POLITICAL CYCLES AND RISK AVERSION

UNIVERSITAT JAUME I

VICENT MOLINER MARTÍNEZ

al314472@uji.es

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Directed by: Marina Pavan

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➢ ABSTRACT

This paper checks whether the main implications of the Pastor and Veronesi (2017) model of political cycles driven by time-varying risk aversion are valid for the Spanish case. In particular, we analyze whether the quarterly growth rate of the Spanish real GDP and the excess return behave in such a way as to support this theory. The conclusions obtained are contrary to the theory since we obtain that the economic growth of the country has been faster under the right wing party, and there are no significant differences in excess returns between mandates. These results suggest that this theory might not explain the Spanish political cycles.

➢ INTRODUCTION

Economics and politics are two highly related terms, which is why there are a large number of papers that study the relationship of these two aspects that are so important in the daily lives of individuals. Various studies have been carried out to see how economic aspects influence political results, but also many others to observe how politics influences the economic course. Some studies have a state level, others continental level and others even global level.

Since democracy was established in Spain, Spanish politics has been bipartisan in nature, with one party considered right-wing and another considered left-wing successively taking over power. During all this time there have been different stages of economic expansion and recession and the two parties have seen how these situations affected them directly, both positively and negatively, since the individuals as a whole have chosen to support them by giving them their vote to remain in power, or on the contrary, to vote in favour of the opposition so that it would try to change the course of the economy.

Two economists, Pastor and Veronesi, have conducted a study in which they have created a theory that explains the political cycle of the United States from the point of view of the level of risk of individuals. To argue their theory, they consider that when a person is in a position to make a choice, he or she may be risk-averse or risk-loving, according to this determination, he or she will choose the safest option or, on the contrary, the riskiest. In their work they explain that the individual has to make two main decisions throughout his life, these two are: which political party to vote for, a right-wing party or a left-wing party and for whom to work, for the public or private sector. Thanks to their study, they have come to the conclusion that these two choices depend on the degree of risk aversion that each individual has at each moment, this means that according to the level of risk aversion of an individual, he or she will choose one option or another. In the case of work, if a person has a high aversion to risk he will choose to work for the public sector and if a person has a low aversion to risk his choice will be towards the private sector, the reason for this is because in the public sector there are fewer risks since you are not exposed to the economic situation of a company and in addition, the state is always more reliable than a company. On the other hand, generally the profit can also be greater if you are part of the private sector because you take more risks. In the case of elections, a person with a high aversion to risk will opt for a left-wing party, in the case of the US for democrats and in the case of Spain for the Socialist Party (PSOE), as their measures and political ideas demand more social security and more redistribution of income; on the other hand a person with low aversion to risk will opt for the right-wing party, in the U.S.A., the Republicans and in Spain the Partido Popular (PP), these parties prefer to opt for taking more risks in business and impose lower taxes on businesses and households.

Pastor and Veronesi (2017) have developed a model of the American political cycle, where the presidential puzzle, which consists in the fact that stock market returns have been significantly higher under Democrats than under Republican presidencies. This theory states that when the Democratic Party governs, fewer individuals choose to work as entrepreneurs, and only the best, that is, the most productive, supported by state workers. This forms a work economy with many state workers and few entrepreneurs, which causes a greater growth of the country according to these economists, and consequently a decrease in the level of adversity to the risk of the individuals as a whole. At this moment the citizens are prepared to take more risks in business and this is demonstrated in the elections, since the Republican Party is victorious, which by its measures is characterized by being more risk-takers in business and the country grows economically in a more moderate way, because there are many entrepreneurs and their average productivity is lower and, according to these economists, the economy grows less. This slowdown in the rate of growth of the economy, causes an increase in the level of risk aversion between individuals and reflect this in the next elections, where the Democratic Party will take control of the government. In the empirical analysis of their work, they use data such as the growth rate of U.S. GDP in real terms and an index called excess returns, which corresponds to the differential of investing in the private or public sector, to support their theory of the U.S. political cycle, where Democrats and Republicans have been relieved in power successively depending on the level of risk aversion of the individuals as a whole.

My study consisted of analysing the consequences of the theory presented by Pastor and Veronesi (2017) for the Spanish case. That is to say, my efforts have focused on observing whether the differences obtained in their work between the excess return and the real GDP growth rate also occur between the left-wing party and the right-wing party in Spain. Focusing on ideological similarities, I have assumed that as in the United States, in Spain there is also a right-wing and a left-wing party, which is why my comparisons have been, on the one hand, between the Democratic Party and the Socialist Party, considered left-wing, and, on the other, between the Republican Party and the Popular Party, considered right-wing.

To this end, an empirical study has been carried out based on data such as the growth rate of Spanish real GDP in quarterly terms and an index called excess returns, which corresponds to the difference between the monthly return that an individual obtains when making an investment in the Spanish stock market, the IBEX 35, less the monthly return that an individual obtains when making an investment in short-term treasury bills. The period studied runs from 1 January 1993 to 31 December 2017.

