**ERASMUS UNIVERSITY ROTTERDAM**
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# Tie Colour Matters?
### Impact of the political party affiliation on the US equity market performance

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# ABSTRACT

The 2024 Presidential race in the US starts to gear up, public media is swamped in arguments about policies and potential shifts in the country's governance (Guardian, 2023). Possibly, this political chaos can have an impact on daily investing operations. In this thesis, I demonstrate whether the outcome of the US Presidential and Congress elections is impactful on the performance of the US stock market and if election periods produce abnormal monthly returns. To achieve transparency on the relationship between political and financial factors, I introduce a vector autoregressive model which closely studies the interdependencies between a political party in the executive and legislative branches of government and stock market yields. I find that the financial market performs better under the Democratic President, while Republican Congress delivers larger returns for a value-weighted S&P portfolio. Contrary, election periods seem insignificant and are fast absorbed by the market. Accordingly, this paper suggests that the split US government provides the most plausible environment for American investors.

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# CHAPTER 1 Introduction

Aristotle once famously said: "Man is a political animal" (Abbate, 2016). Unsurprisingly, we can state that our daily lives are often influenced by political events: doubtful presidential candidates, a downturn in the economy, or a potential military escalation. Accordingly, we should expect that the finance market is also impacted by the changes and actions on the political stage. Li and Born (2006) believe that political influence is one of the main drivers of changes in market volatility which in place directly affects market returns. Moreover, it openly affects spending patterns of the population which also disrupts or enhances investment strategies. To answer unresolved questions regarding political influence on the stock market, I will focus on the US as a case. This paper will observe the effects of the ruling party in the United States of America on the monthly S&P portfolio returns in 1926 – 2021.

Republicans and Democrats are depicted in the newspapers as eternal foes and competitors. In the pre-election debates, we can often hear left- and right-wing economic agendas and arguments about fiscal policies. In the classic study by Strom (1990), a clear conclusion of the heterogeneity of political parties was outlined. According to the research, a political party behaves as an organization with its strategic entity. Hence, every decision is purely based on the tactical behaviour of vote-seeking, and we should expect politicians to satisfy the demand of the electorate. These policy deviations are crucial for the quality of investor decision-making to predict abnormal market returns. This topic is not completely new in academic society as similar discussions were raised in multiple countries where the relationship between market returns and political ideology seems to substantially differ. Abidin et al (2010) demonstrate that a right-center party in New Zealand on average provides much higher market returns than a left-wing competitor. In Belgium, Vuchelen (2003) supports Strom (1990) as he found evidence of an incentive for investors to predict political deadlocks in many-party political systems. The most famous previous paper to discuss this topic in the US is presented by Santa-Clara and Valkanov (2003). Researchers focus on the deviation of weighted portfolio returns and found a contradictive result to Abidin et al. (2010) where the left-centered Democratic party provided significantly higher average excess returns. Sabherwal et al (2017) support the results of Santa-Clara and Valkanov (2003) but add that 'sin' stocks (gambling, alcohol, tobacco) perform better under the Republicans. Wong & McAleer (2009) portray an interesting trend of better market returns during the second part of the Republican presidency term which suggests a policy

manipulation before the re-election. Therefore, it seems that researchers agree that Democrats and left-center policies enhance market returns in the US due to a more regulated market approach to policymaking. Fatas and Mihov (2001) explain that increasing fiscal expenditures and social welfare programs postulate higher employment rates and consumption index development which consequently enhance the equity market.

In this paper, I will replicate Santa-Clara and Valkanov's (2003) approach but with one very crucial distinction. None of the researchers considered the party sitting in Congress. I believe neglecting this factor loses the granularity of the research and overgeneralizes the topic as a unified government in the US is a luxury in the last 40 years. It remains unclear whether we can expect more extreme ideological policy-making when the President is backed up by the legislative branch of power. If a tendency of unified power control is not widespread, we should expect more 'trade-off' policies that are closer to centrism. If this is the case, there would be a minor distinction between Democratic and Republican reigns which provides opposite results to the previously cited literature. This thesis is supported by Coleman (2019) who offers the theory of more moderate policymaking when a government is split. On the other hand, Leyden & Borrelli (1995) revealed that a unified government provided a greater quantity of noteworthy enactments. Based on the previous literature, my study will observe if the equity market generally replies more positively to an intrusive Democratic market approach than to the less regulated Republican stance. My paper will focus on this hypothesis: higher monthly market returns are achieved under the Democrats rather than the Republicans. To conclude, my central research topic will be 'What is the effect of the political party affiliation in the executive and legislative government bodies on the equity market stock returns in the US?'

To estimate this relationship, I will use the Centre for Research in Security Prices (CRSP) database for all economic variables. For research purposes, I obtained value and equal-weighted S&P 500 indexes monthly returns for the 1926-2021 period. To control for the macroeconomic variables, monthly inflation rates are used and measured based on the Consumer Price Index (1926-2021). Monthly treasury returns of 5-, 10-, and 30-year bonds will be used to monitor change in market expectations and act as a market benchmark. Presidential and Congressional terms will be collected from the Library of Congress. Hence, in this paper, I will work with the time series data across the last century. To achieve the most efficient results, I plan to use the dynamic regression model. This choice is the most suitable as the model incorporates lagged values of both dependent and exogenous variables over time. From the theoretical point of view,

I will have two statistical model options: vector autoregression (VAR) models can be the most efficient for linking a dependent variable with many macroeconomic factors that are a part of my paper. Autoregressive distributed lag (ARDL) models allow more flexibility with the non-stationary and co-integrated data. Both models can be worked with as they provide a long-term vision and have their benefits. To identify the best model, I will run test regressions and choose the model with the lowest AIC. Independent variables would be the ruling parties in Congress and the White House. These variables will be represented in the form of dummies. One dummy will exemplify the president's affiliation (Republicans with a value of 1), and the second variable will represent the Congress (Republicans with a value of 1). Dependent variables would be lagged value- and equal-weighted S&P 500 indexes monthly returns run in two separate regressions. I also will add a few controls, inflation rate is a useful marker of the business cycles and the current economic state. Treasury bond returns can be considered an indicator of investor expectations as they reflect the perception of confidence in investing in the US debt. Both controls are numerical values. The election factor will be a dummy variable with a value of 1 in the period of the presidential election.

I hypothesize that this research would provide supportive results to Santa-Clara and Valkanov (2003), Sabherwal et al (2017), and Wong & McAleer (2009). However, I would expect to see a weaker difference between ruling parties and returns as my approach is more granular. I predict a meaningful effect but with a lesser magnitude per Coleman's (2019) split government hypothesis. To add to the previous research, my study will show the importance of including the legislative body in the model. As of now, none of the researchers in the US included the Congress ruling party. Hence, this paper should explore the link between political parties in power and monthly market returns in the most detailed approach from the political side of the research. However, I do not plan to provide an answer to the question of whether market returns impact political cycles. This is a reverse version of my topic, and I will have to leave it to interpretation.

The remainder of the thesis is structured in the following order. Section 2 will discuss the most relevant literature and define three hypotheses. Section 3 will operationalize the variables and summarize the data. Section 4 will provide a methodology and discuss why vector autoregressive model is the most fitting for this research. Finally, Section 5 will evaluate the results of my paper and compare to previously conducted research.

# CHAPTER 2 Theoretical Framework

## 2.1 Political Cycle

The term 'political cycle' describes changes and fluctuations of economic performance impacted by external factors of political origin (Britannica, 2023). It's a complex and multifaceted concept as it consists of many deviating effects on the economy.

