the returns of the indices, we use the Pearson correlation test. Pearsons correlation test calculates the correlation coefficient between two pair of variables. The test is a good way to quantify a relationship between two variables after a scatter plot. The test measures the degree of linear relationship between variables. The correlation coefficient is a value in the interval -1 and +1. A negative correlation coefficient implies that one variable decreases while the other increases. A positive correlation coefficient means that both variables increase at the same time. Whether the correlation is strong or not, is captured in the value. A value close to -1 or +1 implies a strong correlation. If the correlation coefficient is zero, there is no correlation.

The correlation test could be performed as a one-tailed or two-tailed test. For å two- tailed test the hypothesis is; H_0: r = 0 versus H_1: r $\neq$ 0 where r is the correlation between a pair of variables.

3.2 Hypothesis two; Changes in mean returns:

Due to different government spending patterns, the valuation of sectors in the US, measured by the mean return, is affected by President and Congress elections. The mean is expected to be higher after the election for health sector when a Democrat is elected, while the defence sector is expected to decrease. The opposite holds when a Republican is chosen. For the stock market in general, represented by *NYSEALL*, we expect higher return after Republicans are elected.

Hypothesis two is tested with two sample t – tests. A two sample t- test is conducted in a similar fashion as the one sample t- test and hypothesis testing. This test is used to test whether the means of two data sets differ. The data sets for hypothesis two are monthly returns for one year before and one year after the elections, represented by the healthcare, defence and *NYSEALL* indices. The significance of this test is measured by the p –value.

Furthermore, we use a two- tailed test, since we are uncertain whether the returns go up or down after an election. When the results are presented, we report the two-tailed test results, but seeing as a one tail t-test would have given half the P-value, we assume statistical significance for tests with a P-value of 0,10 or lower.

An important property of the t- test is its robustness against assumptions of population normality. This implies that t – tests often are valid even when the samples come from non – normal populations. Testing the indices' return for normality, lead us to conclude that the indices are close to normal distributed (See Appendix, Section 11, Figure 11.1).

3.3 Hypothesis three; Changes in Variance of returns:

Variance is generally higher before than after elections due to uncertainty about the election outcome, for healthcare, defence and the stock market in general. We expect that change in variance before and after election will be different depending on whether Democrats or Republicans are elected.

When testing to determine whether two population variances are equal the F- distribution is used. The F – distribution is a sampling distribution of two independent random variables with chi – square distributions, each variable is divided by its degree of freedom. The two variance- test determines whether the variance of two sample sets is significantly different, and is used in hypothesis three. The F- test can be a two- tailed test or a one- tailed test. The two-tailed tests the alternative hypothesis, which that the standard deviations are not equal. The F hypothesis test is defined as $H_0 = \sigma_1 = \sigma_2$ and $H_1 = \sigma_1 \neq \sigma_2$. The statistical significance is defined by the P- value.

4. Data

Table 4.1 gives an overview of data input used in this thesis. The underlying data material in this thesis is from 1973 until 2007. However, the years used when testing they hypothesises might vary according to what factors we are trying to measure.

Table 4.1

Data	Source	Manipulation	Use
Inflation (CPI)	InflationData.com (McMahon, 2008)	-	Deflating government spending
Spending	USGovernmentSpending.com (Chantrill, 2008)	Deflated using CPI	Hypothesis 1 (Comparing Democrats' and Republicans' spending)
Indices	Datastream, Advance 4.0	Monthly observations around the 4th is chosen out from daily data. Percentage change calculated from one month to another in order to find monthly returns.	Hypothesis 2 and 3 (Valuation and Variance)

The yearly inflation rates used to deflate yearly spending figures is collected from the web page InflationData.com (McMahon, 2008). The data in this web page is collected from the US Bureau of Labor Statistics, but is presented in a more user friendly way in InflationData.com.

In order to isolate real increases in government spending, the yearly values of government spending have been deflated to base year 1973 using the CPI data mentioned above. When deflating government spending specific government deflators should be used since the goods and services provided by the government have a different development than consumer goods, and one type of government may exhibit stronger price increases than total government spending. However, we could not find these parameters and have therefore used CPI.

Data on Government spending has been collected from the web page USGovernmentSpending.com (Chantrill, 2008). The historical data on the web page are based on information from the US Census Bureau and the Executive Office of the President of the United States. Missing data has been guesstimated by the publisher. Government spending by sector are yearly figures for the fiscal years, which is October 1 to December 31 the year before, and January 1 through September 30 in the nominal year. This means that there is a one- month lag between the year of spending and the actual year after the election (held in the beginning of November), which may cause some disturbance in our tests.

Government spending has been deflated using yearly inflation rates, as commented on earlier. The reason for this is that we wish to isolate the actual increases in spending made by the respective governments. The increase in spending is calculated with the formula: $(G_{t+1} - G_t)/G_t$. When working with figures for healthcare spending, the percentage increase values from

31

1974, 1975 and 1992 are removed from the data material because these observations stand out as unreasonably high, leading us to believe that they are erroneous.

To represent the valuation of sectors in the US, sector indices for US companies are used. These indices, which are written in cursive throughout the thesis, are collected from Thomson Datastream Advance 4.0, the world's largest and most respected financial statistical database. The indices that have been selected are US Defence (*Defence*), US Healthcare (*Healthcare*) and the *NYSEALL* share index (*NYSEALL*). Government spending on healthcare and defence is likely to be spent domestically, which is why we focus on the US market. The data collected initially was daily index price data, adjusted for splits and dividends to avoid distortions due to technical adjustments to the prices. All the indices are collected using 1973 as base year, which is the furthest back data was available for the *Healthcare* and *Defence. Defence* and *Healthcare* are designed as an average of companies defined to belong in the respective sectors. *NYSEALL* is designed to measure the performance of all common stocks in the New York Stock Exchange. This index represents the general movements in the US stock market, and is therefore used as a basis of comparison for the selected sectors. Differences in reactions of the sectors individually, and the general stock market, to elections may be very interesting as basis for discussions about pricing and expectations. Having a market reference may also help distinguish the results here from general results from other research on for example tax effects.

In order to avoid too low variance in the index data material due to too many observations, monthly observations around the 4th each month were picked out for each of the indices. The 4th is chosen to have dates closely corresponding to the election dates. When testing whether the mean return or variance is different before and after an election, we use the percentage return calculated from one month to the other for one year (4 November (year $_{t-1}$) till 4 October the year of the election (year $_t$)) before the election as the first group, and the equivalent periods for one year after the election. The tests are constructed to check whether the mean return or variance before elections is different from after elections. When a test has been made for several periods, the one-year periods and their monthly returns before the elections are collected in the first group, and the one year periods after elections are in the other group.

Test results are reported in tables for each hypothesis. In the tables, red values show statistically significant results (either on their own, or if they had been performed as a one sided t-test). Blue values are results that are almost significant, or would be almost significant if we were to perform a one-tailed test instead of a two- tailed one. In one-sample t-tests, numbers written in red mean that the relevant value is outside the confidence limits of the comparable value.

5. Results

5.1 Preparatory tests

Yearly spending growth

As mentioned under section 2.1 about Comparison of Democratic and Republican policies, the two parties' policies vary to a certain degree when it comes to ideology and focus. Both parties have members to the far right and left, so they are in reality closer than what European parties are. There are however, reasons to believe that they differ significantly when it comes to government spending since this is one of the parameters where the two parties have opposite opinions. The populist view is that the Republicans seem to prioritize private sector and defence, whereas the Democrats lean more towards public solutions and healthcare. Histograms of government spending in real and nominal values show the overall trends from 1973 until 2007 in government spending.

A histogram of nominal values for government spending on a federal, state and local level split in healthcare, defence and total (including all sectors) spending in USD billions reveals that there has been a yearly increase in total federal government spending since 1973 (figure 5.1.1). Government spending on defence has been somewhat volatile compared to the total spending level. Public spending on healthcare has been increasing steadily over the years, though faster some years than others. The growth rate in healthcare has been higher than the growth rate for total spending, indicating that healthcare has become more prioritized in the USA over the years.

Figure 5.1.1; Spending in nominal values

Nominal spending
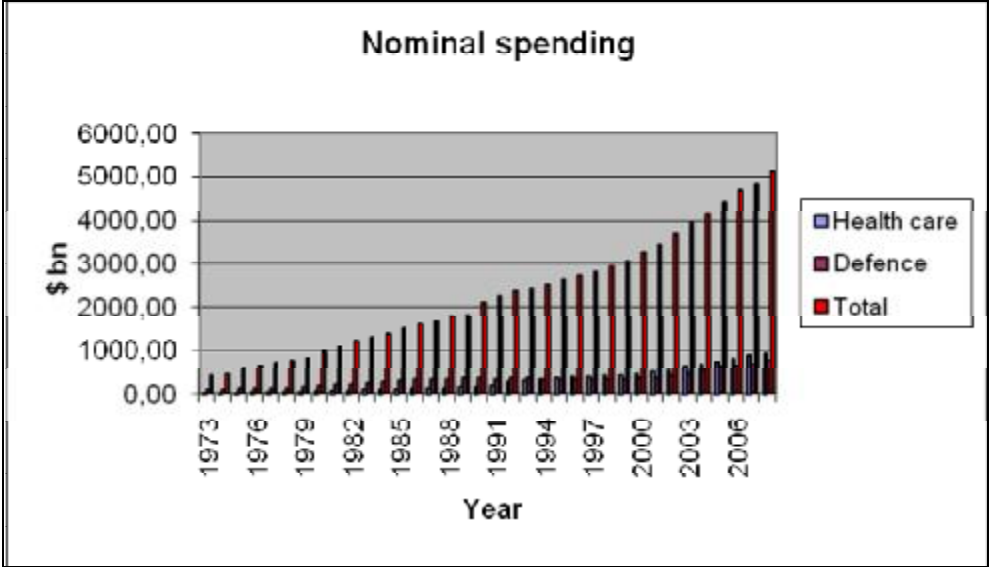
A histogram of real government spending with values deflated back to 1973 (illustrated in figure 5.1.2), better depicts that there is a clear pattern for healthcare. Healthcare spending seems to have increase every year, with one jump in 1992. In 1992 Clinton was elected for President from the Democratic Party. The defence spending pattern is not as clear cut as the healthcare spending, since it seems to be more volatile with an almost cyclical trend. The differences could be a result of defence spending shifting due to unexpected international conflicts, or that defence spending is highly affected by the partisanship of the President and/or Congress.

