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Developed stock market reaction to political change: a panel data analysis

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Abstract This paper utilized panel data to examine the effects of political change in developed stock market. According to Hausman test, we capture the stock return by the fixed-effect model to fit the stock market. Political change was originally intended as an incumbent party impetus to create opportunities for progress. However, this has caused great political party distress, creating political change with an inverse stock return relationship in developed countries.

Keywords Panel data · Political change · Fixed effect model

1 Introduction

Recent globalization with rapid global economy integration has caused individual stock market growth and compaction. The stock market is a national economy barometer in that it speculates on the future of the economy. Thus political information easily spreads into the stock market with consequent mass media development. It generally responds to new political information that may affect the national economy future.

Market participators expect that positive stock returns will exist following a new ruling party's voter expectations. In contrast, if related political information outcome does not allow investors to immediately measure negative stock on the stock market, then negative stock returns are expected. Hence, whether or not political change influences the stock market continues to be an important analysis for scholars and market participators (Chan and Wei 1996; Bittlingmayer 1998; Kim and Mei 2001; Perotti and Oijen 2001; Hassan et al. 2003; Siokis and Kapopoulos 2003).

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Politics and economics are intimately connected. Not only do the two influence each other, they belong to a single body and are inseparable (Nordhaus 1975; Hibbs 1977). The new ruling party faces an unprecedented challenge following democracy and economic development, thus, political change becomes the convention of democratic countries. Political change gives political parties the opportunity to provide acceptable economic policies for voter elections and party competition promotes economic development (Bratsiotis 2000; Easaw and Garratt 2000).

Recent research has further examined market efficiency issues by examining stock market responses to uncertain political events. Most empirical investigations have focused on tracking financial market movements in relation to elections (Gemmill 1992; Gwilym and Buckle 1994; Steeley 2003; Brüggelambert 2004; Chiu et al. 2005). Major studies supported the presidential election cycle, in which US stock markets make larger gains in the third and fourth year of a presidential term, while average returns in the second year are negative (Huang 1985; Foerster 1994; Foerster and Schmitz 1997).

Other studies have focused on stock market preference (Reilly and Lukseitch 1980; Santa-Clara and Valkanov 2003). Further empirical studies examined various types of political information impact on stock markets (Pantzalis et al. 2000; Harms 2002; Wang and Lin 2007). While a prosperous domestic economy cannot guarantee victory for the ruling party, economic decline is frequently a catalyst for party change, based on the above. That political change strongly correlates to the stock market is one motivation behind this study.

Various political events significantly influence stock market behavior, however, only a few academic researches have explored stock market behavior responses to political changes. Therefore, the present study applied panel data to examine how stock market behavior reacts to political uncertainty, such as political changes in developed countries. This paper is organized as follows. Section 2 presents data and methodology. Next, Sect. 3 describes the preliminary analysis and presents empirical evidence. Finally, Sect. 4 presents conclusions.

2 Data and methodology

2.1 Data description and sources

This study utilized panel data using the sample of political changes of major democratic countries during the period November 9, 1979 to January 19, 2001. The political information regarding the political changes in the United States, Japan, United Kingdom and France was obtained from the *China Time* and was verified using *World Political Leaders* and official records of individual countries. Because this study only considers the transition of ruling party in president (the United States) and prime ministers (Japan, France and the United Kingdom), thus, in the study sample, most studied of the transition of ruling party Japan had the highest number of samples (4), followed by France (4), the United States (2) and the United Kingdom (2), thus, the final sample comprised 12 elections occurring in the United States, Japan, the United Kingdom and France.

We utilize daily stock return data for individual country indices, Nikkei 225, SBF-250, FTSE 30 and Dow Jones 30 are provided by the Taiwan Economic Journal (TEJ) database. Daily stock returns were calculated as the difference in the natural logarithms of daily stock prices multiplied by 100.

2.2 Methodology

We assume that the country-specific effect exists, and utilize panel data estimation techniques, namely, a one-way fixed effect model and a one-way random effect model. The fixed effect model produces consistent estimates, while estimates obtained from the random effect model will be more efficient. The Hausman test determines the preferred model.

The panel data advantageously allows researcher flexibility in individual behavior modeling differences compared to a cross section. First, they usually give the researcher a large number of data points, increasing the degrees of freedom and reducing collinearity among explanatory variables, hence improving econometric estimate efficiency. Second, longitudinal data allow researchers to analyze a number of important economic questions that cannot be addressed using cross-sectional or time series data sets.

