

THE INFLUENCE OF ELECTION
CYCLES ON STOCK MARKET
FLUCTUATIONS IN DEVELOPING
COUNTRIES

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Abstract

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The thesis deals with election cycles in stock returns of 52 developing and developed countries and provides the analysis of influence of information transparency on stock returns and volatility of returns during election periods. The data covers the period from January 1994 to January 2012. The volatility of stock returns is estimated by EGARCH model in order to capture time-varying volatility and the asymmetry effects of “bad news” and “good news” as a result of political shocks caused by election cycles.

The results show that election cycle starts 9 months prior to elections and finishes 6 months after the elections. The analysis reveals that information transparency influences stock returns during election cycle, but changes in volatility of returns due to corresponding changes in information transparency has significant impact only 6 months before the elections.

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Chapter 1

INTRODUCTION

Investors in modern financial markets have a significant amount of diverse information: corporate earnings reports, macroeconomic indicators, political statements and news, including election outcomes. This information is used by investors to change their forecasts of future economic growth of the country. As a consequence, expectations of investors change and this influences stock market prices. Although it is known that prices of assets respond to new information, a number of questions still arise concerning the connection of information quality and returns on assets that investors are willing to obtain. For instance, whether the extent of information about elections outcomes and the country's information and political transparency during the election periods have an effect on stock market prices?

The theoretical framework describing the functioning of the stock market is based on the Efficient Market Hypothesis (Fama 1970) and the Rational Choice Theory (Becker 1978). An efficient market provides all relevant information to market participants. The rational players do everything possible to use the information for the profit maximization. The efficient market reflects all relevant information in the market prices. But in the financial markets, as well as in other markets, there is an asymmetry of information (Dierkens 1991; Aboody and Lev 2000; Fama and French 2005; Chae 2005). It is reflected in the fact that the participants of the financial markets, who are going to invest their capital, and the politicians or political parties, governing the country, who want to be reelected, have different ideas and information about the state of the economy. Differences in the information used to make decisions influences these decisions, and therefore the actions of market participants and the conditions of equilibrium in the market. As a result, information asymmetry of the participants of stock markets can lead to a state of disequilibrium in the capital markets and to the formation of heterogeneous expectations (Chae 2005).

Under asymmetry of information the owner of capital, who wants to invest his capital in the stock market, may foresee certain actions of country's leadership in order to stimulate the economy. For example, the displacement of a specific minister or the reorganization of the government in general, an increase or decrease in the interest rate etc. The information on the decisions that the concerned politicians make available to investors and other participants of the stock market is considered as a signal to market participants about possible economic consequences of this information (Leland and Pyle 1977). At the same time politicians, who possess relevant information about the economic situation in the country, encourage stock market participants to take actions that will be most beneficial for their particular political party or for themselves. However, participants of the stock market tend to interpret information (signals) that they use in order to make their decisions properly.

An increase in political transparency leads to increase in the responsibility of political actions. This helps to associate certain political results with particular political leaders. Logically, the decision makers are interested in a good attitude to them from the voters, and at the same time seek to avoid responsibility for the actions that have negative evaluation. Higher political transparency allows revealing both positive and negative results of the politician's actions. It permits voters and opposite political parties to assess causes and consequences of economic policy of the government with greater accuracy. But the ability of voters to evaluate political leaders critically depends on the availability of all relevant and reliable information (i.e. information transparency) which they can get from the media (Alt and Lassen 2006).

The developing countries stock markets have been shown to be less efficient (in terms of the Efficient Market Hypothesis) compared to developed countries due to information asymmetry (Henry 2000; Ciner and Karagozolu 2008). In developing countries with low levels of democracy, that is, countries where democratic institutions are being formed, but the state reserves significant control functions, there is a greater possibility of change in democratic direction

of development. Political uncertainty in these countries often has very different characteristics and a greater scale than in developed countries, where political institutions are fully formed and effectively execute their functions (Hays et al. 2003). This can lead to higher stock prices fluctuations during the election periods and higher dependence of stock prices on information about elections and overall political transparency in developing countries. As the extent and reliability of information in developing countries is different the influence of elections should be bigger because of uncertainty leading to increase in trading before the elections in developing countries relative to developed countries.

This research studies time varying volatility of the stock market and considers elections as the reason of the stock market volatility in the short-run. The research is based on the hypotheses that especially in the election periods political and information transparency become an important part of the stock market transparency, i.e. determines the overall stock market efficiency. The less politically and informationally transparent is the economy the higher is the market uncertainty in the election periods. This leads to change in amount of trading and thus in stock returns in the election periods and increase of stock market volatility. Due to the lack of political and information transparency in developing countries in comparison with developed ones stock market volatility could be higher in developing countries in the election periods.

The main source of data for this research is Thomson-Reuters database, from which data set on closing stock market prices covering 52 developing and developed countries with time dimension ranging from 1992 till 2012 is taken.

In order to obtain the goal of this research, a panel study methodology is applied. Also, to assess volatility of stock market returns an EGARCH model is used. The sample size consists of 8510 monthly observations.

This study consists of several chapters. In Literature review main papers from this field of research are defined. The Methodology Chapter provides an outline

of methods that are used. The Data Chapter describes the research data. In Empirical results part the main results are presented. The last chapter concludes.

LITERATURE REVIEW

From the viewpoint of the impact of information on decision-making of stock market participants and on functioning of the market in general can be noted two assumptions:

- It is supposed that all participants of the stock market assess the subjective likelihood of different future states of the economy equally and have the same expectations of the related future returns, which is reflected in the assumption of homogeneous expectations (Sharpe 1964; Lintner 1965; Mossin 1966; Shleifer and Summers 1990).

- It is assumed that all stock market participants assess probabilities of future states of the economy differently and, therefore, have different estimates of expected returns in these states. Such differences are generated by a variety of information that stock market participants possess, recognize as true and change their decisions on stock market operations on this basis. In this case assumption of heterogeneous expectations of stock market participants is imposed (Lintner 1969; Miller 1977; Mayshar 1982; Basak 2000; Zapatero 1998). The introduction of this assumption significantly changes approaches to assessment of market equilibrium under condition of different information that buyers and sellers of securities possess.

On the basis of these two assumptions (assumption of homogeneous expectations and assumption of heterogeneous expectations) information theory of stock market is formed (Grossman and Stiglitz 1980; Chen 2004). In this theory special importance is given to the reflection of data in current prices of financial assets and much attention is paid to the justification of the possibilities of achieving market equilibrium under conditions of asymmetric information that stock market participants possess. Chen et al. (2007) show that distribution of information is

the main factor that determines the behavior of the stock market and the conditions of equilibrium.

Within the information theory of stock market there are two basic concepts:

a) A concept of information efficiency of stock market (Efficient Market Hypothesis), under which it is attempted to understand the impact of information and information characteristics on the functioning conditions of stock market: stock prices and profitability of underlying assets (Fama 1970; Dow and Gorton 1997; Jin et al. 2000). The most important conclusion of this information concept is that on the assumption of transparency and accessibility of stock market and under realization of assumption of homogeneous expectations for all participants of stock market theoretically it is possible to say that all available information is reflected in current stock prices through their respective quotation conditioned by the changes in the demand and supply in the stock market (Fama 1970).

b) A concept of information asymmetry of stock market, which suggests that in the stock market, as well as in other financial markets, there is an asymmetry of information for their participants about investment objects (Akerlof 1970; Bagehot 1971). The essence of this concept is that the participants of the stock market in order to justify their investment decisions are trying to understand the information signals that occur in the stock market and its external environment through so-called signaling mechanism and signaling effect and determine their actions (Leland and Pyle 1977). The most important signals for stock market participants are different news in some degree related to the future economic conditions of the country. The concept of information asymmetry of stock market participants is based on the assumption that stock market participants possess different information about the objects of exchange trading, and other information that may influence their decisions and actions in the stock market (Dierkens 1991; Aboody and Lev 2000; Chae 2005).

Using information theory and its concepts the impact of political and information variables on economic and stock market performance of the country is modeled in several ways:

1. Through political business cycle theory (PBC) that is proposed by Nordhaus (1975), in which business cycles occur because of non-rationality of voters and opportunistic behavior of policy makers (Nordhaus 1989). PBC theory explores the politically oriented models of business cycles by studying the main factors that depend on public policy and determine the fluctuations of GDP (import prices for oil, innovations, labor force participation, environmental policy, etc.). For example, one of the results of this theory is the finding that the reduction in inflation occurs in the initial period of governance by the political party or particular president and rise in the inflation rate just before the new elections, which leads to economic cycles in the economy (Alesina and Roubini 1992). In whole, the empirical results of PBC theory suggest that the main macroeconomic indicators (GDP, investment, inflation, exchange rate) adjust prior to the elections, in the election year and in the period after the elections (Rogoff and Sibert 1988; Barreira and Baleiras 2000).

