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# Election Cycles and Stock Market Reaction: International Evidence

**Jiyoun An and Cheolbeom Park**

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**Wook Chae**  
*President*

# **Election Cycles and Stock Market Reaction: International Evidence**

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## EXECUTIVE SUMMARY

This study investigates movements of the stock return volatility during election periods (from one-year before an election to one-year after the election) with the use of data from 16 countries. The main findings of this study are (1) stock return volatility declines over time as elections approach, (2) the level of the stock return volatility during election periods is lower than that during non-election periods, and (3) the stock return volatility rises quickly during election months and immediately after the elections. The first and second findings confirm conjectures made on the dynamic pattern of the volatility in previous studies such as Pantzalis *et al.* (2000) and Wisniewski (2009).

**Keywords:** Elections, Stock return volatility, Uncertainty

**JEL Classification:** G11, G12, G14

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# Election Cycles and Stock Market Reaction: International Evidence

Jiyoun An and Cheolbeom Park<sup>1</sup>

## I. Introduction

The stock return volatility plays an important role in investors' decision making process in practice and in theoretical models of economics as well. However, our understanding of the volatility has not improved much, since seminal works by Shiller (1981) and Schwert (1989). Shiller (1981) demonstrated that stock prices are too volatile to be explained by movements of dividends, and Schwert (1989) reported that macroeconomic variables and financial variables can explain only a small portion of the variations in the volatility. In this study, we attempt to enhance the understanding of the volatility by examining stock return volatility around election times from 16 countries. Elections are an important political event which determines the direction of future economic management. Changes in policies, which are determined by election outcomes, can influence not only

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consumers' welfare but also firms' profits. Because of this, it is natural for investors in the market to predict election outcomes well before election days, and the election itself is regarded as an additional factor that would impact volatility around elections. In addition, if stock return volatility exhibits certain trends during election periods, it will be reflected not only in stock prices but also in option prices, which is valuable information for investors.

In spite of the importance of stock return volatility, however, the research on volatility during election periods is scant. Without examining the return volatility directly, some studies have made interpretations for movements of stock prices during election periods based on a conjecture for dynamic patterns of the volatility. For example, Pantzalis *et al.* (2000) report that stock prices rise as elections approach, and surmise that these increases in prices result from decreased uncertainty as elections get closer. Also, Wisniewski (2009) has interpreted the overpricing of stock prices during election periods, reported in Herbst and Slinkman (1984), Huang (1985), Gärtner and Wellershoff (1995) and Wisniewski (2009), as the result of the lower risk perceived by investors during election campaigns. Wisniewski (2009) conjectures that the perceived risk over election periods tend to be lower than that during non-election periods because rosy promises and optimistic policies are made by politicians in the midst of election campaigns. He argued that this perception of lower risk is the main reason for overpricing during election periods. The main purpose of our study is to examine whether the evolution of stock return volatility during election periods is consistent with the conjectures in Pantzalis *et al.* (2000) and Wisniewski (2009). That is, we are checking directly whether the volatility declines as elections approach (the conjecture in Pantzalis *et al.* (2000)) and whether the volatility before elections tends to be lower than the volatility during non-election periods (the conjecture in Wisniewski

(2009)). In addition, Bialkowski *et al.* (2008) find that stock markets are extremely vulnerable around elections in terms of the volatility, which might reflect surprise at election outcomes. We will examine whether this phenomenon by Bialkowski *et al.* (2008) is also robust in the 16 countries considered in this study.

After estimating stock return volatility under the GARCH (1,1) model, we run panel regressions of the estimated volatility on time-dummy variables indicating time lag from election months. We find that the volatility declines as election months approach, rises rapidly during the election months and immediately after the elections, and then stabilizes around normal level. This pattern in the volatility is robust regardless of whether other control variables are used, whether the rightist (or leftist) party wins the election, and whether observations before 1980 or after 1980 are used in the analyses. This pattern seems intuitive and consistent with the conjecture in Pantzalis *et al.* (2000) because the volatility becomes lower as election days approach. The finding that the level of the return volatility before elections is lower than that during non-election periods is also in line with the conjecture in Wisniewski (2009) based on the psychological model by Loewenstein *et al.* (2001). Finally, the behavior of the volatility during election months and immediately after elections is consistent with the finding in Bialkowski *et al.* (2008).

In order to present these findings, our study is organized as follows. Section II provides a brief discussion of our econometric methodology about how to estimate the return volatility and how to find the evolution of the volatility around election-periods. Section III presents data used in our study and summary statistics for important political and economic variables. Main empirical results are reported in Section IV and concluding remarks are offered in Section V.