Panel data allow construction and testing of more complicated behavioral models than purely cross-sectional or time series data, and also provide resolution or reduction of key econometric problems that often arise in empirical studies, namely, the assertion that omitted variables correlated with explanatory variables cause certain effects. Furthermore, panel data suitably examine dynamic effects, as in the first-order model. Therefore, the basic regression model for a panel data set is,

$$y_{i,t} = x'_{i,t}\beta + \gamma y_{i,t-1} + z'_i\alpha + u_{i,t} \tag{1}$$

X is a set of dummy variables reflecting political change impact. Subscript I indicates the country and t indicates the time period. Individual effect (heterogeneity) is $z'_i\alpha$ where z_i contains a constant term and a set of individual or group specific variables, which may be observed, all of which are taken to be constant over time t. $y_{i,t-1}$ is the lagged dependent variable suited for examining dynamic effects.

Country-specific effect is assumed to exist, and panel data estimation techniques are utilized, namely, a one-way fixed effect model and a one-way random effect model. In the fixed effect model, country-specific effects are assumed as fixed parameters to be estimated. The modified model is

$$y_{i,t} = x'_{i,t}\beta + \gamma y_{i,t-1} + \alpha_i + u_{i,t} \tag{2}$$

where $\alpha_i = z'_i\alpha$, embodies all the observable effects and specifies an estimable conditional mean. This fixed effect approach takes α_i as a group-specific constant term in the regression. The term "fixed" used here indicates that the term does not vary over time, not that it is nonstochastic, which need not be the case.

In the random effect model, country-specific effects are treated as stochastic.

$$\begin{aligned} y_{i,t} &= x'_{i,t}\beta + \gamma y_{i,t-1} + u_{i,t} \\ &= x'_{i,t}\beta + \gamma y_{i,t-1} + \eta_i + \lambda_t + \varepsilon_{i,t} \end{aligned} \tag{3}$$

where $u_{i,t} = \eta_i + \lambda_t + \varepsilon_{i,t}$, η_i is an individual effect, and λ_t is a time-specific effect and $\varepsilon_{i,t}$ is purely random effect. The fixed effect model produces consistent estimates, while random effect model estimates will be more efficient. A Hausman test is used to determine which model is preferred.

$$\begin{aligned} W = (\hat{B}_{GLS} - \hat{B}_{LSDV})'[Var(\hat{B}_{LSDV}) - Var(\hat{B}_{GLS})\,]^{-1} \\ \times (\hat{B}_{GLS} - \hat{B}_{LSDV}) \sim \chi^2(k-1) \end{aligned} \tag{4}$$

where W is chi-square distributed with k-1 degree of freedom, $\hat{B}_{GLS}$ is the random-effects estimator and $\hat{B}_{LSDV}$ is the fixed-effects estimator.

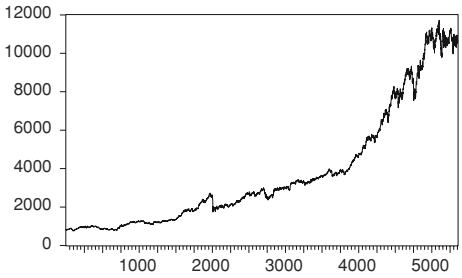

Fig. 1 Graph of DJIA index

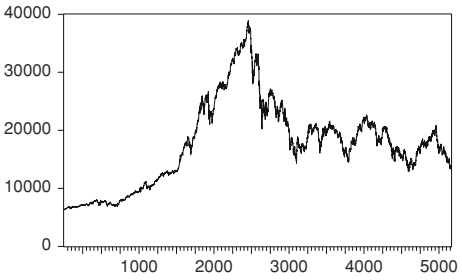

Fig. 2 Graph of Nikkei 225 index

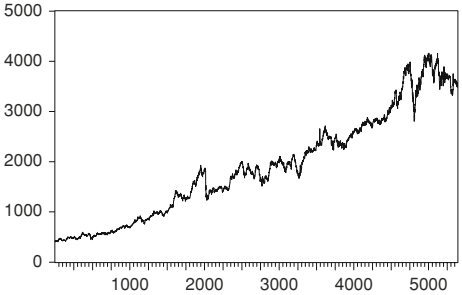

Fig. 3 Graph of FTSE 30 index

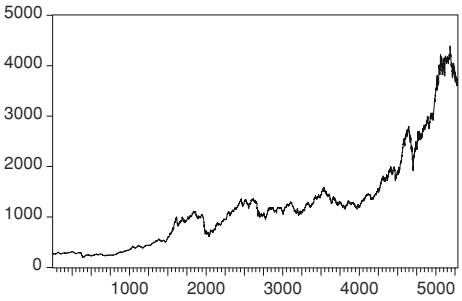

Fig. 4 Graph of SBF 250 index

3 Preliminary analysis

This section presents the preliminary analysis of the American, Japanese, Britannic and France stock market respectively. The trend of stock market and return are shown in Figs. 1–4 and Figs. 5–8, respectively. Table 1 lists the basic statistics of daily Nikkei 225, SBF-250, FTSE 30 and DJIA stock market during the sample period.

