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The Presidential Puzzle Revisited

Evidence for the 'Democratic premium' using the latest stock market data

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ABSTRACT

The ‘Presidential Puzzle’ describes the discrepancy in stock market returns under Democratic and Republican presidents in the U.S. I replicate a simplified version of the seminal work on the ‘Presidential Puzzle’ by Santa-Clara and Valkanov (2003) by clustering the standard errors and find that my results are largely consistent with their findings. For the value-weighted return portfolio the difference amounts to 15.31 percentage points and for the equal-weighted return portfolio this is 16.28 percentage points. The ‘Democratic premium’ is not concentrated around election dates, nor is it related to business-cycle variables connected with expected returns. The observed higher volatility under Democratic presidents for the whole sample is unlikely a result of recent crises. I provide evidence suggesting the higher excess returns can be explained by a risk premium. The ‘Democratic premium’ remains evident over the whole sample period but loses significance for the most recent subsample period.

Keywords: presidential puzzle, stock market returns, political cycle, financial economics

JEL code: *G140*

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1 Introduction

The interaction between the political cycle and stock market returns, also referred to as the 'Presidential Puzzle' has caught the attention of investors, scholars, and most importantly policymakers for some time. Research on this subject by academics has risen in more recent years. This phenomenon, which has originally been brought to light in the seminal study by Santa-Clara and Valkanov (2003) presents that stock market returns are significantly higher under Democratic presidential terms compared to their Republican opposition. Despite the discovering of this anomaly more than twenty years ago, its relevance remains apparent in our complex and highly politicized economic environment. This is clearly illustrated by the stock market performance during the recent transition from President Donald J. Trump to President Joseph R. Biden. As the presidency was passed on from a Republican to a Democrat, the S&P500 experienced a substantial growth, gaining over 14% in Biden's first 100 days in office, being one of the strongest starts for a U.S. president in recent history. [1] However, determining whether this event is a confirmation of the 'Presidential Puzzle' or merely a coincidence driven by other factors, shows the need for thorough and updated research. I investigate this phenomenon using an extended dataset, to further examine the lasting mystery of the 'Presidential Puzzle'. I aim to provide an updated view on this longstanding academic research and offer valuable insights in understanding the complex interaction between politics and financial markets.

In this thesis I set out the theoretical framework in which I discuss advances on the 'Presidential Puzzle' and sketch a view of the researched areas. I discuss the early work in this field after which I move on to the seminal work of Santa-Clara and Valkanov (2003). I then continue with the subsequent research performed and end with the critiques and controversies. After I set the theoretical framework, I outline my data sources and uses and describe the methodology. I then proceed to display the results which include establishing the correlation, controlling for business cycles influences, election shocks and the varying risk hypothesis. Thereafter, I discus the results and its limitations and draw my conclusion. I end with the implications and suggestions for further research. In contrast to the seminal work, I cluster the standard errors which give me more conservative results but allow me to make inferences with confidence.

I find a correlation between the political party and stock market performance. This correlation remains significant for the value-weighted excess return portfolio (VWR-TBL) after controlling for business-cycle variables including the dividend-price ratio, the term-spread, the default-spread and the relative

[1] (Daniel, Will) 26th April 2021 Markets.businessinsider.com 'The US stock market has seen better returns in Joe Biden's first 100 days than under any other president in the last 75 years' & (Cox, Jeff) 26th April 2021 CNBC.com 'Biden's 100-day stock market performance is the hottest going back to the 1950s' & spglobal.com 'S&P500'

rate. Based on my event study analysis, the election shocks do not play a role in explaining the difference in stock market performance under the two political parties. The cumulative abnormal returns do not show any significance around the time the election results are announced. Lastly, I find that volatility might give an explanation to the 'Democratic premium'. For the whole sample, the volatility under Democratic administrations is higher when including the control variables. This significant result indicates the 'Democratic premium' is merely a 'risk premium' and deserves further attention. It goes against the results of Santa-Clara and Valkanov (2003) who find higher volatility under Republican administrations. I argue that the added subsample period (1999:01 – 2020:12) influences this volatility.

Concluding the results show a similar pattern to that of the seminal work. Clustering the standard errors has a large impact on the significance but a 'Democratic premium' remain evident for some portfolios. The premium is not concentrated around the election dates. The added subsample period gives reason to suspect the higher returns under Democratic presidencies are a result of the higher volatility and therefore merely a 'risk premium'.

2 Theoretical Framework

The political cycle theory suggests cyclical shifts in policy can affect financial markets. Understanding this relationship can hold significant potential benefits for multiple parties involved. Financial analysts as well as investors could create forecasting models and implement this within investment strategies. For policymakers, it gives them a way of understanding the effects of certain political decisions allowing them to be better informed when making decisions. Economists and academics can research the topic since it challenges the efficient market hypothesis developed by Fama (1970). It advances on the idea that markets always reflect all relevant information and are therefore always perfectly efficient which should make it impossible to consistently achieve higher than average returns on investments. The market should be purely driven by fundamentals and not cyclical political events.

Santa-Clara and Valkanov (2003) can be considered the most influential study in this research area. With their paper, 'The Presidential Puzzle: Political Cycles and the Stock Market' they have shown compelling empirical evidence of significant stock market return discrepancies which are highly correlated with the incumbent U.S. President's political party. They find that the stock market shows significantly higher returns under Democratic presidential terms compared to Republican. They refer to this as the 'Presidential Puzzle'. This observation seems contradicting considering the pro-business approach typically associated with the Republican party.

2.1 Early work

The interaction between political cycles and the performance of the stock market has long been an area of academic interest, even well before we were introduced to the 'Presidential Puzzle'. The initial stages of this investigation were marked by a combination of curiosity, skepticism, and a growing field of empirical evidence.

Early efforts by Allvine and O'Neill (1980) triggered further academic research. Not only did their work highlight the potential existence of a presidential cycle in stock market returns, it also connected distinct patterns in market performance that seemed inevitably connected to the four-year presidential term. By unveiling a pattern where market performance moves parallel to the political cycle, they challenged traditional views on market dynamics, including the efficient market hypothesis (Fama, 1970). More researchers started to add on to this yet unexplored terrain. Notably Stovall (1992), building on earlier work, showed that U.S. stock markets generally display a weaker performance in the subsequent year after the election of a new president. This provided better insight into the political cycle patterns.

These earlier studies laid a foundation of an entirely new line of thought showing how the stock market, which was often viewed as a measure of the economy as a whole, could be influenced by the cyclical predictability of political changes. This led to deeper investigation into the underlying drivers behind these observations starting with Hensel and Ziemba (1995). Their sample consisted of observations from 1929 to 1992. When looking at small capitalization stocks, they found that there was a difference of 18.6 percent percentage points between Democratic and Republican administrations. The statistical significance of this difference has later been confirmed by Johnson, Chittenden and Jensen (1999). They find a difference of over 20 percentage points for the small capitalization stocks between the two administrations.

2.2 Seminal work

The groundbreaking work of Santa-Clara and Valkanov (2003) shifted the research area in a way that it built upon the initial observations and theories of their predecessors, but simultaneously suggests a new view on the political cycles' impact on stock returns. They apply econometric models to analyze the dataset from 1927 to 1999. The comprehensive dataset allows them to capture bigger trends of the relationship between presidential cycles and stock market returns. This all while taking into account significant events, varying economic conditions, and different administrations across the whole timespan. Their research results in a counterintuitive observation: they find that the stock market performs significantly better under Democratic than under Republican presidents. This result is robust after controlling for multiple macro-economic and business cycle variables such as inflation and interest rates. Their discovery contradicts the conventional thought because Republicans are commonly associated with their pro-business ideology. Santa-Clara and Valkanov (2003) coined this discrepancy the 'Presidential Puzzle'. This phenomenon has far-reaching implications. It presents an anomaly that challenges the understanding of factors influencing the stock market. The seminal work serves as a starting point for future research, leading to various studies trying to either explain and replicate or challenge their findings.

2.3 Subsequent research

Santa-Clara and Valkanov (2003) attracted attention within the academic community leading to more research on politics and stock market dynamics. Pástor and Veronesi (2013) responded to their research by proposing a framework explaining the higher stock prices observed under Democratic presidents. According to them, those higher prices are driven by the increasing uncertainty about government policies under Republican presidents. By introducing this new argumentation, they added an extra layer of complexity to the puzzle, assuming uncertainty to be the main influence of market behavior. In parallel, researchers began to compare the findings and examine whether similar dynamics can be observed in the political cycles and stock market returns of countries outside the U.S. (Bohl & Gottschalk, 2006) provides an analysis using an international dataset of 15 countries. They show that the 'Democratic premium' is not strikingly a pervasive global phenomenon. Białkowski, Gottschalk

and Wisniewski (2008) investigates the stock market volatility around national elections for 27 OECD countries from 1980 to 2005. They find that the national elections trigger a higher stock market volatility. They dedicate this to the uncertainty hypothesis, meaning that the period leading up to the elections is usually accompanied by higher uncertainty which is reflected through a more volatile stock market. The international research spans a lot further than those two studies.[2] By placing it in the international context, those comparisons broaden the narrative and provide a more complete and nuanced understanding of this phenomenon and its global relevance. Simultaneously, the robustness of Santa-Clara and Valkanov (2003) findings is tested when academics try to replicate the study using different methodologies and datasets.

