# DIVIDED GOVERNMENT AND POLITICAL RISK IN THE UNITED STATES

## Gobierno dividido y riesgo político en los Estados Unidos

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*Abstract*

This paper examines the impact on political risk of having a divided government in the United States. We consider almost 60 years of data and use stockmarket return volatility as a measure of risk. Results show a positive and statistically significant relationship between periods of divided government and higher volatility. Divided governments are associated with an increase of 2.8 percentage points in annual volatility. Divided branch governments are found to lead to an increase of 4.1 percentage points in volatility, whereas a divided legislative government is linked to an increase in volatility of 5.8 percentage points. The President's party does not seem to be, in itself, a driver for market volatility. However, a Democrat President coinciding with a unified government leads to a significant decrease in volatility of 2.8 percentage points. Overall, our findings support the view that divided governments increase political risk. This result lends support to the balancing model and is difficult to reconcile with gridlock theory.

*Keywords*

Political risk; divided government; unified government; stock market volatility; balancing model; gridlock theory.

*Resumen*

Este trabajo examina el impacto en el riesgo político de tener un gobierno dividido en los Estados Unidos. Consideramos casi sesenta años de datos y utilizamos la volatilidad en el precio de las acciones como medida del riesgo. Los resultados muestran una relación positiva y estadísticamente significativa entre los estados de gobiernos divididos y una mayor volatilidad. Los gobiernos divididos están asociados con un aumento de 2,8 puntos porcentuales en la volatilidad anual. Se concluye que los gobiernos con ramas divididas conducen a un aumento de 4,1 puntos porcentuales en la volatilidad, mientras que un gobierno legislativo dividido está vinculado a un aumento de 5,8 puntos porcentuales en esa misma variable. El partido del presidente no parece ser, en sí mismo, un motor de la volatilidad del mercado, pero un presidente demócrata bajo un gobierno unificado lleva a una disminución significativa de la volatilidad de 2,8 puntos porcentuales. En general, nuestros hallazgos respaldan la opinión de que los gobiernos divididos aumentan el riesgo político. Este resultado favorece el modelo de equilibrio politico y es difícil de conciliar con la teoría de bloqueo.

*Palabras clave*

Riesgo político; gobierno dividido; gobierno unificado; volatilidad bursátil; modelo de equilíbrio politico; teoría de bloqueo.

*SUMARIO*



## I. INTRODUCTION

Governments shape the economic environment in which businesses operate: they may launch new taxes, grant subsidies, promote investments in infrastructure projects or in specific industries, and implement regulatory measures. Because these discontinuities in the business environment resulting from political change may be difficult to anticipate, firms face what might be called political risk.

Political risk is an important notion that is often brought up in institutional economics, finance and political economy. It may thus be defined as the "uncertainty about the impact of an administration's future policies" (Kim *et al.*, 2012, 196).

While there has been increasing academic interest in the intersection of politics and economics, relatively little attention has been paid to the relationship between patterns of institutional control (divided government vs. unified government) and political risk. This omission in the case of the studies pertaining to the US political system is especially surprising given the extraordinary importance of that economy and the increasingly common occurrence of divided governments in that country since the 1980s.

In this paper we fill this gap by exploring the impact of government on political risk in the US. In particular, we empirically assess whether having a divided government (as opposed to a unified government) has a significant impact in the political risk to which the United States' firms (and thus, stock market investors) are exposed. Furthermore, we analyse the combined effects of partisan effects (leftwing governments vs. rightwing governments) and government status on political risk.

Following the testing framework proposed by Füss and Bechtel (2008), we use data on stock market returns and political indicators in the US from 1950 till 2007 and exploit the fact that return volatility is one of the most

widely accepted measures of risk. Return volatility allows one to overcome the shortcomings of alternative measures of political risk mentioned by Alon and Martin (1998) such as wrong choice of data, analytical tools, and interpretation of results; in consequence, in recent years market volatility has been increasingly adopted in order to learn the impact of politics and political institutions on the economy in general and on financial markets in particular (Füss and Bechtel, 2008; Bechtel, 2009; Furió and Pardo, 2012).

Our results show a positive and statistically significant relationship between divided states of government and higher volatility. Divided governments are associated with an increase of 2.8 percentage points in annual volatility even after controlling for a set of economic and political variables. We also examined the importance of two different forms of divided government distinguishing between divided branch government and divided legislative government. Divided branch governments are found to lead to an increase of 4.1 percentage points in volatility whereas a divided legislative government is linked to an increase of 5.8 percentage points in that same variable. The President's party does not seem to be, in itself, a driver for market volatility, but a Democrat President under a unified government leads to a significant decrease in volatility of 2.8 percentage points.

Overall, these results suggest that partisan conflict between the executive and legislative branches do not affect the possibility of economic policy change, thus lending support to the balancing model proposed by Fiorina (1991) and Alesina and Rosenthal (1995), among others. On the contrary, our findings are difficult to reconcile with the gridlock theory (Brady, 1993; Fowler, 2006). Therefore, our results contribute to the ongoing debate over the consequences of divided government between those who believe it may lead to higher economic uncertainty (Fiorina, 1991) and those who believe that coordination problems in divided governments may help the status quo to prevail (Fowler, 2006).

The remainder of the paper is structured as follows. In the next section, we present the theoretical framework and discuss the relationship between government status and political risk. In Section 3, we describe our sample and explain the estimation strategy and the specification of the models. Section 4 reports the outcomes of the estimation of the models. Finally, section 5 discusses these results and concludes the paper proposing avenues for further research.

## II. GOVERNMENT STATUS AND POLITICAL RISK

According to Menefee-Libey (1991: 643), we are facing a divided government when "a partisan conflict exists between the executive and legislative branches". Tautologically, a unified government is a government where such

conflict does not exist. In the context of the current study, a US government is considered unified when both Houses of the Congress are controlled by the same party of the President. The reason is simple: even though the legislative branch is comprised of two chambers, they both have its mechanisms to prevent legislation from being signed into law from the President, and so the unified government is only achieved in case both chambers are controlled by the same party. Thus, for our purpose the Congress has to be treated as a single entity. Notwithstanding, along this study we propose two different classifications of the government status, depending on the party and on the number of chambers controlled by the President.

The impact of government status on the volatility of stock returns is based on the premise that the value of a firm is equal to the present value of its expected cash flows, whereas the discount rate represents investors' required rate of return. If there is uncertainty regarding the future implementation of economic policies, the range of realizations for expected cash flows and discount rates for individual firms and for the market as a whole should be wider and the variance of returns should increase accordingly.