2. Using partisan political business cycle theory as an alternative to the previously mentioned. In this theory the economic cycle considers in the context of the action of political parties in pursuit of some ideological goal (Alesina 1987). This theory suggests that under proportional electoral system in particular country, where government is formed under a multi-party coalition, the ideological basis of the main ruling party is an important factor in determining the partisan objectives of the government. If partisan politics has a place in the government, its ideological structure affects the macroeconomic performance of the economy in the election period. According to this viewpoint Hibbs (1977) provides empirical evidence, which demonstrates that Socialist Parties in Europe and the Democratic Party in the United States implement economic policies that lead to low unemployment, high inflation, while the Conservative Parties in Europe and the Republican Party in the United States use policies that lead to high unemployment

coupled with low inflation. Using the assumption of rational expectations of voters such models conclude that, for example, in the USA a recession may be expected with the advent of the Republican Party and economic growth may be predicted after a victory of the Democratic Party (Alesina, 1988).

3. Third research stream represents studies of election cycles and its influence on economic performance of the country. The basic sources of election cycles are political business and budget cycles and information asymmetry, which result in information gains that elected political leaders obtain in comparison with voters (Cukierman and Meltzer 1986; Rogoff and Sibert 1988; Rogoff 1990; Gonzalez 1999). The main idea is that politicians have two types of opportunities: those, which they can use during a long period of time to influence the outcomes of elections, and opportunities to control the relevant spheres of economic policy, which they can exploit (take advantage) during election period through the use of media or imitation of efficient state activities. Using it Rogoff and Sibert (1988) show on the example of such macroeconomic indicators, as taxes, spending, deficit and growth of the money supply that the information asymmetry can lead to election cycles. Alt and Lassen (2006) discover that greater transparency of the budget of the country leads to lower level of budget deficit in the election period, because the budget deficit is very costly for reelection of particular politician or political party. Clark and Hallerberg (2000) show the presence of election fiscal cycles in OECD countries with fixed exchange rates. Persson and Tabellini (2004) find evidence of election cycles in the dynamics of fiscal instruments, depending on the constitutional system of the country and the level of democracy.

4. A set of studies that examine influence of political and information variables on stock market performance. These studies are divided into four main groups:

4.1. Examines different aspects of time varying volatility of stock market. The general anomalies include the calendar (seasonal) anomalies (Lakonishok and Smidt 1988), the January Effect or the Turn-of-the-Year Effect (Ziemba 2011; Rozeff and Kinney 1976), the Day-of-the-Week Effect (Gibbons and Hess 1981),

the Monday Effect (French 1980) and Week-End Effect (Keim and Stambaugh 1984). For example, the empirical results of Cross (1973) show that the average returns of the S&P 500 index on Tuesday are bigger than the average returns of this index on Friday for the period from 1953 to 1970. French (1980) confirms these results, using data on the average returns of the S & P 500 index, but for the period from 1953 to 1977. Similar conclusions are found by Gibbons and Hess (1981) and Smirlock and Starks (1986). The day of the week effect is also observed for the stock indices of other countries. For example, Jaffe and Westerfield (1985) analyzing the weekend effect for the stock markets of Australia, Canada, Japan and the UK find that the minimum average returns for Japanese and Australian stock markets falls on Tuesday. Solnik and Bousquet (1990) show similar results, but for the stock markets of France. Barone (1990) also find that the average minimum returns on stocks traded on the Italian stock markets mainly fall on Tuesday. Later, Agrawal and Tandon (1994) and Balaban (1995) show that the distribution of stock returns for different countries varies depending on the corresponding day of the week. In addition, Flannery and Protopapadakis (1988) find that the day of the week effect is presented in the US T-bill market. Also, Cornell (1985), Dyl and Maberly (1986) and Gay and Kim (1987) discover the day of the week effect in commodity and stock futures markets of the United States. In general, the day of the week effect is common for different countries and different types of financial markets.

4.2. Studies influence of information asymmetry on stock market performance. For example, Shiller (1981) shows that the variable nature of stock returns are difficult to describe just by shocks to future cash flows or future changes in interest rates. He comes to the conclusion that there are non-economic factors that determine the fluctuation of stock prices. Later Engle and Ng (1993) find that bad news in the form of unexpected negative stock market returns create more volatility, (on the example of Japanese stock market) than good news in the form of unexpected positive stock market returns, and deduces that information asymmetry presents in the volatility of stock market returns. Jensen and Johnson (1995) discover that reduction in the interest rate leads to less volatile stock market

returns than after increase in the interest rate. Later Jensen, Johnson and Baumann (1997) study the aggregate stock market index at the industry level and also find that rise in the interest rate increases the volatility of stock market returns in various industrial sectors. Gulley and Sultan (1998) show that the decrease in the consumer confidence index has a bigger impact on the Dow Jones Industrial Average than the growth of this index. Veronesi (2002) find that investors tend to be more sensitive to the news in a highly uncertain economic environment, and, therefore, expect that the stock markets will be more volatile, which in turn increases volatility of the stock market even more. Overall, the empirical results presented above indicate the presence of certain information asymmetry in the stock market returns, which is expressed in the form of responses to various economic and noneconomic news.

4.3. Analyses the effect of elections on stock market fluctuations and identification of the presence of election cycles in the stock market returns and in their volatility. For example, Booth and Booth (2003) examine the short-term effects of the impact of political business cycles on stock market fluctuations and President Cycle Effect. Adrian and Rosenberg (2008) study short-term (temporary) and long-term (permanent) stock market volatility referred to dates of presidential/parliament elections. Other papers test the partisan hypothesis in relation to a particular country or a group of countries, i.e. the link between ruling political parties and stock market behavior, so-called “democrats premium effect” (Anderson et al. 2007; Hensel and Ziemba 1995; Santa-Clara and Valkanov 2003). And, finally, there are papers that study stock market index behavior several weeks before and after elections (Adrian and Rosenberg 2008; Altin 2012; Pantzalis et al. 2000).

4.4. Examines the difference in the stock market fluctuations between developed and developing countries. For example, Shi and Svensson (2002) show the presence of systematic differences between these countries, particularly in developing countries political business cycles are more pronounced due to imperfections of the institutional environment. Alfaro et al. (2008) find that the

quality of monetary institutions is an important factor in explaining the high level of stock market fluctuations in developing countries. Rodríguez and Santiso (2008) find relationship between portfolio investments in developing countries and political factors and show that the level of financial development depends on democratic reforms, since democratization leads to political liberalization, and this, in turn, creates conditions for economic liberalization. Boutchkova et al. (2007) discover that the policy affects the volatility of the stock markets and find that with a weak democratic system of government volatility of stock prices increases in sectors with greater state share. Schuknecht (1996) conducts a cross-country study of the presence of political business cycles in 35 developing countries using statistics for the period from 1970 to 1992 and discover that in the developing countries the increase of public expenditures through the providing of subsidies for the purchase of food or creation jobs by way of appropriate social programs have a greater effect on voting behavior than tax cuts.

In this thesis, in contrast to existing literature, I would like to analyze relationship of information transparency and stock markets during the election periods. Firstly, I will empirically study what is a length of election cycles in stock returns in developing countries and what are the differences in stock market movements for developing and developed countries during the election periods. Secondly, I will examine the influence of information transparency on stock market returns during the election periods. Finally, an analogous analysis will be completed for the volatility of stock returns, in order to discover if elections create more uncertainty for the stock markets in developing countries and if information transparency plays an important role during the election periods.

METHODOLOGY

In order to study stock markets' sensitivity to election results from a comparative viewpoint and over time a panel study methodology is applied. The methodology is based on Santa-Clara and Valkanov (2003) approach. If it assumed that stock markets are rational, then information is included in the stock prices instantly, and so it is possible to estimate the results of the elections on the stock price within a relatively short period of time. For example, Leblang and Mukherjee (2005), Santa-Clara and Valkanov (2003) show that the stock market participants in order to adequately assess the expected returns on stocks they wish to buy try to get all the necessary information about future economic policy of the government and, therefore, the overall assessment of a large number of informed market participants transforms into the stock market reaction to the expected future economic policy of the government. Also there are papers that examine the impact of the elections outcomes (margin of victory, change in the government's political orientation etc.) on the stock market indexes (Bialkowski et al. 2008). Recent studies also confirm that stock prices react to the increase in the probability of success of a particular political party in the upcoming elections (Bechtel 2009; Fuss and Bechtel 2008; Herron 2000; Leblang and Mukherjee 2007).

The number of elections in this study is equal 219 in total within 52 developed and developing countries between 1994 and 2012 years (to increase sample size and robustness of the results). These countries are chosen according to next principles: developed or developing country; for the purpose to present all parts of the world economy; availability of data. The first research hypothesis is:

***H₁**: Stock market returns in developing countries increase before every election and decline after every election in comparison to the periods without elections, showing evidence for elections cycles in stock market movements in these countries.*

The election cycles form under unprincipled behavior of the politicians in preelection period. They use expansionary economic policies before elections in order to obtain more votes, but due to lack of political and information transparency in developing countries stock market traders cannot relatively accurately determine the content and objectives of economic policy, and, therefore, correctly predict the dynamics of macroeconomic indicators. The extra stimulation of the economy by the government leads to increase in stock returns before the elections and decrease in stock returns after the elections due to contraction in the priming of the economy.

The examination of election cycles in stock market movements is done using properly defined dummy variables. The structure of the dummy variables replicates the effect of election cycles on stock market taking into account time periods before the elections and after the elections for developing and developed countries.