2.4 Critiques and controversies

The causal direction of the relationship assumed by Santa-Clara and Valkanov (2003) has been a main topic of debate. They show a strong correlation between the political cycle and stock market returns but proving a real causal relationship has been challenging. Critics such as Sy & Al Zaman (2011) claim this ambiguity disturbs the interpretation of the 'Presidential Puzzle' and argue it needs further research to separate correlation from causation. Santa-Clara and Valkanov (2003) assume the political events, and the election of the president in particular, to be exogenous events. They acknowledge that there are numerous models predicting the outcome of presidential elections using economic data. This limitation is further explained in Snowberg, Wolfers and Zitzewitz (2007). They provide an alternative explanation for the 'Presidential Puzzle' by looking at data from prediction markets and find that the perception of economic performance under different parties may be influenced by partisan bias. The perceived performance under different presidents may be more related to the affiliation voters have towards the party rather than the actual economic performance. This influences the 'Presidential puzzle' in a way that for example investors believe the economy will perform better under one party and therefore might invest more when that party is in power. This creates a self-reinforcing effect driving up stock prices even further.

In addition, Santa-Clara and Valkanov (2003) methodological choices have been criticized and other academics argue that alternative econometric models or control variables could yield different interpretations of the data. One of those main arguments is concerning the robustness of the observed effect when different financial and economic variables are incorporated into the analysis. Pástor & Veronesi (2013) comes closest to addressing this critique. This has to do with their relatively small sample size. While they do have a lot of observations, the number of presidential elections amounting to 18 might not be enough to capture every factor that can affect the relation between the presidential cycle and the stock market performance.

[2] Cahan, Malone, Powell and Choti (2005), Anderson, Malone and Marshall (2008), Hudson, Keasey and Dempsey (1998), Füss & Bechtel (2008), Döpke & Pierdzioch (2006)

3 Data

In this section I will outline the variables that I used in this study. In line with the study of Santa-Clara and Valkanov (2003), I break it down into three categories for conveniency: Financial variables, Political variables, and Control variables. A summary of these statistics can be found in Table I. All data are monthly, spanning from January 1927 to December 2020. This period includes 1129 monthly observations, 23 elections 7 Democratic and 7 Republican presidents.

With regard to the subsample lengths, I choose to maintain the original subsample boundaries and extend the study with a third subsample containing the time period 1999:01 – 2020:12. Even though the third subsample is shorter, it ensures a direct link to the original study. Preserving the original subsample boundaries makes my results more comparable to theirs. An alternative would be to create equal-length subsamples. This would better distribute the data over the different subsamples. However, this is not needed since Santa-Clara and Valkanov (2003) find the same results when performing the regressions with different subsample lengths. They find that as long as there are enough monthly observations for when both political parties were in office, which is at least 2 different presidential terms, the subsample length does not influence the results much. Therefore, by employing the first strategy of creating three different subsamples, I am able to assess if the original findings hold for the 21st century, which has seen significant changes in political and financial structures. This simultaneously serves as a robustness check for the obtained results by Santa-Clara and Valkanov (2003). I analyze the following subsamples in addition to analyzing the full sample: The first subsample from 1927:01 to 1962:12 includes the Great Depression and World War II. It contains 444 observations with 4 Republican and 6 Democratic presidencies. The second subsample from 1963:01 to 1998:12 includes Black Monday and its subsequent recovery. It contains 5 Democratic and 6 Republican presidencies. And the third subsample from 1999:01 to 2020:12 includes the Global Financial Crisis and partially the effect the Covid-19 pandemic has had on the stock market. It contains 3 Republican and 2 Democratic presidencies.

3.1 Financial

I use the log monthly returns for the equal-weighted (EWR_t) and value-weighted (VWR_t) portfolios from the CRSP database. Next to this I compute the log interest rate (TBL_t) from the three-month Treasury bill for which I access the Federal Reserve Economic Database. For more stock return data, I refer to Compustat. For the historical inflation rates (INF_t) data I use the USinflationcalculator which contains monthly data from 1914 to 2023.

I calculate the volatility (VOL_t) using daily stock return data from the CRSP database. I compute the volatility by calculating the standard deviation for each month within each year as argued by Markowitz (1952).

3.2 Political

As political dummies I use $RD_t = 1$ if a Republican president is in office at time *t* and $RD_t = 0$ if that is not the case. Similarly, $DD_t = 1$ if a Democratic president is in office at time t and $DD_t = 0$ otherwise. This dummy variable is motivated by a 'partisan' view of political cycles discussed in Alesina (1987) and Hibbs (1977), who highlight the difference in policies of the two political parties. Arguing that core policy decisions which are mainly related to consumption taxes, government spending and social benefits are different under Democrats and Republicans.

3.3 Control

I employ a set of conditioning variables to examine their effects on the economic landscape.

The conditioning variables I use are the annualized logarithmic dividend-price ratio (DP_t), the term spread (TSP_t), which is derived from the difference between the yield to maturity of a 10-year Treasury note and the three-month Treasury bill, the default spread (DSP_t) between yields of BAA- and AAA-rated bonds, and the relative interest rate (RR_t) computed as the deviation of the three-month Treasury bill rate from its one-year moving average. The control variables are also from the CRSP database.

Their relation to the stock market and predictive powers have been proven in the following papers Campbell & Shiller (1988), Fama (1989), and Fama & French (1988), but is not limited to these studies. [3]

[3] Other notable studies proving the predictive power of the control variables: Chen, Roll and Ross (1986), Naranjo, Nimalendran and Ryngaert (1998), Patelis (1997), Chen, Lesmond and Wei (2007), Gilchrist & Zakrajšek (2012).

Table I

Summary Statistics Financial and Control Variables

The table reports the sample average (Mean), standard deviation (Std.Dev) and number of observations (Obs) of all financial and control variables used in this thesis. All returns are in logarithmic form and expressed in annualized percentage points.

	1927:01 - 2020:12			1927:01 - 1962:12			1963:01 - 1998:12			1999:01 - 2020:12		
Series	Mean	Std.Dev	Obs	Mean	Std.Dev	Obs	Mean	Std.Dev	Obs	Mean	Std.Dev	Obs
VWR-TBL	5.53	22.34	1129	16.36	20.63	444	-11.40	7.56	432	15.07	23.04	277
VWR-INF	9.05	9.15	1129	10.81	11.75	444	7.76	6.88	432	8.53	7.20	277
EWR-TBL	7.80	24.66	1129	19.52	26.06	444	-9.47	9.75	432	16.47	23.45	277
EWR-INF	11.32	13.08	1129	13.97	17.39	444	9.69	9.19	432	9.93	9.44	277
TBL-INF	0.29	1.64	1129	-0.46	17.19	444	1.60	0.40	432	-0.55	1.86	277
VOL	10.93	7.90	1129	11.85	9.47	444	8.89	5.28	432	12.69	7.90	277
DP	-3.39	1.82	1129	-4.61	1.79	444	-3.18	1.35	432	-1.65	0.62	277
DSP	1.10	0.60	1129	1.23	0.79	444	1.02	0.46	432	1.02	0.41	277
TSP	1.16	1.28	1129	0.51	0.71	444	1.63	1.48	432	1.47	1.25	277
INF	2.26	4.57	1129	0.99	5.61	444	3.91	3.25	432	1.79	3.43	277
RR	0.03	0.04	1129	0.02	0.04	444	0.04	0.05	432	0.02	0.02	277

The return portfolios should be interpreted as follows: VWR-TBL creates the excess value weighted return portfolio by subtracting the three-month Treasury bill rate, which serves as a risk-free rate, from the value-weighted returns. This approach is widely used and discussed by Sharpe (1964) as well as Fama & Macbeth (1973). This same principle goes for the equal-weighted return portfolio (EWR-TBL). VWR-INF and EWR-INF display the real market return for both value- and equal-weighted portfolios by subtracting the inflation rate. Lastly TBL-INF reflects the real risk-free rate of return, again by subtracting the inflation rate.