The theoretical literature regarding the expected impact of the government status on the market's volatility provides no consensus. In fact, the balancing model and the gridlock theory predict opposing effects. On one hand, the balancing model proposed by Fiorina (1991) and Alesina and Rosenthal (1995) predicts that divided government greatly enlarges the set of policy alternatives. Consequently, a divided government tends to increase political risk comparing to a unified government where one party determines policy. On the other hand, the gridlock theory defended by Brady (1993) and Fowler (2006) posits that divided governments are susceptible to stalemate and gridlock which substantially restricts the range of possible policies. Under a divided government, the status quo is more likely to prevail which should lead to a decrease in political risk and to a lower stock market volatility.

In order to understand how the causality goes from government status (divided government vs. unified government) to the financial market, it is important to appreciate the main drivers that may lead to a different level of political risk as a consequence of having a different pattern of institutional control. Those drivers, according to the way through which they may have an impact, may be divided in two main types: economic and political.

Regarding the economic consequences, it is fair to say that there is a consensus that the government status matter to the economy. For example, Lohmann and O'Halloran (1994: 628-628), studied the effect of domestic conflicts and political institutions on trade policy and concluded that "domestic political divisions and the institutions they foster have a significant impact on international trade policy". According to the authors, a

divided government tends to be associated with higher levels of protectionism. Karol (2000) examined the impact of government status on the liberalization of the US trade policy and concluded that divided governments may have an influence on trade, even though the key is the strength of protectionist forces in Congress, and not the divided government itself. Also, regarding budget policies for the US, Alt and Lowry (1994: 823) showed that "divided government matters, institutions matter, and party control matter", because "divided legislatures do not appear to adjust revenues in response to surpluses and deficits". Poterba (1994: 815) corroborates this view adding that unified governments "adjust more quickly to unexpected deficit shocks than do divided governments", and thus "deficit reduction in the U.S. is lower under divided government". Accordingly, Roubini and Sachs (1989) found that unified governments tend to respond more quickly to income shocks and thus, divided governments have been less effective in reducing the budget deficit than stable and majority-party governments. Finally, Fowler (2006) shows that the inflation risk tends to be significantly lower when the president does not control the Congress. Overall, it seems fair to conclude that the majority of the existing studies that address the economic impact of the government status suggests that divided governments entail less political risk.

In what concerns the second set of factors (political factors) through which divided government may result in a different level of political risk, there is a lower level of consensus. While some authors such as Mayhew (1991), Jones (1994) and Baumgartner *et al.* (2014) advocate that there is no relevant difference between law production in a divided and a unified government, there are some other scholars that disagree. For example, Tsebelis (1999) predicts that divided governments when there a differing partisan dominance of different institutions will lead to a decrease in law production when compared to unified governments since the different parties have to agree on how to deviate from the status quo. And Howell *et al.* (2000) corroborate this perspective estimating that periods of divided government depress the production of landmark legislation by about 30 %, at least when productivity is measured on the basis of contemporaneous perceptions of important legislation.

Other authors sustain that the analysis of successful legislation may lead to biased inferences. For instance, Edwards *et al.* (1997) suggest that the probability of important legislation failing to pass increases about 45 % under divided government.

An additional factor that may strengthen the relationship between government status and stock market's volatility is the presidential attitude, which is plausible to be different under a divided or a unified government.

According to Nicholson *et al*. (2002: 701) "a divided government context has the effect of increasing presidential approval relative to periods of unified government", since it is an opportunity for presidents to help themselves in the public arena. This is due to two aspects: first, when it comes to presidential evaluations blame is more critical than credit which is congruent with the definition of negativity bias: "greater weight given to negative information, relative to equally extreme and equally likely positive information in a variety of information-processing tasks" (Nicholson *et al*., 2002: 703); and secondly, divided government "muddles the informational waters by offering citizens two potential targets of blame for policies" (Nicholson *et al*., 2002: 703). On the contrary, in a unified government context the president bears the full weight of negative evaluations. Because of this asymmetric situation, that is, because presidents should benefit more from sharing blame than they lose by sharing credit under divided governments, one expects presidents to take additional risks in that situation, which would cause a higher levels of market volatility in periods of divided government.

When it comes to the impact of the government status on the political risk, reflected in the stock market volatility, there are to our best knowledge only two published studies. The first one was conducted by Bechtel and Füss (2008) for the German case. They empirically evaluate whether divided government reduces political risk on financial markets using daily German stock market data from 1970 to 2005. The authors showed that the gridlock theory was consistent with their findings since divided government was found to produce a volatility reducing effect on the German stock market.

The second study was carried out by Kim *et al.* (2012) using US data. The authors examined the impact of the alignment of each state governor and the federal government in the firms' stock returns. They concluded that the proximity to political power had a pervasive effect on the cross section of stock returns. According to the authors, this is due to the fact that that political proximity brings higher uncertainty regarding future policies, which exposes the firms to higher political risk.

Partisan differences between Democrats and Republicans are found to be important in explaining political risk (Chiou and Rothenberg, 2003). These two parties have different goals and react differently to changes in permanent expected levels of income resulting from the business cycle (Alt and Lowry, 1994). The empirical evidence seems to confirm the relevance of partisan effects. For example, Mukherjee and Leblang (2007) show that when leftwing parties were in power in the US and in the UK during the 20$^{th}$ century the volatility of the respective stock markets has been mitigated. In the same vein,

Füss and Bechtel (2008) recur to data from Germany to find that volatility tends to increase as the electoral prospects of right-leaning parties improved. However, Bechtel (2009) documents that the incumbency of right (left)-leaning governments in that same country leads to lower (higher) investment risk measured by the volatility of the main German stock market index. Moreover, the intensity of this partisan effect depends on whether government is unified or divided.

Overall, these studies highlight the importance of understanding the relationship between the political power in general and the government status in particular, and the uncertainty felt in the economy. Moreover, the divergent findings of scholars suggests that a more systematic examination of divided government is necessary. However, to the best of our knowledge, there are no studies looking at the effect of government status on political risk in the US. With the current paper we intend to fill this gap in the literature.

## III. DATA AND METHODOLOGY

### 1. DATA ON STOCK MARKET PRICES AND VOLATILITY

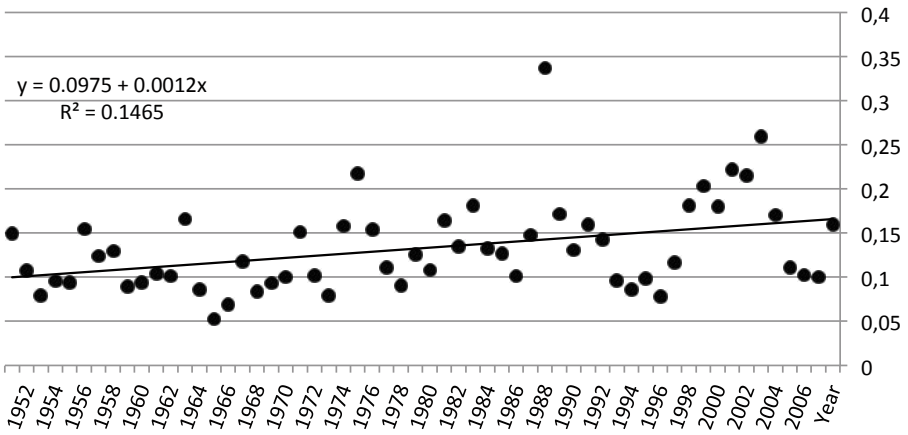
Our sample covers a period of 58 years, from 1950 until 2007, which compares favorably with similar studies, such as the already mentioned Füss and Bechtel (2008), which only included 35 years of data. We decided not to include in the sample the period after 2008 since from that year on, with the onset of the crisis in the subprime segment, the US stock market was marked by several episodes of high volatility which are hardly attributable to government status.