In order to assess this hypothesis the series on stock market prices are used to calculate monthly returns. The monthly returns for each country are converted from local currency to USD using next formula:

$$r_t = \frac{E_{i,t-1}}{E_{i,t}} \ln \left(\frac{P_{i,t}}{P_{i,t-1}} \right) \cdot 100\% \quad (1)$$

where: $r_{i,t}$ – monthly stock market return in the country i at time t ; $E_{i,t}$ $E_{i,t-1}$ – exchange rates of the country i at time t and $t-1$ against USD; $P_{i,t}$ $P_{i,t-1}$ – values of stock index of the country i at time t and $t-1$.

Therefore, a model of election cycle may be presented in the following way:

$$r_{i,t} = \alpha + \beta_1 \cdot PREEL_{i,t} + \beta_2 \cdot UNDEV_{i,t} + \beta_3 \cdot PREEL_{i,t} \cdot UNDEV_{i,t} + \beta_4 \cdot AFTEREL_{i,t} + \beta_5 \cdot AFTEREL_{i,t} \cdot UNDEV_{i,t} + \sum_{q=1}^3 \lambda_q \cdot EC_{i,q,t} + \varepsilon_{i,t}, \quad (2)$$

where: $r_{i,t}$ – monthly stock market returns in the country i at time t , %;

$PREEL_{i,t}$ – dummy variable, is equal to 1, if t is in K , $K \in (6,7, \dots, 12)$, months before elections in the country i and 0 otherwise. Alt and Lassen (2006) and Schuknecht (1996) model political influence using dummy variable that is equal to one in the year of elections, minus one in the year after elections and zero otherwise and finds a strong significant effect of elections on the fiscal balance in the developing countries;

$AFTEREL_{i,t}$ – dummy variable, is equal to 1, if t is in K , $K \in (6,7, \dots, 12)$, months after elections in the country i and 0 otherwise (Alt and Lassen 2006; Schuknecht 1996);

$UNDEV_{i,t}$ – dummy variable, is equal to 1, if country i at time t belongs to developing country and 0 otherwise;

$PREEL_{i,t}; UNDEV_{i,t}$ – interaction dummy variable to capture difference in stock returns between developed and developing countries in preelection period;

$AFTEREL_{i,t}; UNDEV_{i,t}$ – interaction dummy variable to capture difference in stock returns between developed and developing countries in postelection period;

$EC_{i,t}$ – vector of economic variables of the country i at time t , consists of variables that take into account: the rate of economic liberalization in the country ($ECFREE_{i,t}$), global stock market index (r_{t-1}^{world}), stock market development ($STOCKDEV_{i,t}$);

$ECFREE_{i,t}$ – qualitative variable taking into account the rate of economic liberalization in the country of interest (0 for lowest score, 100 for highest score) (Rodríguez and Santiso 2008). Boutchkova et al. (2007) find that the stock market fluctuations increase in developing countries if there is a likelihood of change in the future economic policy of the government;

r_{t-1}^{world} – monthly stock market return on global stock market index at time $t-1$, DJGI (DJ Global Index), to take into account influence of world stock market dynamics to control for global macroeconomic effects in order to increase the probability that the change in stock market trading is caused by the elections, %;

$STOCKDEV_{i,t}$ – stock market development indicator of the country i at time t measured as stock market capitalization to GDP of the country i at time t , %.

The interpretation of the coefficients in this model is next: α is average return over the periods after controlling for other variables in the model; $\beta_1 + \beta_3$ is average change in stock returns in time periods before elections in developing countries ceteris paribus and $\beta_4 + \beta_5$ is average change in stock returns in time periods after elections in developing countries holding other factors fixed.

If relevant tests (Hausman specification test, Breusch-Pagan LM test, F test) do not show presence of fixed effects or random effects the model in Eq. (2) is estimated using OLS. Due to nature of the data the model is assumed to be tested on heteroscedasticity and serial correlation of error terms ε_p , because variance of estimates might be biased leading to wrong conclusions about their statistical significance. Also, due to panel specification there is might be a problem of cross-sectional dependence.

***H₂**: Stock market returns are on average higher in developing countries in election period due to lower information transparency.*

Higher information transparency allows revealing both positive and negative results of the politician's actions. It permits voters and opposite political parties to assess causes and consequences of economic policy of the government with greater accuracy. The ability of voters to evaluate political leaders critically depends on the availability of all relevant and reliable information, which they can get from the media. The higher information transparency in the country – the more precise estimation of future economic policy can market obtain and thus more accurately reflect it in the stock prices. But the lower information transparency in developing countries – the higher possibilities for politicians to stimulate economy before elections, and hence this leads to increase in stock returns in election periods for developing countries.

Hypothesis **H₂** is tested using next model:

$$\begin{aligned}
r_{i,t} = & \alpha + \beta_1 \cdot MEDIA_{i,t} + \beta_2 \cdot PREEL_{i,t} + \beta_3 \cdot AFTEREL_{i,t} + \beta_4 \cdot UNDEV_{i,t} + \\
& + \beta_5 \cdot MEDIA_{i,t} \cdot PREEL_{i,t} + \beta_6 \cdot MEDIA_{i,t} \cdot PREEL_{i,t} \cdot UNDEV_{i,t} + \\
& + \beta_7 \cdot MEDIA_{i,t} \cdot AFTEREL_{i,t} + \beta_8 \cdot MEDIA_{i,t} \cdot AFTEREL_{i,t} \cdot UNDEV_{i,t} + \\
& + \sum_{s=1}^3 \gamma_s \cdot POL_{i,s,t} + \sum_{q=1}^3 \lambda_q \cdot EC_{i,q,t} + \varepsilon_{i,t},
\end{aligned} \tag{3}$$

where: $MEDIA_{i,t}$ – qualitative variable to take into account level of press freedom in the country of interest: (ranges from 0 – highest level of press freedom to 100 – lowest level). Veronesi (2002) shows that in conditions of high stock market fluctuations investors tend to be more sensitive to the news and demand higher return on stocks with high risk and, therefore, stock prices in the more stable periods are lower. Labmert et al. (2011) determine that the information aspect may explain the higher volatility in the stock markets in election period, finding that stock prices become less informative during elections. Amihud and Wohl (2003) show that the media attention determines the significance to the public of any news and, hence, the degree of inclusion of these news into stock prices. Koutmos (1999) finds that good news in the form of positive past returns has more stable effect on the conditional mean of stock market returns than bad news, in the form of negative past returns.

$MEDIA_{i,t} \cdot PREEL_{i,t}$, $MEDIA_{i,t} \cdot PREEL_{i,t} \cdot UNDEV_{i,t}$ – interaction dummy variable to capture difference in stock returns induced by influence of information transparency between developed and developing countries in preelection period;

$MEDIA_{i,t} \cdot AFTEREL_{i,t}$, $MEDIA_{i,t} \cdot AFTEREL_{i,t} \cdot UNDEV_{i,t}$ – interaction dummy variable to capture difference in stock returns induced by influence of information transparency between developed and developing countries in postelection period;

$POL_{i,t}$ – vector of political transparency variables of the country i at time t , consists of dummy variables that take into account: level of political rights in the country ($POLRIGHTS_{i,t}$); presence of an independent institution that can control adequacy of laws to the constitution in the country ($INDEPINST_{i,t}$); political system in the country ($POLSYS_{i,t}$);

$POLRIGHTS_{i,t}$ – dummy variable to take into account level of political rights (relevance of elections for the executive and legislature as an expression of the will of the polity, election laws and campaigning opportunities, voting power of the electorate, political competition, evidence of political power-shifting through elections, significant opposition voting, freedom from external and military control of domestic politics, minority self-determination or pluralism, decentralization of political power, and the attempt of political agents to reach a consensus on major national issues) in the country of interest (1 for highest score, 7 for lowest score) (Rogoff 1990; Persson and Tabellini 2004);

$INDEPINST_{i,t}$ – dummy variable to take into account existence of an independent institution, which decides whether laws are in conformity with the Constitution in the country of interest; is equal to 1 if exist, 0 if does not exist and 2 in case of undemocratic rule (Gonzalez 1999; Shi and Svensson 2002). Henisz (2004) shows that the influence of political news is less in countries with restrictions on the power of political leaders; and stock traders, interpreting the results of the elections, take into account these conditions. Furthermore, he finds that the reaction of stock markets to the political processes remains for several weeks after the elections until the process of forming of a new government is ended;

$POLSYS_{i,t}$ – dummy variable to take into account political system in the country of interest: is equal to 0 for other system, 1 for presidential system, 2 for semi-presidential dominated by president, 3 for semi-presidential dominated by parliament, 4 for parliamentary system (Rogoff 1990; Persson and Tabellini 2004).

If relevant tests (Hausman specification test, Breusch-Pagan LM test, F test) do not show presence of fixed effects or random effects the model in Eq. (3) is estimated using OLS. The model is assumed to be tested on heteroscedasticity, serial and auto- correlation.

H_3 : If there are election cycles, stock market volatility is higher in the developing countries in comparison to the developed countries.

Political uncertainty in developing countries often has very different characteristics and a greater scale than in developed countries, where political institutions are fully formed and effectively execute their functions. This leads to higher stock prices fluctuations during the election period and higher dependence of stock prices on results of the elections in developing countries.