The results obtained differ from the theory of these two economists, since in the period studied, the popular party obtains a higher average rate of growth of the Spanish GDP, contrary to its study, in which the party that obtains the highest index is the democratic party, supported under the hypothesis that there is more fiscal redistribution and the country grows faster. Another example that our results are not the same as those of Pastor and Veronesi (2017) is the result of the excess return, where we have obtained that there is no significant difference between the excess returns of the different parties, a result that again differs from theirs, since in their case a significant difference is obtained and it is the democratic party that obtains the greatest excess return on average, backed up by the argument that its redistributive policies provide more security, which causes less uncertainty among individuals, and the differential between the index of investment in the private sector and the index of investment in the public sector has to be smaller for individuals to choose to invest in the private sector.

In what remains of the work, I first expose the bibliographical revision made prior to the study, focusing above all on the work of Pastor and Veronesi (2017) which is the core of my study, as I question their theory for the Spanish case. Next I expose some key terms that have seemed to me interesting and precise for the good understanding of the carried out study. The fourth section corresponds to the empirical analysis, main part of my work, where I obtain contrasted data and expose them to later compare them with the theory of Pastor and Veronesi (2017), in this section I also dedicate a part to the realization of a simple econometric model with which I doubt the significance of the data and the correlation between them. Finally, in the conclusion I expose the results obtained from the theoretical point of view and my conclusions drawn with the realization of the work.

➢ LITERATURE REVIEW

The study that has been carried out has to do with two crucial aspects in the daily life of all the citizens of a country; I am referring to the economy and politics. Previous studies have verified the relevance that the economy has on the electoral votes; or in other words, how economic aspects such as the behaviour of the stock market or macroeconomic factors influence such an important decision in the life of any individual as the election of the governing political party in a region. An example of them are the studies of Pantzalis et al. (2000) that examined the behaviour of the stock market in the days before and after the elections or of Booth an Booth (2003) that concluded in their work that the American stock market usually goes better in the second parts of the mandates. Other studies have focused on the relationship between political orientation and the stock market, many of them showing that stock market performance is greater under the mandate of left-wing parties, Democrats in the case of the US, than under the mandate of right-wing parties, Republicans in the case of the US.

Dolores Furió and Ángel Pardo (2011) studied the relationship between politics and the Spanish stock market, as well as the empirical implications and the hypothesis of uncertain information. To do this, they used daily stock market data from the Spanish index and the world stock index from January 1976 to October 2008. With these data, they tried to empirically demonstrate two theories that explain how stock market policy affects the Spanish case. On the one hand, the theory that states that in the second part of the electoral mandate, public spending is increased since expansionary policies are prioritized in this period, and on the other hand, the different consequences that the stock markets have in mandates of different parties due to their different political ideologies.

They concluded that there are no systematic differences in interest spreads in the last two years before the elections, i.e. in the difference in stock market performance and excess returns, which means that there are no abnormally positive returns during the second half of the legislature. This contradicts the opportunistic theory of the political cycle which states that before the elections there is an expansion of the economy with a corresponding increase in inflation and after the electoral process there is a reduction of these two variables. They also concluded that market behaviour is egalitarian when current government leaders win or lose. On the other hand, the results obtained confirmed the idea that the stock market reacts differently according to the ideology of the current ruling party both in the days before and after the elections and throughout the term. Finally, they came to the conclusion that the volatility of stock performance increases significantly with the arrival of unexpected information to a market, a clear example of this are election days where economic uncertainty grows and stock markets are affected.

This leads us to another term that has marked research, the word uncertainty and how it affects the market and its functioning. Jurado, Ludvigson and Ng (2015) attempted to measure uncertainty through the common variability of unpredictable components in econometric models. They were clear that uncertainty played an important role in economic cycles and with their work they brought new measures of uncertainty and made them understood within economic activity. To this end, they developed an econometric model based on three key factors: an estimate of the prediction, an error in the estimate of the prediction and an estimate of macroeconomic uncertainty constructed from individual uncertainty measures. The conclusions they obtained were that many economic recessions are associated with high increases in uncertainty, while other periods of more moderate economic non-growth are not; this means that when an episode of high quantitative importance of uncertainty occurs, it is highly correlated with real economic activity; on the contrary, less persistent episodes of uncertainty do not mean periods of economic recession. Gil, Perez and Urtasun (2017) observed that global economic activity was developing in 2017 in a context of high uncertainty due to the holding of geopolitical events such as Brexit and the victory of Donal Trump in the U.S. presidential elections and other factors such as the persistence of the migration crisis or tensions in the Middle East and conducted in their study an analysis of the level of uncertainty in the Spanish economy. They analysed different indicators according to their origin: volatility in financial markets, the degree of disagreement between economic agents on the economic situation and uncertainty over economic policies. They reached some conclusions, such as that despite the notable increase in the level of uncertainty in 2016, it does not reach the average level of the recession of 2008-2013, that changes in uncertainty have a greater impact on the Spanish economy if they are captured by financial indicators, especially on investment, and that the increase in the level of uncertainty suffered in 2016 originated outside the Spanish economy.