Historically, the influence of political cycles on the economy was discussed for many decades. One of the first meaningful works appeared in 1978 when Frey (1978) showed that political cycles are drivers of government expenditure patterns and significantly affect business confidence. The latter is also substantially affected by the ideological changes in the country's regulation as every business model has to adapt to the shifts in the policymaking strategy. Time confirmed these statements. Alesina et al. (1997) demonstrate that prior to the US elections, parties can be engaged in manipulative policies to endorse their chance of re-election. Incumbent governments will increase government spending and implement tax reductions to boost the economy. Similarly, monetary policy can be also influenced to adjust interest rates according to the political agenda of the party. Finally, Potrafke (2012) performed one of the largest to date analysis with OECD countries from 1951-2006. The author finds mixed evidence and suggests that political cycle effects are dependent on the ideology of the government in power. Therefore, economists have studied this matter for decades and the current school of thought states that political cycles are prominent and alter economic activities.

However, the interest of this thesis is not political macroeconomic influence but the topic that stems from the above discussion. Political cycles impact the state of the economy and the way its governed. In anticipation of changes, investors have to modify their expectations regarding the best capital allocation and investment strategies. While business entities have to fine-tune their operations to achieve the highest efficiency that results in leading market performance. Thus, my thesis topic has a similarity to the classical studies listed previously as it appreciates the importance of macroeconomic factors such as inflation and interest rates on the stock market performance (Wong & McAleer, 2009).

Nevertheless, studied in this paper relationship is different as it implies indirect causality. I am not focused on the total effect of the political action on the economy but rather on how a change in policymaking impacts the investment climate in the country. Previous research showed substantial evidence that economic performance is affected but what is the association with the stock market? To answer this question, we will have to dive deep into the spider web of potential multi-granular outcomes. To show the consequence of politics on the stock market, I have to account for how the economy responds to the changes on the political stage.

## 2.2 The impact on the stock market

The stock market reacts to the news. Naturally, the state of the stock market is heavily prejudiced by the changes in the economic environment. It is sensible to assume that the equity market earnings will be affected by the expectations of the electorate whether a party in power will succeed, or a reform will be instrumental (Herbst & Slinkman, 1984). These political changes/actions can be highly forceful to the social and economic situation of the country.

*The first notions* of the relationship between political parties and market returns appeared with the development of democratic regimes and econometric tools in the late 20th century. Niederhoffer et al. (1970) supported a view of the time that Republicans were preferred on Wall Street. The authors implemented a descriptive method and analysed Dow Jones Industrial Average (DJIA) monthly returns during different administrations. The main argument for the right-wing ideology involved the creation of a free-market environment that benefited investor expectations and firms' efficient operations procedure. Nevertheless, the authors conducted this research more than 50 years ago, hence, this relationship could have drastically changed.

In the next decade, Herbst & Slinkman (1984) supported the thesis of Niederhoffer et al. (1970) saying that the Republican President guarantees better stock market outcomes due to providing an incentive for innovation via open markets. The authors also contributed to the topic by controlling for interest and inflation rates that demonstrated that the best environment for the stock market lies in the period of low inflation and interest rates. Additionally, authors provided evidence to Alesina et al. (1997) by identifying that stock market returns are indeed larger in the before election year.

Döpke and Pierdzioch (2006) find a similar outcome in the case of Germany where, on average, the stock market obtains higher returns under the rule of the right-wing parties. The economists provide a similar reasoning to Niederhoffer et al. (1970) and add that right-wing parties tend to be more conservative, and this factor creates confidence in future. Abidin et al (2010) validates that centre-right parties are also historically more prominent for the stock returns in New Zealand.

To conclude, most of the authors conclude that the right-wing party in power in the developed economy radiates, on average, higher stock returns. The main explanation behind this phenomenon lies in the conservative policy-making that does not negatively affect expectation of investors and companies.

## 2.3 Impact of political cycles on the stock market: the US case

A good view on this topic can be seen in the two-party system in the US. Two leading actors in this research would be the Democratic and the Republican parties. Two chief American political parties have generally different approaches to domestic policies. According to Freeman (1986), two parties might share similarities in the governing forms but are two polarities in terms of political culture. Democrats prefer more intrusion into social welfare and income redistribution. Contrary, Republicans favour tax reductions and deregulated markets. Innately, we should expect market reaction to vary. To see how exactly this relationship will operate, I have to control two crucial power branches, legislative and executive. Hence, the independent variables of this research will be expressed in the form of political affiliation of the US President and a majority party in Congress.

Early research was conducted by Niederhoffer et al. (1970) and Herbst & Slinkman (1984). As outlined previously, the economists emphasize the importance of investor expectations, and a business-friendly attitude Republicans provide. The authors suggest that open market environment incentivizes innovation and allows businesses to master their operations by not imposing many limitations and setting low taxes. However, both papers were written more than 25 years ago, and our sample has grown.

The most prominent paper up to date was written by Santa-Clara and Valkanov (2003) who used the largest available dataset from 1927 – 2000 to analyse the effect of the Presidential cycles in the US on the S&P 500 index. At that time, it was the largest research performed on this topic separately and in detail. The economists believe that politics should have at least an indirect effect on the stock market due to macroeconomic influences. Logically, understanding these fluctuations can enhance investors' chances to obtain abnormal returns. Researchers implemented a time-series model with ARMA errors and lagged dependent variables. A dummy variable was used to represent the party of the president. The results of the research were one-sided showing that Democrats provide an astonishing annualized abnormal return of 9%, while the Republican Party had only 2%. Hence, Santa-Clara and Valkanov (2003) demonstrated that the political business cycle exists in the US stock market. Unfortunately, the authors did not provide political explanations for this phenomenon. Most of the papers in the last two decades like Sabherwal et al (2017), and Wong & McAleer (2009) agree with this statement. However, it should be mentioned that all these papers used similar time-series approaches and did not consider a party in Congress.

Contrary, Leblang & Mukherjee (2005) presented a different outcome. Researchers used an event study model where a party in power was an independent variable. The authors took a slightly altered standpoint believing that a party with a closer friendship to the business community should be able to provide better market performance. Their paper confirmed this supposition by displaying that Republicans achieve higher market returns, especially, in the first year of the presidency. Similar to the US, Conservatives provided higher market returns in the UK. One interesting explanation for this deviation from the previous research is higher military spending by the Republican Party which increased the capitalisation of arms production firms which are often publicly traded and are part of the S&P 500 index. Thus, the authors state that a core factor of market performance is to diminish market intervention and increase tax reductions which help businesses to operate better.

Another school of thought appeared in the paper of Pástor & Veronesi (2020). They argue that the timing when parties are elected is crucial. Democrats are mostly elected when economies are on the run and higher long-term returns are anticipated. Republicans win office when returns are already low. To account for this, authors use time variation in expected returns in risk aversion. When risk aversion is high, investors will demand larger compensation for risk. Most importantly, researchers did not find Congress to be a significant variable that proves their

major point. If indeed there was a stronger policymaking performance by Democrats, then we should expect Congress to be statistically meaningful too as the President needs the support of the legislative branch of power. If this is true, it supports the notion of Coleman (2019) that both parties engage in moderate policymaking and ideology does not play a significant role. It will be the timing that matters.

To sum it up, we have three opinions on the research topic: a confident Democrat performance which yields higher on average excess returns, a stronger return rate for Republicans due to a more business-friendly policymaking, and no specific association.