Figure 5.1.2: Spending in real values, deflated to 1973
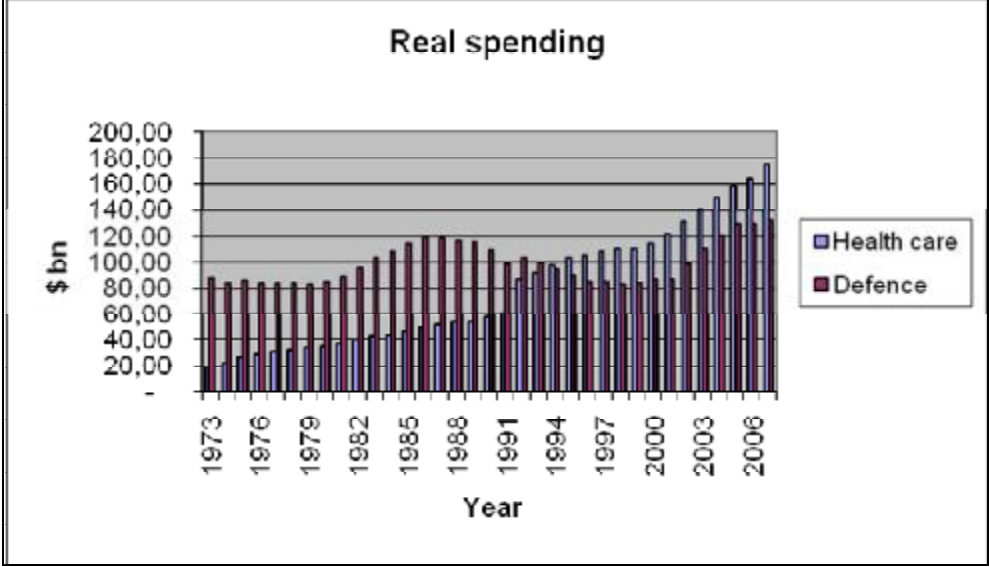
Real spending

Scatterplots of changes in government spending:

Plotting the real changes in government spending by sector against years, figure 5.1.3, and shading according to which party which has the Presidency, where grey is a Republican President and white is a Democratic President, shows no specific pattern for increases in healthcare spending. For the increase in defence spending it seems Republican Presidents increase spending more than Democratic Presidents, since all observations under Democratic Presidents are under the regression line, whereas the observations for Republican Presidents are mostly over the regression line. This finding corresponds well with the fact that the President is the military Commander in Chief. Total spending during a Democratic President is under the regression line when plotting the total increase in spending against years, while most of the observations under a Republican President are more spread out. This implies that there is more volatility in changes in total spending during a Republican than a Democratic Presidency.

Figure 5.1.3: Change in real government spending, grey shading Republican President Partisanship
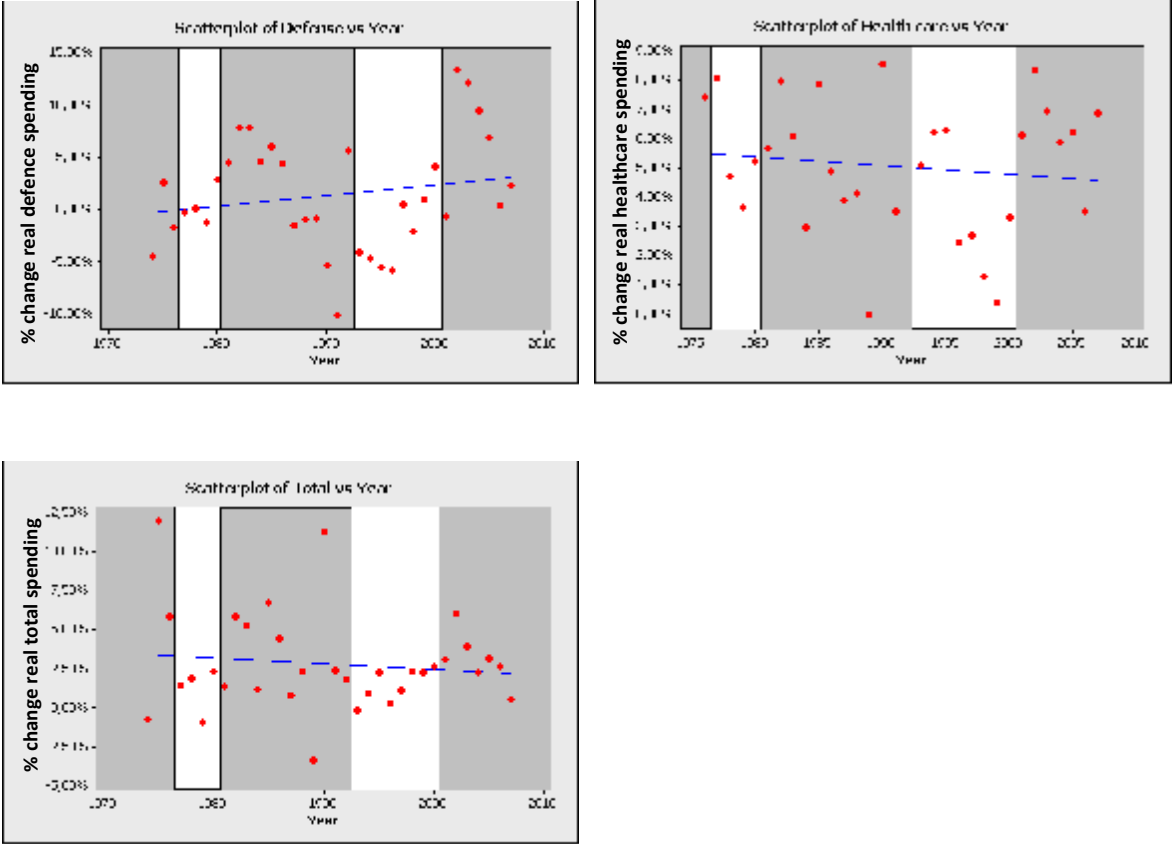
Plotting the increases in government spending by sector against years, figure 5.1.4, and shading for when there is a Republican or Democratic majority in Congress with the same colours as the in the previous test, implies that there are no systematic increases in spending depending on the majority in Congress in the healthcare sector. For defence spending, there seems to be a relatively high number of observations above the regression line when there has been a Republican majority in Congress, compared to years with Democratic majority. Changes in total spending seem to be bigger under Democratic majority in Congress compared to Republican majority.

The trend for percentage change in spending is negative for health care and total, while it is positive for defence. However, the average levels between the three are very different. The average growth for the defence sector is around 2%, for the health care sector about 5% while total is around 3%. The observations in the defence sector have a wider interval of changes than the other sectors. This implies a higher volatility, which corresponds well with the fact that defence spending is often temporarily boosted due largely to factors outside normal circumstances.

Figure 5.1.4: Change in government spending, grey shading Republican Congress majority
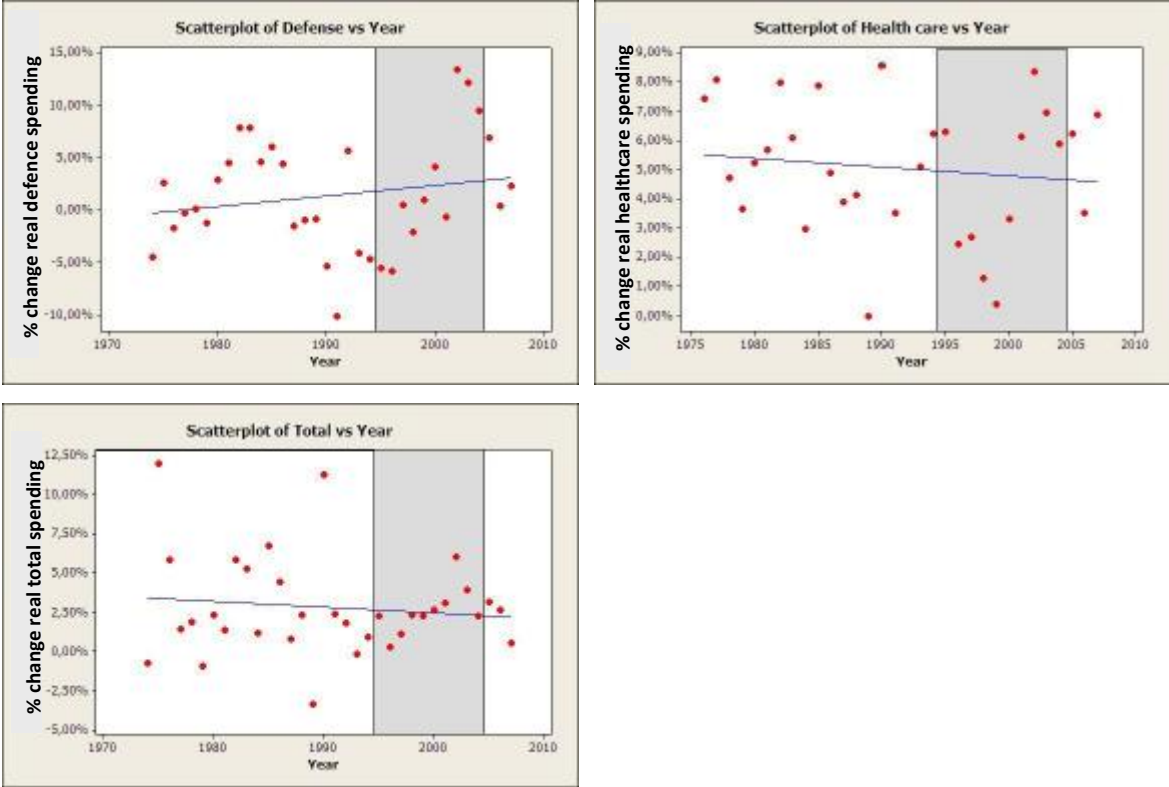
Scatterplots of yearly average index returns

Plotting the yearly average returns in indices by sector against years, (figure 5.1.5) and shading for when there has been Republican or Democratic Presidency with the same colours as the in the previous test, indicate no clear cut patterns for neither of the indices/ power. The only obvious observation is that seem to be relatively more observations above the regression line during Democratic Presidencies.