Once we understood that there is a high correlation between the economy and the political electoral process and that the phenomenon of uncertainty is a key factor in economic recessions, we thought it was key to investigate the influence that economic results have on voters when it comes to backing or removing their support for the current government. Tomás Mancha Navarro and María Teresa Gallo Rivera (2015) studied it for the Spanish case. If the economic indicators are positive, voters decide to support their administration by giving them their vote, but if they are negative, they penalize them by giving the vote to the opposition. The authors of the paper call this way of thinking of the citizens as the logical reward/punishment. To carry out the study, they tested two models of behaviour, the first, called the voter "interested" or "selfish" where it is assumed that the only thing that influences the voter are the changes in their own standard of living, and the second, called the voter "naive" or "impulsive" where it is assumed that the behaviour of the voter only varies due to an economic or extra-economic crisis. The study concludes that the evolution of the voting intention of the governing party and the main opposition party has been cyclical, with periods over the years in which voter support for the government has increased and others in which such support has decreased. It is for this reason that an interrelationship can be established between the economy and politics in the case of Spain based on the intention to vote and the voter's assessment of the macroeconomic situation and his or her own independent economic situation.

In the empirical part of this work, it has been demonstrated by the estimation of the functions of popularity that under the hypothesis of the "interested" voter the obtained results are satisfactory, demonstrating that an increase of the salary income increases the popularity of the governing party and that this one is harmed by the passage of time due to the political wear and tear. On the other hand, the estimation of the functions of popularity under the hypothesis of the "naive" voter has also turned out as expected, since for example it is observed that an increase in inflation negatively affects the popularity of the current government and an increase in GDP or a reduction in unemployment positively affects the ruler.

Santa-Clara and Valkanov (2003) were the first to empirically analyse the relationship between the presidential elections and the stock market. In their study, they documented that the excess returns, the difference between the yield of the shares and the yield of the monthly treasury bills, correlate with the presidential-partisan cycles and tested some hypothesis on the origin of this correlation. The data used correspond to the period from 1927 to 1998 in the U.S.A., contains 18 elections, 10 Democratic presidents and 8 Republicans.

In their study they obtain a significant difference of the excess returns from the economic and statistical point of view, the data reveal a 2% under the republican presidency and an 11% under the democratic presidency; that is to say, a difference of 9% per year. In order to contrast these results, they used several robustness tests, tests that confirmed the results obtained, although given the limitations of the data, they could not be absolutely sure that the impact of the political cycles on the stock market was not just a coincidence.

They focused on discovering whether the difference in average yields was due to a difference in expected yields or a difference in unexpected yields. When they name expected returns they refer to a "democratic risk premium" and for unexpected returns they refer to when the policies promulgated by the ruling party systematically deviate from what the market foresees. The result they obtained was that the difference in returns between presidential parties consists largely of a difference in unexpected returns rather than a difference in expected returns. Presidential parties therefore capture variations in yields that are largely uncorrelated to what is explained by fluctuations in the economic cycle. This conclusion is reached, among others, thanks to the fact that on the dates close to the elections no great movement in prices is observed, which corroborates that the difference in yields was largely unforeseen by the market, since if the difference in profitability was due to a greater democratic risk premium, they should have observed a great movement in the stock exchange quotations at times when uncertainty is resolved as to which party wins the presidency.

It can be said that individuals make two important choices throughout their lives, in which sector they work (public or private) and which political party they vote for to govern them and make decisions on their behalf (left-wing or right-wing party). Pastor and Veronesi (2017) demonstrate that decision making in these two elections depends on how adverse an individual is to risk; if an individual has a high level of risk aversion, he or she will prefer to work in the public sector and vote for Democrats; conversely, if an individual has a low level of risk aversion, or risk lover, he or she will make the decision to work in the private sector and vote for the Republican party. In their work, they develop a model of political cycles determined by the variation of risk aversion over time, thereby reinforcing the idea that the presidential puzzle emerges endogenously; with this term they refer to the succession of the two historic parties in the United States that are the Republicans and the Democrats. For his empirical analysis he uses US data from 1927 to 2015.

The empirical analysis of this work provides data to show why individuals vote for one party or another in the United States. The Republican Party, which is a conservative party, can be classified as a right-wing party that prioritizes its efforts on social issues, allowing the economy to flow more freely; that is, it is in favor of the concept of the minimum state. It is characterized because it is in favor of taking enough risks in business. On the opposite side are the Democrats, a party that represents liberal ideas and that can be classified as more left-wing than the party described above; its main objective is fiscal redistribution, in order to obtain less economic inequality among individuals in a country and that is why it imposes higher taxes.

The main idea developed in this work is the explanation of the economic cycle depending on the adversity to the risk of individuals. When expectations of a recession are high, the degree of uncertainty grows and individuals increase their degree of adversity over risk, since they prefer safety to risk. This is because the increase in the level of uncertainty causes a greater aversion to the risk of individuals and therefore, there are fewer people willing to work as entrepreneurs, those who decide to do so are the best, the most productive and that is why the economy can grow more. Consequently, with the economic growth of the country, the adversity to the risk of individuals decreases, who believe that it is time to risk and not feel so protected. The next elections are won by the Republican Party and this is a cycle that is repeated constantly.