## II. Methodology

Several approaches for measuring stock return volatility have been proposed. Although there are pros and cons for each of them, we have employed a GARCH (1,1) model to estimate the volatility. Since the introduction by Engle (1982) and Bollerslev (1986), GARCH models have been quite popular in the literature and widely used in predicting future volatility. Moreover, GARCH models enable us to estimate volatilities from monthly stock return data, while realized volatility or implied volatility requires additional higher frequency stock return data or option price data for estimation. Thus, GARCH (1,1) model is selected, being practical as well as reasonable. We estimate the volatility for each country according to the following GARCH (1,1) representation:

$$r_{i,t} = \alpha_i + \varepsilon_{i,t}, \quad \varepsilon_{i,t} \sim N(0, h_{i,t}) \quad (1)$$

$$h_{i,t} = \gamma_0 + \gamma_1 h_{i,t-1} + \gamma_2 \varepsilon_{i,t-1}^2 \quad (2)$$

where  $r_{i,t}$  is the stock market return for country  $i$  on day  $t$ ,  $\varepsilon_{i,t}$  denotes the country-specific shocks to stock returns, and  $h_{i,t}$  denotes its conditional variance. Equations (1) and (2) are jointly estimated by the Maximum Likelihood Estimation (MLE) method.

Once the estimates of stock return volatilities ( $h_{i,t}$ ) are obtained under the set-up described by equations (1) and (2), we run an unbalanced panel regression with fixed effects to examine the dynamic pattern of volatilities from one-year before an election to one year after the election. That is, the following panel re-

gression is run:

$$h_{i,t} = \beta_i + \sum_{k=-12}^{12} \delta_k D_{i,k,t} + \sum_j \theta_j X_{i,j,t-1} + u_{i,t} \quad (3)$$

where  $\beta_i$  represents the country-specific time-invariant factors, and  $X_{i,j,t}$  denotes control variables other than  $D_{i,k,t}$ .  $D_{i,k,t}$  is a dummy variable which is set as one if time  $t$  is  $k$ -month away from an election in country  $i$ , and to be zero otherwise. Hence,  $\delta_k$ , the coefficients for  $D_{i,k,t}$ , will show the dynamic pattern of the volatility from one-year before an election to one-year after the election. In addition to the dynamic pattern of the volatility,  $\delta_k$  shows the relative magnitude of the volatility over the two year period around an election compared with the average of the volatility during non-election periods.<sup>2</sup> Since elections are rare events in nature, we have employed a panel analysis of 16 countries to overcome possible problems with small samples resulting from rare events in the analysis of one country. The 16 countries include: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Italy, Japan, Netherlands, Spain, Sweden, the United Kingdom and the United States.

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<sup>2</sup> Non-election periods are time periods which do not fall into the period between one-year before an election and one-year after the election.

### III. Data

The initial data sample begins with the political parties dataset compiled by Duane Swank to obtain political variables.<sup>3</sup> Swank's dataset covers 21 countries from 1950 to 2006, which contains election dates for each of those countries and election outcomes such as which party won for each election. Swank (2010) classifies various political parties in OECD countries into three categories – leftist, centrist, and rightist parties – and reports each party's cabinet portfolios (as a percentage of all cabinet portfolios). We take the cabinet portfolio percentage to indicate which party, leftist or rightist, has won each of those elections. While constructing election outcome variables, we treat the centrist party as the leftist one.<sup>4</sup> As a result, for example, the Republicans are considered as the rightist party and the Democrats as the leftist party in the US.

International stock market variables are obtained from the Global Financial Database and those variables include: monthly total stock market return index (close), dividend yield, price to earning (PE) ratio, current exchange rate, 10-year government bond yield, 3-month Treasury bill yield, and consumer price index. The Global Financial Database provides stock market and economic data for a long time period (over 200 years) for many countries, while the available time periods of other financial database sources (e.g. Datastream) are mostly from 1980s for their international samples. Our empirical results using the sample starting from 1950 is far less risk in terms of sample period selection bias. We require

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<sup>3</sup> The web address of Duane Swank's homepage is [http://www.marquette.edu/polisci/faculty\\_swank.shtml](http://www.marquette.edu/polisci/faculty_swank.shtml).

<sup>4</sup> Thus, this classification could be considered as the rightist versus the non-rightist.

that each observation include these variables. Moreover, countries such as Norway which have too short time period regarding stock market data have been dropped. Finally, there are 16 countries in our analysis sample with data from the period 1950 to 2006.

For our regression analysis, several variables are calculated. Real stock returns are the log difference of stock return index minus inflation rate. Inflation rate is the log difference of consumer price index. Term spread is the difference between 10-year government bond yields and 3-month Treasury bill yields. Relative interest rate is the difference between 3-month Treasury bill yield and its one-year moving average.

Summary statistics for political systems and elections in the 16 countries are presented in Table 1. All countries have adopted a Parliamentary system except France and the US. France has a Dual Executives system, while the US has a Presidential system. The sample periods for most countries start from the 1950s and is dictated by the subset of data availability between the Global Financial Database and Swank's dataset. Table 1 also shows the number of elections which have been won by the rightist party and the number of elections which have been won by the leftist party. Those numbers vary greatly across countries, which possibly reflect political preference of those countries. For example, the rightist party in Japan has won all the elections in our sample, whereas the leftist party has been overwhelmingly popular in Finland and Sweden. The average durations between two consecutive elections lie between 31 months and 54 months, which implies that elections have been held every 2.5 to 4.5 years on average.