Figure 5.1.5: Average yearly Index returns, grey shading for Republican Presidencies
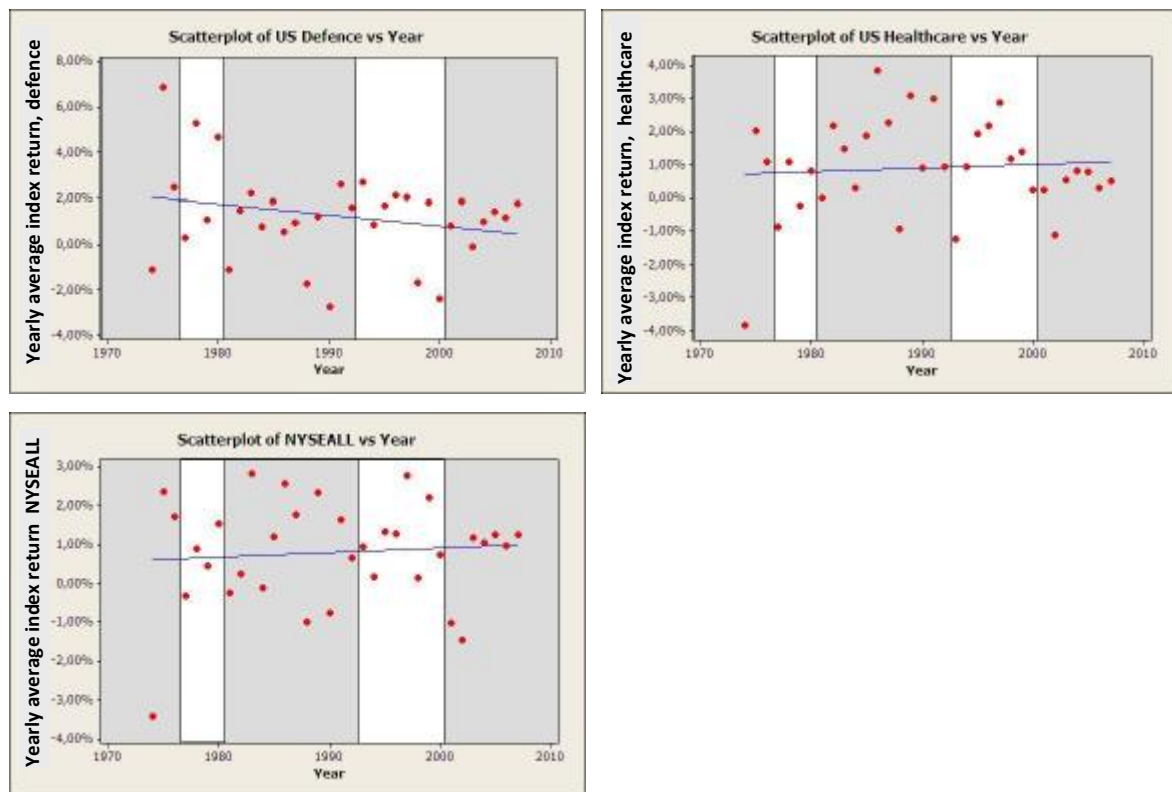
Plotting the average yearly returns in indices by sector against years, (figure 5.1.6), and shading for when there has been Republican or Democratic majority in Congress, with the same colours as the in the previous test, indicates a relatively positive reaction in *Defence* when there was a Republican majority in Congress. Relative to the number of observations, the defence index has fewer observations under the regression line during Republican Congress majority. The healthcare index has generally been more over the regression line than under, independent of majority in Congress. This could be seen in light of previous tests, where it is evident that this sector has generally had a positive trend every year. On a total level, there seems to be no clear cut pattern according to the majority in Congress, this could

imply that there are other factors than increases in government spending which influence the returns.

Figure 5.1.6 Average yearly Index returns, shading for Republican Congress
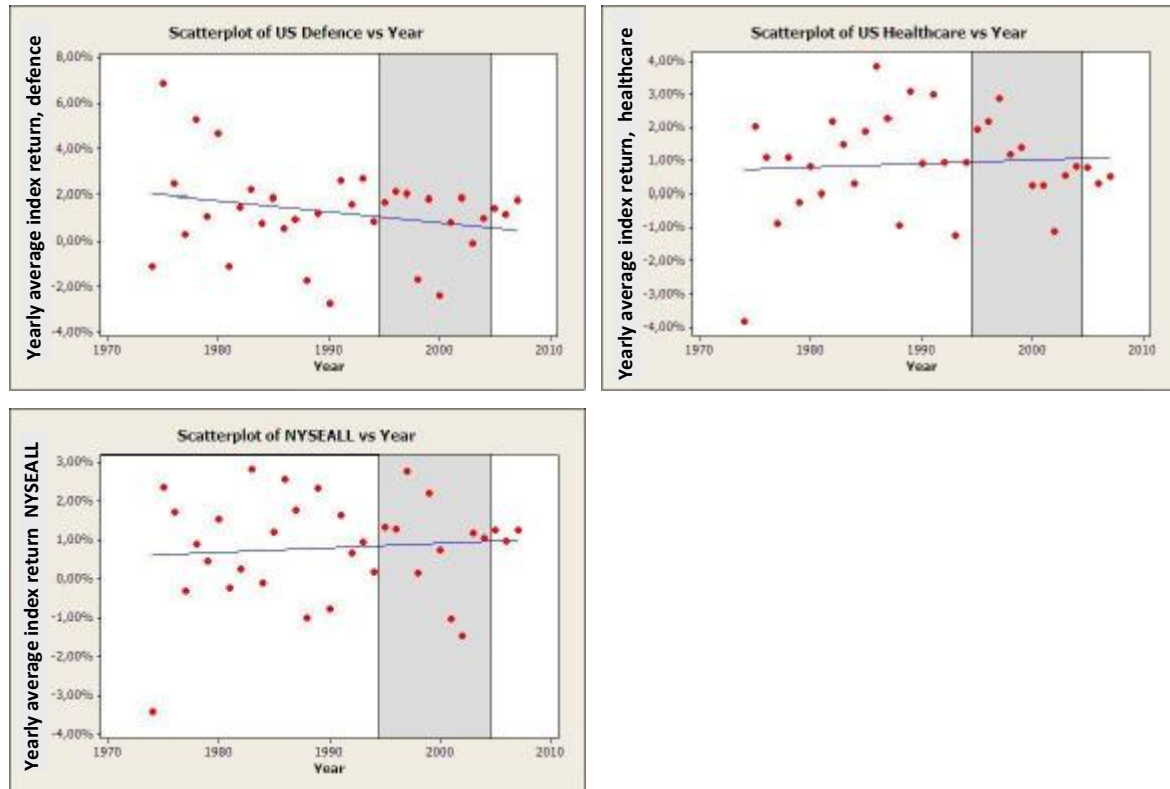
Growth in spending and yearly average return on indices

In figure 11.3.1 the indices' returns are plotted against the change in government spending for the corresponding sectors. Health care spending and *Healthcare* seem to be negatively correlated. The scatter plot shows that there is more variation with the index return, than in government spending. This implies that there could be other factors than government spending which affect the index return. When it comes to the defence spending and *Defence*, they are also negatively correlated. The change in government spending within the defence sector lies between minus 5% and 15%. There seems to be more volatility in this sector as well as a higher correlation between the spending and returns. It therefore seems that government spending is more important for this sector, than for the healthcare sector.

The fact that both sectors seem to be negatively correlated with changes in spending is the opposite of what we expected to find. According to valuation theory and public policy theory,

increased government spending is supposed to fuel the private production sectors within the affected sectors. Finding quite the opposite of what we initially thought, implies that government policies might not have as much effect on the stock market as we expected. A further analysis of these correlations was performed, but did not contribute with any additional information. These results are presented in the appendix (figure 11.3.1 and table 11.3.1).

In order to confirm that the growth rates in government spending on each of the three sectors we discuss are different, we perform two sample tests on the mean changes in real federal spending in the period from 1973 to 2007. This is done by comparing two sectors at a time. The tests show the growth in health care is significantly higher than growth in total spending and that the growth is health care spending is higher than the growth in defence spending. The mean increase in total spending is 1,42% higher than the mean growth in defence, but this difference is not significant. The results are presented in the appendix (11.4).

5.2 Testing hypothesis one: Change in spending

Spending patterns differ between Republican and Democrat majority in Congress and President Partisanship. The mean change in government spending on Healthcare increases more during Democrat Congress majority and President partisanship than during Republican partisanship. The mean change in government spending on Defence increases more during Republican Congress majority and President partisanship than during Democrat partisanship.

Result summary, hypothesis one:

Government spending on defence, healthcare and total levels tend to increase more during Republican presidencies than during Democrat presidencies.

Government spending tends to increase more during Democrat majorities in congress than during Republican majorities, except for in the Defence sector.

5.2.1   Presidencies

Table 5.2.4 : Change in spending by sector during Democrat/Republican Presidencies

1t test					95% CI	
Variable	N	Mean	StDev	SE Mean	LCL	UCL
Health care Dem Pres	12	0,04107	0,02237	0,00646	0,02685	0,05528
Health care Rep Pres	19	0,05618	0,02211	0,00507	0,04552	0,06683
Defense Dem Pres	12	-0,01301	0,03262	0,00942	-0,03373	0,00772
Defense Rep Pres	22	0,0281	0,0582	0,0124	0,0023	0,0539
Total Dem Pres	12	0,01344	0,01141	0,00329	0,00619	0,02069
Total Rep Pres	22	0,03566	0,03542	0,00755	0,01996	0,05136

In table 5.2.4*, tests for increases in spending depending on Presidency are illustrated. When testing for differences in spending between Democrat and Republican Presidents, comparing the one sample t-tests reveal that in both defence, healthcare and total spending, the mean for Democrat Presidents are outside the confidence intervals of the equivalent variable for Republicans, and vice versa. In addition, the mean spending increase for all three groups is higher for Republican Presidents than for Democrat Presidents.

*Text colour in table is explained on page 33

For defence, Democrat Presidents have, on average, decreased the spending with 1,3%, whereas Republican Presidents on average have increased spending with 2,8%. This is consistent with the previous claim that Republicans tend to be more proactive in issues military actions in connection with conflicts, as well as general.

In the case of healthcare, spending has increased on average with 4,1% under Democrat Presidents, whereas spending has increased on average with 5,6% under Republican Presidents. This result is somewhat surprising considering the fact that Democrats generally tend to advocate public universal healthcare solutions, in contrast with the Republicans. However, the results may not be of as much significance as it seems, seeing as the Congress often is of a different majority party than the President's partisanship. Congress is in control of the budgets, and should therefore have more impact on the spending levels. In times of Republican Presidents, Congress majority has often been Democrat, and vice versa (described in figure 2.1.1 and 2.1.2).