Hypothesis H_3 is evaluated using volatility of stock market returns, which is estimated by variance of nominal stock market returns. For this purpose AR(1)-EGARCH(p,q) model is chosen in order to reliably represent dynamics of financial time series using approach of Bialkowski et al. (2008) for panel data.

Hypothesis H_3 is tested using next model:

$$\begin{aligned} r_t &= \alpha + \beta \cdot r_{t-1} + \varepsilon_t, \\ \varepsilon_t &= h_t \cdot z_t, \quad E(\varepsilon_t) = 0, \quad \text{Var}(\varepsilon_t) = h_t, \quad z_t \sim i.i.d(0,1), \end{aligned} \quad (4)$$

where: r_{t-1} – AR(1) term (to account for autocorrelation in stock market returns).

Volatility is estimated as h_t using EGARCH(p, q) specification:

$$\begin{aligned} \log(h_t) &= w + \sum_{i=1}^p \delta_i \cdot \log(h_{t-i}) + \sum_{j=1}^q a_j \cdot g(z_{t-j}), \\ g(z_t) &= \theta \cdot z_t + \gamma [|z_t| - E|z_t|], \end{aligned} \quad (5)$$

where: p – number of lagged AR terms; q – number of lagged returns innovations; $g(\cdot)$ – impact function of lagged innovations; E – expectations operator; σ , a – estimated parameters.

The equations (4) and (5) are evaluated using maximum likelihood method. Number of lags in the model is chosen using AIC criterion.

Using derived time series volatility h_t and equation (1) the model to test hypothesis H_3 is next:

$$\begin{aligned}
h_{i,t} = & \alpha + \beta_1 \cdot PREEL_{i,t} + \beta_2 \cdot UNDEV_{i,t} + \beta_3 \cdot PREEL_{i,t} \cdot UNDEV_{i,t} + \\
& \beta_4 \cdot AFTEREL_{i,t} + \beta_5 \cdot AFTEREL_{i,t} \cdot UNDEV_{i,t} + \sum_{q=1}^3 \lambda_q \cdot EC_{i,q,t} + \varepsilon_{i,t}.
\end{aligned} \tag{6}$$

If relevant tests (Hausman specification test, Breusch-Pagan LM test, F test) do not show presence of fixed effects or random effects the model in Eq. (6) is estimated using OLS. The model is assumed to be tested on heteroscedasticity, serial and autocorrelation.

H₄: *If hypotheses H₂ and H₃ are true, stock markets are more volatile in developing countries in periods with lower information transparency.*

To test hypothesis ***H₄*** next model is estimated:

$$\begin{aligned}
h_{i,t} = & \alpha + \beta_1 \cdot MEDIA_{i,t} + \beta_2 \cdot PREEL_{i,t} + \beta_3 \cdot AFTEREL_{i,t} + \beta_4 \cdot UNDEV_{i,t} + \\
& + \beta_5 \cdot MEDIA_{i,t} \cdot PREEL_{i,t} + \beta_6 \cdot MEDIA_{i,t} \cdot PREEL_{i,t} \cdot UNDEV_{i,t} + \\
& + \beta_7 \cdot MEDIA_{i,t} \cdot AFTEREL_{i,t} + \beta_8 \cdot MEDIA_{i,t} \cdot AFTEREL_{i,t} \cdot UNDEV_{i,t} + \\
& + \sum_{s=1}^3 \gamma_s \cdot POL_{i,s,t} + \sum_{q=1}^3 \lambda_q \cdot EC_{i,q,t} + \varepsilon_{i,t}.
\end{aligned} \tag{7}$$

If relevant tests (Hausman specification test, Breusch-Pagan LM test, F test) do not show presence of fixed effects or random effects the model in Eq. (7) is estimated using OLS. Hypothesis ***H₄*** assumes that stock market volatility is higher in developing countries in comparison with developed ones due to lack of information transparency in developing countries.

Chapter 4

DATA DESCRIPTION

The data is structured as panel data that consists of 52 countries covering developing and developed countries based on IMF classification. The purpose is to raise size of the sample and increase robustness of the results.

Descriptive statistics of key variables are presented in Table 1 and Table 2.

Monthly data set on closing stock market prices covering 52 developing and developed countries with time dimension ranging from 1994 till 2012 for different countries is used. The data set is obtained from **Thomson-Reuters database**.

Table 1. Number of general elections by country, 1994-2012

Argentina	6	France*	5	New Zealand*	2	Spain*	5
Australia*	4	Germany*	5	Norway*	2	Sweden*	3
Austria*	6	Greece*	7	Peru	2	Switzerland*	5
Belgium*	5	Hungary	3	Philippines	4	Taiwan*	7
Brazil	5	India	5	Poland	7	Thailand	5
Bulgaria	4	Indonesia	3	Romania	5	Tunisia	4
Canada*	7	Ireland*	3	Russia	4	Turkey	1
Chile	4	Israel*	5	Serbia	3	Ukraine	2
Croatia	4	Italy*	3	Singapore*	3	United Kingdom*	4
Czech Republic*	2	Japan*	5	Slovakia*	3	United States*	10
Denmark*	6	Latvia	4	Slovenia	1		
Egypt	5	Lithuania	2	South Africa	1		
Estonia	2	Malaysia	3	South Korea*	5		
Finland*	5	Mexico	7				
		Netherlands*	6				
Total							219

Note: elections – general presidential or/and parliamentary; * indicates a country that belongs to group of developed countries.

Table 2. Descriptive statistics of key variables

Variable	Obs.	Mean	Std. Dev.
Stock returns, r , (%)	8510	0.516	7.333
Political system in the country, <i>POLSYS</i>	8510	2.981	1.121
Level of political rights, <i>POLRIGHTS</i>	8510	1.838	1.421
Existence of an independent institution, <i>INDEPINST</i>	8510	0.834	0.371
Level of press freedom, <i>MEDIA</i>	8510	30.233	18.242
Rate of economic liberalization, <i>ECFREE</i>	8510	66.418	8.982
Global stock market index (returns), r^{World} , (%)	8510	0.252	4.943
Stock market development, <i>STOCKDEV</i> , (%)	8510	71.269	63.978
Time before elections, <i>PREEL</i> (for 6 months)	8510	0.149	0.356
Time after elections, <i>AFTEREL</i> (for 6 months)	8510	0.151	0.357
Time before elections, <i>PREEL</i> (for 9 months)	8510	0.220	0.414
Time after elections, <i>AFTEREL</i> (for 9 months)	8510	0.217	0.412

Data set of election variables (time dimension ranging from 1994 till 2012 for different countries) including: $PREEL_{i,t}$, $AFTEREL_{i,t}$ election dates is obtained from the next sources:

www.electionresources.org, www.systemicpeace.org/polity/polity4.htm,
http://www.ipw.unibe.ch/content/team/klaus_armingeon/comparative_political_data_sets/index_ger.html, <http://www.electionworld.org>,
<http://www.ifes.org/eguide/elecguide.htm>.

Data set on the rate of economic liberalization in the country ($ECFREE_{i,t}$) with time dimension ranging from 1994 till 2012 for different countries is obtained from www.freedomhouse.com, www.heritage.org, www.freetheworld.com.

Data set on stock market development indicator of the country ($STOCKDEV_{i,t}$) with time dimension ranging from 1994 till 2012 for different countries is obtained from www.data.worldbank.org.

Data set on global stock market index (r^{world}) – DJ Global Index including stock price and volume of trade with time dimension ranging from 1994 till 2012 is obtained from **Thomson-Reuters database**, www.finance.yahoo.com, www.google.com/finance/.

Data set on political system variable – $POLSYS_{i,t}$ with time dimension ranging from 1994 till 2012 for different countries is obtained from: www.electionresources.org, <http://www.ifes.org/eguide/elecguide.htm>, <http://www.electionworld.org>, www.wikipedia.org.

Data set on information and political transparency variables ($MEDIA_{i,t}$, $POLRIGHTS_{i,t}$, $INDEPINST_{i,t}$) with time dimension ranging from 1994 till 2012 for different countries is obtained from: www.freedomhouse.org/report-types/freedom-world (Freedom in the World), www.stats.uis.unesco.org, www.freedomhouse.com (Press Freedom Index), www.transparency.org (Transparency International Reports), www.govindicators.org.

The test on stationarity of stock returns for all 52 countries is implemented using Augmented-Dickey Fuller test and results are presented in Table A1 and Table A2: the null hypothesis of nonstationarity of stock returns on the 1% significance level is rejected for all 52 countries.

Figure 1 and Figure 2 show dynamics of each country stock index over estimated period. The figures illustrate different dynamics of stock market indices over 1994-2012 time periods for developed and developing countries and also show stock market indices across countries are to some extent synchronized in their movements.