Table 2 reports descriptive statistics for aggregate stock returns and volatility estimated under the GARCH (1,1) model. The average of stock returns across the 16 countries over the sample period is about 7% a year, while the median of

Table 1. Data Availability and Election

Country	Political system	Total number of samples	Election day in the sample		Number of elections				Average durations (months)
			First election included	Last election included	Total	Right Party (Win)	Left Party (Win)	Tie	
Australia	Parliamentary	681	28-Apr-1951	9-Oct-2004	22	15	7	0	31
Austria	Parliamentary	444	1-Mar-1970	26-Oct-2006	12	2	8	2	40
Belgium	Parliamentary	672	11-Apr-1954	18-May-2003	16	13	3	0	39
Canada	Parliamentary	683	10-Aug-1953	23-Jan-2006	18	6	11	1	37
Denmark	Parliamentary	372	15-Feb-1977	8-Feb-2005	11	5	6	0	34
Finland	Parliamentary	276	15-Mar-1987	16-Mar-2003	5	0	5	0	48
France	Dual Executives	623	17-Jun-1951	16-Jun-2002	15	11	4	0	44
Germany	Parliamentary	648	6-Sep-1953	18-Sep-2005	15	9	6	0	45
Greece	Parliamentary	268	18-Oct-1981	7-Mar-2004	6	3	3	0	54
Italy	Parliamentary	683	7-Jun-1953	10-Apr-2006	14	11	2	1	49
Japan	Parliamentary	564	20-Nov-1960	11-Sep-2005	16	16	0	0	36
Netherlands	Parliamentary	672	25-Jun-1952	22-Nov-2006	17	14	2	1	41
Spain	Parliamentary	294	28-Oct-1982	14-Mar-2004	7	3	3	1	43
Sweden	Parliamentary	624	26-Sep-1956	17-Sep-2006	17	1	16	0	38
UK	Parliamentary	683	23-Feb-1950	5-May-2005	15	7	7	1	47
US	Presidential	683	4-Nov-1952	2-Nov-2004	14	8	6	0	48

stock returns is approximately 10%. These values do not seem to depend much on political systems (e.g. Parliamentary system, Presidential system, or Dual Executives system) or on whether the political power is held by the rightist or leftist party. However, the average of stock returns during the post-1980 period is much higher than that during the pre-1980 period. The average of stock returns during the post-1980 period is 10%, while the average of stock returns during the pre-1980 period is only 4%.

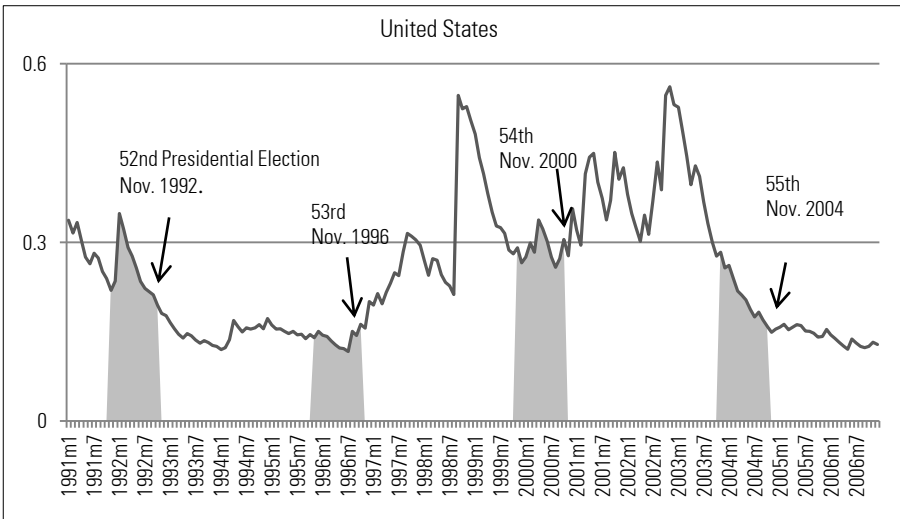
Table 2. Descriptive Statistics

Variables	Types	Mean	Standard deviation	25th Percentile	Median	75th Percentile
Real monthly stock returns (annualized)	Total	0.07	0.64	-0.25	0.10	0.44
	Parliamentary	0.07	0.65	-0.25	0.10	0.44
	Presidential	0.08	0.50	-0.21	0.10	0.41
	Dual executives	0.06	0.64	-0.31	0.11	0.50
	Right party wins	0.07	0.59	-0.25	0.10	0.43
	Left party wins	0.08	0.68	-0.26	0.10	0.45
	Before 1980 year	0.04	0.53	-0.25	0.06	0.36
	after 1980 year	0.10	0.71	-0.26	0.13	0.49
Stock return volatility	Total	0.21	0.21	0.12	0.16	0.21
	Parliamentary	0.21	0.22	0.12	0.16	0.21
	Presidential	0.18	0.13	0.11	0.16	0.19
	Dual executives	0.20	0.19	0.12	0.15	0.23
	Right party wins	0.23	0.22	0.12	0.16	0.22
	Left party wins	0.18	0.13	0.11	0.15	0.20
	Before 1980 year	0.13	0.05	0.10	0.13	0.17
	after 1980 year	0.23	0.24	0.13	0.17	0.24

The second panel of Table 2 reports summary statistics for volatility, which shows a similar pattern to that of average stock returns. Similarly to stock return, the summary statistics of the estimated volatility do not seem to depend much on political systems or on which party holds the political power. However, we can also note a large difference in the volatilities before and after 1980. The average volatility during the post-1980 period is 23%, while during the pre-1980 it is 13%. In summary, stock markets from the 16 countries have shown higher stock returns and higher volatility after 1980.