4 Methodology

First, I plot a chart to visually analyze the excess value-weighted returns for every president in my dataset. By computing the average returns, I can determine which president is associated with higher-than-average returns and link this to their political party to get a generalized view of how the stock market performs in relation to both parties.
I run a regression to determine the correlation between real- and excess returns and political variables.

$$r_{t+1} = \alpha_1 RD_t + \alpha_2 DD_t + u_{t+1} \tag{1.1}$$

The returns are presented by r_{t+1}. As seen in the equation, the lag shows that the political variables are already known at the beginning of the return period. Where the presidential dummies are *RD* for Republican and *DD* for Democratic. I want to check if there is a difference in the returns for one of the two parties by constructing the hypotheses accordingly: the null hypothesis of no difference between the coefficients $\alpha_1 - \alpha_2 = 0$ and the alternative hypothesis of $\alpha_1 - \alpha_2 \neq 0$.
Santa-Clara and Valkanov (2003) use two subsamples containing 1927:01-1962:12 and 1963:01-1998:12. I additionally compare the other subsample containing the data for the period 1999:01-2020:12. Secondly, in contrast to Santa-Clara and Valkanov (2003), I perform my regression analyses with clustered standard errors by president whereas they use asymptotic standard errors using the Newey-West (1987) approach as well as bootstrapping their standard errors.

If I have established that there is a difference in returns between Democratic and Republican presidencies, I replicate the methodology employed by Santa-Clara & Valkanov (2003) to check whether the returns should be connected to either expected or unexpected returns using their three different approaches.
Approach one suggests the political cycle could be proxying for variations in expected returns by cause of business-cycle fluctuations. To test this hypothesis, I examine the relation between the political dummies and returns using multiple macro-economic variables, proven to forecast the stock market, as control variables for business cycle fluctuations. The control variables are the variables defined in the data section.

$$r_{t+1} = a_1 RD_t + a_2 DD + X_t + u_{t+1} \tag{2.1}$$

Expected returns are explained by the following: X_t is a vector which contains multiple macroeconomic variables related to the business cycle; the default spread (DSP_t), the term spread (TSP_t), the log dividend yield (DP_t), and the relative interest rate (RR_t). a_1 and a_2 serve as coefficients which should

equal zero if political variables contain information solely about returns that can be explained by business cycle fluctuations. RD and DD again denote the political dummy variables.

The second approach assumes a difference in realized returns due to the volatility around election dates. It implies there should be a large return around the time the results are revealed if there is a significant discrepancy in the expected returns between Democrats and Republicans.
I plot the cumulative abnormal returns (CARs), explained by MacKinlay (1997), surrounding election dates that were won by Republicans or Democrats for the latest subsample and the elections analyzed by Santa-Clara and Valkanov (2003) to see if the returns differ significantly after the election result is announced. Next to this I perform a t-test to check if the election results significantly impact the stock market returns.

The third approach is the 'risk premium' approach. It assumes there is a compensation for risk which explains the difference in returns under Democratic presidents. This might be due to the different economic policies pursued by both parties. Republicans tend to be more pro-business biased in contrast to Democrats. However, the risk could also be an outcome of uncertainty among actors on the stock market about these policies. This discrepancy in the riskiness of the stock market should logically lead to a risk premium for investors to compensate for the higher risk during a specific presidential period. I measure the volatility of returns during Democratic and Republican presidencies as a means of examining this hypothesis as follows: Under the null hypothesis volatility is constant during both presidencies $\alpha_1 = \alpha_2$ and alternatively $\alpha_1 \neq \alpha_2$. Using the following regressions:

$$VOL_t = \alpha_1 RD_t + \alpha_2 DD_t + \varepsilon_t \tag{3.1}$$

Regresses the monthly volatility, VOL, on the political dummies RD and DD. And,

$$VOL_t = \alpha_1 RD_t + \alpha_2 DD_t + \gamma X_t + \varepsilon_t \tag{3.2}$$

where X_t includes the control variables, *DSP, TSP, DP* and *RR*.

I compute the VOL variable using daily stock return data and calculate the monthly standard deviations form daily return data with the help of a pivot table function in excel.

Combining the three approaches, I am able to conclude if the observed difference in returns between the two parties is attributed to variances in the expected returns that investors had anticipated before the

events took place. The difference in unexpected returns may suggest a consistent positive surprise among investors during Democratic presidencies.

5 Results

As my study runs in line with Santa-Clara and Valkanov (2003) I compare most of my results to theirs to see if the 'Democratic premium' remains evident to this day. To test the robustness of their findings I compare the datasets and replicate the analyses but, simultaneously, add the most recent data and cluster the standard errors by president. A quick overview of average stock market performance gives a brief insight into the performance per president as well as the performance per political party. Figure 1 plots the average excess value-weighted return for each president in the period 1929 to 2021. Democrats are shaded in a darker color. The dashed line denotes the average return of the data meaning every bar above the dashed line has shown higher-than-average excess returns. Democratic presidents have all been associated with higher-than-average excess returns in this series with a total number of 7 (100%). However, Republican presidents show different results: 3 out of 8 have shown lower-than-average returns. The difference being 100 percent (Democratic) to 62.5 percent (Republican) showing excess value-weighted returns.

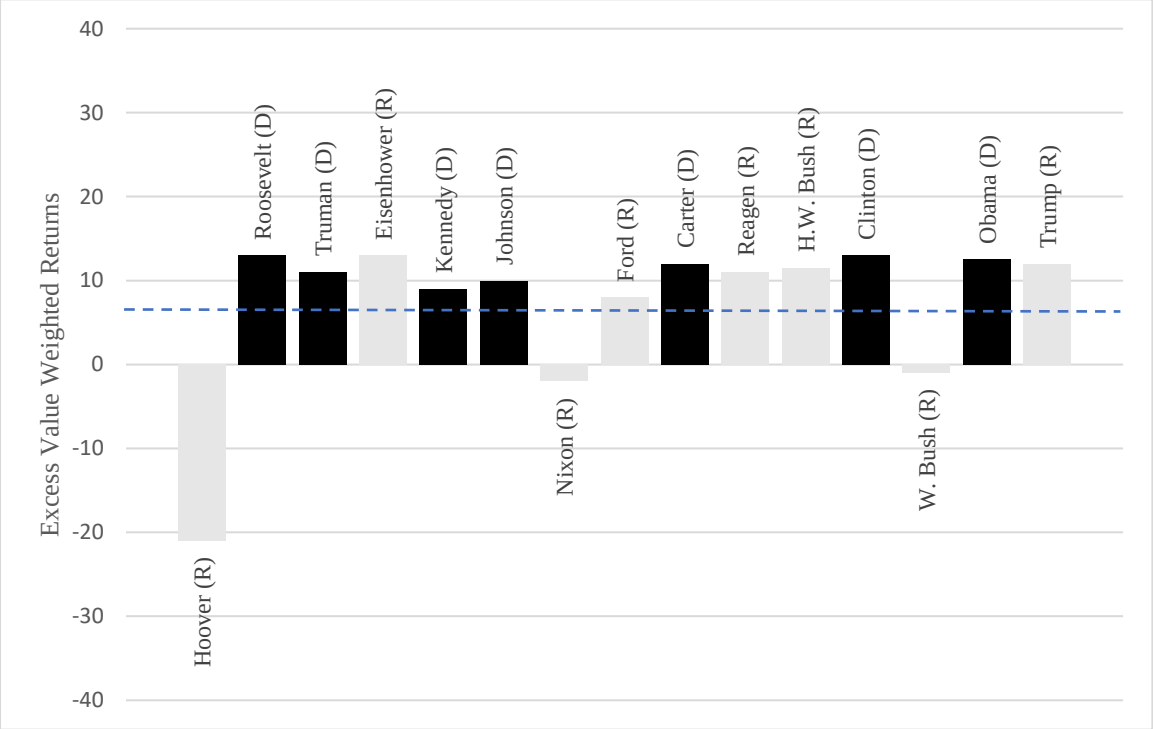


Figure 1. Average annual excess return by president, 1929 to 2021 (excluding President Coolidge). Figure 1 displays the average annualized excess value-weighted returns for each president for the period 1929 to 2021. Democratic presidents are displayed with a darker shade. The average excess return is denoted with a dashed line. All Democratic presidents in my sample are associated with higher-than-average excess returns whereas only 5 (out of 8) Republican presidents have been associated with higher-than-average returns.

Santa-Clara and Valkanov (2003) do not include the presidency of Coolidge in their empirical analysis. Which is most likely due to incomplete data of the full presidential term. This can still be considered noteworthy since it shifts the overall view in favor of the Republicans due to the highest average value weighted return. I retrieve the missing observations for the earlier years from the tradingeconomics.com United States stock market index (US30) dataset.