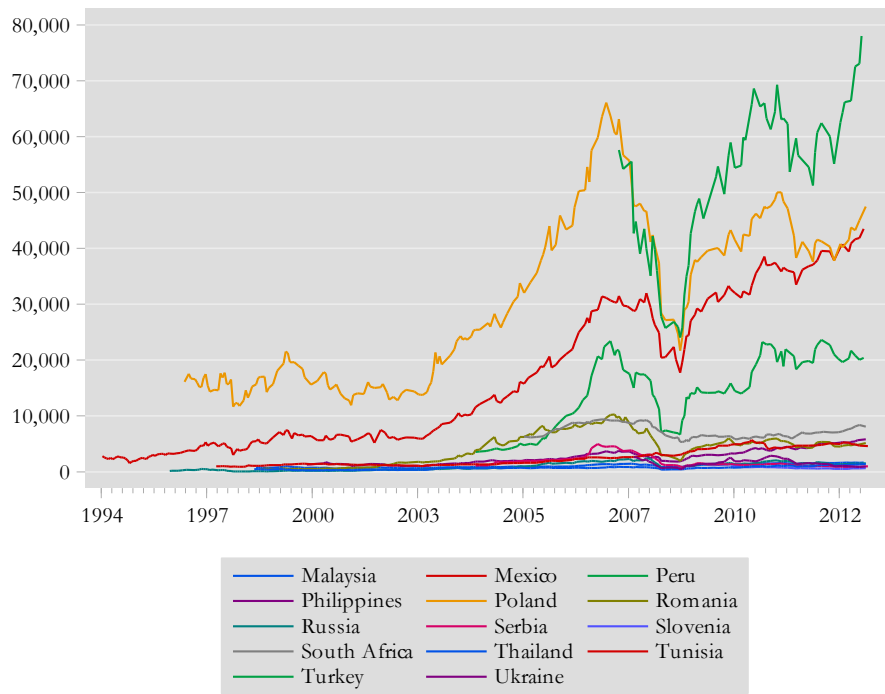
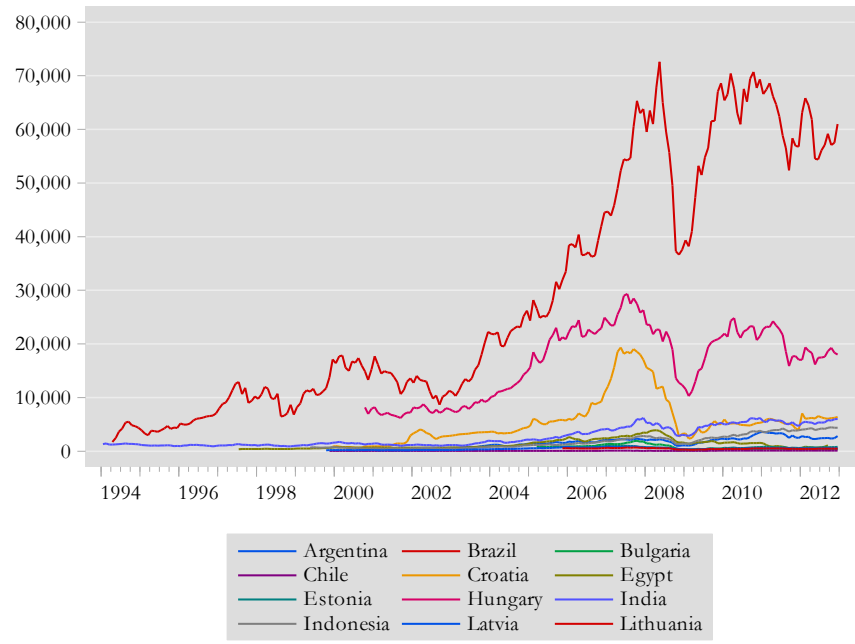


Figure 1: Stock market price indices of developing countries (in local currencies)

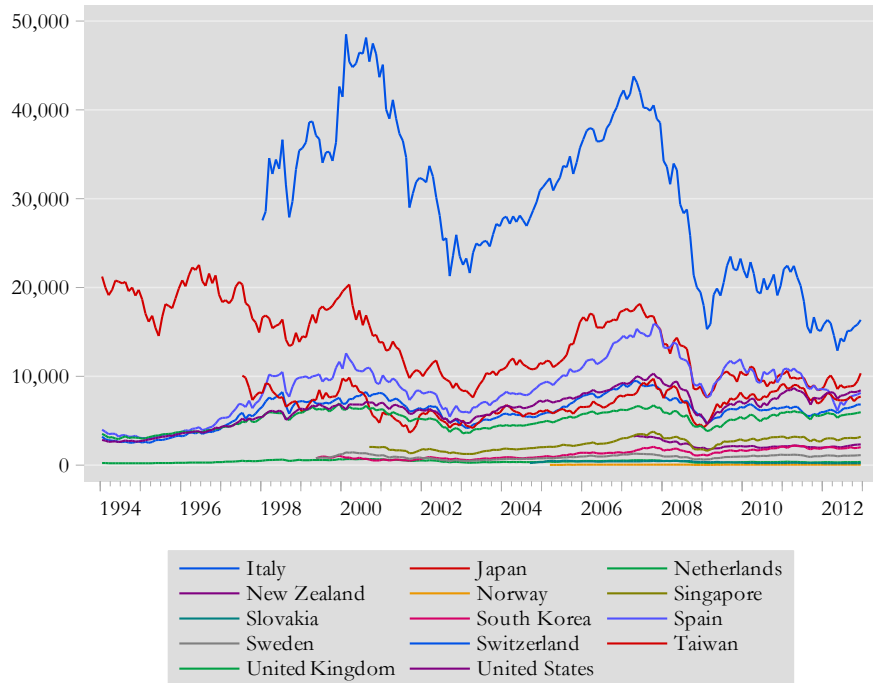
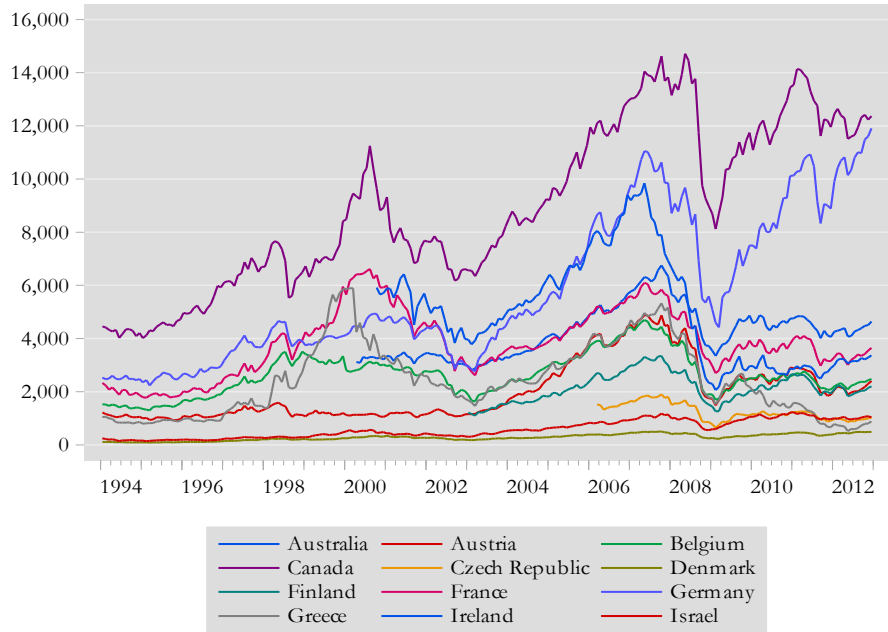


Figure 2: Stock market price indices of developed countries (in local currencies)

EMPIRICAL RESULTS

In this section the main results on election cycle differences and influence of information transparency on stock returns and its volatility in developing and developed countries are presented. The analysis is conducted using panel regression.

Election Cycle in Stock Returns

The analysis of hypothesis **H1**, stated in Eq. (2) starts with test on stationarity of stock returns in order to check necessity in additional data transformation. The test is implemented using Augmented-Dickey Fuller test. Results are presented in Table A1 and Table A2, where main descriptive statistics of stock returns for all 52 countries are presented together with relevant Augmented-Dickey Fuller test results. As can be seen from the tables the test rejects the null hypothesis of nonstationarity of stock returns for all 52 countries on the 1% significance level. This indicates that there is no need in additional transformation of the data.

Model stated in Eq. (2) on existence of election cycle for developing countries is estimated with length of election cycle growing from 6 to 12 months for periods before and after elections. Model was estimated using pooled OLS, because, first, F test shows no sign for fixed effects and, second, Breusch-Pagan LM test shows no evidence for random effects. From the set of all available combinations (models with length of election cycles from 6 to 12 months before elections and from 6 to 12 months after elections) the best model is chosen using AIC test (Akaike information criterion). Results are summarized in Table A3. As can be seen the election cycle lasts from 6 up 9 months before elections (due significant results of particular model estimation) and 6 months after elections. So, on average election cycles for the sample of 52 analyzed

countries is equal to 9 months before elections and 6 months after that. According to the hypothesis specification stated in Eq. (2) estimation results are presented in Table 3 (models were estimated using Driscoll-Kraay standard errors in order to control for heteroscedasticity, cross-sectional correlation and autocorrelation of order 1, presence of which show relevant tests).