Figure 1 plots the stock return volatilities calculated from GARCH (1,1) of the United States from Jan. 1991 to Dec. 2006. The plotted period includes four elections from 52<sup>nd</sup> to 55<sup>th</sup> presidential election. The stock return volatilities in some period before the election shows clearly declining trends in three cases (52<sup>nd</sup>, 54<sup>th</sup>, 55<sup>th</sup>), which suggests a declining relationship between stock return volatilities and election cycles.

**Figure 1. Implied Volatilities of the United States and Election Cycles**



Note: The area indicates 12 months before the presidential election month.

## IV. Empirical Analysis

### 1. Stock Return Volatility around Elections

The main goal of our study is to investigate the dynamic pattern of the volatility from one-year before an election to one-year after the election. From this investigation, we can check whether conjectures on the volatility made in previous studies are realistic and plausible. For this purpose, we have set dummy variables indicating the time difference between the election month over the two-year period around it. We regress the estimated return volatility on these dummy variables along with other control variables, and check the movements of the coefficients on these time dummy variables. The results are presented in Table 3. In the first column of Table 3, we have run a panel regression of the volatility on only those time-dummy variables and country-dummy variables which capture time-invariant specific factor in individual countries. As shown in the first column, the coefficients of dummy variables before an election are largely negative and become significant at least at the 10% level from 4 months before an election to one-month before the election. From the election month and on, these coefficients rise initially, and then become insignificant and fluctuate around zero.

Nearly the same results are obtained in the second column, even when other control variables such as inflation rate, the log dividend-price ratio, term spread, the relative interest rate, and the growth rate of industrial production are included in the regression. These variables are reported to have explanatory power for stock returns and are lagged for one-month to avoid a possible endogeneity issue.

Table 3. Regressions with Monthly before &amp; after Election Dummy Variables

Variables	All sample		
	(1)	(2)	(3)
12 months (before)	0.003 (0.02)	0.008 (0.02)	0.006 (0.02)
11 months (before)	0.013 (0.02)	0.021 (0.02)	0.018 (0.02)
10 months (before)	0.003 (0.02)	0.016 (0.02)	0.015 (0.02)
9 months (before)	-0.010 (0.02)	-0.002 (0.02)	0.000 (0.02)
8 months (before)	-0.016 (0.02)	-0.013 (0.02)	-0.013 (0.02)
7 months (before)	-0.014 (0.02)	-0.01 (0.02)	-0.011 (0.02)
6 months (before)	-0.025 (0.02)	-0.023 (0.02)	-0.024 (0.02)
5 months (before)	-0.035 (0.02)	-0.032 (0.02)	-0.032 (0.02)
4 months (before)	-0.043* (0.02)	-0.04 (0.02)	-0.04 (0.02)
3 months (before)	-0.042* (0.02)	-0.04 (0.03)	-0.039 (0.02)
2 months (before)	-0.044** (0.02)	-0.041* (0.02)	-0.040* (0.02)
1 month (before)	-0.042* (0.02)	-0.043* (0.02)	-0.043* (0.02)
Election month	-0.032 (0.02)	-0.022 (0.03)	-0.023 (0.03)
1 month (after)	-0.007 (0.02)	0.003 (0.03)	0.003 (0.03)
2 months (after)	-0.012 (0.02)	0.001 (0.02)	0.002 (0.02)
3 months (after)	-0.013 (0.02)	-0.001 (0.02)	0.000 (0.02)
4 months (after)	0.009 (0.03)	-0.013 (0.02)	-0.013 (0.02)
5 months (after)	0.018 (0.03)	0.002 (0.02)	0.001 (0.02)