### 2.3.1 Party Affiliation

The first hypothesis will observe if there is a causal relationship between a party in power and market returns. Based on the previous research, most of the authors tend to claim that Democrats provide a better outcome in the last two decades.

To illustrate how this relationship operates, we need to look from a few angles. First and potentially of the utmost importance is the **macroeconomic influence**. Freeman (1986) outlines that Republicans on average often prefer market deregulation and reduced taxation. According to Leblang, & Mukherjee (2005), this goes in line with higher business efficiency, larger profits, and drives better stock prices. On the other hand, Democrats prioritize social spending in the form of welfare programs which can increase consumer spending in the long term and boost economic growth which indirectly increases stock prices. Therefore, the two parties have two different approaches to tackle the economic state of the country and if a political party will be significant, we will be able to see who was more efficient in the last 100 years. Meltzer & Vellrath (1975) mention that overall, two parties can also focus on specific agendas prior to the elections to enhance re-election chances. By controlling or stabilising favourable economic conditions such as inflation, unemployment, and income growth party are willing to achieve more votes from the electorate. Hence, we should not neglect the fact of political opportunism too and do not blindly rely on long term ideologies as there might be no effect at all.

Therefore, the first hypothesis has to observe which political party (if any) on average delivers better returns. Based on previous research, most economists support the thesis of the Democratic Presidency being more fruitful in terms of returns due to an increase in long term

consumer spending. In the first part of the paper, I will detect if this phenomenon holds in the larger sample.

**H1:** Democratic President provides statistically larger market returns than a Republican.

### 2.3.2 Congress

However, we should not forget about the notion of Pástor & Veronesi (2020). We may indeed find a meaningful association between the presidential officer and market returns but we cannot be sure that this correlation exists only due to this factor. To ensure that these results are not spurious, we have the second variable of the ruling Congress party. Unfortunately, we lack evidence for this statement as most of the prominent research did not find or either did not observe this relationship. Santa-Clara and Valkanov (2003) did not study this relationship, while we have evidence in favour of the right-wing governance by Leblang & Mukherjee (2005).

Finding another economically significant relationship in this area will disprove the point of Pástor & Veronesi (2020) who based their argument on the absence of correlation. If there is indeed only the effect of executive branch of power but not the legislative, it may create a doubt over the economic significance of results. Consequently, I create the second hypothesis to check for the meaningfulness of Congress.

**H2:** Democratic Congress provides statistically larger market returns than Republicans.

### 2.3.3 Elections

Another prominent source of influence is **social expectations**. When investors have a positive prediction of the political party in power actions and statements, we can expect a positive perception of the investment opportunities. Oppositely, a shaky stance of the ruling party or an expectation of an unstable economic situation can force investors to disengage from investing, thus decreasing stock prices and market returns. Li & Born (2006) demonstrate evidence for this statement. Researchers show that there is a clear negative association between political

uncertainty prior to the elections and stock market returns. The economists suggest that investors are risk-averse and prefer to sit through a period of high doubt.

Similar results were displayed by Goodell & Vähämaa (2013) as there was a positive correlation between election winner probability and a volatility index. It leads to the conclusion that political uncertainty drives market returns too as investors are forced to revise their anticipations. Oppositely, Jones and Banning (2009) believe that these assumptions are exaggerated, and the public reaction is quickly absorbed in the market and lasts only in the short-term. Therefore, Jones and Banning (2009) suggest that we will not see a long-lasting volatility fluctuation.

The final hypothesis of this paper will control for the social expectations during elections. In the third hypothesis, I will evaluate if investors can expect abnormal returns during the election periods.

**H3:** There are abnormal returns during the election periods.

# CHAPTER 3 Data

In this research, I will classify two types of variables, economic and political. By definition, economic variables will be quantitative. These variables will represent macroeconomic factors and market returns from 1926 to 2021. To obtain market returns which serve as a dependent variable, I used the **Centre for Research in Security Prices** (CRSP) database. CRSP was also used to extract macroeconomic controls. In this paper, we will use the inflation rate, treasury bonds with maturities of 5, 10, and 30 years. CRSP is one of the largest open-source financial database which collects historical stock market and investable data. It is recognized by many universities, including the Erasmus School of Economics. Hence, I can believe that data quality is high and there is no mistake margin.

The dependent variable is the **S&P 500 portfolio monthly returns**. The S&P 500 index is used to measure 500 of the largest trading firms in the US based on market capitalisation. Polson & Tew (2000) consider S&P 500 indexes to be reflective of the overall market performance as it covers a wide range of industries and company sizes. They find that most of the funds underperform to this benchmark and this index is often used by professional investors to extract useful market trends. My sample consists of 1151 monthly return observations running from 1926 to 2021. This variable will allow me to see a market reaction of the most influential firms to the political parties. In this paper, I chose to focus on the returns of two portfolios. The first case is a market-cap-weighted portfolio where the most traded stocks have the largest weight. The second choice fell on an equal-weighted portfolio where smaller companies have more influence as each stock has the same weight. The equal-weighted portfolio was chosen to avoid bias of including the effects mostly on the largest firms.

Other economic variables will be used as controls. The **inflation rate** is also extracted from 1926 to 2021 and has the same number of observations. This rate is calculated based on the monthly differences in the Consumer Price Index. This control is crucial per Pástor & Veronesi's (2020) hypothesis about the influence of the timing of the elections. The inflation rate will let me monitor the business cycles in the US economy. The level of inflation can explain the current health of the economy. If we see very high inflation, we can believe that the economy is overheated, while moderate inflation will represent nourishing growth.

**Treasury bonds** demonstrate investors' expectations of the economy. This variable is represented in the form of a monthly return on the 5-year US treasury bond. We can expect a rising yield when the demand for bonds is falling. This means that investors currently aim at high-risk investments and the economy is growing. Falling yield reflects the opposite situation.

On the other hand, I have collected political variables. In this paper, I have a political party of the US President, the ruling party in Congress, and election periods. To obtain the most precise information about dates and political reigns, I used **the Library of Congress.** The Library of Congress is the oldest cultural institution that serves federal research purposes. It contains information about all presidents, notable events, and politicians. Since this database is closely controlled by the government body and contains the most prominent research, we can be sure that the data is reliable.

All three variables are binary. **The President's variable** has a value of 1 when the President is a Republican. Figure 1 demonstrates the distribution of presidencies among the two parties and respective growth of the Fama-French Total that represents the state of the stock market normal returns. We can see that Republicans were in power for 6 continuous periods, while Democrats were in power 5 times (excluding current Biden's presidency) with a long period before and post WW2. Hence, both parties were occupying the White House for approximately a similar amount of time. **The Congress variable** has a value of 1 when the majority is Republican. Figure 2 demonstrates the distribution between the two parties. We can see that the Democratic Party was predominantly in the majority starting from 1926. **The Election period variable** obtains the value of 1 during the period of election proximity. The American election has a few specific peculiarities. Namely, votes are held in November on the Election Day. However, the new ruler steps into the duties only at the end of January. To observe the fundamental effects, I will identify 3 months prior to the election period and 3 months post-election until a new party takes office. In the before to the Election Day months, changes in the market returns are likely to be the result of electorate anticipations (Vuchelen, 2003). While changes post-Election Day will inform if these expectations were met (Goodell & Vähämaa, 2013) and I will control for the lagged reaction time of investors to the news. In this paper, I decided to limit this period to 3 months prior to the election and 3 months post-election. This was done to observe the effect of the election itself and not to create additional variable noise by extending the period with a chance of capturing partial effects of other variables. This way, I hope to limit the damage of a possible spurious regression.