When looking at the standard deviations in spending, it is almost the same for the two parties when it comes to healthcare. It comes as no surprise that the variance in defence spending is much higher under Republican Presidents, considering their proactive politics in international conflicts. When it comes to total spending, Republican Presidents have had a higher yearly average increase in spending when they have been in office. The standard deviation of total spending has also been higher under Republican Presidents. This could be because Democrats are said to try to keep the level of government spending stable, compared to Republicans, and therefore the variability in spending is more pronounced in periods of Republican partisanship.

5.2.2 Congress majority

Table 5.2.5: Increase in spending by sector during Republican/Democrat majorities in Congress

1t test					95% CI	
Variable	N	Mean	StDev	SE Mean	LCL	UCL
Health care Dem Congr	19	0,05403	0,02167	0,00497	0,04359	0,06448
Health care Rep Congr	12	0,04446	0,02497	0,00721	0,0286	0,06033
Defense Dem Congr	22	0,0058	0,047	0,01	-0,015	0,0267
Defense Rep Congr	12	0,0279	0,0645	0,0186	-0,0131	0,0689
Total Dem Congr	22	0,02852	0,0374	0,00797	0,01194	0,0451
Total Rep Congr	12	0,02653	0,01414	0,00408	0,01754	0,03551

In table 5.2.5, tests for increases in spending depending on majorities in Congress are illustrated. For one sample t-tests on spending during Congress periods, only one mean value is outside the confidence interval of the other party. Defence spending seems to be higher under Republican majority in Congress than under Democrat ones. This result is consistent with the hypothesis that during Republican majority in Congress, more money is spent on Defence. In addition to this, the variance is quite much higher under Republican Congress than under Democrat ones. This strengthens the belief that Republicans more drastically alter spending on defence.

Yearly percentage increase in healthcare spending is on average higher for the Democrats than the Republicans. The mean when the Democrats are in majority is 5,4% and for the Republicans this number is 4,4%. However, the mean values are not outside the other tests confidence intervals. In addition to a similar mean increase, the variance is not very different for Republican and Democrat governments.

When it comes to total government spending, the mean increase has been slightly higher under Democratic Congresses.

The evidence indicates that there are differences in the yearly increased spending level between the Republicans and Democrats. These differences create the foundation for further research into the effects of elections on spending, and through spending on the valuation of sectors, which will be investigated in the next sections.

5.3 Testing hypothesis two; Changes in mean returns

Due to different government spending patterns, the valuation of sectors in the US, measured by the mean return, is affected by President and Congress elections. The mean is expected to be higher after the election for the health sector when a Democrat is elected, while the Defence sector is expected to decrease. The opposite holds when a Republican is chosen. For the stock market in general, represented by NYSEALL, we expect higher return after Republicans are elected.

Result summary, hypothesis two:

Higher mean returns in all sectors tested during Democrat Presidents.

Higher mean return on *Defence* during Democrat Congress majority. Higher mean return on *Healthcare* and *NYSEALL* during Republican Congress majority.

Higher mean returns on *Healthcare, Defence* and *NYSEALL* before than after President elections, regardless of the outcome of the elections. There are only a few exceptions for health care returns. The results are clearer for President elections than Congress elections.

5.3.1   President Elections

Table 5.3.1: All periods under Democrat versus Republican Presidents

	US Defence			Healthcare			NYSE all		
Test on mean, president	Dem	Rep	P - value	Dem	Rep	P - value	Dem	Rep	P - value
All periods under same party	0,0158	0,0092	0,3690	0,0090	0,0078	0,8010	0,0103	0,0051	0,2100

In table 5.3.1, the results from testing all periods under same party against each other are illustrated. The test shows no significant reasons to reject the null hypothesis for *Defence, Healthcare* or *NYSEALL*. However, it may be worth noting that even though the results are not significant, they indicate that mean return is higher in all three indices under Democrat Presidents. This is slightly surprising given the result that healthcare spending increases more under Republican Presidents.

Table 5.3.2 Two sample t-tests on one year before versus one year after President elections

Mean return, president	US Defence			Healthcare			NYSE all		
	Before	After	P-value	Before	After	P-value	Before	After	P-value
Before vs after all elections	0,0147	0,0113	0,7320	0,0062	0,0083	0,7460	0,0079	0,0071	0,8890
All changes in pres. Party	0,0212	0,0098	0,4950	0,0092	-0,0043	0,1460	0,0122	-0,0032	0,0560
Shifts rep -> dem	0,0232	0,0131	0,4700	0,0085	-0,0098	0,1270	0,0118	0,0035	0,3490
Shifts dem -> rep	0,0190	0,0064	0,6800	0,0099	0,0012	0,5840	0,0126	-0,0098	0,1000
Reublican Elected	0,0096	0,0092	0,9810	0,0027	0, 01212	0,2600	0,0049	0,0048	0,9910
Democrat Elected	0,0232	0,0148	0,4220	0,0120	0,0020	0,3300	0,0131	0,0110	0,7840

The next test was whether there is a significant difference in the return on indices before and after all President elections in the period 1973-2007. The results of this test are depicted in the first row in table 5.3.2.

Judging by the high P-values, we cannot reject the null hypothesis a 5% significance level. One interpretation of this might be that the market does not price these sectors differently before and after all President elections. Another interpretation might be that factors of the different elections neutralize any effects that might exist.

At times when there is a shift from a Democrat or Republican President to the opposite, one might expect the stock market to react stronger than under continuity of President partisanship. The result for this test is presented in table 5.3.2 second row. Only four times during our time perspective has the President party changed. The results for *Defence*, *Healthcare* and *NYSEALL* are P- values of 49,5%, 14,6% and 5,6%, respectively. If we had used a one sided test, we would have had an almost significant result for *Healthcare*, and a significant result for *NYSEALL*. The tests mostly indicate that mean return is higher in the year before than the year after an election in which the President partisanship changes.

When isolating the Presidential elections when there has been a shift from a Republican to a Democrat President the P-values for *Defence*, *Healthcare* and *NYSEALL* are 47%, 12,7% and 34,9%, respectively, which can be seen in table 5.3.2, third row. If we had performed a one sided test on *Healthcare*, it would have been very close to significant. In all three tests, the mean return is higher in the year before the elections than after the elections. This could indicate that mean return goes down when Democrat Presidents are elected. Whether these tests are reliable is quite questionable, seeing as there are only 24 observations in each sample set.

Two- sample t-tests for elections where President Partisanship has gone from Democrat to Republican, leaves us with P-values for *Defence*, *Healthcare* and *NYSEALL* of 68%, 54%, and 10% respectively, which is depicted in table 5.3.2, fourth row. This means that a one-tail test for *NYSEALL* would give evidence that the means are significantly different, again with the mean return in the year before the elections higher than after. The results are similar for the two other indices. These results are somewhat surprising, as it seems that mean return in general is higher before than after elections, no matter which party the current and new Presidents belong to. This could be caused by uncertainty of what kind of politics the new President will practice.

The result for the mean return before and after a Republican President is elected, independent of previous party in power, could be seen in table 5.3.2, fifth row. The P- values for *US Defence, Healthcare* and *NYSEALL* are all higher than 5%.

Table 5.3.2, sixth row, presents the results for mean return before and after Democratic Presidents are elected, independent of previous party with President power. As was the case when a Republican President was elected, there seems to be a lower mean after the elections than before, but the results are slightly untrustworthy due to P- values significantly higher than 5% .

Using two sample t-tests around each election when the President party have changed give P-value higher than the 5% significance level. These tests are not included in table 5.3.2 since they do not give any additional results to our test.

5.3.2   Congress elections

Table 5.3.3: Means in whole periods during Democrat/ Republican majority in Congress

	US Defence			Healthcare			NYSE all		
Test on mean, congress	Dem	Rep	P - value	Dem	Rep	P - value	Dem	Rep	P - value
All periods under same party	0,0127	0,0089	0,5920	0,0076	0,0095	0,6840	0,0058	0,0089	0,4670

When testing whether the monthly returns in the years during Democrat Congress majority to those during Republican majority, none of the index means are different judging by statistic significance, as seen in table 5.3.3. The mean return in *Defence* under Democrats is 1,27%, whereas for Republican periods it is 0,89%. This result is slightly surprising considering that Republicans are normally considered more proactive in terms of armed conflicts. The fact that

mean returns in *Healthcare* seem to be somewhat higher under Republican Congress, also seems quite surprising when considering their politics. It may, however, be because Republicans also tend to run more business friendly politics.

Another reason for our surprising results, may be that majority in Congress does not affect the valuation significantly due to low credibility in the party politics or the political processes. It is also possible that it is because the companies in the indices we test do not directly benefit from increased spending.

Table 5.3.4: Two sample t-tests on mean returns one year before versus one year after Congress elections

	US Defence			Healthcare			NYSE all		
Tests on means, Congress	Before	After	P-value	Before	After	P-value	Before	After	P-value
Before vs after all elections	0,0087	0,0157	0,3090	0,0049	0,0133	0,0790	0,0018	0,0140	0,0060
All changes in congress party	0,0116	0,0200	0,3340	0,0075	0,0176	0,2880	0,0046	0,0167	0,1280
Congress shift Rep-> dem (2004)	0,0177	0,0170	0,9610	0,0036	0,0075	0,7560	0,0104	0,0151	0,7140
Congress shift Dem-> rep (94)	0,0055	0,0231	0,1300	0,0114	0,0277	0,2540	-0,0012	0,0182	0,0520
Reublican Elected	0,0035	0,0091	0,6810	0,0077	0,0136	0,4730	0,0009	0,0138	0,1020
Democrat Elected	0,0108	0,0184	0,3400	0,0038	0,0131	0,107	0,0021	0,0141	0,0250

Table 5.3.4, first row, shows the results from testing whether the mean returns in the years before Congress elections are different from the mean returns after Congress election. Mean return in *Healthcare* is significantly higher, with a one tailed test, after Congress elections and mean return in *NYSEALL* is significantly higher after Congress elections. *Defence* mean seems to be higher after elections.

When isolating the elections in which the result has been a change in the majority party in Congress, all the mean returns are higher in the years after than before the elections, as presented in table 5.3.4, second row. *NYSEALL* mean return is almost significantly higher after elections compared before elections. One possible reason for this may be that the market is optimistic with respect to expected changes in the market after a shift in power. These results for Congress elections are again the opposite of what we found under President elections.

Table 5.3.4, third row, gives the results when Congress majority changed from Democrat to Republican. There seems to have been a positive change in returns. *NYSEALL* mean return is significantly higher after the election, possibly suggesting more optimism in the market after the shift. *Defence* and *Healthcare* mean returns are also higher after the elections, suggesting a positive effect of the election, although not as big as in the general market.