Table 3. continued

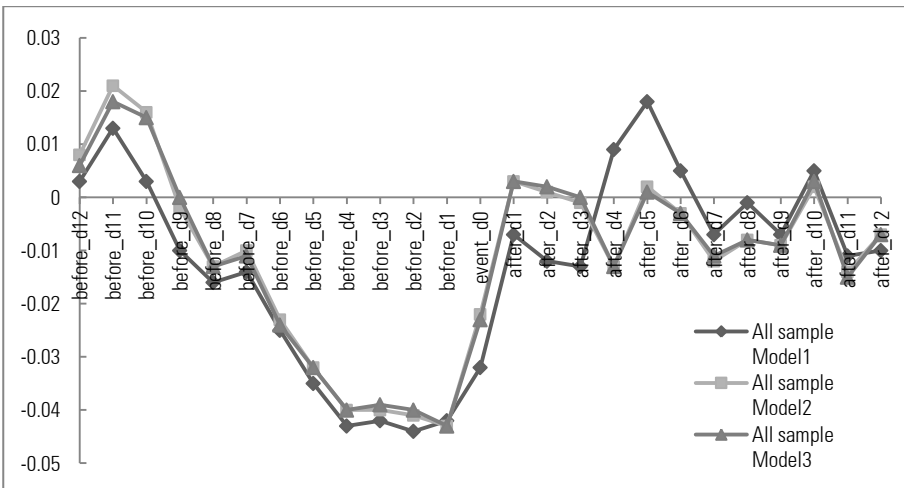
Variables	All sample		
	(1)	(2)	(3)
6 months (after)	0.005 (0.02)	-0.003 (0.02)	-0.003 (0.02)
7 months (after)	-0.007 (0.02)	-0.012 (0.02)	-0.011 (0.02)
8 months (after)	-0.001 (0.02)	-0.008 (0.02)	-0.008 (0.02)
9 months (after)	-0.007 (0.02)	-0.009 (0.02)	-0.009 (0.02)
10 months (after)	0.005 (0.02)	0.002 (0.02)	0.003 (0.02)
11 months (after)	-0.011 (0.02)	-0.014 (0.02)	-0.015 (0.02)
12 months (after)	-0.01 (0.02)	-0.007 (0.02)	-0.007 (0.02)
Inflation rate		0.519* (0.26)	0.559* (0.27)
Log of dividend-price ratio		-1.121 (1.05)	-1.339 (1.11)
Term spread		-1.796 (1.81)	-1.677 (1.85)
Relative interest rate		-1.582 (0.94)	-1.676* (0.93)
Growth rate of IP		-0.166 (0.22)	-0.043 (0.19)
US growth rate of IP			-0.313* (0.16)
Constant	0.345*** (0.01)	0.383*** (0.05)	0.386*** (0.05)
Observations	8870	7304	7304
R-squared	0.002	0.035	0.039
Number of countries	16	16	16
H0: Coefficients of 2 to 1 months (before) = 0			
F-test	3.30	2.52	2.31
Prob > F	0.0648	0.1135	0.1338

Note: Robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

We have obtained similar results in the third column, when the growth rate of the US industrial production is added to control for the global business cycle. Since financial variables and macroeconomic variables can explain a small portion of the volatility in Schwert (1989), the near identical results after the inclusion of these control variables are consistent with the main finding in Schwert (1989).

These results are plotted in Figure 2. In all three cases, the coefficients of time dummy variables decline steadily before an election, rise rapidly during the election month and immediately after the election, and then fluctuate around zero. Interesting issues emerge from these dynamic patterns. First, the dynamic pattern of the volatility is consistent with the conjectures made in Pantzalis *et al.* (2000) and Wisniewski (2009). The declining trend in the coefficients for the time-dummy variables implies that the volatility declines as elections approach. Also, the finding that the sign of these coefficients before an election are mostly negative

**Figure 2. Coefficients of before & after Election Dummy Variables**



before elections suggests that the level of volatility is lower before election than that during non-election periods. The null hypothesis of  $\delta_{-2} = \delta_{-1} = 0$  can be rejected marginally at the 10 % significance level by the F-test, which is shown in the last row of Table 3. The results in Figure 2 and Table 3 imply that the dynamic pattern of the volatility is probably the main reason for the rise in stock prices and overpricing phenomena before elections as indicated by the conjectures in Pantzalis *et al.* (2000) and Wisniewski (2009).

Second, economists have searched for factors impacting stock market volatility, since Schwert (1989) showed that macroeconomic variables and financial variables have a limit in explaining the movements of volatility. The results in Table 3 and Figure 2 suggest that important political events such as elections can be considered a factor which influences the volatility in the stock market. One way to check whether political events shed uncertainty in the stock market is to see whether the movements of the volatility are similar to that of uncertainty provided by elections. The probable winner of an election becomes clearer as election day approaches in most cases. Hence, if political elections are another source of uncertainty in the market, the volatility must decline as the uncertainty of the election results lessen. In addition, the lower volatility level before elections also seems related to the lower perceived risk before elections based on the implications in the model in Loewenstein *et al.* (2001). Therefore, the declining trend in stock return volatility before elections and the lower volatility level before elections, as shown vividly in Figure 2 and Table 3, implies that important political events such as elections are indeed a source of the volatility in the stock market.

Third, Pantzalis *et al.* (2000) find that stock prices are rising prior to an election, and argue that this rise in stock prices is related to the lower uncertainty of the election immediately before it. However, Bialkowski *et al.* (2008) report that

stock markets are extremely vulnerable around elections in terms of the volatility. These seemingly inconsistent findings are also observed in our results of Table 3 and Figure 2. Table 3 and Figure 2 shows that the volatility declines steadily as elections approach, which is consistent with the argument by Pantzalis *et al.* (2000). However, we can also see that there is a rapid rise in volatility during the election month, which might reflect that investors are surprised by the election outcome or that the lower perceived risk returns to normal levels due to the termination of rosy policies and optimistic views before elections. As Pantzalis *et al.* (2000) and Bialkowski *et al.* (2008) use higher frequency data than the data in this study, we are not able to pin down the exact timing of this turning point in the trend of the coefficients, but we can clearly observe a rise in volatility during the election month, which implies the veracity of the finding in Bialkowski *et al.* (2008).

In summary, the dynamic behavior of volatility before elections seems to be consistent with the conjecture on the volatility made in Pantzalis *et al.* (2000) and by Wisniewski (2009). The rise of volatility during election months or immediately after elections is also in agreement with the findings in Bialkowski *et al.* (2008).