**Figure 1**

*Growth of the Fama-French Total under the US Presidents, 1929 – 2020*
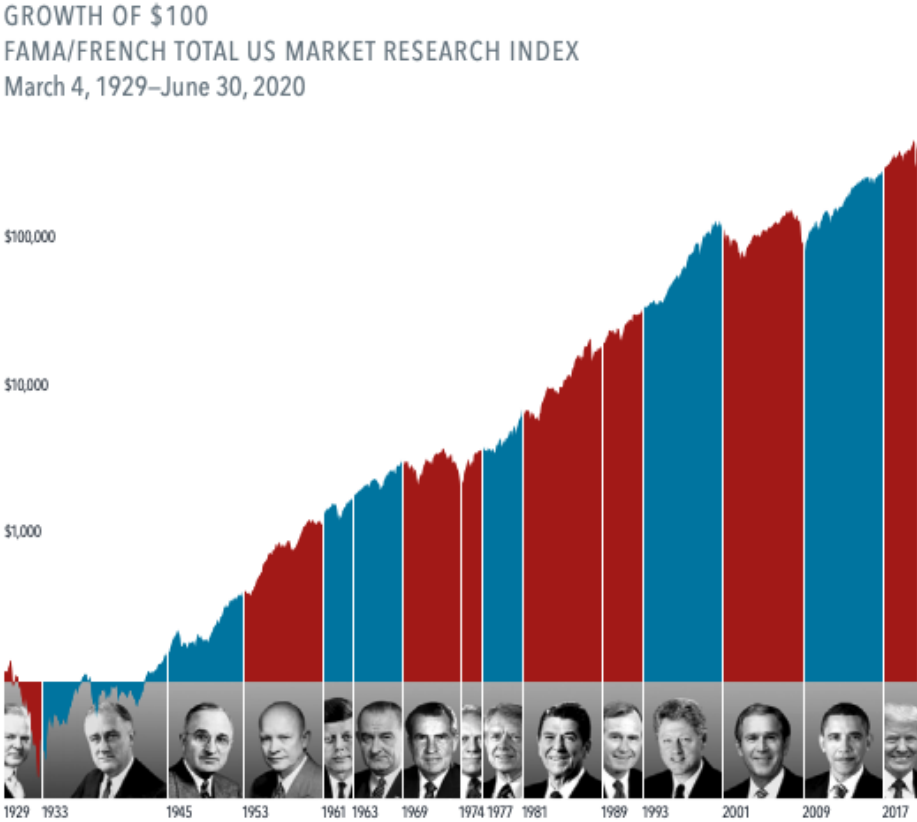


GROWTH OF $100
FAMA/FRENCH TOTAL US MARKET RESEARCH INDEX
March 4, 1929–June 30, 2020

*Advisors, Dimensional Fund (2020). "What History Tells Us about US Presidential Elections and the Market: Citrine Capital: Virtual Financial Planning: San Francisco." Citrine Capital.*

**Figure 2**

*Majority in the US Congress, 1855 – 2025*



Control of the U.S. Senate and House of Representatives: 1855–2025
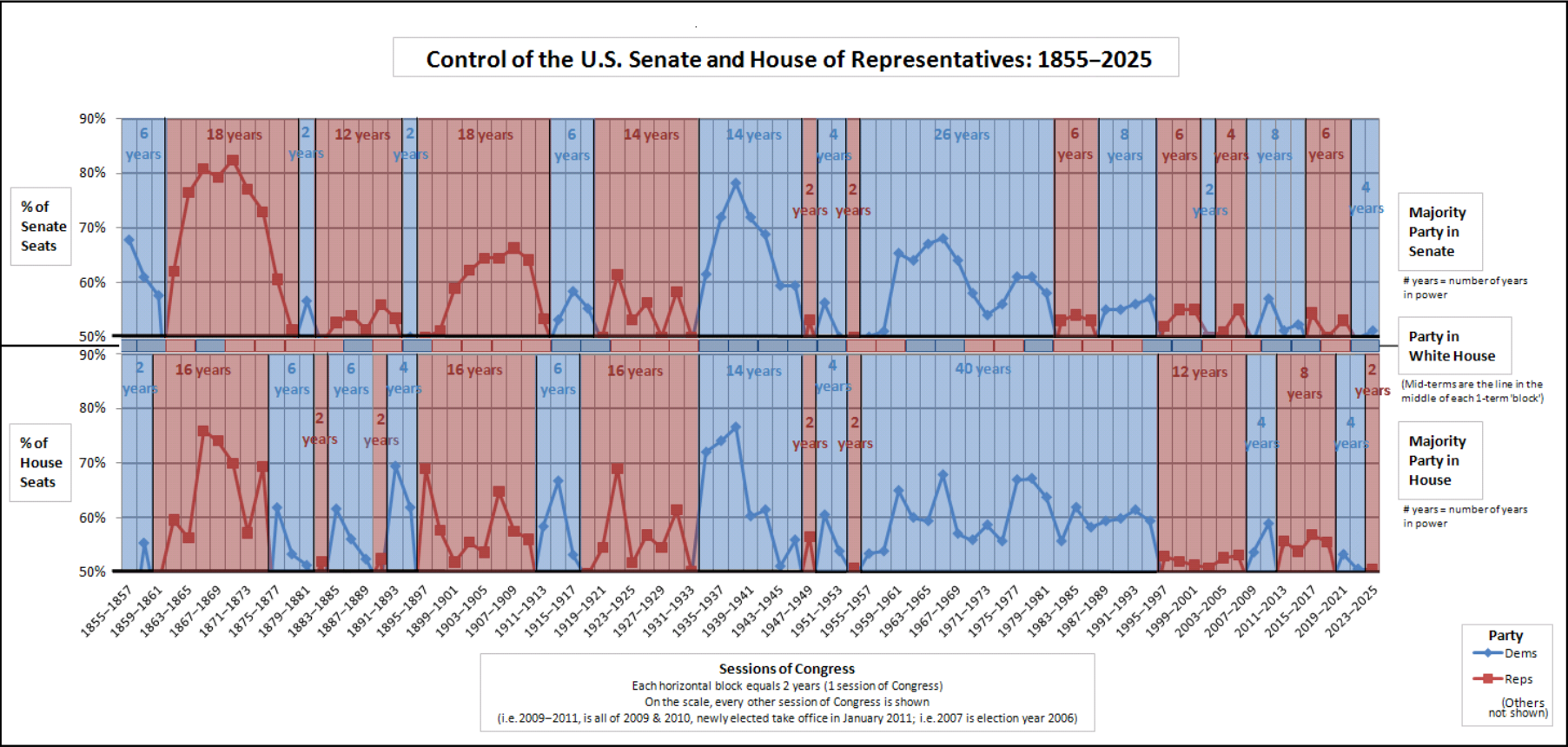
*Chris Houston (2023) - Control of the U.S. Senate.*

Since all variables are described and defined, we can evaluate the descriptive statistics of the sample I will be working with. The results can be seen in the Table 1.