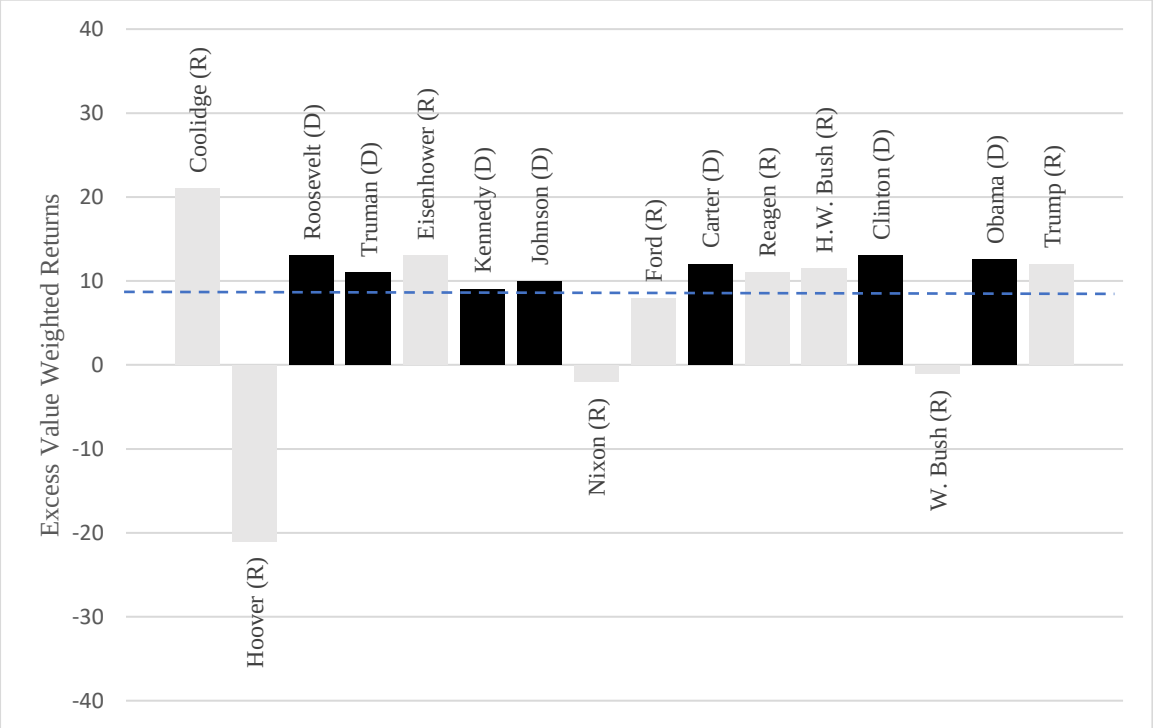


Figure 2 Average annual excess return by president, 1926 to 2021 (including President Coolidge). Figure 2 displays the average annualized excess value-weighted returns for each president for the period 1926 to 2021. Democratic presidents are displayed with a darker shade. The average excess return is denoted with a dashed line. All Democratic presidents in my sample are associated with higher-than-average excess returns whereas only 5 (out of 9) Republican presidents have been associated with higher-than-average returns.

Excess stock market return for President Coolidge accounted for 265.96% is the largest of any U.S. presidency.[4] However, when examining the figure including Coolidge, the absolute numbers remain the same and percentage wise it negatively impacts Republicans only slightly with about seven percentage points (62.5% – 55.6%). This is due to the upward shift of the average return line which drops President Ford (Republican) under the average return line keeping the number of Republican presidents showing higher-than-average excess returns the same. One limitation for this technique of filling the missing data is not having the exact same index as a comparison. This only minimally impacts the results as I compare the results of the two different indexes and find they are identical for almost every period. Concluding, Democratic presidents have shown, both in absolute as in percentage terms, higher-than-average excess value weighted returns compared to Republican presidents.

4 Joel Anderson. Yahoo Finance (2023, June 18). How has the stock market performed under each president? http://bit.ly/stockmarketperformanceunderpresident

5.1 Establishing Correlation

The chart leads me to perform the regression (1.1) to check the correlation between the return portfolios and the political dummy variables. Table II shows the results of $r_{t+1} = \alpha_1 RD_t + \alpha_2 DD_t + u_{t+1}$. For the real value- and equal-weighted return portfolios, I find highly significant coefficients for the two presidencies. For VWR-INF this amounts to 9.38 for the Republican dummy and 8.77 for the Democratic dummy. For EWR-INF this is 11.16 and 11.54 for the Republican and Democratic dummies respectively. For both parties I do not observe a significant difference. For the whole sample, the value and equal weighted excess return portfolios do not have any significance. The real T-bill rate (TBL-INF) 11.95 is significant for the Republican dummy. The only significant differences occur in the first subsample period of 1927:01 – 1962:12. For the value weighted excess returns portfolio (VWR-TBL) the difference of 17.23 in favor of the Democrats is significant under the p-value of 0.05. In this period the real T-bill rate difference of 18.95 is also significant under the 0.05 p-value. The second subsample period 1963:01 – 1998:12 displays significant coefficients for all the variables for both the Republican and Democratic dummy. The added subsample period of 1999:01 – 2020:12 shows significant results for the equal- and value-weighted portfolios (EWR-INF & VWR-INF). The Republican and Democratic dummy variable show highly significant coefficients for all the different portfolios. The reported difference is not significant.

The real T-bill rate difference (TBL-INF) of 16.75 is very different to that of Santa-Clara and Valkanov (2003) who find a difference of 3.70 percentage points. An explanation might be the added subsample which includes the 2008 Financial Crisis during which the Federal Reserve lowered the federal funds rate to zero to stimulate the economy, resulting in lower Treasury bill rate (Cecchetti, 2008). It also includes the Covid-19 pandemic again forcing the FED to cut rates to near zero in March 2020 (Clarida et al., 2021).

This underlines the value of employing excess returns to examine their correlation with political variables. Contrarily, Johnson et al. (1999) and Hensel & Ziemba (1995) focus on stock returns and not excess returns which often results in smaller observed differences between Republican and Democratic administrations.

Table II
Average Returns under Democratic and Republican Presidents

Table II reports the mean excess and real returns of value- and equal-weighted portfolios, VWR-TBL, VWR-INF, EWR-TBL, EWR-INF, and the real interest rate; TBL-INF, during Democratic (DD) and Republican (RR) presidencies. The rates are represented in annualized percentage points. The number below the coefficients RD and DD represent the p-values under the null hypothesis that the estimates are not significantly different from zero (Equation [1.2] $\alpha_1 - \alpha_2 = 0$). The p-value is the result of the test conducted using clustered standard errors by president. The row 'Obs' displays the number of observations for each period. 'R2' shows the average adjusted R2 for the regressions. * p < .05, ** p < .01, *** p < .001.

	1927:01 - 2020:12			1927:01 - 1962:12			1963:01 - 1998:12			1999:01 - 2020:12		
	RD	DD	Diff	RD	DD	Diff	RD	DD	Diff	RD	DD	Diff
VWR-TBL	-2.57	13.56	-16.14	5.14	22.37*	-17.23*	-12.40***	-10.15***	-2.25	4.70	26.30	-21.60
	0.494	0.148	0.114	0.424	0.046	0.161	0.000	0.000	0.260	0.332	0.178	0.259
VWR-INF	9.38***	8.77***	0.61	11.75*	10.03**	1.72	8.33***	7.06***	1.27	8.32***	8.76**	-0.44
	0.000	0.000	0.716	0.038	0.001	0.725	0.000	0.000	0.112	0.000	0.003	0.692
EWR-TBL	-0.79	16.34	-17.13	6.83	26.27*	-19.45	-10.35**	-8.38***	-1.96	6.16	27.63	-21.48
	0.842	0.105	0.115	0.403	0.046	0.184	0.002	0.000	0.439	0.196	0.156	0.250
EWR-INF	11.16***	11.54***	-0.38	13.44	13.93**	-0.49	10.39***	8.82***	1.56	9.77***	10.09**	-0.32
	0.000	0.000	0.886	0.068	0.004	0.944	0.000	0.000	0.198	0.000	0.005	0.831
TBL-INF	11.95**	-4.80	16.75	6.61*	-12.34	18.95*	20.73***	17.21***	3.53	3.62	-17.54	21.16
	0.002	0.571	0.078	0.011	0.151	0.049	0.000	0.000	0.127	0.421	0.353	0.289
Obs		1129			444			432			277	
R2		0.08592			0.11556			0.0546			0.13112	

5.2 Controlling for business cycle influences

I check if the 'Democratic premium' is not merely influenced by other factors which predict stock market returns. This is what would be the 'proxy' explanation. If this is the case, the strong correlation would be inevitable. To do so, I control for business cycle variables which leads to the following regression (2.1).

Table III
Average Returns under Democratic and Republican Presidents, Controlling for Business-Cycle Variables

Table III displays the results from $r_{t+1} = \alpha + \beta\pi_t + \gamma X_t + u_{t+1}$. Regressing returns on political variables and control variables. It reports the mean of excess and real value- and equal-weighted return portfolios; VWR-TBL, VWR-INF, EWR-TBL, EWR-INF, and the real interest rate; TBL-INF, during Democratic (DD) and Republican (RD) presidencies. X_t denotes the control variables; dividend-price ratio (DP), the default spread (DSP), the term spread (TSP), the inflation rate (INF) and the relative rate (RR). The rates are represented in annualized percentage points. The number below the coefficient of RD and DD shows the p-value under the null hypothesis that the estimates are not significantly different from 0 which would be revealed through β. This should equal 0 if political variables contain information solely about returns that can be explained by business cycle fluctuations. The p-value is the result of the test conducted using clustered standard errors by president. The row 'Obs' displays the number of observations for each period. 'R^2' shows the average adjusted R^2 for the regressions. * p < .05, ** p < .01, *** p < .001.