These results may indicate a significant difference, but as the number of observations is only 12 for each population, a definite conclusion should not be made on the basis of the tests in this section.

Table 5.3.4, fourth row, presents the result for the shift from a Republican majority in Congress to a Democrat majority. Interestingly enough mean return is lower after the election than before, whereas the *Healthcare* and *NYSEALL* means are higher after the election. This may possibly be explained by the fact that Democrats are less willing to spend money on military actions.

Table 5.3.4 fifth row, shows the results for when a Republican majority is elected in Congress, independent on the previous party in power. *NYSEALL*, on a one tailed basis, slightly react to the election, with a P – value of 10,2%. The mean return on this index seems to be slightly higher after the election of a Republican majority in Congress than before. Both *Defence* and *Healthcare* show higher values before than after a Republican majority in Congress is elected.

Table 5.3.4 sixth row, shows the results for tests on all elections when Democrats win the majority in Congress. The results for *NYSEALL* are statistically significant, indicating that the mean return is higher after compared to before elections. *Healthcare* is significant when testing on a one tailed basis, since the P – value of the two tailed test is 10,7%. The *Defence* mean return shows a very slight increase in mean return after the election, but the P – value is 34%.

5.4 Testing hypothesis three: Changes in variance of returns

Variance is generally higher before than after elections due to uncertainty about the election outcome, for Healthcare, Defence and the stock market in general. We expect that change in variance before and after election will be different depending on whether Democrats *or* Republicans *are elected.*

Result summary, hypothesis three:

Higher variance in returns before than after elections, both for president and congress elections, regardless of outcome. Variance differences are significant.

As explained under the section "Expectations and valuation", expectations are important to because they play a major role in valuation of indices and stocks. If there is a significant difference in variances, a possible explanation could be that the possibility of a change in President, could trigger the economy in a different ways. Theoretically, government spending has an impact on the economy through stimulating output in the economy, and uncertainty about this will be priced in the stock markets, thereby affecting the volatility. Especially if the market expects a change in President party, the uncertainty around the entire economy might be bigger, "whenever the political orientation of the government changes, the excessive volatility can persist for longer periods, as the newly elected authorities issue new pronouncements and change the direction of public policy." (Bialkowski, Gottschalk and Wisniewskib, 2006)

5.4.1   President Elections

Table 5.4.1 All periods under Democrat versus Republican Presidents

	US Defence			Healthcare			NYSE all		
Test on variance, president	Dem	Rep	P - value	Dem	Rep	P - value	Dem	Rep	P - value
All periods under same party	0,0721	0,0693	0,5650	0,0432	0,0495	0,0710	0,0363	0,0483	0,0000

Table 5.4.1 shows the results for variance test for all periods under same party. According to table 5.4.1, *Defence* has a slightly higher volatility under Democrat Presidents compared to Republican Presidents, which is quite surprising considering Democrat views on military actions. In *Healthcare* and *NYSEALL* the differences in variances are statistically significant. The test results show the volatility in *Healthcare* and *NYSEALL* when there has been a

Republican President compared to the periods with a Democratic President. These could imply that the market responds more when a Republican President is elected than when a Democrat President is elected. This is consistent with the publicly accepted fact that stock markets, and thereby valuation.

Table 5.4.2: Two-Variance tests, testing before versus after Congress elections

	US Defence			Healthcare			NYSE all		
Tests on variance, president	Before	After	P-value	Before	After	P-value	Before	After	P-value
Before vs after all pres. elections	0,0779	0,0562	0,0020	0,0489	0,0400	0,0530	0,0459	0,0354	0,0120
All changes in pres. Party	0,0947	0,0650	0,0110	0,0493	0,0402	0,1640	0,0413	0,0363	0,3810
Shifts rep -> dem	0,0589	0,0325	0,0060	0,0477	0,0321	0,0640	0,0377	0,0202	0,0040
Shifts dem -> rep	0,1219	0,0869	0,1120	0,0519	0,0470	0,6340	0,0468	0,0468	0,8840
Reublican Elected	0,0907	0,065	0,012	0,0510	0,0389	0,0400	0,0518	0,0388	0,0280
Democrat Elected	0,0497	0,0376	0,1030	0,0452	0,0415	0,4370	0,0338	0,0290	0,3690

Testing for all President elections shows that all three indices have significantly higher standard deviation the year before the election than the year after. The P –values for the test are within the range 1,2% - 5,3%, as seen in the table 5.4.2, first row. This gives support to our hypothesis that due to greater uncertainty the volatility before President elections are higher than after. This could imply that the market prices in expectations before elections, and when the outcome is known, the prices fall as a result of lower uncertainty premium. Elections are events which are closely followed by the stock markets, and in general we find support for that elections do have an impact on the valuation of the selected sectors.

By isolating the elections when there has been a change in President party, table 5.4.2 second row, indicates that the standard deviation before Presidential election is significantly higher than the variance after elections for *Defence*. For *Healthcare*, the variance is also higher before the elections than after. The same results are found for *NYSEALL*.

Controlling for symmetry, we test the difference when there has been a change from a Republican President to a Democrat President. The P-values in table 5.4.2, third row, show that there has been a significant difference in the variance before and after the election for all three indices. The variance has historically been significantly higher before the election than after, especially for *Defence*. Considering the different focus of government spending between the two parties, it comes as no surprise that the variance in the defence sector decreases after a Democrat President is elected. What is more surprising is that *Healthcare* volatility decreases, even though Democrats advocate more spending in the healthcare sector.

The results in table 5.4.2, fourth row, indicate that the variance was higher before than after elections when there has been a shift from a Democrat President to a Republican President, with a P-value only slightly above the 5% level for *Defence*. However, the decreases in variance after the election is lower than in the test for a shift from Republican to a Democrat, which could imply that the implicit uncertainty in the valuation before the election is not eliminated after the election. This could be due to expectations to more business friendly politics by the Republicans.

Table 5.4.2 fifth row, present the results for the difference in the variance before and after all the election where a Republican President was elected, independent of previous Presidency. All three indices show that the variance is significantly higher before compared to after the elections.

Table 5.4.2 sixth row shows that variance in *Defence* is higher before than after the elections when a Democrat wins the Presidency. Both *Healthcare* and *NYSEALL* have P-values higher than the critical level. All the indices give indications of the variance being higher before the elections than after.

Testing separately each election when there was a change in President party gave few observations to test, generally gave us results with high P-values, and little value to add to the discussion. These results have therefore been left out in the table 5.4.2, and we will not discuss these tests any further.

5.4.2 Congress Elections

Table 5.4.3: Variance during all periods under Democrat versus Republican majority in Congress

	US Defence			Healthcare			NYSE all		
Test on variance, congress	Dem	Rep	P - value	Dem	Rep	P - value	Dem	Rep	P - value
All periods under same party	0,0707	0,0695	0,8370	0,0504	0,0410	0,0060	0,0468	0,0401	0,0370

Table 5.4.3 presents the result for the periods when the same party has had the majority in Congress, and the variances for the indices during these periods. The results from the F-tests for *NYSEALL* and *Healthcare* show that variance has been significantly higher during Democrat Congresses compared to periods with Republican Congress majority. *Defence*

variance has also been higher under Democrat majority in Congress, which is somewhat surprising since this index has previously shown to represent the most volatile sector.

Table 5.4.4

	US Defence			Healthcare			NYSE all		
Tests on variance, congress	Before	After	P-value	Before	After	P-value	Before	After	P-value
Before vs after all congr.elections	0,0754	0,0638	0,0180	0,0497	0,0410	0,2190	0,0479	0,0405	0,0160
All changes in congress party	0,0309	0,0288	0,7430	0,0318	0,0330	0,8610	0,0186	0,0218	0,4590
Congress shift Rep-> dem (2004)	0,0312	0,0343	0,7630	0,0240	0,0356	0,2080	0,0209	0,0385	0,0540
Congress shift Dem-> rep (1994)	0,0306	0,0233	0,3760	0,0387	0,0280	0,2960	0,0278	0,0164	0,0920
Reublican Elected	0,0841	0,065	0,047	0,04566	0,0438	0,747	0,0422	0,0436	0,800
Democrat Elected	0,0717	0,0634	0,144	0,05136	0,0464	0,230	0,0503	0,0393	0,003

Testing every Congress election indicates that variance in *Defence* and *NYSEALL* has been significantly higher before than after elections. *Healthcare* variance is also higher before than after elections. The valuation is driven by uncertainty, which goes down after the election outcome is known. This gives us pretty much the same conclusions as under the President elections. There seems to be most uncertainty connected to the defence and general stock market when there is an election in Congress. These results are presented in table 5.4.4, first row.

Table 5.4.4, second row, shows the results for the year before and the year after there has been a shift in Congress party. None of the indices show any evidence to reject the null hypothesis of equal variances. This might be due to the fact that all of the elections are grouped together in one test and this could result in eliminating the differences in variance since different election process could even out the main results.

Table 5.4.4, fourth row, presents the results for the shift from Democrat to Republican majority in Congress. The test shows that all indices have higher variance before compared to after the elections, but only *NYSEALL* is significantly different.

Testing only for shifts from Republican to Democrat majority Congress, gives the opposite result of the election when the Congress majority changed in the opposite direction, namely a higher variance after the election. *NYSEALL* has a P-value lower than the significance level, which is shown in table 5.4.4, third row.

Table 5.4.4 fifth row shows that *Healthcare* variance is higher before than after a Republican Congress majority is elected, while *NYSEALL* is slightly higher after the election than before. *Defence* is significantly higher before the election than after on a two tailed t- test basis, with a P- value of 4,7%.

When a Democrat majority in Congress is elected, all the indices have a higher variance before compared to after elections. *NYSEALL* is significantly higher, as presented in table 5.4.4, sixth row. Difference in *Defence* variance comes close to being significant if the t – test is performed as a one tailed test. *Healthcare* is not far from being significant with a one tailed t- test.

6. Robustness check

6.1 Hypothesis one; Change in spending

To test for the robustness in the one sample t – test in hypothesis one, a non- parametric test is performed to test the difference in the increases in government spending under Democrat versus Republican Presidency and majority in Congress. The number of observations for when Democrats and Republicans have had majority or Presidency is significantly different, and does therefore not satisfy the underlying assumptions of a two sample t- test. However, a one sample t – test does not test whether two related samples are significantly different and we therefore include a Wilcoxon signed- rank test as a robustness check.