Table 3. Model of election cycle in stock returns

	(1)	(2)	(3)	(4)
Intercept	2.659 (1.039)	0.289 (0.445)	0.539 (0.407)	0.320 (0.340)
<i>PREEL9</i>	-0.202 (0.183)	-0.490** (0.198)	-0.416* (0.236)	-0.196 (0.187)
<i>UNDEV</i>	0.296 (0.263)	--	--	0.503** (0.224)
<i>PREEL9_</i> <i>UNDEV</i>	0.290 (0.344)	0.921** (0.374)	0.744* (0.427)	0.241 (0.353)
<i>AFTEREL6</i>	-0.645** (0.248)	-0.929*** (0.246)	-0.856*** (0.268)	-0.0637** (0.244)
<i>AFTEREL6_</i> <i>UNDEV</i>	0.412 (0.419)	1.035** (0.424)	0.855** (0.404)	0.351 (0.417)
r_{t-1}^{world}	0.279*** (0.094)	0.281*** (0.095)	0.283*** (0.098)	0.283*** (0.095)
<i>STOCKDEV</i>	0.005*** (0.001)	0.003** (0.001)	--	--
<i>ECFREE</i>	-0.040*** (0.014)	--	--	--
Number of observations:	8510	8510	8510	8510
R²	0.041	0.039	0.038	0.038
F test:	1.03 (0.420)	1.03 (0.420)	1.03 (0.420)	1.03 (0.420)
Hausman test:	--	--	6.700 (0.244)	--
Breusch-Pagan LM test:	--	0.080 (0.390)	1.660 (0.098)	--
Pesaran's test:	186.225 (0.000)	186.367 (0.000)	186.949 (0.000)	187.161 (0.000)
Wald test:	2110.41 (0.000)	2045.76 (0.000)	2057.600 (0.000)	2077.62 (0.000)
Wooldridge test:	79.286 (0.000)	79.548 (0.000)	74.820 (0.000)	74.820 (0.000)

Note: Driscoll-Kraay standard errors in parenthesis. Hausman specification test (p-value presented in parenthesis) with H0: no fixed effects. Breusch-Pagan LM test (p-value presented in parenthesis) with H0: no random effects. Pesaran's test of cross sectional independence (p-value presented in parenthesis) with H0: no cross-sectional dependence. Wald test for heteroscedasticity (p-value presented in parenthesis) with H0: no heteroscedasticity. Wooldridge test (p-value presented in parenthesis) with H0: no first order autocorrelation.

***, **, * – significance levels: 1%, 5% and 10%, respectively.

According to the estimation results presented in Table 3 the third model has most significant coefficients. The interpretation of coefficients of third model in Table 3 is next: $-0.416\%+0.744\%=0.328\%$ is average change in stock returns in 9 months before elections in developing countries *ceteris paribus*; $-0.856\%+0.855\%=-0.001\%$ is average change in stock returns in 6 months after elections in developing countries holding other factors fixed. So, this show different pattern for developing countries in stock market movements before and after elections: investors observe populist decisions of the government in preelection periods in order to reinforce economic growth in the country and try to achieve benefits from these actions by increasing trading which leads to increase in stock returns; after the elections returns slightly decrease due to may be lack of confidence in subsequent economic decisions of the government.

Election Cycle and Information Transparency

Concerning effect of information transparency on stock returns during election period the relevant model (see Eq. (3)) is estimated using the results of evaluation of hypothesis **H1** in previous section, where model for election cycle in stock returns with length of election cycle equal to 9 months before elections and 6 months after elections is derived. Model was estimated using pooled OLS, because, first, F test shows no sign for fixed effects and, second, Breusch-Pagan LM test shows no evidence for random effects. Results of the estimated models are summarized in Table 4 (second, third and fourth model were calculated using Driscoll-Kraay standard errors in order to control for heteroscedasticity, cross-sectional correlation and autocorrelation of order 1, presence of which show relevant tests).

According to the estimation results presented in Table 4 the third model has most significant coefficients (variables *POLSYS*, *POLRIGHTS*, *INDEPINST*, *PREEL9*, *UNDEV* were dropped from this specification due to insignificant coefficients).

Table 4. Model of influence of information transparency on stock returns

	(1) ¹	(2)	(3)	(4)
Intercept	0.428 (0.378)	0.370 (0.322)	0.264 (0.328)	0.345 (0.348)
<i>MEDIA</i>	0.010 (0.011)	0.018 (0.012)	0.009* (0.005)	-0.001 (0.006)
<i>PREEL9</i>	-0.121 (0.448)	--	--	-0.132 (0.374)
<i>UNDEV</i>	0.324 (0.257)	--	--	0.464 (0.279)
<i>MEDIA_</i> <i>PREEL9</i>	-0.009 (0.020)	-0.017** (0.008)	-0.019** (0.008)	-0.007 (0.017)
<i>MEDIA_</i> <i>PREEL9_UNDEV</i>	0.015 (0.015)	0.022** (0.010)	0.025** (0.010)	0.014 (0.012)
<i>AFTEREL6</i>	-0.627 (0.524)	--	--	-0.646 (0.482)
<i>MEDIA_</i> <i>AFTEREL6</i>	-0.002 (0.024)	-0.030** (0.012)	-0.031** (0.012)	0.001 (0.024)
<i>MEDIA_</i> <i>AFTEREL6_UNDEV</i>	0.010 (0.018)	0.027* (0.013)	0.029** (0.013)	0.008 (0.017)
<i>POLSYS</i>	-0.081 (0.079)	-0.103* (0.053)	--	--
<i>POLRIGHTS</i>	-0.132 (0.130)	-0.153 (0.138)	--	--
<i>INDEPINST</i>	0.174 (0.237)	0.224 (0.222)	--	--
t_{t-1}^{world}	0.283*** (0.015)	0.283*** (0.095)	0.283*** (0.095)	0.283*** (0.095)
Number of observations:	8510	8510	8510	8510
R^2	0.039	0.039	0.038	
F test:	1.03 (0.420)	1.03 (0.420)	1.03 (0.420)	1.03 (0.420)
Hausman test:	--	--	5.460 (0.4866)	3.81 (0.873)
Breusch-Pagan LM test:	4.78 (0.0144)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)
Pesaran's test:	187.092 (0.000)	186.963 (0.000)	187.102 (0.000)	187.102 (0.000)
Wald test:	2093.91 (0.000)	2096.27 (0.000)	2083.200 (0.000)	2083.20 (0.000)
Wooldridge test:	75.343 (0.000)	74.926 (0.0000)	75.149 (0.000)	75.149 (0.000)

Note: Driscoll-Kraay standard errors in parenthesis for model (2), (3) and (4). Hausman specification test (p-value presented in parenthesis) with H0: no fixed effects. Breusch-Pagan LM test (p-value presented in parenthesis) with H0: no random effects. Pesaran's test of cross sectional independence (p-value presented in parenthesis) with H0: no cross-sectional dependence. Wald test for heteroscedasticity (p-value presented in parenthesis) with H0: no heteroscedasticity. Wooldridge test (p-value presented in parenthesis) with H0: no first order autocorrelation.

***, **, * – significance levels: 1%, 5% and 10%, respectively.

¹ – calculated using random-effects model (standard errors in parenthesis).

So, the results from the estimation of the third model in Table 4 show that stock market returns in developing countries on average increase by 0.025% over 9

months before elections due to decrease in information transparency holding other factors constant and on average increase by 0.029% over 6 months after elections due to decrease in information transparency *ceteris paribus*.

Results show that there is also different pattern in stock dependence on information transparency: in developing countries decrease in information transparency causes decrease in stock returns on average, but for developed countries the influence is opposite on average: the lower information transparency the higher returns. And explanation can be next: using results for testing hypothesis **H1** we can say that in periods just before elections stock market trading increases in developing countries (due to reasons mentioned for hypothesis **H1**), which increases stock returns, and this also holds for information transparency effect – decline in this factor leads to rise in stock trading and returns (holding other factors constant). After the elections returns still rise in developing countries, because the lesser information about subsequent economic policy of new government – the higher uncertainty in economic perspectives of particular country, this leads to increase in trading in postelection periods and, thus, to increase in stock returns on average (because developing markets are typically illiquid – stock prices do not move much due to fewer trades in comparison to developed markets, hence true information reveals with a gap and slowly influences prices, creating positive autocorrelation in returns).

Volatility and Election Cycle

Volatility is derived from stock market returns, and is measured by its variance. The analysis can be accomplished only if there is heteroscedasticity in stock returns (mean that volatility changes over time). In order to test heteroscedasticity next tests are used: Portmanteau Q test and Engle Lagrange Multiplier test for ARCH effects (see Table A4). The results show presence of heteroscedasticity in stock returns for almost all countries. Next is estimated conditional volatility using equation (4) and equation (5). For these purpose next

model is selected: AR(1)-EGARCH(p, q). This specification is mostly consistent with modeling financial time-series. Model is evaluated with $\rho \in (1; 2; 3)$ and $q \in (0; 1; 2; 3)$ and best is chosen using AIC test. The most significant results are presented in Table 5.