	1927:01 - 2020:12			1927:01 - 1962:12			1963:01 - 1998:12			1999:01 - 2020:12		
	RD	DD	diff	RD	DD	Diff	RD	DD	Diff	RD	DD	Diff
VWR-TBL	-13.44	1.87	-15.31*	-12.49	-0.91	-11.59*	-6.94***	-6.23**	0.71	-13.37	6.34	-19.71
	0.057	0.859	0.045	0.056	0.902	0.018	0.000	0.001	0.479	0.361	0.788	0.182
VWR-INF	1.82*	2.17	-0.35	2.30	0.22	2.08	5.09**	5.02**	0.072	2.37	3.44	-1.07
	0.047	0.196	0.707	0.215	0.948	0.363	0.001	0.001	0.902	0.423	0.419	0.427
EWR-TBL	-14.36*	1.92	-16.28*	-14.96*	-1.82	-13.14*	-4.40	-4.18*	-0.22	-14.57	5.84	-20.41
	0.042	0.851	0.033	0.043	0.820	0.012	0.083	0.032	0.898	0.276	0.795	0.158
EWR-INF	0.90	2.22	-1.32	-0.17	-0.70	0.52	7.63**	7.07***	0.56	1.17	2.93	-1.77
	0.536	0.329	0.295	0.942	0.852	0.808	0.006	0.000	0.669	0.827	0.632	0.341
TBL-INF	15.26*	0.30	14.96	14.79*	1.13	13.67*	12.03***	11.25***	0.78	13.57	-2.91	18.65
	0.031	0.979	0.055	0.024	0.893	0.029	0.000	0.000	0.222	0.370	0.915	0.228
Obs		1129			444			432			277	
R^2		0.31996			0.44144			0.14146			0.31554	

When adding the control variables, some of the coefficients lose its significance and others become significant. For the whole sample, the difference in both VWR-TBL and EWR-TBL are significantly different under the p-value 0.05 with -15.31 for the value-weighted portfolio and -16.28 for the equal weighted portfolio. The magnitude decreases only slightly. It shows a higher return under the Democratic presidents in relation to Republican presidents. The real portfolios VWR-INF and EWR-INF lose almost all of their significance. Only for the Republican dummy the VWR-INF, EWR-INF and TBL-INF remain significant. The magnitude decreases by 7.56 percentage points for VWR-INF and by 13.57 for EWR-TBL. The first subsample again shows significance in the difference for both VWR-TBL, EWR-TBL and TBL-INF. For the real return portfolios, the results remain insignificant. The second subsample period loses significance for almost all variables but remains significant for the Democratic variable for every variable and RD loses it only for EWR-TBL. The individual dummies lose their significance in the last subsample period for VWR-INF and EWR-INF.

It shows that the political dummies have explanatory power over expected returns that are statistically independent to the business-cycle control variables.

5.3 Election shocks

Santa-Clara and Valkanov (2003) pose election shocks to be another way to distinguish between expected or unexpected returns. If there is a discrepancy in the expected returns between Democratic and Republican administrations, they would expect a big return around the time the results of the election are revealed.

Say the higher excess returns I find for Democratic presidencies are due to a greater risk, the return would drop when a Democrat is announced as president. However, there will not be an immediate reaction to the result if the discrepancy is because of higher unexpected returns under Democrats. Unlike Santa-Clara and Valkanov (2003) I plot cumulative abnormal returns around recent election dates.

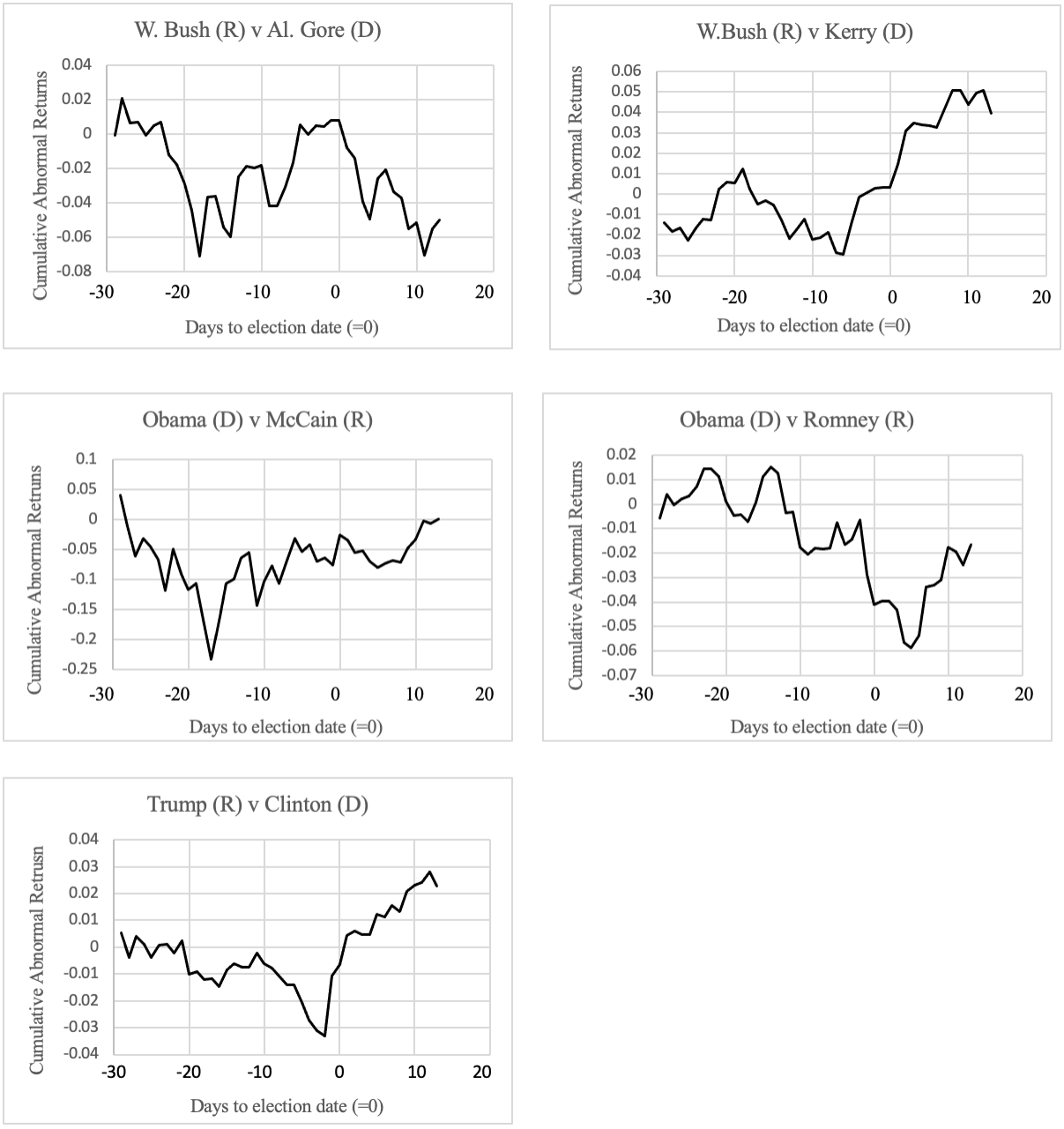


Figure 3 Cumulative Abnormal Returns around election dates. The figure shows the CARs for elections which took place in the latest subsample period 1999:01 – 2020:12. The elections were won by a Republican 3 times (top row and bottom row) and a Democrat (Obama) twice.

The graphs of W.Bush show contradicting results. After his first election, the cumulative abnormal returns decreased slightly only to pick up days after but his second election the cumulative abnormal returns increased after the announcement. For Obama, the first election remains very stable and no change in CARs can be inferred. For the second election (Obama v Romney) it shows a slight decrease but returns to the starting level after seven days. The Trump v Clinton election shows a slight increase in CARs the first days after the election.
A t-test for the five election results all show insignificant results. I cannot infer that the election results have a significant impact on stock market returns.

5.4 Varying risk

Lastly, I examine the chance of 'varying risk' to explain the higher realized returns as tested by Santa-Clara and Valkanov (2003). I want to see if the volatility is significantly different under different political administrations to check whether the 'Democratic premium' could be a compensation for risk. A 'Democratic premium' would justify to merely be a risk premium if I find significantly higher volatility under Democratic presidents.

Table IV
Volatility during Democratic and Republican presidencies

Table IV displays the result from regression equation 3. Panel A displays $VOL_t = \alpha_1 RD_t + \alpha_2 DD_t + \varepsilon_t$ and Panel B displays $VOL_t = \alpha_1 RD_t + \alpha_2 DD_t + \gamma X_t + \varepsilon_t$. X_t denotes the control variables; dividend-price ratio (DP), the default spread (DSP), the term spread (TSP), the inflation rate (INF) and the relative rate (RR). Under the null hypothesis volatility is constant during both presidencies $\alpha_1 = \alpha_2$ and alternatively $\alpha_1 \neq \alpha_2$ which is displayed in the 'Diff' column. The first number under the coefficients is the p-value of the test conducted using clustered standard errors by president. Column 'Obs' displays the number of observations for each period and column R^2 displays the obtained R-squared form the regressions. * p < .05, ** p < .01, *** p < .001.