A Wilcoxon signed- rank test for Presidency and government spending, broken down in defence, healthcare and total levels, shows that there seem to be differences in increased spending depending on which party the President is from. For example, the median for increased defence spending under a Republican President is around three percentage points, while it is negative when there is a Democrat President. These results are the same as the ones we found in the one sample t-tests, and presented in table 6.1.

Table 6.1 Change in spending by sector during Democrat/Republican Presidencies

Wilcoxon			Estimated	Achieved		
	N	N*	Median	Confidence	LCL	UCL
Health care Dem Pres	12	0	0,0418	94,5	0,0269	0,0564
Health care Rep Pres	19	3	0,0582	94,9	0,0468	0,0683
Defense Dem Pres	12	0	-0,0124	94,5	-0,0341	0,0079
Defense Rep Pres	22	0	0,0299	94,9	0,0028	0,0564
Total Dem Pres	12	0	0,0143	94,5	0,0063	0,0222
Total Rep Pres	22	0	0,0329	94,9	0,0192	0,0485

The non – parametric test for increases in government spending and majority in Congress, table 6.2, is not as clear cut as the same test for Presidency, but is still gives indications that the differences are almost significantly different, depending on which party that has the majority in Congress.

Table 6.2 Increase in spending by sector during Republican/Democrat majorities in Congress

Wilcoxon			Estimated	Achieved		
	N	N*	Median	Confidence	LCL	UCL
Health care Dem Congr	19	3	0,055	94,9	0,0435	0,0648
Health care Rep Congr	12	0	0,0447	94,5	0,0288	0,0619
Defense Dem Congr	22	0	0,0073	94,9	-0,013	0,0283
Defense Rep Congr	12	0	0,0246	94,5	-0,014	0,0686
Total Dem Congr	22	0	0,023	94,9	0,0108	0,0405
Total Rep Congr	12	0	0,0258	94,5	0,0171	0,0329

Overall, the non parametric tests give the same conclusions as the one sample t-test.

6.2 Hypothesis two and three; Changes in mean return and variance

To test for the robustness in hypothesis two and three, we have performed mean and variance tests with a shorter timer perspective than one year before and one year after. The time interval is 60 days before and 60 days after an election. The 60-day tests are based on 60 daily observations before the 4th and 60 daily observations after the 4th. This is done in order to check whether a clearer pattern in mean, and variance, is visible in a shorter run around the elections. A test with a shorter time perspective, and with daily data, opens up for more fluctuations which could influence the previous results.

Table 6.3: Mean before versus after President elections, 120 day time perspective

President Elections	US Defence			Healthcare			NYSE all		
Mean return	Before	After	P value	Before	After	P value	Before	After	P value
Shift Dem-rep (80 + 00)	0,0017	0,0007	0,6430	0,0004	0,0002	0,8610	0,0004	0,0000	0,7730
Shift Rep-dem (76 + 92)	-0,0002	0,0018	0,1480	-0,0002	-0,0008	0,4830	0,0000	0,0007	0,2840

The results from short term testing on President elections are shown in table 6.3. Looking at the shifts, the results are slightly different from what we found in two sample t-tests, but since none of the tests are statistically significant, we do not consider them to add any value to the analysis. We also did tests for the individual elections when there were shifts in power, but these tests gave little information of relevance, and are not included in our discussion.

Table 6.4: Mean before versus after Congress elections, 120 day perspective

Congress Elections	US Defence			Healthcare			NYSE all		
Mean return	Before	After	P value	Before	After	P value	Before	After	P value
1994 (dem-rep)	-0,0005	0,0004	0,4750	0,0008	0,0007	0,9600	-0,0001	0,0001	0,8500
2006 (rep-dem)	0,0008	0,0012	0,7660	0,0008	0,0006	0,8150	0,0011	0,0007	0,6630

The results of testing short term effects of elections on index returns are presented in table 6.4. The results slightly differ from what we found in two sample t-tests. However, the P-values are much higher than the significance level of 5%, and we do not see any added value from these tests.

Table 6.5: Variance before versus after President elections, 120 day perspective

President Elections	US Defence			Healthcare			NYSE all		
St dev	Before	After	P value	Before	After	P value	Before	After	P value
Shift Dem-rep (80 + 00)	0,0150	0,0188	0,0150	0,0098	0,0113	0,1170	0,0098	0,0105	0,4470
Shift Rep-dem (76 + 92)	0,0111	0,0098	0,2030	0,0069	0,0071	0,6680	0,0060	0,0049	0,0290

In order to check whether short term effects on variance are even more pronounced than long term ones, two tailed t-tests have been used to test daily return variances for two months before and two months after the elections.

The results when there has been a shift from Democrat to Republican President (table 6.5, row 1) indicate that the variance in the short term for *Defence, Healthcare and NYSEALL* is higher after elections than before. Only *Defence* and *Healthcare* can be considered significant on a 5% level, but we consider these results to be consistent with the findings of Bialkowski et al (2006), that variance is elevated in the short term after elections. This is the opposite of what we find in the long term under hypothesis three.

When there is a shift from Republican to Democrat President (table 6.5, row 2), *NYSEALL* is significantly different before and after elections. This contradicts Bialkowski et al. As for the *Healthcare* and *Defence*, we find high P-values, and do not consider any further discussion to be of value. This is also the case for tests we made on each separate shift, which is why we choose not to include them.

Table 6.6 Variance before versus after Congress elections, 120 day time perspective

Congress Elections	US Defence			Healthcare			NYSE all		
St dev	Before	After	P value	Before	After	P value	Before	After	P value
1994 (dem-rep)	0,0066	0,0070	0,6350	0,0062	0,0057	0,5280	0,0058	0,0048	0,1450
2006 (rep-dem)	0,0068	0,0080	0,2200	0,0047	0,0054	0,2680	0,0048	0,0048	1,0000

Tests for 60-day variance around elections when a shift in Congress majority has occurred, give results with high P-values, and few obvious patterns, as described in table 6.6.

7. Conclusions

In this thesis we have explored the changes in government spending during Democrat and Republican power. Based on these results, we have investigated whether the differences are reflected in the returns in the defence and healthcare sectors, and stock market in general, around elections. This has been done through examination of three hypotheses.

Initially, we find that there are significant differences in changes in healthcare spending and defence spending on aggregated levels. The same goes for healthcare spending and total spending. Healthcare is the sector in which the spending levels have the highest rate of growth. There are no significant differences between increases in defence spending and total spending level.

Tests for hypothesis one (change in government spending) indicate that government spending increases more under Republican Presidents than Democrat Presidents, both on healthcare, defence and in total. However, when testing for Congress majority, government spending on healthcare and in total seems to increase more under Democratic majority in Congress. Defence spending has a higher increase under Republican majority in Congress than a Democratic majority in Congress.

Our results from tests on hypothesis two (changes in mean returns) seem to indicate that there has been a slightly higher (about 0,5%) mean return on both *Defence*, *Healthcare* and *NYSEALL* under Democrat Presidents, and higher return on *Defence* and *NYSEALL* under Republican Congresses.

The test results for hypothesis two concerning elections, indicate that in general returns have been lower after President elections than before President elections, and higher after Congress elections than before elections. Democrats have often been the elected party for Congress, and since they tend to favour increasing government spending, their election results in an increase in returns.

The findings from hypothesis one are not reflected to a full extent in hypothesis two. For example, Republican Presidents tend to have higher increases in all three government spending sectors than Democrat Presidents, which is not reflected in significant higher mean

returns when testing Republicans elected, independent of previous Presidency party under hypothesis two. Furthermore, Democratic majority in Congress has on average higher increased government spending for healthcare and total, and only *Healthcare* shows signs of having significant higher mean return after a Democrat majority is elected. This leads us to conclude that the increases in government spending do not play an important role in the valuations around elections of the sectors assumed to be dependent on government spending policies. This could be due to previously discussed factors such as the time inconsistency problem, constant increases in government spending independent on the party in power or that other factors are more important.

When testing hypothesis three on changes in variance, we find that variance is generally higher before than after elections, and the difference is significant for most of the tests performed. The difference in variance before and after election is more pronounced for President Elections than Congress elections. When Republicans are elected, the drop in variance after the election is more pronounced than when Democrats are elected, indicating that the returns are more stable when a Republican is elected than a Democrat.

The findings lead us to conclude that uncertainty from not knowing what government policies which will be implemented after the elections may affect sectors which are affected by government spending. As the uncertainty is reduced after the elections, so is the variance, no matter if Democrats or Republicans were elected. It may therefore seem that the specific differences in spending increases between the two parties are not reflected in the variance around elections.

8. Recommendation for further research

In this thesis, indices have been used to measure valuation in sectors. This has been done to diminish the effects of short term fluctuations in single shares. By using indices, the fluctuations are more a result of changes affecting entire sectors. Elections are assumed to have an impact on the valuation of entire sectors, and it was therefore natural to begin with a research paper testing the broad and general impact of elections. A recommendation for further work could be to use for example 30 companies within sectors and measure the impact on government spending and election on each one of these.

In addition to the recommendation to use other data for valuation, there are other channels which could affect the valuation of companies through election than government spending. This could for example be tax policy difference between the Democrats and the Republicans, or their environmental policies. The result that was found in this paper could therefore be altered if one controlled for other channels, either separately or all together. This could be done statistically by constructing a regression, using more independent variables to better explain the valuation. This regression should for example adjust for business cycles, and thereby exclude the cyclical effects of government spending. Another interesting aspect to include is how government spending is financed- through debt or increased taxes.

9. Postscript; The 2008 election and Financial crisis

The United States Presidential election of 2008, was held on Tuesday, November 4 Democrat Barack Obama won decisively over the Republican Party's nominee, John McCain.

In the time before the election, the economy had been experiencing the start of a financial crisis after a crash in the subprime market and credit crisis, accompanied by a downturn in international growth, and a decrease in domestic demand which has not been substituted by an increase in international demand. Unemployment rates increased, salary levels decreased, and the value of stocks and houses deteriorated, making most people, financial institutions and banks worse off. These factors help to explain that CNN find in their pre-election poll that the state of the economy was the most important issue for 62% of the American people when they voted. Next in line came the war in Iraq (10%), terrorism (9%), and health issues (9%). ""The credit crisis has forced both candidates to put the economy at the center of their campaigns," notes Robbert van Batenburg, head of global research at Louis Capital Markets, in a report, "The Final Stretch: Stocks Sensitive to Election Outcome." The financial problems have without doubt played a major role in this President election in the USA" (Vikås, 2008).