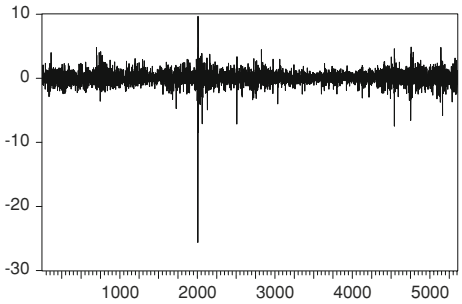

Fig. 5 Graph of DJIA stock returns

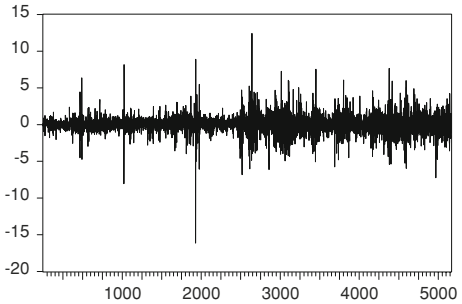

Fig. 6 Graph of Nikkei 225 stock returns

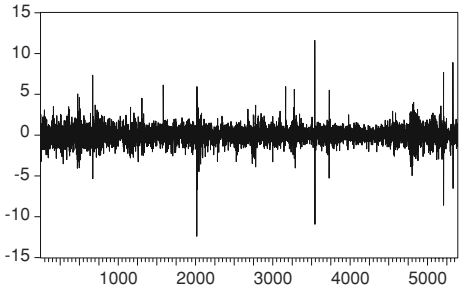

Fig. 7 Graph of FTSE 30 stock returns

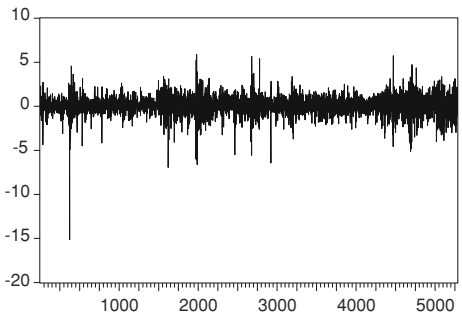

Fig. 8 Graph of SBF 250 stock returns

Table 1 Basic statistics for stock returns

Statistics	DJIA	Nikkei 225	FTSE	SBF
Mean	0.0481	0.0151	0.0399	0.0506
Maximum	9.6692	12.4303	11.6065	5.8860
Minimum	−25.6325	−16.1354	−12.4002	−15.1119
Std. Dev.	1.0463	1.2680	1.0820	1.0461
Skewness	−2.9174**	−0.2048**	−0.4018**	−1.0223**
Kurtosis	72.4873**	11.2149**	13.5954**	12.1944**
$Q^2(6)$	244.1452**	515.8089**	1325.5463**	376.0537**
$Q^2(12)$	259.6462**	622.7942**	1379.2889**	580.7405**
ADF test	−53.7841**	−55.2498**	−52.2217**	−48.5729**
P–P test	−71.5520**	−71.4989**	−74.8131**	−64.6006**
Jarque-Bera	1084750.4412**	14553.7569**	25343.3409**	19525.3082**

** (*) denotes statistical significance at 1% (5%) level. Normal test is checked by the Jarque-Bera test and are asymptotically chi-square distributed with 2 degree of freedom. Q2(6) (Q2(12)) is the Ljung-Box Q statistic for the squared returns lagged 6 (12) trading days and its critical value at 5% significant level is 12.5916 and 21.026. The ADF and the P–P tests are under the hypothesis (H0: unit root) which its critical value is decided on the critical value table of MacKinnon (1991)

The mean of DJIA, Nikkei 225, FTSE 30 and SBF-250 stock returns are 0.0481, 0.0151, 0.0399 and 0.0506 that are not significantly different from 0 at the 5% level. The skewness of Nikkei 225, SBF-250, FTSE 30 and DJIA stock returns series are significantly skewed to the left at 5% significance level and kurtosis are also significantly excess kurtosis at the 5% level. The skewness and kurtosis measurements are highly significant revealing departures from normality. Likewise, the Jarque-Bera statistic for Nikkei 225, SBF-250, FTSE 30 and DJIA stock returns series reject significantly the assumption of the normality at the 5% level. Regarding the shape parameters of the distribution of Nikkei 225, SBF-250, FTSE 30 and DJIA stock returns, this study concludes that the distributions are clearly non-normal. The rejection of normality can be partially attributed to intertemporal dependencies in the moments of the series, which is strongly supported by Jarque-Bera statistic of the returns and squared returns.