Table 5. Model selection for volatility analysis

Model	AR	EGARCH				AIC
	ρ	ω (const.)	γ (earch)	α (a_earch)	β (egarch)	
AR(1)-EGARCH(1,0)	0.136*** (0.007)	3.921*** (0.009)	-0.047*** (0.009)	0.377*** (0.012)	--	57263.47
AR(1)-EGARCH(1,1)	0.108*** (0.010)	0.190*** (0.011)	-0.063*** (0.004)	0.320*** (0.009)	0.950*** (0.003)	55520.89
AR(1)-EGARCH(2,0)	0.140*** (0.005)	3.925*** (0.009)	-0.115*** (0.010)	0.351*** (0.013)	--	57326.48
AR(1)-EGARCH(2,1)	0.126*** (0.008)	0.211*** (0.012)	-0.061*** (0.004)	0.282*** (0.009)	0.945*** (0.003)	55777.13
AR(1)-EGARCH(1,2)	0.125*** (0.008)	0.856*** (0.038)	-0.063*** (0.005)	0.238*** (0.009)	0.776*** (0.009)	56439.24
AR(1)-EGARCH(2,2)	0.130*** (0.006)	0.381*** (0.018)	-0.053*** (0.006)	0.402*** (0.012)	0.902*** (0.004)	56211.86
AR(1)-EGARCH(3,2)	0.139*** (0.006)	0.953*** (0.044)	-0.071*** (0.006)	0.261*** (0.012)	0.752*** (0.011)	56581.67
AR(1)-EGARCH(2,3)	0.165*** (0.006)	0.670*** (0.042)	-0.019*** (0.004)	0.207*** (0.009)	0.828*** (0.010)	56994.05
AR(1)-EGARCH(3,3)	0.123*** (0.006)	0.631*** (0.034)	-0.086*** (0.008)	0.423*** (0.013)	0.837*** (0.009)	56382.12

Note: Number of observations is equal to 8510 for all models. AIC denotes Akaike information criterion.

***, **, * – significance levels: 1%, 5% and 10%, respectively.

The results show that best specification to estimate volatility is AR(1)-EGARCH(1, 1) – has lowest value of AIC.

Next, using derived volatility h_t , hypothesis **H3** is tested. Model was estimated using random-effects panel regression, because Breusch-Pagan LM test shows evidence for random effects.

Results of the estimated model are summarized in Table 6 (model was calculated using Prais-Winsten regression (due to random-effects specification) to obtain panel-corrected standard errors in order to control for heteroscedasticity, cross-

sectional correlation and autocorrelation of order 1, presence of which show relevant tests).

Table 6. Model of election cycle in volatility of returns

Intercept	<i>PREEL9</i>	<i>PREEL9</i> <i>UNDEV</i>	<i>AFTEREL6</i>	<i>AFTEREL6</i> <i>UNDEV</i>	r_{t-1}^{world}
52.069*** (3.804)	-2.346** (0.979)	5.137** (2.234)	-1.787* (0.950)	3.947* (2.147)	-0.782*** (0.000)
Number of observations:					8510
R²					0.043
Breusch-Pagan LM test:					19016.620 (0.000)
Pesaran's test:					212.756 (0.000)
Wald test:					32078.70 (0.000)
Wooldridge test:					418.155 (0.000)

Note: Panel-corrected standard errors in parentheses are obtained using Prais-Winsten regression. Breusch-Pagan LM test (p-value presented in parenthesis) with H0: no random effects. Pesaran's test of cross sectional independence (p-value presented in parenthesis) with H0: no cross-sectional dependence. Wald test for heteroscedasticity (p-value presented in parenthesis) with H0: no heteroscedasticity. Wooldridge test (p-value presented in parenthesis) with H0: no first order autocorrelation.

***, **, * – significance levels: 1%, 5% and 10%, respectively.

The results from the estimated model show that volatility of stock returns is on average by 5.137 higher for developing countries in preelection periods holding other factors fixed and on average by 3.947 higher in postelection periods in comparison to average volatility in periods that are not connected to elections ceteris paribus. So, this indicates that during the election periods volatility of stock returns tends to increase in developing countries in comparison to decrease in developed countries, which can reflect overall uncertainty of investors in upcoming election results in developing countries and subsequent change in economic policy of the government after elections due to populist economic decisions taken prior to elections.

Volatility and Information Transparency

Concerning effect of informational transparency on stock returns volatility the relevant model in equation (7) is estimated using the results of hypothesis **H1** estimation and hypothesis **H3** from previous section. Results of the estimated

model are summarized in Table 7 (model is calculated using Prais-Winsten regression (due to random-effects specification) to obtain panel-corrected standard errors in order to control for heteroscedasticity, cross-sectional correlation and autocorrelation of order 1, presence of which show relevant tests).

Table 7. Model of influence of information transparency on volatility of returns

Intercept	<i>MEDIA</i>	<i>MEDIA</i> <i>PREEL6</i>	<i>MEDIA</i> <i>PREEL6</i> <i>UNDEV</i>	<i>MEDIA</i> <i>AFTEREL6</i>	<i>MEDIA</i> <i>AFTEREL6</i> <i>UNDEV</i>	r_{t-1}^{world}
39.727*** (4.184)	0.414*** (0.126)	-0.098** (0.047)	0.115* (0.070)	-0.072 (0.047)	0.071 (0.070)	-0.781*** (0.085)
Number of observations:						8510
R²						0.042
Breusch-Pagan LM test:						16089.390 (0.000)
Pesaran's test:						213.477 (0.000)
Wald test:						37845.710 (0.000)
Wooldridge test:						419.044 (0.000)

Note: Panel-corrected standard errors in parentheses are obtained using Prais-Winsten regression. Breusch-Pagan LM test (p-value presented in parenthesis) with H0: no random effects. Pesaran's test of cross sectional independence (p-value presented in parenthesis) with H0: no cross-sectional dependence. Wald test for heteroscedasticity (p-value presented in parenthesis) with H0: no heteroscedasticity. Wooldridge test (p-value presented in parenthesis) with H0: no first order autocorrelation.

***, **, * – significance levels: 1%, 5% and 10%, respectively.

The results from the estimated model show that effect of information transparency occurs only in preelection period, as can be seen from relevant significant coefficients in Table 7. Volatility of stock returns due to influence of information transparency is on average by $-0.098+0.115=0.017$ higher for developing countries in preelection periods in comparison to average volatility in periods that are not connected with elections holding other factors fixed.

CONCLUSIONS

The main goal of this thesis is to investigate systematic effects of election cycles and information transparency on stock market returns and volatility of returns in order to capture distinct pattern between developed and developing countries. Empirical results show that there are differences in stock market movements for developing and developed countries: in preelection periods on average stock returns decrease for developed countries and increase for developing countries, in postelection periods on average stock returns are lower for developed countries and almost the same for developing countries in periods not influenced by election cycle. This indicates presence of election cycle both for developed and developing countries, but with different pattern. The election cycle starts 9 months prior to each election and ends 6 months after each election.

Results show that there is also a distinct pattern in stock dependence on information transparency: in developed countries decrease in information transparency causes decrease in stock returns on average, but for developing countries the influence is opposite on average: the lower information transparency the higher returns.

Also, there is evidence that volatility of stock returns during the election periods tends to increase in developing countries in comparison to decrease in developed countries, which can reflect overall uncertainty of investors in upcoming election results in developing countries and subsequent change in economic policy of the government after elections due to populist economic decisions taken prior to elections.

The results also show that effect of information transparency occurs only in preelection period: volatility of stock returns due influence of information transparency is lower for developed countries in preelection period in comparison to volatility in periods that are not connected with elections. For developing countries volatility of stock returns due to information transparency effect is higher in preelection period in comparison to volatility in periods that are not related to elections.

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APPENDIX

Table A1. Descriptive statistics of monthly stock returns in developing countries

Country	Mean	Std. Dev.	ADF	ADF p-val.	Obs.
Argentina	1.098%	0.102	-10.777	0.000***	150
Brazil	1.733%	0.098	-13.248	0.000***	225
Bulgaria	-0.907%	0.096	-6.322	0.000***	94
Chile	0.764%	0.055	-13.247	0.000***	158
Croatia	1.360%	0.129	-10.467	0.000***	157
Egypt	0.601%	0.097	-3.611	0.006***	183
Estonia	0.164%	0.093	-8.237	0.000***	86
Hungary	0.684%	0.073	-10.532	0.000***	147
India	0.809%	0.075	-14.835	0.000***	228
Indonesia	1.458%	0.072	-10.644	0.000***	164
Latvia	1.001%	0.066	-9.047	0.000***	159
Lithuania	-0.308%	0.087	-6.901	0.000***	86
Malaysia	0.564%	0.049	-11.166	0.000***	164
Mexico	1.324%	0.076	-16.352	0.000***	228
Peru	1.826%	0.101	-4.710	0.000***	99
Philippines	0.974%	0.062	-10.925	0.000***	147
Poland	0.726%	0.073	-13.238	0.000***	192
Romania	1.573%	0.096	-10.447	0.000***	162
Russia	1.129%	0.143	-10.881	0.000***	196
Serbia	0.099%	0.087	-5.892	0.000***	99
Slovenia	-1.219%	0.052	-5.465	0.000***	33
South Africa	0.309%	0.044	-8.710	0.000***	87
Thailand	0.707%	0.076	-12.556	0.000***	164
Tunisia	0.841%	0.040	-12.298	0.000***	180
Turkey	0.728%	0.093	-7.955	0.000***	63
Ukraine	-1.734%	0.153	-5.501	0.000***	60
All	0.842%	0.087	--	--	3711

Note: ADF means Dickey-Fuller (H0: unit root).