Period	RD	DD	Diff	Obs	R^2
			Panel A: No Controls		
1927:01 - 2020:12	11.27***	10.67***	0.60	1129	0.0015
	0.000	0.000	0.745		
1927:01 - 1962:12	12.24*	11.61**	0.63	444	0.0010
	0.039	0.001	0.904		
1963:01 - 1998:12	9.76***	7.79***	1.96	432	0.0342
	0.000	0.000	0.094		
1999:01 - 2020:12	12.64***	12.74**	-0.09	277	0.0000
	0.000	0.001	0.945		
			Panel B: With Controls		
1927:01 - 2020:12	3.86***	4.36*	-0.49	1129	0.3014
	0.000	0.011	0.617		
1927:01 - 1962:12	3.88	2.28	1.60	444	0.4075
	0.075	0.370	0.431		
1963:01 - 1998:12	7.22**	6.01**	1.21	432	0.1157
	0.001	0.009	0.179		
1999:01 - 2020:12	0.64	2.04	-1.40	277	0.4416
	0.715	0.474	0.408		

I find that volatility is higher by 0.60 percent under Republican administrations than under Democratic for the whole sample. This is almost identical to the first subsample result. However, the findings are not significantly different. The individual coefficients are significant but show, for the first two subsamples, higher volatility under Republican presidential terms than Democratic. When analyzing panel B with the control variables the results change quite drastically. The whole sample period 1927:001 – 2020:12 now shows a higher volatility under Democrats opposed to Republicans. The coefficient of the whole sample is not significant, neither are the other three subsamples. For the most recent subsample 1999:01 – 20202:12 the coefficient of the difference shows a higher volatility under Democratic administrations. I must be careful interpreting this since its individual coefficients are not

significant. The negative magnitude is noteworthy. It implies that the volatility is higher for the period, under Democratic presidents. This is in line with the 'risk premium' hypothesis. It goes against the findings of Santa-Clara and Valkanov (2003).

6 Discussion

In my analysis I cluster the standard errors by president. Santa-Clara and Valkanov (2003) use various other econometric techniques to make their results more robust including bootstrapping the regressor. I perform the same analysis using White (1980) standard errors and find different results with regard to their significance. The results can be found in the appendix A1, A2 and A3.
Table II asses the correlation between the political variable dummies and the stock market performance in the form of different portfolios. For the first subsample period I find significant results for the difference between the dummies of VWR-TBL and for some individual variables. The difference of -17.23 shows a significantly higher value-weighted excess return for Democratic presidents during the period 1927:01 – 1962:12. This implies there is a correlation between the political party and stock market performance.
For the subsample period 1963:01 – 1998:12 I find significant results for VWR-TBL and EWR-TBL, which are the excess return portfolios, to be in favor of the Democratic dummy whereas the VWR-INF and EWR-INF, which are the real return portfolios, are significantly higher under the Republican dummy variable. While many different factors including interest rate- and inflation expectations can influence the return portfolios, it does not explain the difference between the real- and excess return portfolios for the different political parties. The underlying effect causing this difference remains unsolved.

When including the control variables in the regression analysis, the real return portfolios (VWR-INF & EWR-INF) lose significance for most subsample periods. This implies the control variables contain information which influence stock market performance. Another strange phenomenon reveals when looking at the real value- and equal-weighted return portfolio. The significance of almost all coefficients seems to disappear except for the subsample period 1963:01-1998:12 for RD. The interest rate wants to track inflation in most circumstances. This interplay researched by Fisher (1930) is widely accepted. Therefore, it is strange that I find statistically significant results for the excess return portfolios but not for the real market portfolios in other samples. In recent years, the Fisher effect has been investigated by many researchers. [5] Mishkin (1992) establishes that a strong Fisher effect, which is a high correlation between inflation and the interest level, is only present during certain periods.

[5] Fahmy & Kandil (2003) , Mishkin (1990), Mishkin (1992)

Most importantly, it shows the Fisher effect only appears in samples where interest rates and inflation have trends, which they point out to be present during the postwar period before October 1979. No effect is observed in the period October 1979 to September 1982 or before WWII. This does not match my results at all: the results are only significant for the subsample period 1963:01 to 1998:12 which contradicts the theory. It deserves further attention as I am not able to point out the cause of this phenomenon.
Concluding, the results in table III show the correlation for the excess return portfolios between returns and the political party dummies is not influenced by the indirect relation between business cycle variables and political parties for some variables.

From the event study analysis, I find no significant effect of election results on the stock market returns. Unlike Santa-Clara and Valkanov (2003) I look at Cumulative Abnormal Returns but I find the same result. This visual analysis in combination with the findings of Santa-Clara and Valkanov (2003) and testing the CARs for significance, implies expected returns are very unlikely the explanation for the 'Democratic premium'. It would be plausible for the excess returns to steadily accumulate over the whole presidential term. It could be useful to take a bigger interval for the analysis since the effect could be analyzed over a longer period.

For the 'risk premium' hypothesis, I determine the volatility differences between the two parties. In panel A, I find higher volatility in the first two subsamples and only a small difference in the last. This contradicts the 'risk premium' hypothesis since in that case the volatility should be higher under Democratic presidencies. Panel B includes the control variables. The sample as a whole shows a higher significant volatility under Democratic presidents. This indicates the 'Democratic premium' is possibly a mere 'risk premium'. The second subsample period 1963:01 – 1998:12 has a significantly higher volatility under Republican (7.22) than under Democratic (6.01). This finding does not support the 'Democratic premium' hypothesis and is more in line with the findings of Santa-Clara and Valkanov (2003). The most recently added subsample again shows a higher volatility under Democratic presidential terms. The results for the latest period are not significant.
There are some important events to take into consideration which have had a significant impact on the volatility within the U.S. stock market over the last 20 years that can also have influenced the results of the whole sample. The Global Financial Crisis (2007 – 2008) also referred to as 'subprime mortgage crisis' was characterized by high volatility within financial markets worldwide but especially in the U.S. which is proven by Schwert (2011). During this period the Republican George W. Bush was president and experienced a highly volatile market. A second major impact on the stock market volatility has been the Covid-19 pandemic. Baker, Bloom, Davis, Kost, Sammon and Viratyosin (2020) analyzes the impact on the U.S. stock market and find an even more volatile market in comparison to the Financial

Crisis. [6] During this period Republican President Donald J. Trump was the current president. Finding a difference in volatility higher for Democrats after both major events which caused markets to be volatile took place while a Republican president was in office, is remarkable.
Concluding, there might be an indication the 'Democratic premium' is a result of higher risk under Democratic presidents and is therefore merely a 'normal' risk premium.

The regression results lose much of their significance due to the clustering of standard errors. Clustering the standard errors is important as my data is clustered by president. Different presidents and especially different political parties tend to implement different economic policies. These policies can have a significant effect on the economy and therefore also the stock market. Next to this, time periods with a lot of political instability such as during the World Wars and the Great Depression may also lead to clustering per president. This translates to more conservative results but at the same time strengthens the interpretation of the results.

[6] See appendix A4 for full volatility chart

7 Limitations

The findings of my study should be interpreted with causation given the following limitations:

One of the main critiques is the short sample period of 72 years. The interplay between the presidential cycle and the stock market performance might need a broader sample to capture all the factors that affect this relationship. My study expands the dataset to 96 years addressing this limitation and weakening its argumentation because I expand the dataset by 24 year of monthly data. You can still argue that the sample period is too short to try and explain this phenomenon. Since the turnover of presidents is a long process, it is a matter of time to be able to perform the same analysis in the future.

Secondly, the paper does not take important factors into account such as investor sentiment or political uncertainty and their effect on the stock market. Baker, Bloom and Davis (2016) argues that the uncertainty surrounding different policies implemented by a president may explain deviations in the stock market.

Thirdly, due to a lack of data availability, I do not look at different size decile portfolios whilst numerous studies highlight the difference between large- and small size effects including Santa-Clara and Valkanov (2003). They even find that the difference in returns decreases with the market capitalization of firms. This varies from 7 percent for the large firms to around 22 percent for the smallest. Since I study one portfolio which is computed in four different ways, the index may not be representative of the performance of the overall stock market.

Lastly, whilst unlike Santa-Clara and Valkanov (2003) I cluster the standard errors by president, I do not bootstrap the data to make my findings robust to the possibility my assumptions may be true. It may lead to my confidence intervals being too narrow which can shift the view of how precise the results actually are. It can also lead to think that the hypothesis tests may be too powerful and rejecting the null hypothesis even when it is true (Type I error) as a result making incorrect inferences about my data.