**Table 1**

*Descriptive statistics*

| Variable | Obs # | Mean | Std. dev. | Min | Max |
|----------|-------|------|-----------|-----|-----|
| PVW | 1151 | .0064821 | .054102 | -.291524 | .412291 |
| PEW | 1151 | .0085026 | .0672629 | -.314686 | .677637 |
| Bond-30 | 962 | .0048926 | .0301595 | -.147382 | .172202 |
| Bond-10 | 968 | .0044256 | .019625 | -.066819 | .099993 |
| Bond-5 | 969 | .0043308 | .0133269 | -.058022 | .106119 |
| Inflation | 1152 | .0024001 | .0052715 | -.020548 | .058824 |
| President | 1152 | .4904514 | .5001259 | 0 | 1 |
| Congress | 1152 | .3446181 | .47545 | 0 | 1 |
| Elections | 1152 | .1458333 | .3530923 | 0 | 1 |

*Note: PVW stands for the Value-Weighted Portfolio, PEW stands for the Equal-Weighed Portfolio*

Table 1 illustrates that the monthly yields of both portfolios are positive. Interestingly, an equal-weighted portfolio delivers a higher return, on average. However, it also visibly that it has mostly 2% more volatility. Treasury bond yields are located in the vicinity of 0,45%. The inflation rate in the long term is positive with a maximum point of almost 6% per month.

Political variables are dummies; hence, means are proportions. We can see that Republican Presidents constitute nearly exactly half of the whole sample which confirms visuals from the Figure 1. In a similar way, Congress was mostly run by the Democratic party showing that Republicans were in possession of the legislative branch only 34.5% of the sample period.

# CHAPTER 4 Methodology

In this paper, I will replicate Santa-Clara and Valkanov's (2003) statistical approach. The authors used a dynamic regression model. I will partially alternate this method by using a different set of independent variables. In this paper, I will use S&P 500 portfolio returns of value and equal-weighed portfolios instead of abnormal returns. Another difference will be a larger timeline. The VAR method is especially useful for controlling dynamic changes in the macroeconomic variables along the timeline of the research. Political parties can implement policies with lasting effects and economic conditions are subject to cyclical behaviour. Dynamic regression model allows me to account for these changes as both independent and dependent variables are lagged and time varying. As values are lagged, I can capture potential lagged feedback effects since we should not expect that working with immediate effects will be enough.

I have identified two candidates for the methodology, a vector autoregression (VAR) model and an autoregressive distributed lag (ARDL) model. The VAR approach is more flexible as I can accommodate both stationary and non-stationary variables. It works well with both long and short-term dynamics and captures interdependencies between variables of interest. By implementing this model, it will be clear how a change in one variable will affect other factors. However, there is a serious flaw as VAR does not detect causality but only describes the relationship. I will have to implement a Granger causality test in the regression model.

Contrary, ARDL does not work well with the short-term impact as it focuses on the long-term association. Additionally, the model assumes integration of the same order, thus, I cannot work with non-stationary variables. On the other hand, ARDL addresses endogeneity with dependent variable lagged values.

To decide on the number of lagged values, I ran a test to identify the most relevant number of lagged values. In Table A1 (in Appendix), we can see that the model with only one lag has the lowest AIC, hence, it will be used. This result is applicable to both VAR and ARDL models, therefore, we can compare approaches with the identical number of lags.

**Table 2**

*The lowest AIC between two models*

| Model | N | ll(null) | ll(model) | df | AIC | BIC |
|-------|------|----------|-----------|-------|-----------|-----------|
| VAR | 968 | 0 | 10367.42 | 42.00 | -20650.84 | -20446.08 |
| ARDL | 968 | 1704 | 1712 | 7.00 | -3409 | -3375.12 |

To decide between the two model specifications, I will check the lowest AIC. From Table 2, it is visible that the VAR model is superior to ARDL as it explains more information. Both models included 1 lagged value for all relevant variables: dependent, independent, and controls. To be sure that our results are unbiased, I checked for serial autocorrelation and normality. Based on Tables A2 and A3 (in the Appendix), my data does not experience any of these issues, hence, assumptions are fulfilled. Conclusively, VAR statistical model is eligible to use in this research and will be implemented.

Thus, I can formulate hypotheses regressions. I will run two regressions where one dependent variable is a value-weighed portfolio (PVW). Another one will use an equal-weighted portfolio as a dependent factor (PEW). Three independent variables will be dummies representing a part of the President (president), the ruling Congress party (congress), and if there is an election period commencing (elections). Control variables will be combined into a common variable (controls).

**Regression #1.** *Effect on the Value Weighted Portfolio*

$$PVW = \alpha + \varphi_1 President_{t-1} + \varphi_2 Congress_{t-1} + \varphi_3 Elections_{t-1} + \varphi_4 Controls_{t-1} + \varepsilon_i$$

**Regression #2.** *Effect on the Equal Weighted Portfolio*

$$PEW = \alpha + \varphi_1 President_{t-1} + \varphi_2 Congress_{t-1} + \varphi_3 Elections_{t-1} + \varphi_4 Controls_{t-1} + \varepsilon_i$$

Finally, as mentioned earlier in this chapter, the VAR model provides the best possible description of the association but demonstrates no causality. To solve this issue, I will run a Granger Causality test post my regressions for both regressions. Granger results are represented in chi columns in Tables A5 & A6 in the Appendix. By outlining the outcomes, I will be able to see if there is a statistically meaningful impact of the Republican party in the White House and Congress (as it is assigned value of 1) for H1 and H2. The elections variable will depict if there is any impact in H3.

# CHAPTER 5 Results & Discussion

## 5.1.1 Impact on the weighted value portfolio

Since all assumptions are tested and approved, I am guaranteed to limit the potential bias of results. Running a VAR model regression with one lagged value gives me the result of Table 3.

We can see that the President variable has a negative effect on the PVW, hence, hypothesis 1 is confirmed for value-weighted portfolios as the Democratic Party brings, on average, brings 0.0055% more return than Republicans. On an annual basis, it is an average of 1.068%. Contrarily, market responds better to have a Republican majority in Congress, where a monthly return of 0.006% more appears (annualized to 1,074%). While a monthly increase in inflation has a negative effect on the PVW by 0.625%. Thus, **Hypothesis 1 can be rejected** under 5% of significance level, while **Hypothesis 2 is overturned** claiming that Republican Congress allows the market to perform better.

Looking at the relationship between other variables, we see that each is significantly determined by its previous lag, however, there is no interdependency among independent factors. This can be seen in the cross-sectional results in Table 3. Interesting to note that Treasury Bonds provide higher monthly returns under the Republican President, while inflation is larger during Democrat rule in Congress.

Election periods seem to have no abnormal influence on the PVW in this model as the negative effect is not statistically meaningful and the p-value is above 5%. Election periods have a non-significant negative effect (p-value of 0.21) on the value weighted portfolio returns. In conclusion, **hypothesis 3 cannot be rejected** as I do not observe any abnormal deviations to portfolio returns during the election periods.

*Table A5 in the Appendix provides more insight in the R-squared values which are above 70% that indicates strong explanatory power*. Additionally, all chi values of Granger tests in Table A5 are statistically significant. This leads to a conclusion that results of Table 3 are *causal*.