Data on stock market returns was retrieved from Thomson Reuters DataStream and from Quandl. The stock market index used to perform the analysis was the S&P 500 since it is the main indicator for the overall performance of the US stock market.

We define stock market volatility as the 20-day standard deviation of returns. This is a common way to measure volatility in the finance literature. We compute it by firstly converting close prices into a logarithmic return series. From this return series we then computed the 20-day standard deviation of returns and annualized the values obtained by multiplying them by the square root of the number of trading days in a year.

Figure 1 provides an overview of the historical evolution of the S&P 500 in terms of volatility.

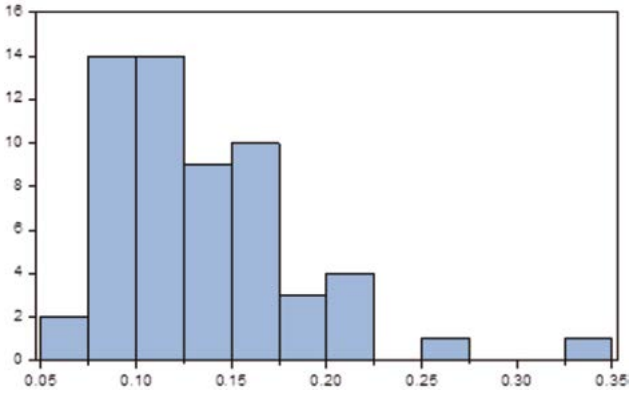
Figure 1. *S&P 500 volatility (annualized standard deviation) and linear trend line*




By looking at a scatter plot of volatility through time, one can point out that the periods of high stock market volatility seem to coincide with years in which the US witnessed financial crashes. In fact, the peaks of volatility associated with the first oil shock in 1973/1974 as well as those resulting from the stock market crashes in October 19, 1987 ("the Black Monday") and in 2002 ("tech bubble crash") are well visible in the figure.

The volatility histogram as well as the most relevant descriptive statistics pertaining the volatility data series are presented in Figure 2.

Figure 2. *Volatility's histogram and descriptive stats*

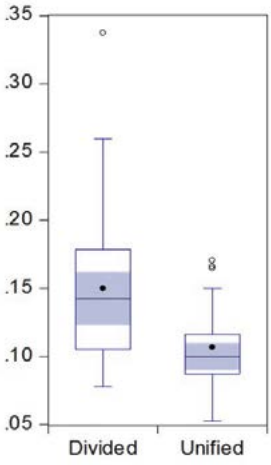



| | |
|---|---|
| Mean | 0.1329 |
| Median | 0.1211 |
| Maximum | 0.3373 |
| Minimum | 0.0526 |
| Std. Dev. | 0.0511 |
| Skewness | 1.4762 |
| Kurtosis | 6.1478 |
| Jarque-Bera (p-value) | 0.0000 |

The volatility data set has a mean of 0.1329 and a standard deviation of 0.0511. The maximum shown in the figure below, 0.3373, and the minimum, 0.0526, concern to the years of 1987 and 1964, respectively.

As explained before, the main explanatory variable in this study is a dummy variable, which is set to 1 in the case of a divided government (cases in which the political party of the President does not control both the Senate and the House of Representatives), and 0 otherwise. It is also important to point out that, from 1950 until 2007 divided government is the predominant status of government (35 years, against 23 years of unified governments). Figure 3 presents the box-plot for each one of the volatility data series (divided and unified government) as well as the respective descriptive statistics.

Figure 3. *S&P 500's volatility according to government status*




| | **Period under divided government** | **Period under unified government** |
|---|---|---|
| Number of observations | 35 | 23 |
| Mean | 0.1500 | 0.1068 |
| Median | 0.1427 | 0.1001 |
| Maximum | 0.3373 | 0.1704 |
| Minimum | 0.0779 | 0.0526 |
| Std. Dev. | 0.0547 | 0.0306 |
| Skewness | 1.3135 | 0.7687 |
| Kurtosis | 5.2525 | 2.9990 |
| Jarque-Bera (p-value) | 0.0001 | 0.3221 |
| Welch's unequal variance t-test (p-value) | 0.00031 | |
| Wilcoxon rank-sum test (p-value) | 0.0008 | |

From the analysis of Figure 3, it can be observed that, in general, stock market volatility was higher in periods of divided government. This indication is statistically confirmed by the results of the Welch's unequal variances t-test (to the mean) and of the Wilcoxon rank-sum test (to the median). In addition, one

can conclude that the dispersion of the volatility was considerably lower during periods of unified government: both the overall dispersion of the observations and the dispersion of the observations that belong to the the central quartiles is smaller under these periods. The results of the Jarque-Bera test indicate that the distribution of the observations departs significantly from normality only in periods of divided government. The values for kurtosis confirm that the distribution of volatility in periods of unified government is what one would expect if observations were normally distributed.

Finally, the configuration of the box-plot and the positive values for the skewness statistic indicate that in periods of divided government the distribution of the volatility is skewed to the right, i.e., there is a significant number of large volatility events. This suggests, once again, that it is important to control for the presence of outliers in the multivariate analysis.

## 2. DATA ON THE US GOVERNMENT STATUS

Regarding the data related to the US government status in the period under scrutiny, we used a database developed by Baumgartner *et al*. (2014), and double checked it against the institutional information provided by the website of each of the US legislative and executive branches. The database contains not only information on the parties that control each branch from the 82nd until the 109th Congress, but also information on the extent of that control (number of seats per party in both the Senate and the House) among other variables that will be discussed in the subsection relative to the control variables.

Obviously, in order to understand whether the differences in the stock market volatility can be attributed to the government status, one needs to consider a set of control variables.

## 3. CONTROL VARIABLES

In order to examine if there is a systematic influence of the government status on the stock market volatility, one needs to develop a model that includes a set of control variables. In this regard, the set of control variables to be included may be divided in two groups: economic/financial variables and political variables.