In the empirical analysis of the study by Pastor and Veronesi (2017) they use data on the variation rate of the real GDP, and show that under the Democratic Party the economic growth is greater, with a growth rate of 4.86% on average compared to the 1.70% on average obtained by the Republican Party. Another significant fact that explains the difference in business risk taking between the two parties is the excess returns, for this they calculate the difference between the natural logarithm of the quarterly return of the stock exchange ("stock market returns") and the natural logarithm of the interest rate of the short-term treasury bill, the Democratic party obtains a stock excess return of 10.69%, compared to -0.21% of the Republican party. Thus, the data show that the performance of the stock market is much higher under Democrats, a justification for this is that Republicans take more risks in business and this generates more uncertainty among investors or what is the same, individuals feel more unprotected, less secure, which means that the difference between the index of investing in the private sector, belonging to the stock market, and the index of investing in the public sector, through short-term treasury bills, has to be greater for some of the individuals to choose to invest in the private sector.

After this literature review, I conclude that there is a high correlation between economics and politics. Political parties depend to a large extent on the economic situation, since thanks to the studies carried out previously we have observed that one of the things that most influences an individual when it comes to voting is the general economic situation as well as the personal situation. Individuals can consider themselves lovers or opponents of risk, depending on this they will prefer the political measures of a right-wing party or a left-wing party. Thanks to the study by Pastor and Veronesi (2017) we have seen how adversity affects the risk of individuals to the political cycle in the case of the United States, reaching the conclusion that the presidential puzzle emerges endogenously and that the modification of the ruling party depends on what economic situation the country is in, and on how voters absorb this situation, demanding more security, or on the contrary more risk, depending on their level of risk aversion.

In the following study, we will try to explore whether a presidential puzzle exists in Spain, analysing data from 1993 to 2017. As in the U.S.A., in Spain, a right-wing party and a left-wing party have been taking over the mandate since the beginning of the democracy. It is true that the results of the general elections in 2015 and 2016 have resulted in a reconfiguration of the party system, as indicated by Sánchez Muñóz, O (2017) in his work, where he explains that Spain has gone from a perfect two-party system to a fragmented multi-party system. Although for the purposes of this study, Spain has only been governed by the Socialist Party or the Popular Party.

➢ DEFINITION OF KEY TERMS

- Uncertainty:

Uncertainty is a crucial concept for the understanding of economic phenomena. Uncertainty is understood as a situation in which the probability of the occurrence of a certain event is not completely known. Uncertainty then means, in economics, an unpredictable situation or imperfect forecast of future events.

Uncertainty in our study has an important role since individuals, when they find themselves in an uncertain economic environment, feel an increased sense of uncertainty and this strongly influences their decisions. When there is a high level of economic uncertainty, the population demands more security from the government, and on the contrary, when there is economic stability, individuals prioritize business risk over security. As right-wing and left-wing parties are characterized by more risk takers in business and fewer risk takers respectively, depending on the level of uncertainty of the individuals, they will decide to support one party or another with their vote.

- Risk aversion:

The basic idea that can be extracted and that summarizes the concept of risk aversion is that if two options or alternatives are presented when it comes to choosing, an individual catalogued as a "risk-averse" will opt in most cases for the one that presents less risk. On the other hand, a risk-loving person will choose the riskier option over a choice, which usually has the greatest possible benefit.

Thanks to the study by Pastor and Veronesi (2017) it has been possible to observe that for the United States there are data that demonstrate that the succession of the ruling party depends on the level of adversity to the risk of the population at each moment. In this work we will analyze whether the consequences derived from this hypothesis are also present in the Spanish case.

- Bipartisanship:

The mandate of the Spanish government can be described as bipartisan because after the collapse of the Unión de Centro Democrático (UCD), the Partido Popular (PP) and the Partido Socialista Obrero (PSOE) have alternatively occupied the government of

Spain, with an absolute majority or with the support of other smaller political groups, and with the other party as the political leader of the opposition.

Since 2014, alternative parties such as Podemos or Ciudadanos have appeared on the bipartisan political scene, representing an alternative to the two parties par excellence, but the reality is that no party other than the two majorities has managed to seize power from them.

In this study it will be checked whether the differences obtained by Pastor and Veronesi (2017) belonging to the real GDP growth rate and the excess return between the two American parties also occur between the two Spanish parties.

- Economic differences between PP and PSOE:

In order to understand the study that has been carried out, it has been important to know the different preferences that the two political parties have when it comes to acting with respect to business and the economy in general. For this reason, researching the historical decisions taken by the two sides, it can be said that the PSOE tends to penalise companies and great wealth more than the PP; this is done through greater fiscal redistribution, and it is put into practice mainly through higher taxes, such as personal income tax or corporate income tax. A significant measure of the PSOE is that it tends to raise taxes on high income taxpayers, thus trying to reduce the difference between the wealth of different social classes. It has also been concluded that the PP is in favour of a lower collection by the state, its argument is that this favours job creation, entrepreneurship and innovation.

These deductions and others that have been known thanks to previous research, lead us to the conclusion that if individuals are in a moment of uncertainty, where most of them have a high adversity to risk, they will prefer the measures of the Socialist Party, which will generally provide them with more economic security and will be less risk-taker in business. On the contrary, if individuals are risk lovers and find themselves in a reliable economic situation, they will tend to vote for the Popular Party, since it will implement less restrictive measures for entrepreneurs and will be more risky in taking business.