**Table 3**

*Value-Weighted Portfolio regression*

| | PVW | President | Congress | Elections | B5 | Inflation |
|---|---|---|---|---|---|---|
| L.PVW | 0.0245 | -0.104 | -0.0505 | 0.111 | -0.0197 | 0.00102 |
| | (0.449) | (0.187) | (0.559) | (0.465) | (0.055) | (0.744) |
| L.President | **-0.00550**$^*$ | 0.977$^{***}$ | -0.00928 | -0.00332 | **0.00276**$^{**}$ | -0.0000714 |
| | (0.042) | (0.000) | (0.200) | (0.795) | (0.001) | (0.784) |
| L.Congress | **0.00601**$^*$ | 0.00887 | 0.972$^{***}$ | 0.00427 | 0.00105 | **-0.000597**$^*$ |
| | (0.038) | (0.211) | (0.000) | (0.755) | (0.254) | (0.033) |
| L.Elections | -0.00477 | 0.0000802 | -0.00878 | 0.832$^{***}$ | -0.000333 | -0.000417 |
| | (0.210) | (0.993) | (0.387) | (0.000) | (0.783) | (0.255) |
| L.B5 | 0.139 | 0.337 | 0.184 | 0.895 | 0.106$^{**}$ | -0.0161 |
| | (0.170) | (0.175) | (0.499) | (0.061) | (0.001) | (0.100) |
| L.Inflation | **-0.625**$^*$ | 0.0226 | -0.821 | -1.316 | -0.0200 | 0.459$^{***}$ |
| | (0.035) | (0.975) | (0.301) | (0.346) | (0.832) | (0.000) |
| Constant | 0.00985$^{***}$ | 0.00800 | 0.0169$^{**}$ | 0.0239$^*$ | 0.00241$^{**}$ | 0.00202$^{***}$ |
| | (0.000) | (0.172) | (0.008) | (0.033) | (0.002) | (0.000) |
| Observations | | | | | | 968 |

*Note: p-values in parentheses \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.00. Values in bold demonstrate statistically significantly coefficients. This table has to be read from left column to the right. Each title of the column (PVW, President, etc) represents independent factors in the regression. Row names (L.PVW, President, etc) demonstrate all variables that served as dependent. Rows represent the coefficient and p-values of the independent variables, hence, creating a matrix of interdependencies.*

## 5.1.2 Impact on the equal value portfolio

Running a VAR model regression with one lagged value gives me the result in Table 4. Overall, I achieve very similar outcomes with PEW to Table 3. Democratic presidency delivers, on average, a monthly return of 0.00652% than a Republican which almost coincides with the results from PWV. Something different happens with the influence of Congress, as this variable seems to lose its significance. Thus, **hypothesis 1 is still rejected**, however, **hypothesis 2 cannot be rejected with equal-weighted portfolios**. Most of the independent variables and controls still do not have any dependent effects, apart from the usual suspects in Table 3. Five-year bonds have higher monthly rates under the Republican presidency, while inflation rates are still higher in the long term under the Democratic party.

Elections play no role in this model either. There is a negative but not meaningful impact on the equal weighted portfolio returns (p-value of 0.692). I demonstrated insignificant changes in both PVW and PEW returns. Therefore, investors should not expect any abnormal deviations to the market rates three months prior to and post-elections. **Hypothesis 3 cannot be rejected again**, so I can state that there is no effect of elections on the S&P 500 portfolios. All results achieved in this section include the Granger Causality test within the VAR model specification (Table A5, chi column). *Additionally, all R-squared are significantly high which entails a high explanatory power (Tables A5).* **Accordingly, we observed causal relationships**.

**Table 4**

*Equal-Weighted Portfolio regression*

| | PEW | President | Congress | Elections | B5 | Inflation |
|---|---|---|---|---|---|---|
| L.PEW | 0.0903** | -0.0646 | -0.0590 | -0.00508 | -0.0192* | 0.00298 |
| | (0.005) | (0.342) | (0.428) | (0.969) | (0.029) | (0.266) |
| L.President | **-0.00652*** | 0.977*** | -0.00938 | -0.00370 | **0.00274**** | -0.0000618 |
| | (0.038) | (0.000) | (0.196) | (0.772) | (0.001) | (0.813) |
| L.Congress | 0.00403 | 0.00855 | 0.972*** | 0.00493 | 0.00102 | **-0.000605*** |
| | (0.230) | (0.227) | (0.000) | (0.718) | (0.266) | (0.030) |
| L.Elections | -0.00174 | 0.000321 | -0.00869 | 0.832*** | -0.000294 | -0.000417 |
| | (0.692) | (0.972) | (0.392) | (0.000) | (0.808) | (0.254) |
| L.B5 | 0.172 | 0.354 | 0.178 | 0.839 | 0.105** | -0.0151 |
| | (0.144) | (0.153) | (0.513) | (0.079) | (0.001) | (0.122) |
| L.Inflation | -0.668 | 0.0528 | -0.808 | -1.351 | -0.0146 | 0.459*** |
| | (0.052) | (0.942) | (0.308) | (0.333) | (0.877) | (0.000) |
| Constant | 0.0115*** | 0.00769 | 0.0170** | 0.0252* | 0.00243** | 0.00199*** |
| | (0.000) | (0.189) | (0.008) | (0.025) | (0.001) | (0.000) |
| Observations | | | | | | 968 |

*Note: p-values in parentheses * p < 0.05, ** p < 0.01, *** p < 0.00. Values in bold demonstrate statistically significantly coefficients. This table has to be read from left column to the right. Each title of the column (PVW, President, etc) represents independent factors in the regression. Row names (L.PVW, President, etc) demonstrate all variables that served as dependent. Rows represent the coefficient and p-values of the independent variables, hence, creating a matrix of interdependencies.*

**5.2 Reflection on the influence of political factors**

**Party of the President.** This paper confirmed the results of Santa-Clara and Valkanov (2003), Sabherwal et al (2017), and Wong & McAleer (2009). Democratic presidency indeed achieves, on average, higher monthly returns. Contrary, the research by Niederhoffer et al. (1970) and Herbst & Slinkman (1984) was rejected as Republican Presidents do not seem to provide higher returns anymore. This can be due to a larger database we currently possess and a change in the political spectrum in the US. Although, as was expected, controlling for Congress diminished the influence from 7% annual abnormal returns of Santa-Clara and Valkanov (2003) to 1.068% PVW and 1.08% PEW on an annual basis. Overall, it does not appear to be a huge return on investment (ROI) in the end. However, these results are statistically significant, hence, the Democratic President delivers a better outcome for investors.

There are a few possible explanations for this phenomenon. Previously it was mentioned that Democrats implement ideological policies of active income redistribution, social welfare support programs, and regulate markets more than their political competitors (Freeman, 1986). Naturally, we can assume that there can be an indirect relationship between income redistribution and stock market performance. Bowles and Gintis (1996) outline that institutional arrangements that provide efficient income redistribution facilitate the growth of the economy. At the same time, Thewissen (2014) advocates that income inequality has a negative relationship with economic development. Nazir et al. (2010) employed the analysis of economic growth on the stock market returns in African countries and found that there is a persistent trend of parallel movement of economic development and market returns. African countries provide a good framework in this context as their economies are rapidly developing and we can see a direct effect. Observing more stabilized economies, Antonious (2010) deep-rooted this assumption by demonstrating a similar outcome in Germany. The author claims that the rationale behind this causality is formed by increased corporate profits and higher investment activity. State government constructs an indirect impact by indulging in support programs. Positive conditions such as rising incomes contribute to overall consumer spending and expectations in the future. Hence, citizens start to spend and/or invest more which strengthens stock market returns. Meanwhile, professional investors adjust their expectations accordingly too.