Firstly, in what concerns the set of economic/financial variables, we control for the United States' GDP growth rate, inflation, federal deficit (in percentage of GDP), and years of stock market crashes. Data on the GDP growth rate were retrieved from the Bureau of Economic Analysis - Department of Commerce. Data on inflation and federal deficit were

retrieved from the Federal Reserve Bank of St. Louis. Given the impact of these variables on financial markets' volatility, they are commonly used as control variables in the fields of political and financial economics (Alon and Martin, 1998; Bechtel and Füss, 2008). The last control variable —years of stock market crashes— intends to capture effects from major events in the financial markets. This is due to the existence of huge peaks in terms of volatility that cannot be attributed to the political situation of the United States. Thus, we create a dummy that equals 1 if the year in question is located on the top decile of annual volatility. This allows to control for the effects arising from events such as the first oil shock (1974), "the Black Monday" (1987) and the tech bubble crash (2002), in which financial markets witnessed situations distress hardly related to the status of US government.

When it comes to political variables, we considered a total of three variables. The first two control variables intend to capture the depth of the union or division of the government, from two different angles. The first variable is "Distance" which refers to the ideological distance between the majority and the opposition during divided government in the House of Representatives. It assesses how far, in terms of ideology, the government and the opposition are (Baumgartner *et al*., 2014). The second variable is "Cohesiveness" and refers to the ideological distance within the majority in times of unified government in the House of Representatives. In other words, cohesiveness assesses the intra-majority ideological distance. Both these variables were built by Baumgartner *et al*. (2014) based on Bailey (2007)'s ideal point estimates. The variables "Distance" and "Cohesiveness" increase with political polarization. Since these variables are only available up until 1999, from the year 2000 onwards we will not be able to control for these effects. Finally, we control for election years as it is standard procedure in political studies. This is supported by the literature, since pre-election periods tend to be associated with higher policy uncertainty and increased stock market volatility (Pantzalis *et al.*, 2000; Bialkowski *et al*., 2008). In the US case, there are two kinds of elections: Presidential elections that happen every four years, and Congress elections that occur every two years. Thus, we use one dummy variables for each one of those elections.

## 4. METHODOLOGY

In order to empirically test whether the government status does ultimately affect stock market volatility, we follow the testing framework suggested by Bechtel and Füss (2008). Thus, market volatility will be regressed using a standard OLS approach on the variables presented in the previous

subsections. We will use a HAC Newey-West estimator to prevent any issues related to the existence of heteroskedasticity and autocorrelation among the residuals. In the first set of models, each "Divided Government" dummy" equals 1 if when at least one of the chambers of Congress and the presidency are controlled by different parties, and 0 otherwise. The models to be estimated are as follows:

$$\text{Annual Volatility} = \alpha + \beta_1 \textit{ Divided Government} \quad (1)$$

$$\text{Annual Volatility} = \alpha + \beta_1 \textit{ Divided Government} + \beta_2 \textit{ Inflation} + \beta_3 \textit{ GDP Growth} + \beta_4 \textit{ Deficit} + \beta_5 \textit{ Crash Year} + \beta_6 \textit{ Presidential Election} + \beta_7 \textit{ Congress Election} \quad (2)$$

$$\text{Annual Volatility} = \alpha + \beta_1 \textit{ Divided Government} + \beta_2 \textit{ Inflation} + \beta_3 \textit{ GDP Growth} + \beta_4 \textit{ Deficit} + \beta_5 \textit{ Crash Year} + \beta_6 \textit{ Presidential Election} + \beta_7 \textit{ Congress Election} + \beta_8 \textit{ Distance} + \beta_9 \textit{ Cohesiveness} \quad (3)$$

We also develop a different specification of divided and unified government. Thus, three possibilities of government status will be considered: unified government (President plus both chambers belonging to the same party), weak divided (President plus one chamber belonging to the same party) and strong divided (President belonging to a party different from the one that controls both chambers). In these models, we will exclude the dummy variable that accounts for the existence of crash years since it raises concerns of multicollinearity. This new specification will be tested using the following two models:

$$\text{Annual Volatility} = \alpha + \beta_1 \textit{ Strong Divided} + \beta_2 \textit{ Weak Divided} \quad (4a)$$

$$\text{Annual Volatility} = \alpha + \beta_1 \textit{ Strong Divided} + \beta_2 \textit{ Weak Divided} + \beta_3 \textit{ Inflation} + \beta_4 \textit{ GDP Growth} + \beta_5 \textit{ Deficit} + \beta_7 \textit{ Presidential Election} + \beta_8 \textit{ Congress Election} \quad (4b)$$

Finally, to enhance the quality of the analysis, we will develop three additional models. With these models, we will examine whether the feature "political party" is of relevance in the issue under study. It could be the case that times of higher (or lower) volatility are intrinsically related to a specific President's party, and not necessarily related to the government status. In the first of those two models the government status will not considered as an explanatory variable since we only intend to understand if there is any relationship between annual volatility and the president's party. In the

second model, we will analyze if there is any significant difference between the cases of a democratic and a republican unified governments. So, we take both aspects into account: presidential party and government status. The last model will include, in addition, a set of control variables. The models are as follows:

$$\text{Annual Volatility} = \alpha + \beta_1 \textit{ Democrat President} + \beta_2 \textit{ Inflation} + \beta_3 \textit{ Crash Year} + \beta_4 \textit{ GDP Growth} + \beta_5 \textit{ Deficit} + \beta_7 \textit{ Presidential Election} + \beta_8 \textit{ Congress Election} \quad (5a)$$

$$\text{Annual Volatility} = \alpha + \beta_1 \textit{ DUnified Democrat} + \beta_2 \textit{ Unified Republican} \quad (5b)$$

$$\text{Annual Volatility} = \alpha + \beta_1 \textit{ DUnified Democrat} + \beta_2 \textit{ Unified Republican} + \beta_3 \textit{ Inflation} + \beta_4 \textit{ GDP Growth} + \beta_5 \textit{ Deficit} + \beta_7 \textit{ Presidential Election} + \beta_8 \textit{ Congress Election} \quad (5c)$$

## IV. EMPIRICAL RESULTS

### 1. ESTIMATION OF THE MODELS

Table 1 display the results for models (1) (2), and (3). All the models are globally significant at a 1 % level. The estimates for the key explanatory variable, i.e. the variable "Divided Government", are highly significant in all the models. Regarding model (1), the coefficient of that variable indicates that having a divided government leads to an increase of about 4.33 percentage points in US stock market volatility. When we included the set of control variables, the value of the coefficient decreases to 2.5 percentage points but continues to be statistically significant at the 1 % level. Having a crash contributes to an increase in the annual stock market volatility of 11.31 percentage points and, surprisingly, having a presidential election reduces that volatility in 0.02 percentage points, although in this later case the estimate is only significant at a 10 % level. The finding that electoral uncertainty had a volatility-reducing effect contradicts the results obtained by Bialkowski *et al*. (2008) and supports the assertion made by Füss and Bechtel (2008). In model (3) we add two variables that capture the degree to which the government in unified or divided. The overall significance of the model decreases slightly, signaling that those two variables do not contribute to explain the volatility. The existence of a divided government continues to contribute to an increase of 2.8 % of the volatility.