The current situation indicates a need for government to stimulate the economy. It is therefore reasonable to expect that government spending politics is going to be in focus, especially in the short term, which could imply that the election in 2008 will to a higher degree affect the valuation of the selected sectors in this thesis.

The economic development which has led to today's situation in the credit market could be explained using the IS – LM model. Since the short recession in 2001, FED has conducted an expansionary monetary policy in the US. This has lead to an overheating of the economy over several years, and caused a financial bubble. Expansionary monetary policy increases money supply, and causes outward shifts in the LM – curve. This supplies the economy with more capital, which leads to lower interest rates which again stimulates the economy and increases production. For example, lower interest rates stimulate the economy by making previously unfeasible investments profitable due to lower cost of capital. The positive shift in the LM - curve is shown in table 9.1.

An increase in money supply, such as from expansionary monetary policy, shifts the LM –
curve outwards, and creates increased production as well as lower interest rates. The increase
in money supply stimulates through supplying the economy with more capital. The increase in
capital results in lower interest rates, which again makes previously unfeasible investments
profitable due to lower cost of capital. This again stimulates the economy.

Figure 9.1 IS – LM model with shift in the LM - curve
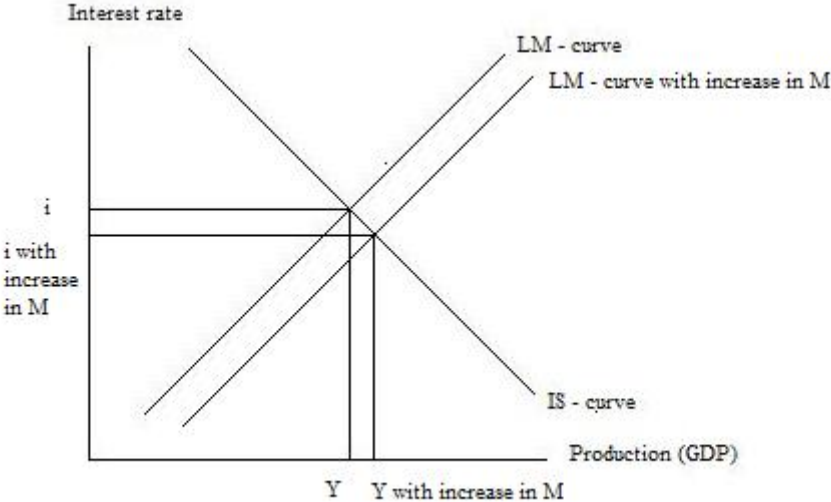
After the 2007 announcement of a high default percentage on subprime loans in US, the US
economy has experience a negative shift in the LM –curve in 2008. The money supply has
decreased and we are experiencing a credit crunch. In addition to contractive monetary policy,
the slope of the LM – curve has flattened out. The slope of the curve is affected by the
variables in the LM – equation, and in times when the economy is heading for a recession, the
M^s tends to be very low. This is the situation late December 2008, and could be presented
with an almost horizontal LM –curve. In situations like this, an increase in government
spending will have a bigger effect on output than in times where the money supply is more
normal. This situation is illustrated in figure 9.2.

Figure 9.2 IS – LM model
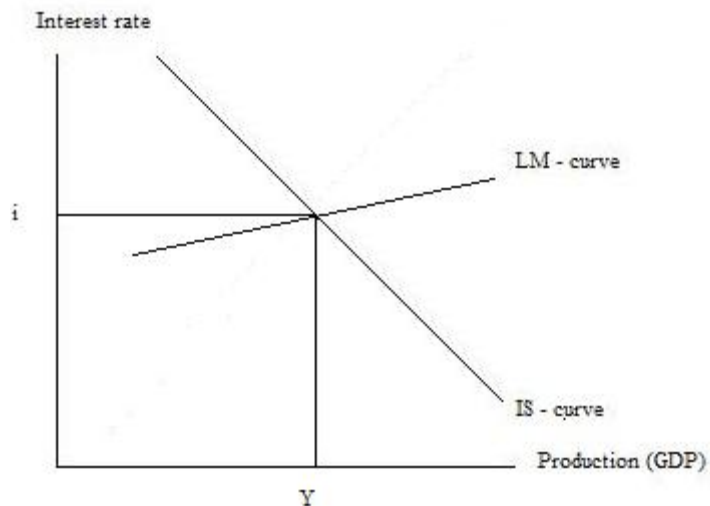
The present situation is said to be of potential benefit for a Democratic President. "With little to choose between the candidates in terms of policy, there is a case for arguing that the Democrats' tolerance for intervention in the markets could prove beneficial at the margin given the recent financial turmoil." (Vinding, 2008)

Prior to the 2008 election, the two President candidates presented different views on how to best solve the financial crisis. Both of the candidates were skeptical to George W. Bush's approach, and propone more proactive approaches to the crisis. However, people seem to lack confidence in the candidates' abilities to bring the country out of the crisis. This could again imply that the election outcome would not have an impact on the valuation, or that it has only a minor impact.

As a response to the economic situation in the fall 2008, Obama has suggested a temporary tax reduction on personal income taxes, but a lot of critics point out that this would not give an effect on production and employment. The tax reduction would give incentives to higher saving rates rather than increases in consumption since the current economic situation is highly insecure. However, the saving rates have been extremely low in the years prior to 2008, and a boost in savings could be beneficial to a certain degree. The Democrat candidate has also proposed increased public investments, such as investments on infrastructure and schools, to fuel the economy. Furthermore, Obama has stated that he wishes a stricter financial system, so that the country can benefit from less volatile financial markets by

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excluding creative derivate instruments. This is perceived as negative by the financial markets, since empirical studies have showed that the economic growth would have been lower if more rules had been implemented after world war two. Ideally, the financial markets would like the government to intervene to only to a certain degree before knowing the true outcome of the financial crisis. However, with the current understanding of the depth of the financial crisis, all actors agree that government intervention is needed, but there is a discussion amongst the actors as to the degree of the government intervention.

McCain on the other hand, has the opinion that differing international regulations is an advantage, since it will be easier to find out which sets of rules and regulations which are effective. In addition, the McCain campaign stated that they would like to increase the equity share limit required for banks to lend money, and regulate for more visibility within the bank and financial systems to reduce the domino effect when one bank goes bankrupt. More regulations on transparency would make it easier to know when an economy is reaching a financial bubble, and would help avoid the bubble to burst before anyone knows what kind of instruments that have been traded in the financial markets.

Both candidates state that the system with incentive to top managers must be changed, so that they are not mainly based on risk taking. It is also proposed by both candidates that FED should to a higher degree be responsible for stability in the financial markets, and also take economic stability into account when setting the discretionary inflation target. The financial markets before the election were in general evaluating the trade-off between lower growth, but higher stability (with Democrats) and high growth with more volatility (with Republicans).

The financial situation in the United States has dominated the 2008 Presidential election, with health and defense issues next in line to be considered by the voters and financial markets. The healthcare system in the United States is mainly built on private insurance. This creates a system which differentiates the rich from the poor, and is therefore assumed to be of great importance. If you fall ill in the United States, you depend on a good insurance to get medical assistance. Both of the President nominees stated during the election campaign that they would like to reform the system, but they had different approaches. McCain suggested that the reform should happen on a private basis, promoting a payment reform that allows moving

away from the current fragmented and volume-based service to a system which rewards coordinated and quality focused care. Obama was and is for controlling the reform Washington. The Democrat view is that every American should have access to health services either though their employer, national authority or from state level. Furthermore, it is emphasized that children should be properly secured to get health services regardless of their parents' economic situation.

After 9/11 there has been a lot of focus on terrorism and defense issues in the US. Both parties have signaled increased investment in the defence sector, but it seems McCain had plans for more spending on defence than Obama.

When the election outcome was clear, Obama's victory signaled a change in US political direction which gave a surge of 4.1% in the S&P 500 Index on Tuesday 4th. This was quickly reversed again, overshadowed by the realities of the worsening economic and earnings picture, resulting on Wednesday and Thursday in the S&P 500's biggest two-day loss (-10.0%) since 1987. This implies a limited belief that the President could or would change the seriousness of the financial crisis. The President election is apparently not considered to be an easy fix for today's financial problems. Another interpretation of the lack of reaction from the stock market may be that the result was already priced into the market since the polls indicated that Obama was going to win. This year's result falls in line with historical results, and also with our findings. Since 1988, on average, stocks fell 0,5 percent from Monday to Wednesday of a Presidential election week when the Democrats took the White House compare to an increase of 0,7 percent after a Republican victory, according to professor Jeremy J. Siegel at Wharton School (Grynbaum, 2008). However, over a full term, stocks have historically fared better under Democratic administration. Even though the election week ended with red numbers, Obama's first press conference as President led to positive closing numbers on Friday 7th. During this conference, Obama pledged to confront the US' economic crisis as priority number one, and already wanted to see a rescue plan for the middle class which will include a new fiscal stimulus package. Late November there was surge in the stock markets due to announcements of Obama's ministers. Especially the announcement of Obama's new finance minister, Timothy Geithner, who has worked with financial crisis for over twenty years appeared to give optimism to the stock markets. This optimism sent the Dow Jones Industrial Index up 6,5% in one day (Ånestad, 2008). Overall though, the index

ended with red numbers with a total down of 5,3% for the entire week. It therefore seems as the markets do respond to political announcements, and that these positive announcements are able to slightly improve Wall Street's trust concerning the handling of the crisis. (BarackObama.com, 2008) (JohnMcCain.com, 2008) (Arne John Isachsen, 2008)

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11.   Appendix

11.1 Normality of indices

As described earlier, an assumption for using the T- test is that the population is normally or almost normally distributed. Histograms of the index values display bell shaped figures, and Minitab Normality tests result in P-values lower than 5%. Given these characteristics we assume that the requirement of normality for the indices is met.