## 2. Robustness Checks

We investigate whether the dynamic pattern of the volatility around elections - the declining trend before, a rise during, and fluctuations after elections - is robust in this sub-section. First, we check if the dynamic pattern of stock return volatility differs depending on which party wins an election. Santa-Clara and Valkanov (2003) demonstrate that the US stock returns have been much higher when Democrats are in the White House. Hence, the volatility around election time

Table 4. Right Party Versus Left Party

Variables	Right wins		Left wins	
	(1)	(2)	(3)	(4)
12 months (before)	0.031 (0.02)	0.013 (0.02)	-0.057 (0.04)	-0.037 (0.03)
11 months (before)	0.033 (0.02)	0.015 (0.02)	-0.033 (0.05)	-0.01 (0.04)
10 months (before)	0.021 (0.02)	0.009 (0.01)	-0.036 (0.05)	-0.002 (0.03)
9 months (before)	0.007 (0.02)	-0.006 (0.02)	-0.051 (0.05)	-0.024 (0.04)
8 months (before)	0.007 (0.02)	-0.018 (0.02)	-0.067 (0.04)	-0.043 (0.03)
7 months (before)	-0.001 (0.02)	-0.024 (0.02)	-0.057* (0.03)	-0.041 (0.02)
6 months (before)	-0.011 (0.02)	-0.036* (0.02)	-0.062* (0.03)	-0.05 (0.03)
5 months (before)	-0.025 (0.02)	-0.050** (0.02)	-0.074* (0.04)	-0.057 (0.03)
4 months (before)	-0.029 (0.02)	-0.054* (0.03)	-0.084* (0.04)	-0.069* (0.03)
3 months (before)	-0.022 (0.02)	-0.049 (0.03)	-0.088* (0.04)	-0.063 (0.04)
2 months (before)	-0.022 (0.01)	-0.036* (0.02)	-0.088* (0.04)	-0.067* (0.04)
1 month (before)	-0.018 (0.02)	-0.038 (0.02)	-0.096** (0.04)	-0.086** (0.04)
Election month	-0.018 (0.02)	-0.025 (0.03)	-0.088** (0.03)	-0.073* (0.04)
1 month (after)	-0.001 (0.03)	-0.007 (0.04)	-0.044 (0.04)	-0.026 (0.04)
2 months (after)	-0.006 (0.02)	-0.003 (0.03)	-0.042 (0.03)	-0.025 (0.03)
3 months (after)	-0.005 (0.02)	-0.012 (0.03)	-0.031 (0.04)	0.006 (0.03)
4 months (after)	-0.008 (0.02)	-0.017 (0.03)	0.025 (0.07)	-0.019 (0.04)
5 months (after)	0.001 (0.02)	-0.006 (0.03)	0.035 (0.06)	0.004 (0.03)

Table 4. continued

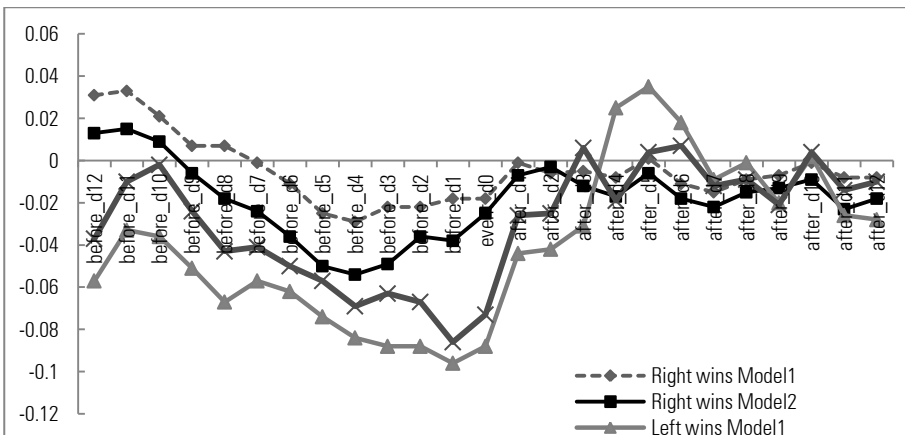
Variables	Right wins		Left wins	
	(1)	(2)	(3)	(4)
6 months (after)	-0.011 (0.02)	-0.018 (0.03)	0.018 (0.05)	0.007 (0.03)
7 months (after)	-0.015 (0.03)	-0.022 (0.04)	-0.009 (0.04)	-0.012 (0.02)
8 months (after)	-0.009 (0.02)	-0.015 (0.03)	-0.001 (0.03)	-0.009 (0.02)
9 months (after)	-0.007 (0.03)	-0.013 (0.03)	-0.02 (0.04)	-0.021 (0.02)
10 months (after)	-0.001 (0.03)	-0.009 (0.03)	0.002 (0.04)	0.004 (0.03)
11 months (after)	-0.008 (0.02)	-0.023 (0.03)	-0.026 (0.04)	-0.014 (0.02)
12 months (after)	-0.008 (0.02)	-0.018 (0.03)	-0.028 (0.04)	-0.01 (0.03)
Inflation rate		0.443* (0.24)		0.598 (0.64)
Log of dividend-price ratio		-2.014 (1.89)		-1.076 (1.14)
Term spread		-1.207 (0.81)		-1.792 (3.40)
Relative interest rate		-1.02 (0.70)		-1.824* (0.94)
Growth rate of IP		-0.052 (0.07)		-0.15 (0.40)
US growth rate of IP		-0.232* (0.13)		-0.307 (0.33)
Constant	0.307*** (0.01)	0.390*** (0.07)	0.391*** (0.02)	0.401*** (0.08)
Observations	4818	3821	3788	3231
R-squared	0.004	0.067	0.008	0.039
Number of countries	15	15	15	15