Table 1. *Estimates of Models (1), (2) and (3)*

| **Variables** | **Model (1)** | **Model (2)** | **Model (3)** |
|---|---|---|---|
| Constant | 0.1068*** | 0.0925*** | 0.0981** |
| | (0.0000) | (0.0000) | (0.028243) |
| **Divided Government** | **0.0432*** ** | **0.0249*** ** | **0.0286*** ** |
| | **(0.0006)** | **(0.0087)** | **(0.0016)** |
| Inflation | | 0.1940 | 0.2538 |
| | | (0.1339) | (0.1316) |
| **GDP growth rate** | | **0.0811** | **0.1557** |
| | | **(0.6563)** | **(0.3886)** |
| Deficit | | 0.2632 | 0.1123 |
| | | (0.3192) | (0.6582) |
| **Crash Year** | | **0.1131*** ** | **0.1092** ** |
| | | **(0.0000)** | **(0.0264)** |
| Presidential Election | | -0.0227* | -0.0251 |
| | | (0.0630) | (0.1275) |
| **Congress Election** | | **0.0087** | **0.0131** |
| | | **(0.4481)** | **(0.3652)** |
| Distance | | | -0.0002 |
| | | | (0.9821) |
| **Cohesiveness** | | | **-0.0146** |
| | | | **(0.5783)** |
| N | 58 | 58 | 50 |
| R-squared | 0.1750 | 0.6381 | 0.5790 |
| Adjusted R-squared | 0.1603 | 0.5874 | 0.4843 |
| F-statistic | 11.883 | 12.5954 | 6.1146 |
| Prob. (F-statistic) | 0.0010 | 0.0000 | 0.0000 |
| Prob. (Wald F-statistic) | 0.0006 | 0.0000 | 0.0000 |

Notes: The dependent variable is the annual volatility measured by the annualized standard deviation of the S&P500's daily returns from 1950 to 2007 in the case of models (1) and (2) and from 1950 to 1999 in the case of model (3). Estimates in the case of models (1) and (2) follow the OLS approach with a HAC Newey-West estimator (p-values in parenthesis) and in the case of model (3) with a White- heteroskedasticity-consistent estimator given that with the HAC estimator there were signs of multicollinearity. Divided Government, the explanatory variable, is a dummy variable that takes the value of 1 if the presidential party does not control both congressional chambers, and 0 otherwise. Inflation, GDP growth, Deficit, Crash Year, Distance and Cohesiveness are variables to control for the economic environment. Presidential Election and Congress Election are dummy variables to control for election years. *, ** and *** represent significance at the 10 %, 5 % and 1 % levels respectively.

Table 2 displays the results for the models (4a) and (4b), that is, the models that make a distinction between a weak divided government

(President plus one chamber belonging to the same party) and a strong divided government (President belonging to a party different from the one that controls both chambers).

Table 2. *Estimates of Models (4a) and (4b)*

| **Variables** | **Model (4a)** | **Model (4b)** |
|---|---|---|
| Constant | 0.1068*** | 0.1012*** |
| | (0.0000) | (0.0000) |
| **Strong Divided** | **0.0395*** ** | **0.0412** ** |
| | **(0.0060)** | **(0.0116)** |
| Weak Divided | 0.0557** | 0.0586** |
| | (0.0204) | (0.0182) |
| **Inflation** | | **0.2456** |
| | | **(0.1427)** |
| GDP growth | | -0.0429 |
| | | (0.8604) |
| **Deficit** | | **-0.3986** |
| | | **(0.3964)** |
| Presidential Election | | -0.0340** |
| | | (0.0117) |
| **Congress Election** | | **0.0226** ** |
| | | **(0.0338)** |
| N | 58 | 58 |
| R-squared | 0.1859 | 0.2842 |
| Adjusted R-squared | 0.1563 | 0.1840 |
| F-statistic | 6.2822 | 2.8363 |
| Prob (F-statistic) | 0.0034 | 0.0143 |
| Prob (Wald F-statistic) | 0.0020 | 0. 0001 |

Notes: The dependent variable is the annual volatility measured by the annualized standard deviation of the S&P500's daily returns from 1950 to 2007. Estimates follow the OLS approach with a HAC Newey-West estimator (p-values in parenthesis). Strong Divided is a dummy variable that takes the value 1 if the presidential party does not control any of the congressional chambers, and 0 otherwise. Weak Divided is a dummy variable that takes the value 1 if the presidential party controls only one of the congressional chambers, and 0 otherwise. Inflation, GDP growth, and Deficit are variables to control for the economic environment. Presidential Election and Congress Election are dummy variables to control for election years. *, ** and *** represent significance at the 10 %, 5 % and 1 % levels respectively.

The results are congruent to the previous findings. Once again, the models are globally significant at the conventional levels. Both the

explanatory variables are positive and significant at a 95 % confidence level in models (4a) and (4b). We can observe that a "weak divided" government is expected to increase the annual volatility by 5.5 percentage points and 5.8 percentage points in models (4a) and (4b), respectively. On the other hand, a "strong divided" government is shown to provoke an increase in the annual volatility by 4 percentage points and 4.1 percentage points in models (4a) and (4b), respectively. Note that it would probably be expected that, in line with the previous findings, a strong division would yield an higher uncertainty than a weak division. However, the classification of "strong" and "weak" is rather ambiguous. In this case the classification is assumed from the standpoint of the President (President against the chambers). If a distinct perspective was assumed the results would, naturally, be switched.

Models (5a), (5b), and (5c) are developed to understand if the party of the president is, by itself, responsible for a different level of volatility. Table 3 shows the results for model (5a). The variable "Democratic President" is not statistically significant at the conventional levels which indicate that the president's party is not the driver of market volatility.

Table 3. *Estimates of Model (5a)*

| **Variables** | **Model (5a)** |
|---|---|
| Constant | 0.1134*** |
| | (0.0000) |
| **Democratic President** | **-0.0161** |
| | **(0.1031)** |
| Inflation | 0.2140* |
| | (0.0812) |
| **GDP growth** | **0.0868** |
| | **(0.6716)** |
| Deficit | 0.2056 |
| | (0.4216) |
| **Crash Year** | **0.1230*** ** |
| | **(0.0000)** |
| Presidential Election | -0.0183 |
| | (0.01272) |
| **Congress Election** | **0.0056** |
| | **(0.6447)** |

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| Variables | Model (5a) |
|---|---|
| N | 58 |
| R-squared | 0.607602 |
| Adjusted R-squared | 0. 552666 |
| F-statistic | 11.06022 |
| Prob (F-statistic) | 0.000000 |
| Prob (Wald F-statistic) | 0. 000000 |

Notes: The dependent variable is the annual volatility measured by the annualized standard deviation of the S&P500's daily returns from 1950 to 2007. Estimates follow the OLS approach with a HAC Newey-West estimator (p-values in parenthesis). Democratic President is a dummy variable that takes the value 1 if the president belongs to the Democratic Party, and 0 otherwise. Inflation, GDP growth, Deficit, and Crash Year are variables to control for the economic environment. Presidential Election and Congress Election are dummy variables to control for election years. *, ** and *** represent significance at the 10 %, 5 % and 1 % levels respectively.