Since the influence of social support and income redistribution is clear. I should analyse the power of tighter market regulations. Green et al. (2000) find a twofold effect of stock market regulations on the returns on equity. There is seemingly a considerable influence of higher transaction costs. To impose stricter control on the London Stock Exchange, the British government implements compliance regulations and certain restrictions on trading activity. Thus, authors conclude that it limits liquidity and lower stock market regulations can theoretically be associated with lower transaction costs. However, this topic is more of ethical nature, rather than a quantitative analysis I am performing in this research. On the other hand, by setting these regulations, the British government prevents jumping share volatility. The magnitude and frequency of stock market fluctuations were detected to be reduced as speculative and excessive trading are subject to regulation. Overall, the economists conclude that mature equity markets **benefit** from stricter market regulations as they enhance the stability of volatility. However, these rules have to be well-designed not to hurt the efficiency of trading.

Conclusively, this research supports the thesis of the Democratic presidency to improve market performance due to the specificity of party special welfare policies. Nevertheless, we should not forget that Congress has to be taken into account too.

**Party in Congress.** The influence of Congress on the stock market returns in this research is dualistic. I achieved significantly better market returns under Republican Congress with a value-weighted portfolio, however, nothing similar was displayed for the equal-weighted portfolio returns. Unlike, in the first hypothesis, we cannot see a clear-cut answer to the statement. Thus, a deeper discussion is required.

First, we see that it is indeed important to include this independent variable. The absence of Congress in the research of Santa-Clara and Valkanov (2003) might have provided such immense results. Meanwhile, I can also state that Pástor & Veronesi (2020) were indefinite about a spurious regression. Leblang & Mukherjee (2005) advocated that the Republican party should deliver higher market returns because of their 'business-friendly' approach in the form of tax reductions and less regulated markets which can result in the operational efficiency of firms. This assumption can be echoed for PVWs; however, it is not achievable for PEW. A question appears, what is the aspect driving this deviation?

A logical explanation lies in the structural difference between the two portfolios. PWVs base their weight on the current trading volumes of stocks which can be *sector concentrated.* According to Corporate Finance Institute (2023), the 11 most traded sectors in the S&P 500 are information technology, health care, financials, consumer discretionary, communication services, industrials, consumer staples, energy, utilities, real estate, and materials. According to LexisNexis report (2022), information technology and health care sectors are in the top two most innovative industries. Unsurprisingly, we can expect that these sectors will benefit from a free-market setup if to believe Green et. (2000) results. Thus, Republican de-regulated markets provide fertile land for innovative projects. This thesis is supported by Leblang & Mukherjee (2005), Freeman (1986), and Niederhoffer et al. (1970).

Apart from the obvious reason above, there is a phenomenon called 'sin stocks'. By definition, these are stocks issued by firms from industries with ethically questionable business models and negative social influence. The most popular examples include tobacco, alcohol, weapons, gambling, and adult entertainment industries.

In the research by Fabozzi et al. (2008), economists outlined that sin stocks perform better than a broad stock sample by 2-4% per year on average. Researchers list a few potential reasons highlighting investors' neglect of ethical concerns and an ability to capitalize on undervalued assets. Generally, these industries are considered to be of limited competition, hence, firms can achieve higher operational efficiency which positively affects share values. Finally, investors demand higher risk premia due to the constant risk of these industries being exposed in the news. Therefore, if these stocks are profitable and yield higher returns than ordinary options, we should expect these stocks to appear often in the S&P value-weighted portfolios in the relevant industry sectors (Yahoo Finance, 2023).

Sabherwal et al. (2017) conducted a research on the influence of the political party on the performance of sin stocks in the US. The authors confirmed the effective performance of sin stocks and added that under Republican administration in the White House and Congress majority, these stocks accomplish especially well. Economists explain this notion by relying on the similar argument listed before, Republicans are more conservative and are less expected to pass any innovative restrictions which will subsequently hurt the returns of sin stocks. Convincingly, there is economic evidence why value-weighted portfolios can perform better under the Republican Congress.

In conclusion, I provided evidence that during the combination of the Democratic administration and the Republican majority in Congress, investors can expect to achieve higher returns. This is an interesting finding as none of the earlier research reached a combined solution. Preceding papers always identified one party to deliver better outcomes. However, using a more complicated VAR model seems to stipulate a more granular product. As a robustness check, I performed a simple ARDL (1,1,1,1) model to sense check my results and achieved close to identical outcomes (values in parentheses display the number of lags for independent variables). However, R-squared values are reduced to approximately **60%** for both regressions, hence, VAR was indeed a better fit.

**Table 5**

*ARDL (1,1,1,1) model regression for Value-Weighted Portfolio*

| PVW | Coefficient | Std. err. | t | P>t | 95% LL | 95% UL |
|-----|------------|-----------|-----|-----|--------|--------|
| L.PVW | .0245 | .0325 | 0.75 | 0.451 | -.0393 | .0887 |
| L.President | **-.0056** | .0027 | -2.02 | 0.044* | -.0108 | -.0001 |
| L.Congress | **.0062** | .0029 | 2.06 | 0.039* | .0002 | .0117 |
| L.Elections | -.0049 | .0038 | -1.25 | 0.212 | -.0122 | .0027 |
| L.B5 | .1395 | .1021 | 1.37 | 0.172 | -.0608 | .3398 |
| L.Inflation | **-.6252** | .2981 | -2.10 | 0.036* | -1210.165 | -.0403 |
| Constant | .0098 | .0024 | 4.10 | 0.000*** | .0051 | .0146 |

*Note: p-values * p < 0.05, ** p < 0.01, *** p < 0.00. Values in bold demonstrate statistically significantly coefficients.*

**Table 6**

*ARDL (1,1,1,1) model regression for Equal-Weighted Portfolio*

| PEW | Coefficient | Std. err. | t | P>t | 95% LL | 95% UL |
|-----|------------|-----------|-----|-----|--------|--------|
| L.PEW | **.0904** | .0324 | 2.79 | 0.005* | .0269 | .1539 |
| L.President | **-.0066** | .0032 | -2.07 | 0.039* | -.0127 | -.0003 |
| L.Congress | .004 | .0034 | 1.20 | 0.232 | -.0026 | .0106 |
| L.Elections | -.0015 | .0045 | -0.39 | 0.693 | -.0105 | .0069 |
| L.B5 | .1732 | .118 | 1.46 | 0.146 | -.0599 | .4032 |
| L.Inflation | -.6685 | .3445 | -1.94 | 0.053 | -1345.257 | .0083 |
| Constant | .0116 | .0028 | 4.15 | 0.000*** | .0061 | .017 |

*Note: p-values * p < 0.05, ** p < 0.01, *** p < 0.00. Values in bold demonstrate statistically significantly coefficients.*

My results also emphasize the importance of bi-partisan collaboration during periods of split government. Coleman (2019) provided a framework accenting on the importance of trade-offs and more moderate policymaking under these conditions. Finally, I can reject the hypothesis of Pástor & Veronesi (2020) who attributed the presidential effect to the spurious regression as there was no effect found in the Congress variable. In this paper, I achieved statistically significant causal effects of both variables in two portfolio types.

**Elections.** Unlike in other papers, I did not find any causal relationship between presidential election periods and stock returns on either of the portfolios. One explanation can be methodological, Santa-Clara and Valkanov (2003) implemented a dummy variable where the whole year was checked. In my paper, I limited the election period to 3 months prior to and post-elections. My reasoning behind this choice was to avoid possible spurious regression as the whole year seems to be a large selection model which can be affected by out-of-sample factors.