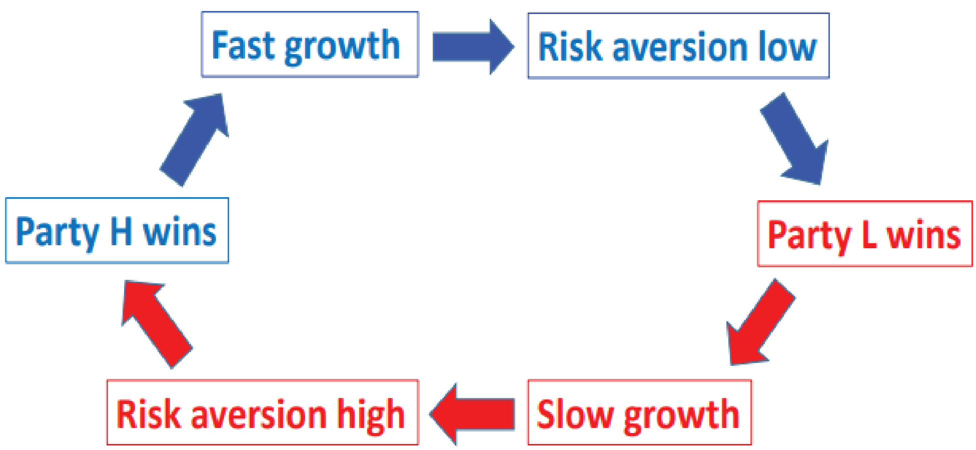
The study will analyze with empirical data whether there are differences in economic performance under the two Spanish political parties.

- Political cycle:

In the study carried out by Pastor and Veronesi (2017), they speak of the political cycle frequently. They refer to it from the point of view of risk aversion and argue it in the following way: when the United States is governed by the Democrats, the country grows economically speaking quite fast, this rapid growth causes a decrease in the level of risk aversion of citizens. At that time citizens are willing to take more risks in business and the Republican Party wins the election. By the measures taken by this party, the country grows in a more moderate way and consequently the level of risk aversion of individuals suffers an increase. The next elections are won again by the Democratic Party and the cycle starts again.

In this work it will be verified through empirical data if the described theory of the political cycle is applicable for the Spanish case.

The following image is extracted from the work paper by Pastor and Veronesi (2017), used to explain the American political cycle from the point of view of individuals' aversion to risk.



➢ EMPIRICAL ANALYSIS

The study carried out will focus on analyzing the consequences obtained by Pastor and Veronesi (2017), belonging to the difference in data between the real GDP growth rate and the excess return between the different US parties, from the Spanish point of view; in other words, we will analyse the data for the case of Spain, and in this way we will be able to check whether the theory of the political cycle and the aversion to risk exposed by these two economists is valid for the Spanish case

The Spanish government is bipartisan, which means that two parties have historically been revealing themselves in power. One considered right-wing, called the Partido Popular (PP) and another considered left-wing, the Partido Socialista Obrero Español (PSOE). As they are two different ideologies, they differ in many aspects, both economic and social; this is why logic makes us think that according to the demands demanded by the citizens, one party or another will win.

To check if the same conclusions are obtained and the theory of the political cycle and risk aversion is valid, we use the growth rate of Spanish real GDP per capita in quarterly term and the excess returns in monthly terms, which correspond to the difference between the performance of the Spanish stock market, measured as the percentage monthly change in the IBEX 35, and the return obtained by acquiring a Spanish short-term treasury bill.

- Real GDP Growth rate:

The GDP variation rate (Gross Domestic Product) is a measurement frequently used in the economic study to analyse the increases or decreases that the GDP experiences in certain periods of time. The periods included when calculating variation rates are usually one year, generally, or also by quarters. Basically, the GDP variation rate is quite useful when observing and measuring the economic growth that a country or territory has experienced in said period, and giving this change a percentage value. By analysing the evolution of a country's GDP, we can verify, by definition, the changes in the country's productivity at any given time.