The Ljung-Box Q statistics of the Nikkei 225, SBF-250, FTSE 30 and DJIA stock returns and squared returns for 6 and 12 lags are statistically significant at the 5% level, revealing the presence of linear interdependence. The results of the ADF and P–P tests for the unit root test, Nikkei 225, SBF-250, FTSE 30 and DJIA stock returns are stationary and the lag interval is 1, which is determined based on the minimum values of AIC and SBC.

4 Empirical result

This study applied the Hausman test to compares fixed effect and random effect models. Table 2 reveals that A Hausman test used to determine fixed effect model is preferred. $W = 3.13 < 5.9915 = \chi^2_{0.05}$ (2), the Hausman test statistic is insignificant and denotes that the fixed-effect model is better than the random-effect model fitted to stock market, hence, this study capture the stock return by the fixed-effect model.

Following the fixed effect, the political change dummy coefficient, D_1, is significantly negative at 5% significant level on DJIA, Nikkei 225, SBF-250 and FTSE 30 stock returns.

Table 2 Panel data

Coefficient	Fixed effect	Random effect
Constant	0.0011** (0.0001)	0.0010** (0.0002)
D_1	−0.0008** (0.0003)	−0.0006* (0.0003)
D_2	−0.0009** (0.0002)	−0.0008** (0.0002)
D_3	0.0010** (0.0004)	0.0009** (0.0004)
a_1	0.0201** (0.0072)	0.0203** (0.0072)
Hausman test	3.13	

Numbers in parentheses are asymptotic standard error. ** (*) denotes statistical significance at 1% (5%) level. Hausman test is checked by the chi-square distributed with 2 degree of freedom

Left or Right economic policy greatly affects national future development. Previous lack of administrative procedure transparency caused insufficient information and monopolies by state-run business. Related economic policies missed opportunities for public debates as a result. Arguments between different political party advocates emerged as ideology battles. Discussion is lost in the midst of political power struggles, but the political process in a democratic society frequently enables political ideas. Through communication, coordination, and citizen and policy-maker consensus, issues are ruminated. Partiality reduces to a minimum when thoroughly discussed issues filter through formal check-and-balance mechanisms of political and policy-making systems.

But different political parties have different economic agendas, leading to frequent economic policy modification. The entirely different economic agendas dispute underwent a long series of events: protracted debates between ruling and opposition parties, and a series of intensive inter-party negotiations and mediations. Therefore, the wave of anger and disagreements still have not quieted down, and constructive discussions on economic policies have emerged from a seemingly unending cycle of political and ideological fights, without returning to basic issues. Long-term government policies as a result cannot be fully implemented and lead to market confusion. Investors therefore hold conservative stock market positions.

The 1987 Crash dummy, a_2, shows DJIA, Nikkei 225, SBF-250 and FTSE 30 as significantly negative at the 5% level. After the American stock market posted high points on August 5, 1987 and optimistic news spread, increasing government bond profit, Secretary of Finance, James Baker, announced US dollar depreciation. Growing US trade deficit and Iran's bombing of US ships caused the stock market to rattle. On October 16, the stock market index closed at 2246.74, down by 17.5%. On Monday, October 19, the global money market began to feel the effects of US stock market volatility. Hong Kong, Singapore, and other stock markets began to fluctuate and the London stock market followed. Wall Street dropped to 22.6% by the end of the day, the biggest single trading day drop in history.

Analytical findings suggest that political change effect on stock returns after the 1987 crash significantly exceeded those prior to the 1987 crash. The market anticipates newly elected president policies. Prior to the stock market crash, political realities distorted economic principles. Economic and finance policies are frequently unable to eliminate political party consciousness and thinking, faced with simultaneous change in government. Consequently, policies typically become muddled and the market enters a state of uncertainty. Added to this is the clash and conflict of Congress or Parliament policies and slow policy performance. These factors negatively influence and create uncertainties for the national economy. Ruling party change initially created unavoidable difficulties in policy continuity. After the 1987 crash however, increasing numbers of specialists and economists participated

in government policy making as a result of increasing democratic party and market sector maturity. These policy makers drafted scholarly, professional, brief, yet effective finance and economic policies for legislation, with strict surveillance of the opposition party. The opposition party also proposed alternative finance and economic policies, keeping the ruling party cautious and working hard at good performance to maintain power. Hence, political change after the 1987 crash has positively effect individual country economic performance.