Table 4 shows the results for models (5b) and (5c), which take into account both features: the government status and the president's party.

Table 4. *Estimates of Models (5b) and (5c)*

| Variables | Model (5b) | Model (5c) |
|---|---|---|
| Constant | 0.1500*** | 0.1148*** |
| | (0.0000) | (0.0000) |
| **Unified Democrat** | **-0.0452*** ** | **-0.0286*** ** |
| | **(0.0014)** | **(0.0047)** |
| Unified Republican | -0.0377*** | -0.0169 |
| | (0.0054) | (0.2223) |
| **Inflation** | | **0.2327*** |
| | | **(0.0809)** |
| GDP growth | | 0.1310 |
| | | (0.5013) |
| **Deficit** | | **0.2337** |
| | | **(0.3637)** |
| Crash Year | | 0.1127*** |
| | | (0.0001) |
| **Presidential Election** | | **-0.0231*** |
| | | **(0.0597)** |
| Congress Election | | 0.0092 |
| | | (0.4211) |

…/…

…/…

| Variables | Model (5b) | Model (5c) |
|---|---|---|
| N | 58 | 58 |
| R-squared | 0.1767 | 0.6414 |
| Adjusted R-squared | 0.1468 | 0.5829 |
| F-statistic | 5.9050 | 10.958 |
| Prob (F-statistic) | 0.0047 | 0.0000 |
| Prob (Wald F-statistic) | 0.0030 | 0.0000 |

Notes: The dependent variable is the annual volatility measured by the annualized standard deviation of the S&P500's daily returns from 1950 to 2007. Estimates follow the OLS approach with a HAC Newey-West estimator (p-values in parenthesis). Democratic President is a dummy variable that takes the value 1 if the president belongs to the Democratic Party, and 0 otherwise. Inflation, GDP growth, Deficit, and Crash Year are variables to control for the economic environment. Presidential Election and Congress Election are dummy variables to control for election years. *, ** and *** represent significance at the 10 %, 5 % and 1 % levels respectively.

The results remain, in general, in line with the previous findings. Unified governments are clearly associated with times of lower volatility in the stock market. Moreover, in this case we can see the difference between having a unified government with a democrat president and a unified government with a republican president. In model (5b), both the explanatory variables are statistically significant at the 1 % level. Democratic unified governments tend to be associated with the largest decrease in the stock market volatility: 4.5 percentage points against a decrease of about 3.8 percentage points in the case of a republican unified government. However, in model (5c), when all the control variables are considered, a republican unified government ceases to have any statistically significant effect in the stock market volatility. This may be due to the fact that the sample only included 6 years of such situation, which naturally makes the statistical test to become more demanding. Notwithstanding, the dummy "democratic unified government" is still significant at the 1 % level, signaling a decrease of 2.87 percentage points in the market volatility, even after considering the complete set of control variables.

Overall, the abovementioned set of models show, on a consistent basis, that divided governments in the US are associated with a higher stock market volatility. In the main models, the effect ranges from 2.5 percentage points to 4.8 percentage points. Moreover, the later models show that we can exclude the possibility of such result being driven by the difference in the presidential party.

## 2. ROBUSTNESS TESTS

We subject the models to a series of robustness tests to verify the results. Robustness checks include testing for omitted variables bias, testing for autocorrelation and testing for multicollinearity between explanatory variables.

Regarding the presence of omitted variables, we applied the standard Ramsey Regression Equation Specification Error Test (RESET) which indicated that the models do not suffer from functional misspecification, with a high degree of confidence.

Even though all the models were estimated with a HAC Newey-West which enables the statistical inference even in the presence of heteroskedasticity and autocorrelation, we conducted some tests to understand whether there is a high degree of serial correlation in the data. We used the standard Durbin-Watson test and the Ljung-Box test, which led to the conclusion that from all the models of the study only model (1) suffered from autocorrelation issues for both the lag 1 and lag 2. In the models (4b) and (5b) the problem is limited to the first lag only.

Although the potential multicollinearity problems have been dealt with in the course of the models' estimation phase, we conducted a test based on Variance Inflation Factors (VIF). Those factors test the magnitude to which the variance of estimated coefficients is inflated because of multicollinearity issues. We concluded that there were no signs of extreme collinearity between variables that would decrease the meaning of the coefficients that were previously estimated.

Finally, a word should be said about the possibility of reverse causality in the correlation we are examining. It is not likely that our results could be affected by endogeneity problems since it is highly doubtful that the volatility of stock markets could play any relevant role in the definition of the US government status. This conjecture is confirmed by the results obtained with the Granger causality test. In fact, this test indicates that the direction of the (Granger) causality at the horizon of one year is from the divided government to the US stock market volatility and that there is no signs of reverse causation.

Overall, we found our results to be fairly robust so we are able to draw strong conclusions regarding the topic at hand.

# V. DISCUSSION AND CONCLUSION

Government plays a paramount role in modern economies. In this paper we used almost 60 years of data from the US to analyse the impact of the pattern of institutional control (divided government vs. unified government) on

political risk. Following a recent trend in the political science literature, the stock market volatility was used as a measure of risk. Our empirical evidence strongly suggests that political environments in the US characterized by a divided government tend to increase stock market volatility. Divided governments are found to increase the annual volatility by 2.8 percentage points even after controlling for a set of economic and political variables. We also examined the impact of two different forms of divided government distinguishing between weak divided government (the presidential party controls only one congressional chamber) and strong divided government (the presidential party does not control any of the congressional chambers). Strong divided government is found to lead to an increase of 4.1 percentage points in volatility whereas a weak divided government is linked to an increase of 5.8 percentage points in that same variable. The President's party does not seem to be, in itself, a driver for market volatility, but a Democrat President under a unified government leads to a significant decrease in volatility of 2.8 percentage points.

Overall, the present study challenges the gridlock theory and contradicts the conclusions reached by Bechtel and Füss (2008) for the German case. On the contrary, our findings fit well with Conley (2007)'s claim that major shifts in the political landscape have happened in periods of divided government, giving intuitive sense to the increase in stock market volatility during those periods.