8 Conclusion

The ‘Presidential Puzzle’ has been a topic of discussion since 1980 and is still relevant today. The goal of my thesis is to analyze whether or the not the ‘Democratic premium’, remains evident to this day. The observed discrepancy has been analyzed by adding the most recent available data to this study. I replicate a simplified version of the seminal work from Santa-Clara and Valkanov (2003) and expand it by clustering the standard errors. I find that the results are largely consistent with their findings. However, the results for the most recent sample period are less significant, which may be due to the higher volatility under Democratic presidents even when including recent crises such as the Global Financial Crisis and the Covid-19 pandemic.

I find that excess returns of the value- and equal-weighted portfolio correlate with the presidential cycle. The return of the value-weighted CRSP portfolio over the one-month Treasury bill is on average 16.14 percentage points higher under Democratic presidencies opposed to Republican. The excess returns for the equal-weighted portfolio are even more pronounced. This difference amounts to 17.13 percentage points higher during Democratic presidential terms.

My regression shows political dummy variables provide some information about stock market returns that is not explained by business-cycle control variables. When including business-cycle controls, the value weighted excess return portfolio is on average 15.31 percentage points higher during Democratic administrations. For the equal-weighted portfolio this amounts to 16.28 percentage points.

I do not find evidence which indicates that there would be large excess returns for the value-weighted portfolio solely for the days surrounding the election. It is more likely the cumulative higher excess returns increase monotonically over the whole presidency.

For the newly added subsample period I cannot determine whether the ‘Democratic premium’ is a result of the varying risk within presidencies since the results are not significant. The volatility regression analysis might very well indicate that the ‘Presidential Puzzle’ can be explained away taking risk into account. This theory is already heavily advocated by Sy & Al Zaman (2011).

Concluding, the results suggest the ‘Democratic premium’ remains evident for the excess value-weighted return portfolio. However, in most recent years, the higher volatility under Democratic presidents, as well as for the whole sample, gives reason to believe investors demand a risk premium leading to higher excess returns. Further research is needed to confirm my findings and understand the complicated interplay between the political cycle and stock market performance.

9 Implications and suggestions

My findings suggest there may be a presidential cycle in stock market returns. This could be used in the field of finance as it can be useful to develop a new investment strategy that would take advantage of the cyclical pattern. Investment banks should keep in mind that I have merely identified a correlation which cannot simply be interpreted as a causal relation. For society and private investors this research can change investment behavior if they believe that stock market returns are higher under Democratic presidencies. With this information they will likely invest more in the stock market during this period which would in turn only strengthen the finding. Lastly, my findings can educate private as well as institutional investors about the risks and potential rewards of investing under different political administrations in the U.S.

10 Further research

Further research on the 'Presidential Puzzle' could focus on numerous different areas. One area would be to explore the underlying reasons for the political cycle in stock market performance. Examining different policies between the two political parties might give more in depth insight in the way these policies affect the stock market. In line with this, it raises the question if political variables and the election itself are exogenous events. There are multiple studies who build an economic model that is able to predict the outcome of the elections, most notably Erikson (1989).

Another interesting area for further research would be to investigate the risk premium associated with investing under Democratic presidents. As I find the volatility for the whole sample to be quite large, even after including the crises which should result in a less volatile market under Democrats. By obtaining better insight in the total influence the volatility has on stock market performance and the risk premium, you will be able to point out if the observed difference is not due to a higher risk premium. This can be done by measuring volatility in alternative ways such as looking at the implied volatility. The implied volatility can be calculated using option prices and is more like the expectation of the market of future volatility.

Thirdly, it can be interesting to research the 'Presidential Puzzle' within other countries. This can easily be extended to political regimes using a two-party system. As this has already been researched for multiple different countries, it can be useful to gain insights in countries who have a multiple party coalition by performing the same type of regression only adjusting for multiple different political parties. If you find there is a significant difference in the excess returns under different political parties, you can prove the 'Presidential Puzzle' exists in the country.

Lastly an interesting field of research would be the influence wars or conflicts have on the 'Presidential Puzzle'. The influence of war on the stock market has been researched extensively but the interplay between war and the 'Democratic premium' has not.[7] You can measure conflict using different proxies and analyze the effect when the different political parties are in office.

[7] Deger & Smith (1983), Cappelen, Gleditsch & Bjerkholt (1984), Rigobon & Sack (2005), Berkman, Jacobsen & Lee (2011), Omar, Wisniewski & Nolte (2012)

Appendix

Table A1
Average Returns under Democratic and Republican Presidents

Table II reports the mean excess and real returns of value- and equal-weighted portfolios, VWR-TBL, VWR-INF, EWR-TBL, EWR-INF, and the real interest rate; TBL-INF, during Democratic (DD) and Republican (RR) presidencies. The rates are represented in annualized percentage points. The number below the coefficients RD and DD represent the p-values under the null hypothesis that the estimates are not significantly different from zero (Equation [1.2] $\alpha_1 - \alpha_2 = 0$). The p-value is the result of the test conducted using (White, 1980) heteroskedasticity-consistent standard errors, also known as robust standard errors. The row 'Obs' displays the number of observations for each period. 'R^2' shows the average adjusted R^2 for the regressions. * p < .05, ** p < .01, *** p < .001

	1927:01 - 2020:12			1927:01 - 1962:12			1963:01 - 1998:12			1999:01 - 2020:12		
	RD	DD	Diff	RD	DD	Diff	RD	DD	Diff	RD	DD	Diff
VWR-TBL	-2.57 **	13.56***	-16.14***	5.13***	22.37***	-17.23***	-12.40	-10.15***	-2.25**	4.70***	26.30***	-21.59***
	0.000	0.000	0.000	0.000	0.000	0.000	0.427	0.000	0.001	0.000	0.000	0.000
VWR-INF	9.38***	8.77***	0.61	11.75***	10.03***	1.72	8.33***	7.06***	1.27*	8.32***	8.76***	-0.44
	0.000	0.000	0.268	0.000	0.000	0.153	0.000	0.000	0.049	0.000	0.000	0.609
EWR-TBL	-0.79	16.34***	-17.13***	6.83***	27.76***	-19.45***	-10.35***	-8.38***	-1.96*	6.16***	27.6***	-21.48***
	0.322	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.000	0.000	0.000
EWR-INF	11.16***	11.54***	-0.38	13.44***	13.93***	-0.49	10.39***	8.82***	1.56	9.77***	10.09***	-0.32
	0.000	0.000	0.627	0.000	0.000	0.773	0.000	0.000	0.072	0.000	0.000	0.778
TBL-INF	11.95***	-4.80***	16.75***	6.61***	-13.43***	18.95***	20.73***	17.21***	3.53***	3.62**	-17.54***	21.16***
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Obs		1129			444			432			277	
R^2		0.08592			0.11556			0.0546			0.13112	

Table A2
Average Returns under Democratic and Republican Presidents, Controlling for Business-Cycle Variables

Table III displays the results from $r_{t+1} = \alpha + \beta\pi_t + \gamma X_t + u_{t+1}$. Regressing returns on political variables and control variables. It reports the mean of excess and real value- and equal-weighted return portfolios; VWR-TBL, VWR-INF, EWR-TBL, EWR-INF, and the real interest rate; TBL-INF, during Democratic (DD) and Republican (RD) presidencies. X_t denotes the control variables; dividend-price ratio (DP), the default spread (DSP), the term spread (TSP), the inflation rate (INF) and the relative rate (RR). The rates are represented in annualized percentage points. The number below the coefficient of RD and DD shows the p-value under the null hypothesis that the estimates are not significantly different from 0 which would be revealed through β. This should equal 0 if political variables contain information solely about returns that can be explained by business cycle fluctuations. The p-value is the result of the test conducted using (White, 1980) heteroskedasticity-consistent standard errors, also known as robust standard errors. The row 'Obs' displays the number of observations for each period. 'R^2' shows the average adjusted R^2 for the regressions. * p < .05, ** p < .01, *** p < .001.