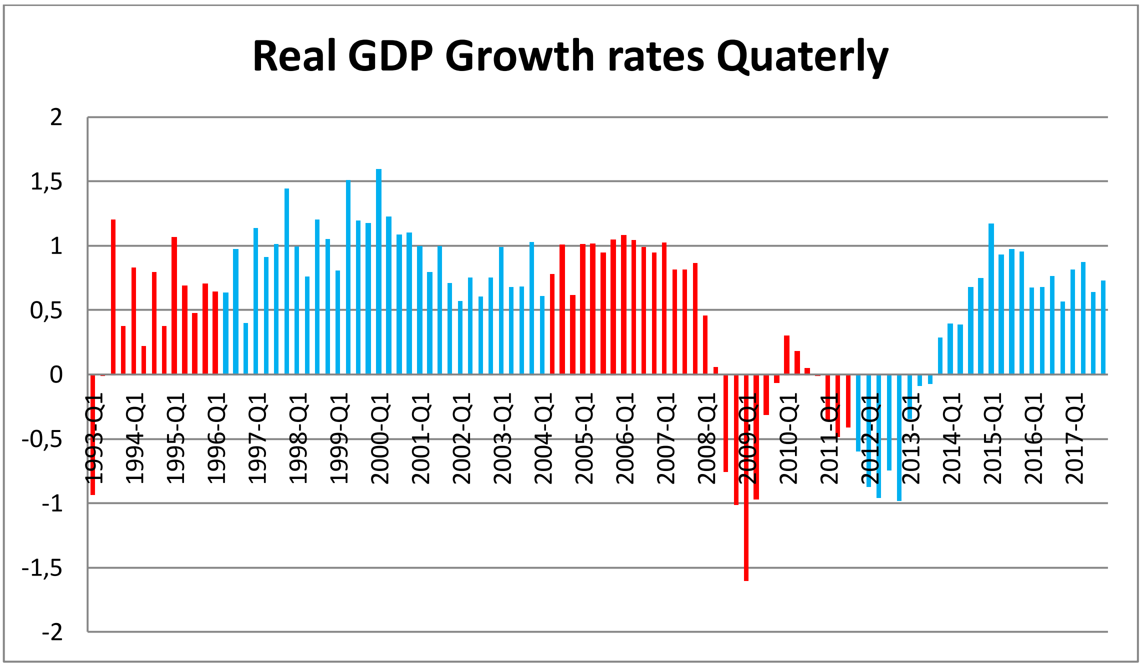
The calculation of this rate is made by dividing a GDP value less another previous GDP value by this same number and multiplied by 100 to obtain the result expressed as a percentage:

$$\text{Economic Growth} = \frac{GDP_2 - GDP_1}{GDP_1}$$

The data have been obtained from the Federal Reserve Economic Data (FRED) belonging to the Spanish real GDP per capita, cover from 1993 to 2017, these two inclusive.

By averaging the growth rate of Spanish real GDP under the mandate of both political parties, we obtain that Spanish real GDP increased by 0.36% when the socialist party governed, more specifically by 0.46% in the first stage (1993-1996) and 0.30% in its second stage (2004-2011). For the Partido Popular we obtain an average growth rate of 0.67% during its governments, an increase of 0.94% in the first stage (1996-2004) and an increase of 0.30% in the second stage (2011-2017). This data contradicts the theory obtained by Pastor and Veronesi (2017) that there is more growth during the government of the left-wing parties, in their case the democrats, since one of the main objectives of these is fiscal redistribution, which causes a period of more uncertainty and consequently a greater aversion to risk among individuals. This means that fewer individuals decide to work as entrepreneurs, those who decide to do so are only the best and also the most productive and that is why the economy can grow more.

In the following graph we can observe the different values of the quarterly growth rate of Spanish real GDP from 1993 to 2017. In red we have the data pertaining to the quarters governed by the socialist party and in blue the data pertaining to the governments of the popular party. It should be noted that in the first stage governed by the Socialist Party there were 2 quarters of economic recession and the average annual growth was 1.94%. In the first stage governed by the Popular Party there was no recessive period and the annual average growth was 3.85%. In the second stage governed by the PSOE there were 10 quarters of economic recession, being the period with the most recessive quarters, and the average annual growth was 1.25%. Finally, in the second stage governed by the PP there were 8 quarters where the growth rate of real GDP per capita was negative and its average annual growth was 1.18%.



The following table indicates some significant data such as the maximum, minimum, mean and standard deviation on the different stages governed by each party between 1993 and 2017.

Real GDP Growth (Quarterly)	Maximum	Minimum	Mean	Stand. Err.
PSOE 1ª stage **(Q1/1993 - Q1/1996)**	**1,203%**	**-0,932%**	**0,4951%**	**0,5424%**
PP 1ª stage **(Q2/1996 - Q1/2004)**	**1,594%**	**0,4%**	**0,9493%**	**0,2823%**
PSOE 2ª stage **(Q2/2004 - Q3/2011)**	**1,082%**	**-1,599%**	**0,3028%**	**0,7562%**
PP 2ª stage **(Q4/2011 - Q4/2017)**	**1,172%**	**-0,977%**	**0,3054%**	**0,6767%**

- ECONOMETRIC STUDY:

To test whether the observed difference in the average real GDP growth rate is significant, we perform the following a simple regression of the real GDP growth rate:

$$\mathbf{Y_t = \alpha + \beta d_t + u_t}$$

We call g the dependent variable, which corresponds to the GDP growth rate, and we call PSOE the independent variable, which corresponds to the ruling party in each quarter:

$$\hat{g}_t = \hat{\alpha} + \hat{\beta}\mathbf{PSOE_t}$$

Where d is a dummy that we have called PSOE and to which we attribute the value of 1 under the mandates of the PSOE an 0 for the mandates of the PP. We have estimated the econometric model by Ordinary Least Squares.

The equation obtained is the following:

$$\widehat{g_t} = \mathbf{0.667 - 0.306} * \boldsymbol{PSOE}$$

variables	Coeff.	St. Err.	Value p
Constant	0.666923 ***	0.0778178	1.52e-013
PSOE	-0.305940 **	0.131678	0.0222
	Obs. 100 R sq. 0.054589 Adj. R sq. 0.044941 F stat 5.397		

***=significant at 1%; **=significant at 5%; *=significant at 10%

Observing the results obtained, we can observe that if the Dummy PSOE is equal to 0, the average growth rate of the Spanish real GDP is equal to 0.67%, which coincides with the average growth rate of the quarters governed by the Partido Popular. If the Dummy is equal to 1, the average growth rate of the Spanish real GDP is equal to

0.36%, which also coincides with the aforementioned results of the average growth rate under the quarters governed by the Socialist Party.