One way of explaining our results relates to investor expectations and the effect such expectations may have on stock market prices. Stock market returns are more volatile in times of uncertainty. The gridlock theory posits that such uncertainty is abated when a government is divided because policies shaping business environments are harder to approve and implement. However, one could argue in alternative that in times of unified government, expectations regarding the policies to be implemented are clearer which decreases investor uncertainty and reduces stock market volatility. Moreover, under divided governments investors may be less capable of understanding the overall political agenda, since there are two different parties trying to set the tone in political terms. This possibility is especially relevant in that the literature suggests that Democrats and Republicans have a significantly different historical record in terms of the fiscal and regulatory policies they try to implement. Indeed, political parties can exert a significant effect on policy outcomes. For example, Alt and Lowry (2000) and Reed (2006) show that tax revenues and tax burdens are higher when Democrats control the budgetary process compared to when Republicans are in control and Roe (2006) documents that leftwing governments tend to eschew investors and capital market regulation and focus on workers and labor market regulation. Furthermore,

Democratic administrations have been associated with significantly higher inflation rates and previous research has concluded that GDP growth is slower during Republican presidential mandates (Alesina and Rosenthal, 1995; Alesina *et al.*, 1997; Leblang and Mukherjee, 2005). Thus, in cases of divided government, ceteris paribus, we will have a potential wider range (in a left-right spectrum) of policies being crafted which will have an impact on the level of uncertainty perceived by investors (Herron, 2000). One implication of this view is that situations where the government is unified might be better (less uncertain) for investors since they are more likely to predict which type of policies will be put in place.

Another way of explaining these results is based on the research of Nicholson *et al.* (2002) that relates the President approval rating with the government status. According to the authors, divided government "provides ambiguous and conflicting information about which branch of government to hold accountable for government performance" (Nicholson *et al.*, 2002: 701) and so their approval ratings tend to be higher under divided governments. Thus, under divided government president should "benefit far more from sharing blame than they lose by sharing credit" (Nicholson *et al.*, 2002: 703). This argument, in the case that presidents are aware of this asymmetry, could lead presidents under divided government to take additional risks in terms of policy, which would materialize in higher levels of market volatility.

Finally, our findings can also be understood at the light of the recent model developed by Azzimonti (2018). In this model, investment returns depend on the state of the economy, with these returns being more volatile when investors observe the occurrence of low probability events, such as a war or a financial crisis. In this context, policymakers can decrease the likelihood of rare events by adopting preventive policies. When the government is divided, the quality of such policies is lower which increases the probability of rare events.

Low risk is crucial to any well-functioning economy, as it stimulates capital investment, facilitates growth, and enhances overall economic performance. An increase in stock market volatility may lead to the deterioration of capital investment by risk-averse investors. Considering such effects, our analysis suggests that states of divided government might be a key explanatory variable on the attraction of capital stock thus indirectly affecting consumption, investment and economic growth.

Our findings are also relevant to the stream of literature on the electoral causes of divided government. There is a growing body of evidence suggesting that moderate voters intentionally bring about divided government by voting for parties whose ideal points may strongly differ from their own preferred policies (Scheve and Tomz, 1999; Kedar, 2006). This practice is often called

ticket-splitting and has been associated with the features of the electoral cycle, more specifically, with the fact that legislative elections may take place separately from the executive election (Shugart and Carey, 1992; Shugart, 1995). The rationale for ticket-splitting often lies in the idea that the voters try to get political actors to be limited in their actions, thus reducing political risk. However, for this argument to hold, political risk should be higher under unified government than under divided government. Since our results do not support this hypothesis, research should be more skeptical toward policy gridlock based explanations of ticket-splitting.

The veto players' theory developed by Tsebelis (1995, 1999, 2002) predicts that divided government will lead to gridlock because under that government status at least two of the veto players (actors whose agreement is necessary for a change of the status quo) will have significantly different preferences. This theory highlights the fact that changes in the legislative or regulatory status quo require the consensus of multiple institutional actors, which include in the US case the President, the Senate and the House of Representatives. As the number of veto players increase and their preferences regarding the direction of policy change diverge, the status quo is predicted to become more stable because these various veto players are unable to unite behind a mutually agreeable shift in policy. Thus, an increase in the number of parties that control at least one of the three institutions at the federal level bias outcomes toward the status quo. Our results are not consistent with the veto players' theory since they suggest that the status quo changes more significantly in the presence of a divided government. Moreover, the variables that capture the ideological distance between the majority and the opposition in the House of Representatives ("Distance") and the ideological distance within the majority ("Cohesiveness") are found to be non-significant thus not confirming what is predicted by the veto players' theory.

We believe our findings carry serious implications for future research on political economics and financial markets since they suggest that government status is a variable that should be considered in the study of economic uncertainty.

There is much more to investigate regarding the impact of divided government. First, given that conflicting results are reached for different countries, it would be important to discern the underlying drivers of the market volatility that can be attributed to the government status. Is it a matter of investors' perception and country's national culture, or is it a matter of the specific political framework in which the country operates on? Whereas the impact of the patterns of institutional control is not dependent upon whether the risk is objective or subjective, the nature and extent of their contribution to risk certainly is. If uncertainty is objective, the contribution of political

decisions to risk is a function of only the decisions themselves. If uncertainty is subjective, the contribution of political risk will be a function of both the decisions and the economic agents' cognitive processes. Second, there is issue of the direction of causality between the government status and the stock market volatility. In this paper, we have implicitly assumed that political variables are exogenous events, that is, were not influenced by the volatility of capital markets. This assumption was given some support when we established that government status does not seem to statistically precede the evolution of the financial variable. However, there are contributions in the literature that suggest that the evolution of stock markets can significantly influence variables of political nature (Fauvelle-Aymar and Stegmaier, 2013). And it is not implausible to admit the existence of dynamics that could lead both to a divided government and to a greater volatility in capital markets. For example, the debate about the possible causes of a financial crisis and about the necessary measures to address it could translate into a polarization of public opinion and an increased likelihood of a divided government. Endogenizing these dynamics in a model is a problem that certainly should deserve further attention. Third, the research for the specific case of the US still has a long way to go. For example, state-level research is necessary to determine the consequences of divided government for political risk in the states. Third, given that it is possible that divided governments may differentially impact policy areas and that the vulnerability to political risk is firm- and industry-specific, it would be interesting to examine the impact of the government status across different firms and industries. Finally, it would be important in the investor's perspective to ascertain whether government status-oriented asset allocations are able to yield abnormal returns.

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## METHODOLOGICAL APPENDIX

We subject the models to a series of robustness tests to verify the results. Robustness checks include testing for omitted variables bias, testing for autocorrelation and testing for multicollinearity between explanatory variables in all of the models that were applied to the full sample and that considered the full set of control variables. Finally, the robustness checks also include testing for endogeneity issues recurring to Granger causality tests.