Note: Robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

may show a different dynamic depending on who is expected to win the election. In order to examine this possibility, we have divided our sample into two subsets:

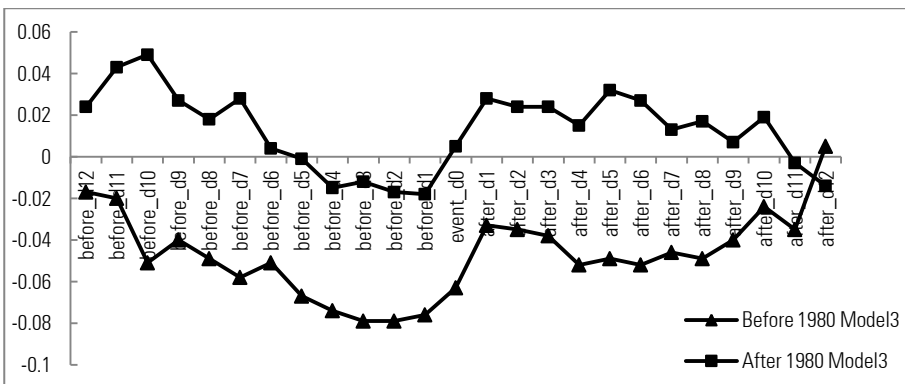
One includes the case in which the rightist party wins elections, while the other set includes the case in which the leftist party wins. After separation of the sample, we run the panel regression with fixed effects again. The results for the rightist party wins are presented in the first and second column of Table 4, while the results for leftist party wins are shown in the third and fourth columns. The results in the first and third column of Table 4 are from the regression of the volatility on time-dummy variables and country-dummy variables only, whereas the results in the second and fourth columns are from the regression with time-dummy variables and country-dummy variables along with other control variables. Similar to the results in Table 3, we can find a declining trend in the time-dummy coefficients before elections and those coefficients are significantly negative over a time range between six months before an election to the election month. We can also observe that the coefficients begin to rise during the election month and become insignificant right at election time and one month after. Movements of these coefficients are plotted in Figure 3.

Figure 3. Coefficients from Right and Left Party Samples



Second, we also investigate whether the results are different over time. The results presented in Table 2 imply that the properties of stock return distribution seem quite different before and after 1980. There are reasons for this change: the globalization of stock markets due to capital liberalization, lower barrier to stock market participation due to the development of information technology, higher economic integration across countries, etc. In order to examine the robustness of the results over time, we have divided our sample into two sub-sample periods: the first includes only observations from before 1980<sup>5</sup> and the other includes only observations after 1980. Then, we run the panel regression with fixed effects as in tables 3 and 4. The results are presented in Table 5 and Figure 4. Consistent with previous results, we obtain a declining trend in the coefficients before elections and a quick recovery during election months. The coefficients are not significant at all when observations before 1980 are used. However, most coefficients before elections are significantly negative when observations after 1980 are used.

Figure 4. Coefficients from before and after 1980 Samples



<sup>5</sup> To have enough observations in both periods, we select 1980 as the cut year.

Table 5. Regressions before &amp; after 1980

Variables	Before 1980	After 1980
	(1)	(2)
12 months (before)	-0.017 (0.03)	0.024 (0.03)
11 months (before)	-0.02 (0.03)	0.043 (0.03)
10 months (before)	-0.051 (0.03)	0.049* (0.03)
9 months (before)	-0.04 (0.03)	0.027 (0.03)
8 months (before)	-0.049* (0.03)	0.018 (0.03)
7 months (before)	-0.058* (0.03)	0.028 (0.03)
6 months (before)	-0.051** (0.02)	0.004 (0.03)
5 months (before)	-0.067** (0.02)	-0.001 (0.03)
4 months (before)	-0.074** (0.03)	-0.015 (0.03)
3 months (before)	-0.079 (0.05)	-0.012 (0.02)
2 months (before)	-0.079** (0.03)	-0.017 (0.02)
1 month (before)	-0.076** (0.03)	-0.018 (0.03)
Election month	-0.063 (0.04)	0.005 (0.03)
1 month (after)	-0.033 (0.04)	0.028 (0.03)
2 months (after)	-0.035 (0.03)	0.024 (0.03)
3 months (after)	-0.038 (0.04)	0.024 (0.03)
4 months (after)	-0.052 (0.04)	0.015 (0.03)
5 months (after)	-0.049 (0.03)	0.032 (0.03)