***, **, * – significance levels: 1%, 5% and 10%, respectively.

Table A2. Descriptive statistics of monthly stock returns in developed countries

Country	Mean	Std. Dev.	ADF	ADF p-val.	Obs.
Australia	0.329%	0.037	-10.569	0.000***	153
Austria	0.343%	0.062	-11.946	0.000***	228
Belgium	0.230%	0.051	-12.046	0.000***	228
Canada	0.516%	0.045	-12.591	0.000***	228
Czech Republic	-0.372%	0.076	-7.559	0.000***	82
Denmark	0.659%	0.055	-13.881	0.000***	228
Finland	0.445%	0.059	-8.688	0.000***	120
France	0.199%	0.056	-13.469	0.000***	228
Germany	0.683%	0.056	-12.676	0.000***	228
Greece	-0.037%	0.090	-13.383	0.000***	228
Ireland	-0.348%	0.066	-10.069	0.000***	147
Israel	0.667%	0.063	-13.085	0.000***	228
Italy	-0.209%	0.066	-12.774	0.000***	180
Japan	-0.266%	0.062	-14.264	0.000***	228
Netherlands	0.202%	0.060	-13.747	0.000***	228
New Zealand	-0.418%	0.038	-7.019	0.000***	69
Norway	0.747%	0.072	-7.942	0.000***	94
Singapore	0.298%	0.059	-9.871	0.000***	148
Slovakia	-0.024%	0.058	-8.564	0.000***	100
South Korea	0.688%	0.076	-12.081	0.000***	164
Spain	0.361%	0.062	-14.047	0.000***	228
Sweden	0.229%	0.063	-5.506	0.000***	164
Switzerland	0.332%	0.047	-12.627	0.000***	228
Taiwan	-0.026%	0.076	-12.542	0.000***	186
United Kingdom	0.243%	0.042	-14.726	0.000***	228
United States	0.492%	0.045	-13.033	0.000***	228
All	0.264%	0.060	--	--	4799

Note: ADF means Dickey-Fuller (H0: unit root).

***, **, * – significance levels: 1%, 5% and 10%, respectively.

Table A3. Models of election cycle in stock market returns of developing and developed countries

Length	Intercept	<i>PREEL</i>	<i>PREEL_UNDEV</i>	<i>AFTEREL</i>	<i>AFTEREL_UNDEV</i>	r_{t-1}^{world}	R ²	AIC
-9m+12m	0.580 (0.401)	-0.456* (0.230)	0.744* (0.427)	-0.584*** (0.209)	0.498 (0.370)	0.283*** (0.098)	0.038	57744.76
-8m+8m	0.571 (0.407)	-0.488** (0.230)	0.699* (0.359)	-0.728*** (0.254)	0.632 (0.390)	0.284*** (0.098)	0.038	57744.34
-7m+8m	0.560 (0.400)	-0.463* (0.233)	0.703* (0.405)	-0.717*** (0.249)	0.632 (0.390)	0.284*** (0.097)	0.038	57745.03
-6m+9m	0.556 (.400)	-0.528** (0.235)	0.924** (0.428)	-0.684*** (0.247)	0.616 (0.373)	0.284*** (0.097)	0.038	57743.38
-6m+8m	0.548 (0.393)	-0.521** (0.229)	0.924** (0.428)	-0.705*** (0.248)	0.632 (0.391)	0.284*** (0.097)	0.038	57743.60
-6m+7m	0.531 (0.398)	-0.504** (0.233)	0.924** (0.428)	-0.712*** (0.252)	0.706* (0.390)	0.283*** (0.097)	0.038	57744.16
-6m+6m	0.533 (0.402)	-0.506** (0.233)	0.925** (0.428)	-0.850*** (0.404)	0.855** (0.404)	0.283*** (0.098)	0.038	57742.29
-7m+6m	0.544 (0.409)	-0.447* (0.238)	0.703* (0.405)	-0.861*** (0.270)	0.855** (0.404)	0.283*** (0.098)	0.038	57743.76
-8m+6m	0.554 (0.416)	-0.470* (0.236)	0.699* (0.359)	-0.870*** (0.275)	0.855** (0.404)	0.283*** (0.098)	0.038	57743.11
-9m+6m	0.539 (0.407)	-0.416* (0.236)	0.744* (0.427)	-0.856*** (0.268)	0.855** (0.404)	0.283*** (0.098)	0.038	57742.52
-9m+7m	0.537 (0.403)	-0.414* (0.234)	0.744* (0.427)	-0.718*** (.252)	0.706* (0.390)	0.283*** (0.098)	0.038	57744.39
-9m+9m	0.565 (0.404)	-0.442* (0.235)	0.744* (0.427)	-0.694*** (0.245)	0.616 (0.373)	0.283*** (0.098)	0.038	57743.57
-12m+9m	0.564 (0.384)	-0.396** (0.186)	0.717* (0.387)	-0.692*** (0.240)	0.616 (0.373)	0.283*** (0.098)	0.038	57742.70
-12m+12m	0.580 (0.378)	-0.412** (0.189)	0.717* (0.387)	-0.584*** (0.206)	0.498 (0.370)	0.283*** (0.098)	0.038	57743.9

Note: Driscoll-Kraay standard errors are presented parentheses. AIC stands for Akaike information criterion.

***, **, * – significance levels: 1%, 5% and 10%, respectively.

Table A4. Tests for ARCH effects

Country	Q	LM	Country	Q	LM
Argentina	1.263 (0.261)	1.231 (0.267)	Australia	9.529 (0.002)***	9.313 (0.002)***
Brazil	7.863 (0.048)** at lag 3	6.630 (0.084)*	Austria	36.501 (0.000)***	35.881 (0.000)***
Bulgaria	13.486 (0.000)***	12.963 (0.000)***	Belgium	10.098 (0.001)**	9.933 (0.002)**
Chile	4.779 (0.091)* at lag 2	4.635 (0.098)* at lag 2	Canada	5.497 (0.019)**	5.409 (0.020)**
Croatia	5.088 (0.024)**	4.967 (0.025)**	Czech Republic	7.097 (0.007)***	6.785 (0.009)***
Egypt	47.970 (0.000)***	47.848 (0.000)***	Denmark	8.233 (0.004)***	8.110 (0.004)***
Estonia	1.784 (0.181)	1.708 (0.191)	Finland	19.249 (0.007)*** at lag 7	13.217 (0.067)* at lag 7
Hungary	1.119 (0.290)	1.092 (0.295)	France	8.522 (0.003)***	8.393 (0.003)***
India	16.879 (0.018)** at lag 7	18.422 (0.011) at lag 7	Germany	11.538 (0.000)***	11.354 (0.000)***
Indonesia	3.927 (0.047)**	3.844 (0.049)**	Greece	2.707 (0.099)*	10.821 (0.055)* at lag 5
Latvia	7.988 (0.046)** at lag 3	6.439 (0.092)* at lag 3	Ireland	9.639 (0.001)***	9.400 (0.002)***
Lithuania	6.813 (0.009)***	6.516 (0.010)***	Israel	6.609 (0.010)***	6.503 (0.010)***
Malaysia	8.975 (0.061)* at lag 4	7.907 (0.095)*	Italy	8.791 (0.012)** at lag 2	8.459 (0.014)** at lag 2
Mexico	19.906 (0.000)***	19.576 (0.000)***	Japan	2.369 (0.123)	2.809 (0.093)*
Peru	12.716 (0.079)* at lag 7	10.330 (0.170)	Netherlands	14.841 (0.000)***	14.598 (0.000)***
Philippines	0.123 (0.724)	0.121 (0.727)	New Zealand	17.726 (0.003)*** at lag 5	18.163 (0.002)*** at lag 5
Poland	12.137 (0.059)* at lag 6	11.643 (0.070)* at lag 6	Norway	12.000 (0.000)***	11.544 (0.000)***
Romania	3.804 (0.051)*	3.718 (0.053)*	Singapore	3.394 (0.065)*	3.309 (0.068)*
Russia	9.105 (0.002)***	8.931 (0.002)***	Slovakia	0.008 (0.925)	0.009 (0.926)
Serbia	11.853 (0.000)***	11.394 (0.000)***	South Korea	9.840 (0.020)** at lag 3	10.937 (0.012)** at lag 3
Slovenia	0.808 (0.368)	0.740 (0.389)	Spain	4.873 (0.087)* at lag 2	4.355 (0.113) at lag 2
South Africa	21.114 (0.000)*** at lag 5	14.891 (0.011)** at lag 5	Sweden	4.459 (0.034)**	4.367 (0.036)**
Thailand	0.367 (0.544)	0.360 (0.548)	Switzerland	26.759 (0.000)***	26.361 (0.000)***
Tunisia	1.024 (0.311)	1.003 (0.316)	Taiwan	3.800 (0.051)*	3.739 (0.053)*
Turkey	17.283 (0.044)** at lag 9	24.740 (0.003)*** at lag 9	United Kingdom	6.455 (0.011)**	6.358 (0.011)**
Ukraine	3.597 (0.057)*	3.385 (0.065)*	United States	16.542 (0.000)***	16.274 (0.000)***

Note: Q denotes Portmanteau (Q) test for white noise in squared residuals of stock returns. LM denotes Engle's Lagrange multiplier test for the presence of autoregressive conditional heteroscedasticity. Prob>chi2 in parentheses.

***, **, * – significance levels: 1%, 5% and 10%, respectively.