### 1. Omitted variables

Regarding the tests for omitted variables, we started by applying a standard Ramsey Regression Equation Specification Error Test (RESET) to models (2), (4b) and (5c). In the remaining models, the Ramsey's RESET test cannot be performed since the only explanatory variables are dummy variables. The results are as follows:

Table A1. *Ramsey's RESET results*

| | **Prob > F** | **Result** |
|---|---|---|
| Model (2) | 0.6935 | Cannot reject $H_0$ |
| Model (4b) | 0.5427 | Cannot reject $H_0$ |
| Model (5b) | 0.5556 | Cannot reject $H_0$ |

Note: $H_0$: Model has no omitted variables.

From these results, we can say that none of the abovementioned models suffers from functional misspecification, with a statistically significant degree of confidence.

## 2. Autocorrelation

Even though all the models were estimated with a HAC Newey-West that enables the statistical inference in the presence of heteroskedasticity and autocorrelation, it is important to understand whether we have a high degree of serial correlation in the main models, as it sometimes happens with time series data.

We first recurred to a standard Durbin-Watson test, to assess if there is autocorrelation of first order (following AR1 processes), and the results were as follows:

Table A2. *Durbin-Watson test's results*

| | **DW Stat.** | **Critical Stat.** | | **Result** |
|---|---|---|---|---|
| | | **dL** | **dU** | |
| Model (1) | 1.2534 | 1.356 | 1.428 | Reject $H_0$ |
| Model (2) | 1.8766 | 1.134 | 1.685 | Cannot Reject $H_0$ |
| Model (4a) | 1.3262 | 1.320 | 1.466 | Inconclusive |
| Model (4b) | 1.3950 | 1.134 | 1.685 | Inconclusive |
| Model (5b) | 1.2713 | 1.320 | 1.466 | Reject $H_0$ |
| Model (5c) | 1.9238 | 1.095 | 1.734 | Cannot reject $H_0$ |

Note: $H_0$: Residuals are not autocorrelated. Critical intervals are at a 1 % significance level.

Firstly, it is important to reinforce that all the models were estimated using a Newey-West HAC estimator that allows statistical inference even in cases of serial correlation. Notwithstanding, it is also important to point out that only in the simplest models we reject the null hypothesis. Those models have only one dummy or a pair of dummies as explanatory variables. In the core models of our analysis, e.g., in models (2), (4b) and (5c), that include all the control variables, the possibility of autocorrelation problems is not excluded by the Durbin-Watson test. Thus, to better assess the issue, we performed a more sophisticated test. Since the Breusch-Godfrey test only has asymptotical validity (its results are not valid for relatively small samples, as it is the case), we run a Ljung-Box test, with two lags, for all the six abovementioned models. The results were as follows:

Table A3. *Ljung-Box test's results*

| | **Prob > F (1st lag)** | **Result (x=1)** | **Prob > F (2nd lag)** | **Result (x=2)** |
|---|---|---|---|---|
| Model (1) | 0.004 | Reject $H_0$ | 0.017 | Reject $H_0$ |
| Model (2) | 0.770 | Accept $H_0$ | 0.924 | Accept $H_0$ |
| Model (4a) | 0.010 | Accept $H_0$ | 0.04 | Accept $H_0$ |
| Model (4b) | 0.007 | Reject $H_0$ | 0.022 | Accept $H_0$ |
| Model (5b) | 0.005 | Reject $H_0$ | 0.021 | Accept$H_0$ |
| Model (5c) | 0.920 | Accept $H_0$ | 0.94 | Accept $H_0$ |

Note: $H_0$: There is no autocorrelation of $x^{th}$ order, being $x$ 1 and 2. Results are drawn upon a 1 % significance level.

So, as we can see, most of the models do not suffer from autocorrelation issues. Only model (1) presents some autocorrelation issues for both the lag 1 and lag 2. In the remaining models, models (4b) and (5b), the problem concerns the first lag only.

### 3. Multicollinearity

Regarding the issue of multicollinearity, we resorted to the computation of Variance Inflation Factors (VIF) for those models were this problem can be of importance, i.e., we excluded the models with only one or two dummy explanatory variables. The results of the multicollinearity tests were as follows:

Table A4. *Variance Inflated Factors test's results*

| | VIF $\beta_1$ | VIF $\beta_2$ | VIF $\beta_3$ | VIF $\beta_4$ | VIF $\beta_5$ | VIF $\beta_6$ | VIF $\beta_7$ | VIF $\beta_8$ | Result |
|---|---|---|---|---|---|---|---|---|---|
| Model (2) | 1.65 | 1.95 | 3.21 | 3.38 | 4.24 | 4.27 | 1.66 | – | Cannot reject $H_0$ |
| Model (4b) | 1.33 | 2.56 | 1.66 | 3.06 | 2.29 | 2.31 | 1.87 | – | Cannot reject $H_0$ |
| Model (5c) | 2.18 | 3.54 | 1.81 | 2.14 | 1.35 | 3.35 | 4.69 | 4.50 | Cannot reject $H_0$ |

Note: The threshold used in this test is the standard value in the literature: as it is usually considered, multicollinearity issues are raised when VIF stats are above 5 for one or more variables.

As it can be seen in Table A4, we found no extreme multicollinearity issues in the models. There are no signs of collinearity between variables that would decrease the meaning of the estimated coefficients.

### 4. Endogeneity

Regarding the issue of endogeneity, we recurred to the estimation of Granger causality between the variable that captures the existence of a divided government and the variable that reflects the volatility in US stock markets. The results of the Granger causality tests are as follows:

Table A5. *Granger Causality between Divided Government and Stock Market Volatility*

| | Number of lags | F value | p value | Result |
|---|---|---|---|---|
| Stock Market Volatility does not cause Divided Government | 1 | 0.10 | 0.75 | Do not reject |
| Divided Government does not cause Stock Market Volatility | 1 | 4.58 | 0.04 | Reject |
| Stock Market Volatility does not cause Divided Government | 2 | 0.87 | 0.42 | Do not reject |
| Divided Government does not cause Stock Market Volatility | 2 | 2.17 | 0.12 | Do not reject |
| Stock Market Volatility does not cause Divided Government | 4 | 0.40 | 0.81 | Do not reject |
| Divided Government does not cause Stock Market Volatility | 4 | 1.26 | 0.30 | Do not reject |

Note: results are drawn upon a 5 % significance level.

Considering one lag in the estimation, the results show that the direction of the (Granger) causality seems to be from the divided government to the US stock market volatility at the horizon of one year. On the other hand, there are no signs of reverse causation from the stock market volatility to the government status since the computed F value was not statistically significant.

However, at two or more lags, there is no statistically discernible relationship between the two variables.

Overall, there seems to be a unidirectional causality of Granger from the divided government to the US stock market volatility.