Thanks to the estimated regression used, we can observe that both the constant and the dummy variable PSOE are significant; which means, first, that the average growth rate of the real GDP growth rate during the period of the PP is significantly different from 0 and second, that there is a difference between the average growth rates of the real GDP growth rate corresponding to each party with a level of significance of 5%. We can also comment that the R-square obtained equal to 0.055 is very low, which means that the variable used explains very little.

It is worth mentioning that there could be an autocorrelation problem, which means that the disturbance of an observation of a certain period could be correlated with the disturbance of one or more previous periods, that is to say, the observations are not independent.

To measure the correlation between the real GDP growth rate and the different governments of the political parties in Spain, we are going to use the following econometric model:

$$\widehat{g_t} = \mathbf{0.139} + \mathbf{0.815} * \boldsymbol{gt1} - \mathbf{0.556} * \boldsymbol{PSOE}$$

variables	Coeff.	St. Err.	Value p
Constant	0.138962 **	0.0583748	0.0193
gt1	0.815122 ***	0.0624272	5.26e-023
PSOE	-0.0555752	0.0715559	0.4393
	Obs. 100 R sq. 0.7168 Adj. R sq. 0.7109 F stat 85.463		

***=significant at 1%; **=significant at 5%; *=significant at 10%

With this new regression we obtain that the dummy variable PSOE is not significant. Therefore we can affirm that, when taking into account the auto-correlation in GDP growth, there is no significant difference between the average growth rates of the two parties. We can also observe that there is a very high and significant correlation, of 0.81, between the variable g in t and the variable g in t-1. Finally, add that the R-square has increased significantly to 0.71, which means that with this regression the variable used explains more than the previous one.

Another regression that we have made as an alternative to the previous one is the following one, in which we can observe that we have put a lag in both the GDP variable and the PSOE dummy, the regression would be the following one:

$$\widehat{g_t} = \mathbf{0.153 + 0810} * \boldsymbol{gt1} - \mathbf{0.0794} * \boldsymbol{PSOEt1}$$

variables	Coeff.	St. Err.	Value p
Constant	0.152762 **	0.0592175	0.0114
gt1	0.809717 ***	0.0626578	9.93e-023
PSOEt1	-0.0794167	0.0705862	0.2634
	Obs. 100 R sq. 0.7186 Adj. R sq. 0.7127 F stat 84.543		

***=significant at 1%; **=significant at 5%; *=significant at 10%

With this new regression we obtain the same conclusions as before, that the PSOE variable with a lag is not significant, therefore, there is no difference between the average growth rates of the real GDP growth rate of the two parties, that there is a high correlation between the variable g in t and the variable g in t-1 and that the R-square is still high and significant, which shows that adding a lag to the two independent variables, the dependent variable is quite explained.

As I have been able to prove, in our empirical analysis we obtain a higher historical growth rate of the Spanish real GDP under the mandates of the Popular Party, so I can conclude that the theory obtained by Pastor and Veronesi (2017) in their study for the case of the United States, is not applicable for the Spanish case.

- Excess returns:

Another piece of information that may be useful to observe the difference in risk taking between the two political parties and thus see if the choice of who should govern them by individuals depends on their level of risk aversion is the Excess returns, which is the difference between the performance of the Spanish stock market, the IBEX 35, and the interest of the short-term treasury bill in Spain.

The excess return is the difference between two indices; the first, the stock exchange index, is the one that an investor obtains if he chooses to invest in the private sector, more specifically in the stock exchange. On the other hand, the second, the index belonging to the short-term treasury bills, is the return that an investor obtains if he decides to invest in the public sector. As pointed out before, according to the theory developed by Pastor and Veronesi (2017), under democratic governments individuals have higher risk aversion, thus, they need a greater difference between the two returns for their choice to opt to invest in the private sector, which provides more profits but is also riskier.

To see if this theory works in the Spanish case, we have obtained data on the monthly value of the Spanish stock exchange, the Ibex 35, and the monthly index of short-term treasury bills issued by the Spanish state in order to calculate the monthly Spanish Excess returns from 1993 to 2017. The data have been obtained from the Federal Reserve Economic Data (FRED).

The results obtained tell us that the value of the monthly excess return in average during the governments of the Socialist Party included in this period of time is -0.6647% and the average interest rate in the governments of the Popular Party in this period is practically 0, more specifically 0.025527%. Breaking down the excess returns data, we obtain that in the part belonging to the stock market index, the average of the PP is higher than that of the PSOE, 0.24% for the right-wing party versus -0.29% for the left-wing party. On the other hand, in the part belonging to the index of short-term treasury bills, it is the socialist party that obtains the highest average, 0.58% compared to 0.21% obtained by the popular party.