From the theoretical point of view, Li & Born (2006) and Goodell & Vähämaa (2013) outlined that elections should play a role as uncertainty increases the volatility of stocks. However, what if investors are able to adjust their expectations faster than the preceding papers suggest? My sample and model are very long-term focused, and this research analysed all election periods in the last 100 years. Oppositely, risks may inflate stock prices in the short-term run which is out of the scope of this paper as a long-term effect dominates. A similar outcome was achieved by Jones and Banning (2009) who also did not detect any election impact in the US. Likewise, authors theorize that the effects in their model were short-lived and did not persist in the long run due to a quick adjustment by investors. This coincides with the infamous Efficient Market Hypothesis, that any abnormal effects will be quickly incorporated into the market.

To better understand this topic, further research is required. I would suggest using a more granular approach and trying to analyse the impact on the daily stock returns and account for emerging political news. For now, I cannot reject my Hypothesis #3 and I conclude that there are no election effects on the monthly stock returns.

# CHAPTER 6 Conclusion

In this thesis, I observed the effects of the US political parties in power on the monthly returns of S&P 500 portfolios. Previous research demonstrated that this topic displayed ambiguous effects as there was no common conclusion on which party tends to drive the stock market better. Older papers demonstrated that Wall Street should prefer the Red Elephant, while most of the recent works suggested that the Democratic party yields more, and election periods are worth looking at. This subject appears to be highly socially relevant as we can expect a cyclical relationship in the financial market. Hence, my thesis discussed whether the Democratic party delivers, on average, better returns while ruling in the White House and Congress and if election periods provoke abnormal returns.

To evaluate this hypothesis, I used a large database of monthly returns on the value- and equal-weighted S&P 500 portfolios from 1926 to 2021. All the political data was gathered from the Library of Congress which provided me with technical details on the election periods and a party in power. The results of the research supported some of the assumptions and rejected others. I indeed confirmed that the Democratic President seems more plausible to the investors as the aggregated annual return is more than 1% higher than under the Republican administration. Contrary, Republican Congress achieves better outcomes for the investors under the value-weighted portfolio supporting the thesis of earlier papers. A potential explanation can be hidden in the performance of sin stocks. Finally, election periods seem not to affect monthly returns and I can state this phenomenon as the evidence of Efficient Market Hypothesis.

To conclude, my study demonstrated that a split government could achieve the best S&P 500 portfolio returns. Democratic presidency provides significantly higher outcomes under both portfolios, while Congress operates more efficiently under the Republican rule for a value-weighted portfolio. Thus, my paper supports the thesis of Coleman (2019) that a split government can be an efficient political solution. More specifically, I showed that financial markets can reply positively to this political stage. On the other hand, I believe previous research overestimated the long-term influence of elections. Investors seem to adjust their expectations faster.

My paper suggests that investors should not rely on the abnormal returns from elections but rather focus on determining a likely winner of the presidential race and Congress majority. The results of these elections can have a periodic impact on the overall market performance. Unfortunately, this thesis also has its limitations. Abnormal returns as a dependent variable can provide more granularity and consistency, however, in the interest of time and due to lack of data availability, this procedure could not be accomplished by me.

Naturally, my thesis leaves a few unanswered questions which can be due to further research. First of all, election periods can be studied for the magnitude of the abnormal short-term effect and how quickly it is being absorbed in the market. For this purpose, the data about daily returns prior- and post-elections should be studied.

Secondly, an interesting finding of Republican Congress influence on the value-weighted but not equal-weighted portfolio stimulates the need for further exploration. Based on the research I conducted, the subject of sin stocks can be of attention due to abnormal returns of unethical stocks (Fabozzi et al., 2008). This can be a separate research question to see if there is a historic tendency of sin stocks to achieve higher yield under Republican governance. It will be informative to observe this trend using the same model as in my thesis.

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# APPENDIX A – Additional Tests and Checks

Table A1 demonstrates that a regression with the Lag order of 1 will provide the lowest AIC which indicates the best fit for the model. Hence, the model with one lagged value was implemented.

**Table A1**

*Lag-order selection criteria*

| Lag | df | p | AIC |
|---|---|---|---|
| 0 | | | -13,8555 |
| 1 | 36 | 0 | **-21,3461** |
| 2 | 36 | 0,011 | -21,3316 |
| 3 | 36 | 0,012 | -21,3168 |
| 4 | 36 | 0,001 | -21,3136 |

In Table A2, I tested for one of the crucial statistical assumptions of normality. As we can see, the data is strongly normally distributed.

**Table A2**

*Shapiro-Wilk W test for normality*

| Variable | Obs | W | V | z | Prob>z |
|---|---|---|---|---|---|
| r | 969 | 0.98613 | 8.5 | 5.293 | 0.000 |

In Table A3, I tested for the assumption of no autocorrelation. As we can see, there is no autocorrelation in the first two lags, hence, assumption is not violated.

**Table A3**

*Lagrange Multiplier test for autocorrelation*

| lag | chi2 | df | Prob > chi2 |
|---|---|---|---|
| 1 | 23.3368 | 36 | 0.53410 |
| 2 | 41.2958 | 36 | 0.25027 |

*H0: There is no autocorrelation.*

In Tables A5 and A6, I provide additional details about the goodness-of-fit of the models. As we can see, all explanatory variables are highly rated with the R squared more than 90%. Thus, I ca conclude that my model has a good explanatory power.

**Table A5**

*PVW Regression additional information*

|  |  |  |  | # obs | 968 |
| --- | --- | --- | --- | --- | --- |
| Log likelihood | 10367.42 |  |  | AIC | -21.33351 |
| FPE | 2.19e-17 |  |  | HQIC | -21.25299 |
| Det(Sigma_ml) | 2.01e-17 |  |  | SBIC | -21.12198 |

| Equation | Parms | RMSE | R-sq | chi2 | P>chi2 |
| --- | --- | --- | --- | --- | --- |
| pvw | 7 | .04144 | 0.0163 | 1600.852 | 0.0137 |
| president | 7 | .101182 | **0.9593** | 22840.59 | 0.0000 |
| congress | 7 | .110725 | **0.9443** | 16403.81 | 0.0000 |
| elections | 7 | .194804 | **0.6955** | 2210.631 | 0.0000 |
| b5 | 7 | .013143 | 0.0339 | 3401.647 | 0.0000 |
| inflation | 7 | .003992 | 0.2304 | 2898.514 | 0.0000 |

*Note: chi values in the last column represent the Granger causality test. All values are significant under 5%. Values in bold demonstrate that independent variables have high R-squared values that leads to a good explanatory power.*

**Table A6**

*PEW Regression additional information*

|  |  |  |  | # obs | 968 |
| --- | --- | --- | --- | --- | --- |
| Log likelihood | 10223.86 |  |  | AIC | -21.03689 |
| FPE | 2.94e-17 |  |  | HQIC | -20.95637 |
| Det(Sigma_ml) | 2.70e-17 |  |  | SBIC | -20.82536 |

| Equation | Parms | RMSE | R-sq | chi2 | P>chi2 |
| --- | --- | --- | --- | --- | --- |
| pew | 7 | .047978 | 0.0190 | 18.75686 | 0.0046 |
| president | 7 | .101225 | **0.9593** | 22820.04 | 0.0000 |
| congress | 7 | .110708 | **0.9443** | 16408.97 | 0.0000 |
| elections | 7 | .194857 | **0.6953** | 2208.883 | 0.0000 |
| b5 | 7 | .013136 | 0.0350 | 3512.334 | 0.0000 |
| inflation | 7 | .00399 | 0.2313 | 2913.214 | 0.0000 |

*Note: chi values in the last column represent the Granger causality test. All values are significant under 5%. Values in bold demonstrate that independent variables have high R-squared values that leads to a good explanatory power.*