Figure 11.1.1 Normality of indices
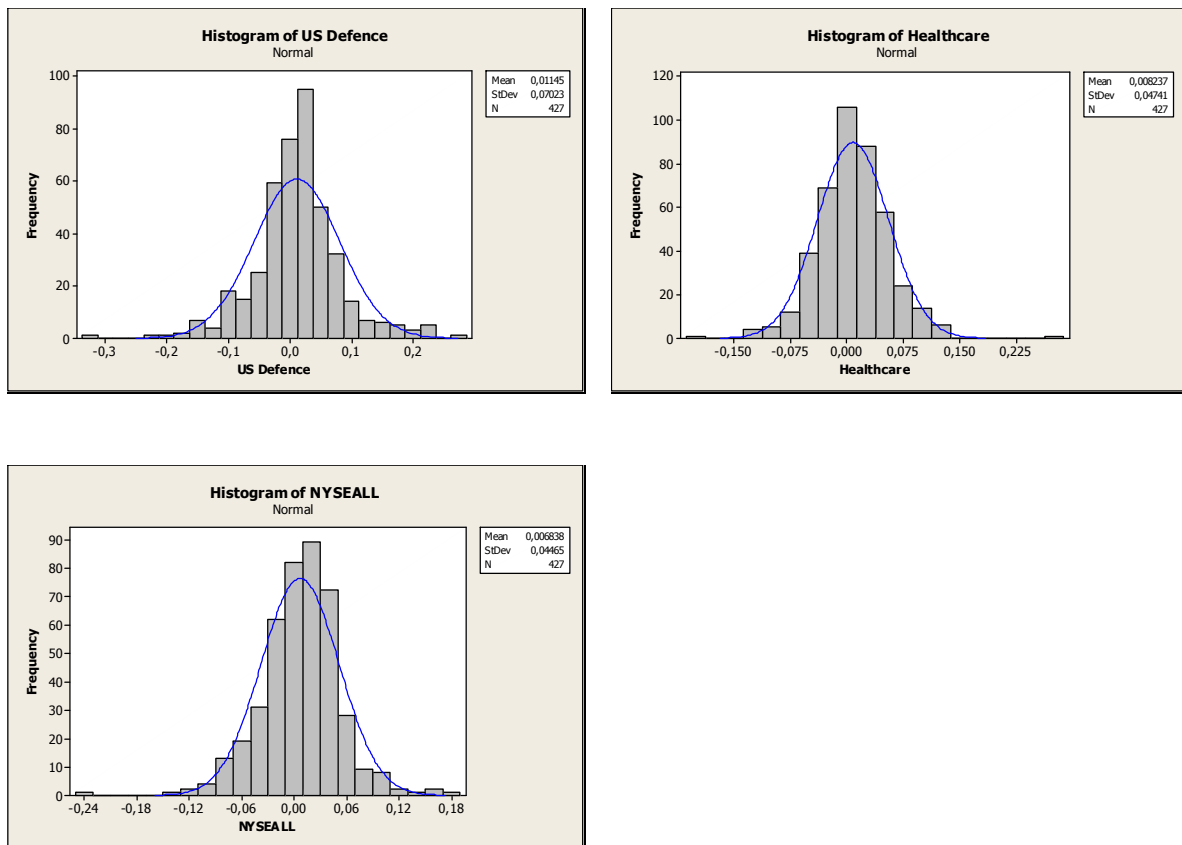
## 11.2 Normality of changes in spending in defence, healthcare and total

In spite of somewhat few observations, histograms of the spending sample sets are not far from being bell-shaped. However, we cannot clearly identify the percentage changes in government spending as normally distributed, but it is not farfetched to assume that it might be the case.

Figure 11.2.1 Normality of changes in government spending
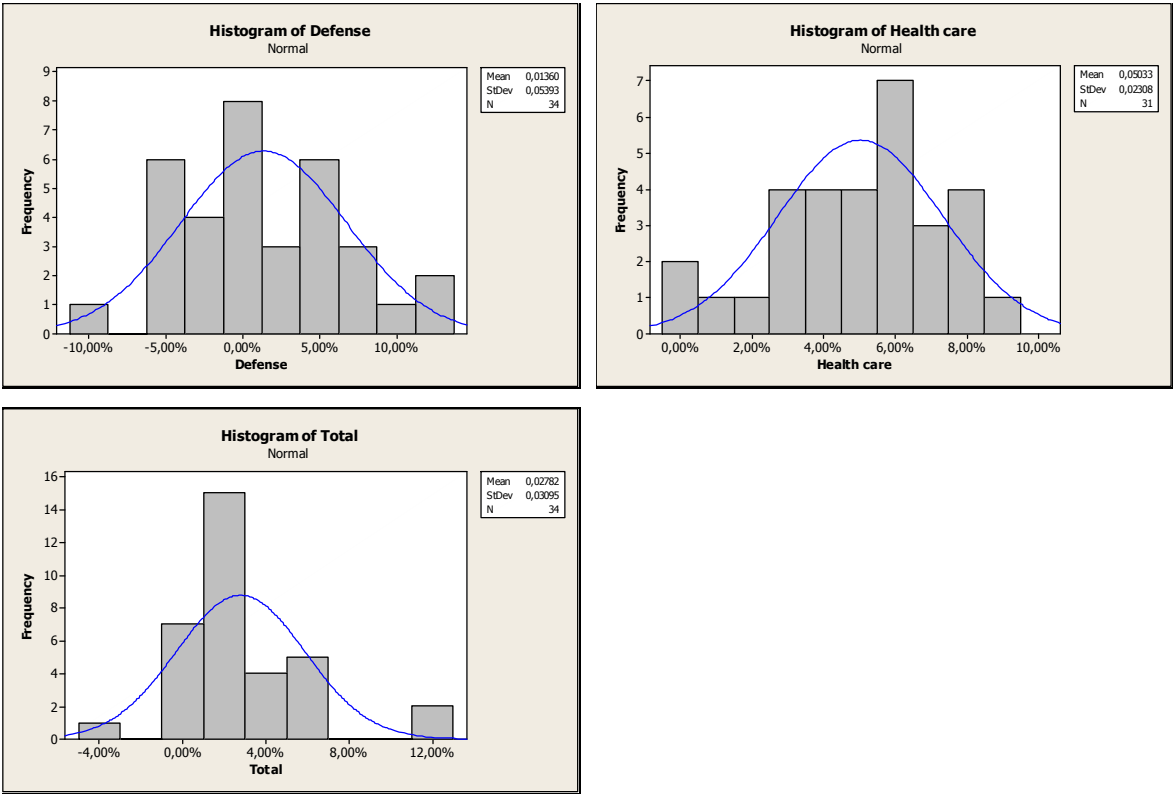
11.3 Yearly average return on index versus percentage change in real spending

Figure 11.3.1 Scatterplot of yearly average return on index versus percentage change in real spending
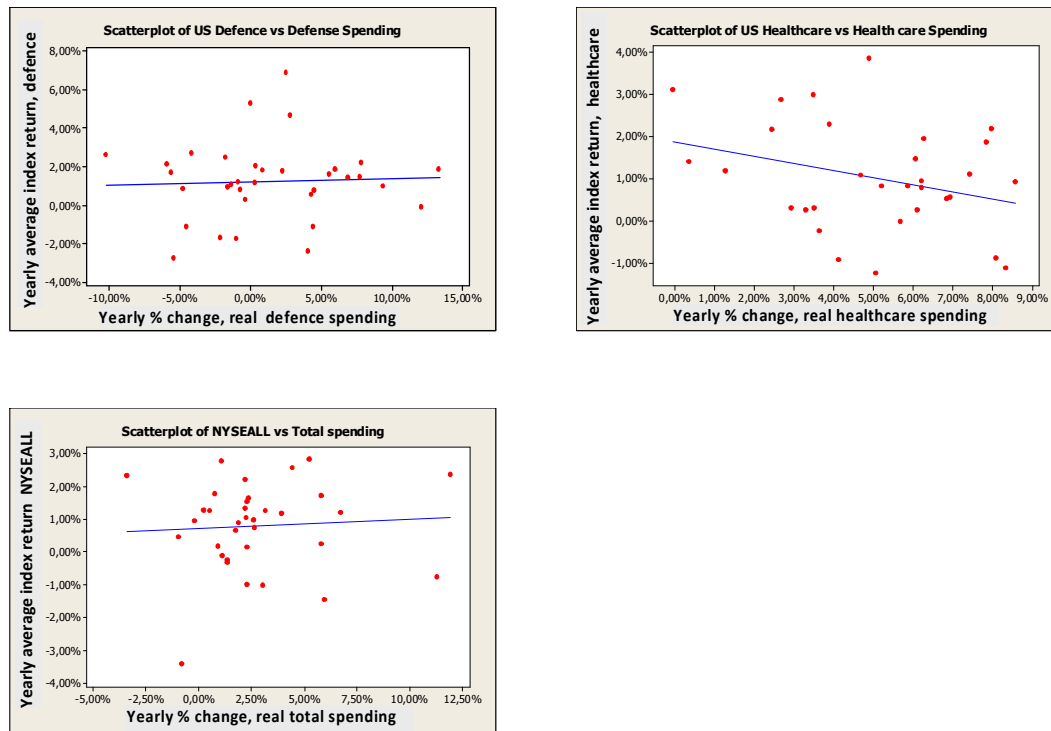
Scatter plots of yearly average return on index versus percentage change in real spending indicate that correlation exists, but not to which extent. To statistically measure the correlation, we preformed a Pearsons correlation test. *Defence* is positively correlated with defence spending, but it is not a significant on a 5% level. *Healthcare* is inversely correlated with healthcare spending, but the observation is not significant here either. Total and *NYSEALL* seem to be positively correlated, though not statistically significant. These results are shown in the table 11.1. These results lead us to question if there is a direct relationship between growth in government spending and returns on the possible indices.

Table 11.3.1: Correlation of government spending

Correlation

Yearly % change/Index return	US Defence	US Healthcare	NYSEALL	P- value
Real defence spending	0,045			0,800
Real healthcare spending		-0,310		0,090
Real total spending			0,062	0,726

11.4 Comparing mean changes in sector government spending

Table 11.4.1 Two sample t- test of defense spending versus healthcare spending

Defence Spending versus Healthcare Spending		
Defence Spending Mean	Healthcare Spending Mean	P - value
0,0136	0,0503	0,001

Table 5.2.1 shows that the changes in healthcare and defence spending are significantly different. The null hypothesis has to be rejected on a 5% significant level, due to a very low P –value. Increase in healthcare spending is on average higher than the increases in defence spending.

Table 11.4.2 Two sample t- test of healthcare spending versus total spending

Healthcare spending versus Total Spending		
Healthcare Spending Mean	Total Spending Mean	P - value
0,0503	0,0278	0,001

The change in healthcare spending is on average significantly higher than the increase in total spending, as illustrated in table 5.2.2. In this test the P – value is also very low and the evidence of a difference is therefore strong.

Table 11.4.3 Two sample t- test of total spending versus defense spending

Total Spending versus Defence Spending		
Total Spending Mean	Defence Spending Mean	P- value
0,0278	0,0136	0,188

The average increase in total spending is higher than the increase in defense spending, but the difference is not significant, since the P – value is 18,8 percent, as seen in table 5.2.3.