In the study carried out, we obtain that the excess return rate is higher under the period governed by the PP, data that also distance us from the theory obtained by Pastor and Veronesi (2017). In their work they argue that excess returns are higher under the left-wing party, the Democrat in the case of the United States and the Socialist party in the case of Spain.

The conclusion we reach is that the theory argued by Pastor and Veronessi (2017) in their work for the case of the United States that the excess return is greater in the mandates of the left-wing party, is not applicable to the Spanish case since we have obtained a higher average excess return during the mandates of the right-wing party, in this case the popular party.

- ECONOMETRIC STUDY:

To see if there is a significant difference in the average of the excess returns between the governments of the Popular Party and the Socialist Party, we carried out an estimated regression of the monthly average of the excess returns, the regression is as follows:

$$\mathbf{\widehat{e_t} = -0.00004 - 0.00661 * PSOE}$$

We have used an econometric model determined by Ordinary Least Squares where the dependent variable corresponds to the excess return index, which we call et, and the independent variable appears as a dummy to which we call PSOE and to which we attribute the value of 1 under the mandates of the PSOE and 0 for the mandates of the PP.

variables	**Coeff.**	**St. Err.**	**Value p**
Constant	-4.15253e-05	0.00199042	0.9834
PSOE	-0.00660626	0.00502263	0.1894
	Obs. 312 R sq. 0.0067 Adj. R sq. 0.0035 F stat 1.73		

***=significant at 1%; **=significant at 5%; *=significant at 10%

Observing the obtained results, we can observe that if the Dummy PSOE is equal to 0, the mean of the monthly excess return is equal to 0.00415%, that is to say, it is practically null, equal to 0. This leads us to conclude that there is no excess return on average.

We also obtain that the Dummy PSOE is not significant because the p-value is quite high, 0.1894, and we cannot reject the null hypothesis that Ho is equal to 0.

Therefore, with this estimated regression, we can conclude that there is no significant difference between the averages of the excess return indices between the different governments of the Socialist Party and the Popular Party.

As in the study of the real GDP Growth Rate, in this regression there can also be an autocorrelation problem; that is to say, our observation could be related to previous periods what would cause that the observations were not independent.

To try to solve the autocorrelation problem, we have made an alternative regression using as independent variables the variable e_t and the dummy PSOE, both with a lag. The regression would be as follows:

$$\boldsymbol{\widehat{e_t} = -0.000144 + 0.0137 * et1 - 0.00598 * PSOEt1}$$

variables	Coeff.	St. Err.	Value p
Constant	-0.00014375	0.00200226	0.9428
et1	0.0137008	0.0418281	0.7435
PSOEt1	-0.00597663	0.00496477	0.2296
	Obs. 312 R sq. 0.0059 Adj. R sq. -0.0005 F stat 0.727		

***=significant at 1%; **=significant at 5%; *=significant at 10%

The conclusions obtained do not differ from the previous model since neither of the two variables is statistically significant and the R-square is equal to 0.006, practically 0, which implies that the dependent variable is very little explained by our regression. This is something not very surprising, given that stock returns are typically not predicable.

➢ CONCLUSIONS

The econometric model presented in this work has focused on checking whether the conclusions obtained by Pastor and Veronesi (2017) in their paper, belonging to the difference in data of the real GDP growth rate and the excess return between the different US parties, which support their theory of the political cycle and aversion to risk, are also obtained for the Spanish case, and therefore, the theory of these two economists would be valid to explain the political cycle of Spain.

The results obtained from the real GDP growth rate and the excess returns are contrary to what Pastor and Veronesi (2017) argued in their work. In the case of Spain, the left-wing party, the PSOE, is the one that obtains the lowest average rate of growth of the Spanish real GDP, which does not agree with the theory argued by Pastor and Veronesi (2017), in which they state that the left-wing party, the Democratic Party, is the one that obtains the highest rate of growth, this is due to the fact that it imposes higher taxes, which means that there are fewer individuals willing to work as entrepreneurs, and those who decide to undertake are only the best; that is to say, the most productive, and therefore the country grows faster. On the other hand, in the Spanish case, the average excess return is higher under the mandates of the right-wing party, the PP, a result that differs from the theory of Pastor and Veronesi (2017), in which they state that the average excess return is higher under the governments of the Democratic party, the left-wing party, backed by the argument that its redistributive policies provide more security, which causes less uncertainty among individuals, and the differential between the index of investment in the private sector and the index of investment in the public sector has to be smaller for individuals to choose to invest in the private sector.

With these results, we can conclude that this theory is not valid for the Spanish case with the data that have been extracted; that is to say, this theory does not explain the Spanish political cycle from the point of view of the adversity to the risk of the individuals as a whole.

It should be noted that in the case of the exposed data of the real GDP growth rate we have obtained a very low R-square in the first estimated regression, which implies that the dependent variable was little explained. In the other two alternative regressions that we have carried out where we have put lags in the independent variables, the R-square has increased significantly, at the same time that we have solved a possible and evident autocorrelation problem. On the other hand, with respect to the excess return data we have not been so lucky, since we have obtained that the two evaluated political parties had on average an index value very close to 0 and in the estimated regression exposed we have obtained that the independent variables are not significant and their level of autocorrelation is 0, which is not at all surprising since the stock market yields in general are not at all predictable.

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