	1927:01 - 2020:12			1927:01 - 1962:12			1963:01 - 1998:12			1999:01 - 2020:12		
	RD	DD	diff	RD	DD	Diff	RD	DD	Diff	RD	DD	Diff
VWR-TBL	-13.44***	1.87	-15.31***	-12.49***	-0.91	-11.59***	-6.94***	-6.23***	0.71	-13.37**	6.34	-19.71***
	0.000	0.292	0.000	0.000	0.725	0.000	0.000	0.000	0.427	0.003	0.192	0.000
VWR-INF	1.82	2.17*	0.35	2.30	0.22	2.08	5.09***	5.02***	0.072	2.37	3.44	-1.07
	0.062	0.020	0.510	0.271	0.918	0.140	0.000	0.000	0.932	0.241	0.098	0.160
EWR-TBL	-14.36***	1.92	-16.28***	-14.96***	-1.82	-13.14***	-4.40*	-4.18*	0.22	-14.57**	5.84	-20.41***
	0.000	0.319	0.000	0.000	0.570	0.000	0.023	0.003	0.846	0.001	0.202	0.000
EWR-INF	0.90	2.22	-1.32	-0.17	-0.70	0.52	7.63***	7.07***	0.56	1.17	2.93	-1.77
	0.496	0.079	0.080	0.949	0.802	0.790	0.000	0.000	0.603	0.694	0.312	0.127
TBL-INF	15.26***	0.30	14.96***	14.79***	1.13	13.67***	12.03***	11.25***	0.78	13.57**	-2.91	18.65***
	0.000	0.853	0.000	0.000	0.592	0.000	0.000	0.000	0.063	0.001	0.586	0.000
Obs		1129			444			432			277	
R^2		0.31996			0.44144			0.14146			0.31554	

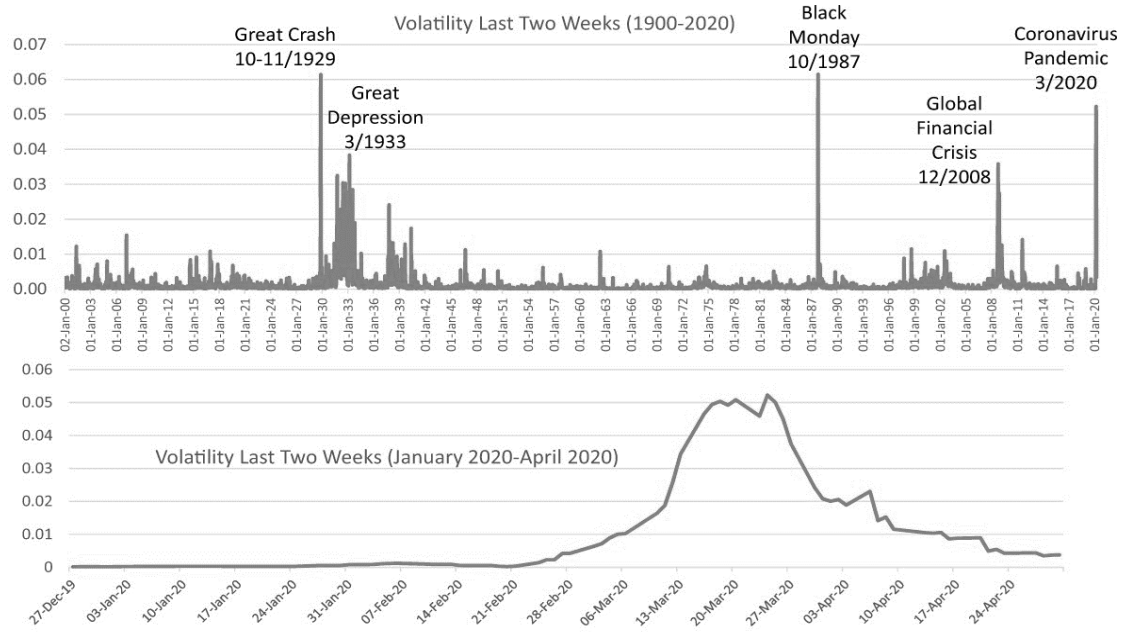
Table A3
Volatility during Democratic and Republican presidencies

Table IV displays the result from regression equation 3. Panel A displays $VOL_t = \alpha_1 RD_t + \alpha_2 DD_t + \varepsilon_t$ and Panel B displays $VOL_t = \alpha_1 RD_t + \alpha_2 DD_t + \gamma X_t + \varepsilon_t$. X_t denotes the control variables; dividend-price ratio (DP), the default spread (DSP), the term spread (TSP), the inflation rate (INF) and the relative rate (RR). Under the null hypothesis volatility is constant during both presidencies $\alpha_1 = \alpha_2$ and alternatively $\alpha_1 \neq \alpha_2$ which is displayed in the 'Diff' column. The first number under the coefficients is the p-value of the test conducted using (White, 1980) heteroskedasticity-consistent standard errors, also known as robust standard errors. Column 'Obs' displays the number of observations for each period and column R^2 displays the obtained R-squared form the regressions.

Period	RD	DD	Diff	Obs	R^2
			Panel A: No Controls		
1927:01 - 2020:12	11.27***	10.67***	0.60	1129	0.0015
	0.000	0.000	0.202		
1927:01 - 1962:12	12.24***	11.61***	0.63	444	0.0010
	0.000	0.000	0.522		
1963:01 - 1998:12	9.76***	7.79***	1.96***	432	0.0342
	0.000	0.000	0.000		
1999:01 - 2020:12	12.64***	12.74***	-0.09	277	0.0000
	0.000	0.000	0.921		
			Panel B: With Controls		
1927:01 - 2020:12	3.86***	4.36***	-0.49	1129	0.3014
	0.000	0.000	0.195		
1927:01 - 1962:12	3.88**	2.28*	1.60	444	0.4075
	0.001	0.036	0.062		
1963:01 - 1998:12	7.22***	6.01***	1.21	432	0.1157
	0.000	0.000	0.061		
1999:01 - 2020:12	0.64	2.04	-1.40*	277	0.4416
	0.700	0.247	0.035		

Note: * p < .05, ** p < .01, *** p < .001

Figure A4 Baker et al. (2020)



The sample period runs from January 2, 1900, to April 30, 2020. From December 1925 onward, returns are computed using Yahoo Finance's "adjusted close" series for the S&P 500 (^GSPC). Before that, returns are from the Global Financial Data extension of the Dow Jones index. In both panels, we calculate realized volatility as the sum of squared returns over the past 10 trading days.

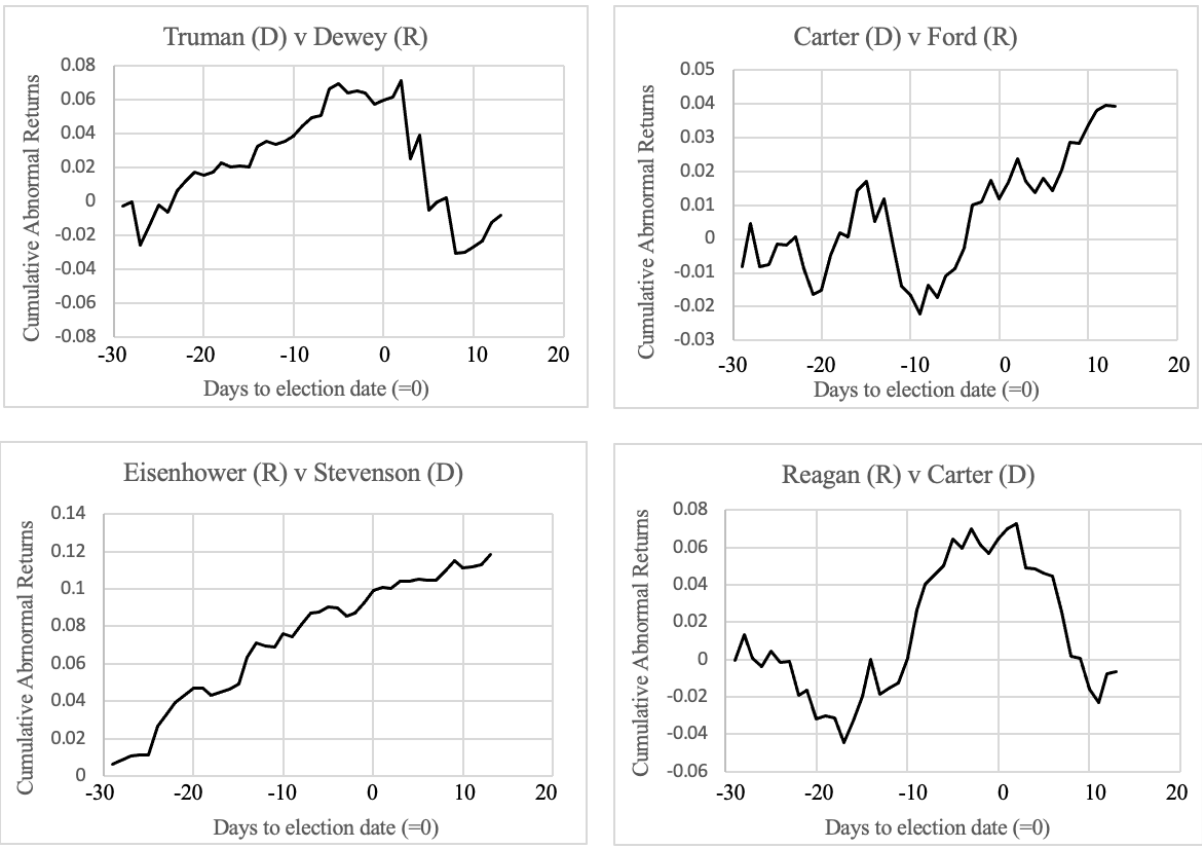


Figure A5 Cumulative Abnormal Returns around most contested elections. The figure displays the CARs for the 4 different elections (top row won by Democrats and bottom row by Republicans) which were closely contested as used in Santa-Clara and Valkanov (2003).

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