Table 5. continued

Variables	Before 1980	After 1980
	(1)	(2)
6 months (after)	-0.052 (0.03)	0.027 (0.02)
7 months (after)	-0.046 (0.03)	0.013 (0.02)
8 months (after)	-0.049* (0.03)	0.017 (0.02)
9 months (after)	-0.04 (0.04)	0.007 (0.02)
10 months (after)	-0.024 (0.03)	0.019 (0.02)
11 months (after)	-0.035 (0.03)	-0.003 (0.02)
12 months (after)	0.005 (0.03)	-0.014 (0.02)
Inflation rate	0.802* (0.41)	0.73 (0.42)
Log of dividend-price ratio	1.893 (1.38)	-1.212 (1.35)
Term spread	0.509 (2.29)	-3.398 (1.94)
Relative interest rate	-0.045 (0.55)	-2.422* (1.27)
Growth rate of IP	-0.017 (0.15)	0.325 (0.39)
US growth rate of IP	-0.488* (0.24)	-0.067 (0.23)
Constant	0.177 (0.10)	0.412*** (0.04)
Observations	2741	4563
R-squared	0.185	0.035
Number of countries	13	15

Note: Robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

After the quick rise during election months, the coefficients become significantly negative again when post-1980 observations are examined. Although the results

are slightly different from the data before 1980, the declining trend in the coefficients and negative coefficients before elections seem robust regardless of the data before 1980 or after 1980.

In summary, movements of time-dummy coefficients before and during the election month, and after elections are quite similar to those in the previous subsection and do not seem to depend on which party wins elections or before and after 1980, although there are some differences in the significance level for those coefficients.

## V. Conclusion

We investigated movements of stock return volatility during election periods (from one-year before an election to one-year after the election) using data from 16 countries. We have found that the volatility declines over time as elections approach, which is consistent with the conjecture in Pantzalis *et al.* (2000) that the uncertainty of election outcomes decrease as elections approach. We have also found that the level of volatility is found to be lower before elections than during non-election periods, which is in agreement with the conjecture in Wisniewski (2009) that investors' perceived risk is lower before elections due to promising policies by politicians. We observe that the stock return volatility rises quite quickly during election months and immediately after, which is consistent with the phenomenon reported by Bialkowski *et al.* (2008). This rise might be due to surprise at the outcome of the election or due to the termination of bright promises made before elections. These dynamic patterns in the volatility during election periods are expected to be helpful for investors in making investment decisions and adjust their portfolios during election periods.

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## 국문요약

본 연구에서는 16개국의 자료를 이용하여 선거 전후 1년간 주식수익률의 변동성이 변화하는 양상을 살펴보았다. 연구결과 1) 선거 전 1년 동안은 선거가 가까워짐에 따라 주식수익률의 변동성이 낮아졌으며, 2) 주식수익률 변동성 수준은 선거 기간(선거 전 1년)에 오히려 비선거 기간보다 낮게 나타났다. 3) 그러나 선거일이 있는 해당 달 혹은 직후 주식수익률 변동성은 급격히 증가하는 경향을 보였다. 첫 번째와 두 번째 결과는 본 연구가 Pantzalis *et al.*(2000)과 Wisniewski(2009)에서 추정한 변동성의 동태적 특성을 계량적으로 확인하는 데 의의가 있다.

**핵심용어:** 선거, 주식 수익률 변동성, 불확실성

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### **저서 및 논문**

“Can Capital Account Liberalization Lessen Capital Volatility in a Country with ‘Original Sin’?”

(공저, *Asian Economic Papers*, 2012)

“Warranted Multiples and Future Returns” (공저, *Journal of Accounting, Auditing and Finance*, 2010) 외

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### **저서 및 논문**

“Disappearing Dividends: Implications for the Dividend-Price Ratio and Return Predictability”

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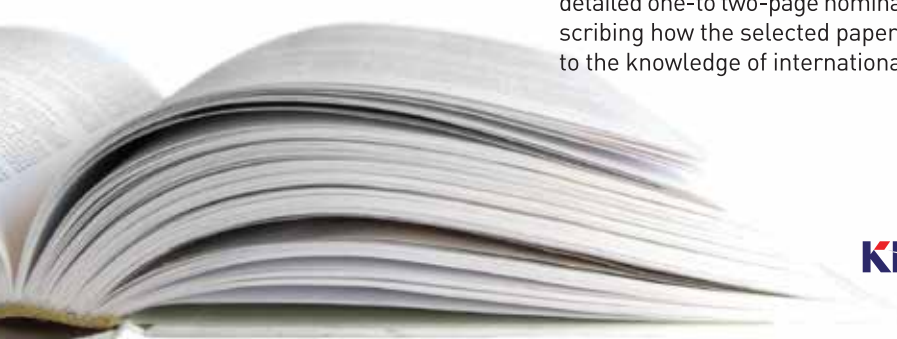
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## Election Cycles and Stock Market Reaction: International Evidence

Jiyoun An and Cheolbeom Park

This study investigates movements of the stock return volatility during election periods (from one-year before an election to one-year after the election) with the use of data from 16 countries. The main findings of this study are (1) stock return volatility declines over time as elections approach, (2) the level of the stock return volatility during election periods is lower than that during non-election periods, and (3) the stock return volatility rises quickly during election months and immediately after the elections. The first and second findings confirm conjectures made on the dynamic pattern of the volatility in previous studies such as Pantzalis *et al.* (2000) and Wisniewski (2009).