5 Conclusions

This paper utilized panel data to examine political change effects on American, Japanese, British, and French stock markets from November 9, 1979 to January 19, 2001. Stock returns were captured according to the Hausman test by the fixed-effect model to fit the stock market. Political changes negatively relate to the American, Japanese, British, and French stock return at 5% significance level, and political change effect on stock returns after the 1987 crash significantly exceed those prior to the 1987 crash.

Political change was originally intended as an incumbent party impetus to create opportunities for progress. This is the democratic politic ideal. However, this has caused great political party distress, creating political change with an inverse stock return relationship in developed countries.

References

Bittlingmayer, G.: Output stock volatility and political uncertainty in a natural experiment: Germany 1880–1940. J. Finance **53**, 2243–2258 (1998)

Bratsiotis, G.J.: Political parties and inflation in Greece: the metamorphosis of the socialist party on the way to EMU. Appl. Econ. Lett. **7**, 451–454 (2000)

Brüggelambert, G.: Information and efficiency in political stock markets: using computerized markets to predict election results. Appl. Econ. **36**, 753–768 (2004)

Chan, Y., Wei, J.: Political risk and stock price volatility: the case of Hong Kong. Pac. Basin Finance J. **4**, 259–275 (1996)

Chiu, C.L., Chen, C.D., Tang, W.W.: Political elections and foreign investor trading in South Korea's financial markets. Appl. Econ. Lett. **38**, 673–677 (2005)

Easaw, J., Garratt, D.: Elections and UK government expenditure cycles in the 1980s: an empirical analysis. Appl. Econ. **32**, 381–391 (2000)

Foerster, S.R.: Stock market performance and elections: made-in-Canada effects? Can. Invest. Rev. **7**, 39–42 (1994)

Foerster, S.R., Schmitz, J.J.: The transmission of US election cycles to international stock returns. J. Int. Bus. Stud. **28**, 1–27 (1997)

Gemmill, G.: Political risk and market efficiency: tested based in British stock and option markets in the 1987 election. J. Banking Finance **16**, 211–231 (1992)

Gwilym, O.A., Buckle, M.: The efficiency of stock and options market: tests based on 1992 UK election polls. Appl. Financial Econ. **4**, 345–354 (1994)

Harms, P.: Political risk and equity investment in developing countries. Appl. Econ. Lett. **9**, 377–380 (2002)

Hassan, M.K., Maroney, N.C., El-Sady, H.M., Telfah, A.: Country risk and stock market volatility, predictability, and diversification in the middle East and Africa. Econ. Syst. **27**, 63–82 (2003)

Hibbs, D.A.: Political parties and macro-economic policy. Am. Political Sci. Rev. **71**, 1467–1487 (1977)

Huang, R.D.: Common stock returns and presidential elections. Financial Anal. J. **41**, 58–61 (1985)

Kim, H.Y., Mei, J.P.: What makes the stock market jump? An analysis of political risk on Hong Kong Stock Returns. J. Int. Money Finance **20**, 1003–1016 (2001)

MacKinnon, J.G.: Critical value for cointegration tests. In: Advanced Texts in Econometrics. Oxford University Press, Oxford (1991)

Nordhaus, W.D.: The political business cycle. Rev. Econ. Stud. **42**, 169–190 (1975)

Pantzalis, C., Stangeland, D.A., Turtle, H.J.: Political elections and the resolution of uncertainty: the international evidence. J. Banking Finance **24**, 1575–1604 (2000)
Perotti, E.C., Oijen, P.V.: Privatization, political risk and stock market development in emerging economies. J. Int. Money Finance **20**, 43–69 (2001)
Reilly, W.B. Jr., Lukseitch, W.A.: The market prefers republicans: myth or reality? J. Financial Quant. Anal. **15**, 541–559 (1980)
Santa-Clara, P., Valkanov, R.: The presidential puzzle: political cycles and the stock market. J. Finance **58**, 1841–1872 (2003)
Siokis, F., Kapopoulos, P.: Electoral management, political risk and exchange rate dynamics: the Greek experience. Appl. Financial Econ. **13**, 279–285 (2003)
Steeley, J.M.: Making political capital: the behavior of the UK capital markets during election 97. Appl. Financial Econ. **13**, 85–95 (2003)
Wang, Y.H., Lin, C.T.: The effect of congressional sessions on the stock market in emerging democracy: the case of Taiwan. Hitotsubashi J. Econ. **48,** 199–212 (2007)