Article

AUSTRALIAN SCHOOL OF BUSINESS
THE UNIVERSITY OF NEW SOUTH WALES

Australian Journal of Management
1–29

DOI: 10.1177/0312896214526213
aum.sagepub.com
SAGE

Should stock market return forecasts be conditioned on politics?

John G Powell
Research School of Finance, Actuarial Studies and Applied Statistics, The Australian National University, Australia

Meifen Qian
International Institute for Financial Studies, Jiangxi University of Finance and Economics, China

Jing Shi
International Institute for Financial Studies, Jiangxi University of Finance and Economics, China; School of Economics, Finance and Marketing, RMIT University, Australia

Qiaoqiao Zhu
Research School of Finance, Actuarial Studies and Applied Statistics, The Australian National University, Australia

Abstract

This paper examines whether stock market returns forecasts should take account of the political party in power by re-examining the prior literature to demonstrate that US stock market political regime differences are neither significant nor long-lasting. We demonstrate that the presidential regime dummy variable used in prior studies is highly auto-correlated, thus potentially violating the ordinary least squares assumption of independently distributed regression errors. Simulation and bootstrap analyses are used to demonstrate that prior findings of higher returns and lower risk under Democratic presidencies are less than would be expected by chance, once account is taken of the persistence properties of the presidential regime dummy variable used in prior studies. Theoretical considerations are also used to explain why presidential regime differences are unlikely to persist, thus further reconciling the paper's findings with prior studies.

Keywords

Auto-correlated explanatory variables, presidential regimes, spurious regression, stock market return differences

Corresponding author:
Jing Shi, International Institute for Financial Studies, Jiangxi University of Finance and Economics, Jiangxi 330013, China.
Email: jshi666@gmail.com

Final transcript accepted 9 February 2014 by Tom Smith (AE Finance).

1. Introduction

Recent research documenting stock market risk and return differences under Democratic vs. Republican presidencies is interesting and thought-provoking, especially since it is generally presumed that the Republican Party is the safe bet for stock market investors (Deitrick and Goldfarb, 2012; Leblang and Mukherjee, 2005; Santa-Clara and Valkanov, 2003). Political theorists have therefore been encouraged to explore the theoretical underpinnings of these surprising empirical results, and to examine whether stock market return forecasts should be conditioned on (made dependent upon) the political party in power.

Leblang and Mukherjee (2005) hypothesize that rational expectations of higher inflation under left-leaning governments lower the volatility and mean level of stock returns, with traders anticipating lower dividend growth and thus reduced stock market trading due to higher inflation under Democratic administrations. Gourevitch et al. (2008) theorize, on the other hand, that left-leaning governments adopt policies that benefit the stock market to spur investment and increase the demand for labour. Both papers test their models' implications and find empirical support for their theoretical models, despite the hypotheses of one paper being contrary to the other. This study therefore seeks to resolve these conflicting empirical results, and to answer the overall question of whether stock market return forecasts in the US and Australia should be conditioned on politics. The answer initially depends upon whether monthly or annual data are employed, with excess return differences only being apparent in US monthly data, thus explaining how conflicting results can be obtained in the literature. Subsequent empirical analysis reveals extreme persistence of the US and Australian political party explanatory variable when monthly data are utilized, thus implying that the monthly results appear to be spurious, and no political party return differences are indeed present, while further theoretical analysis explains why a no-difference result is to be expected.

Contrary to the Leblang and Mukherjee (2005) and Gourevitch et al. (2008) stock market theoretical implications, political party stock market hedging considerations and political party theory provide theoretical reasons as to why presidential regime stock market return and return volatility differences are not likely to be significant (see e.g. Miller and Schofield, 2003; Musto and Yilmaz, 2003). The latter consideration, in particular, suggests that the Gourevitch et al. (2008) voter self-interest assumption can be extended by assuming that both the Democratic and Republican parties will (eventually) adopt economic policies that are in the interest of their constituent voters. Each party will thus seek to avoid economic policies that continually harm the stock market and, either directly or indirectly, their party's core voters, implying that poor presidential regime stock market performance is unlikely to persist from one presidential regime to the next, thus further reinforcing the implication that presidential regime differences are unlikely to be statistically significant. These implications are empirically tested using long-term samples of the stock market return and return volatility over presidential terms, with the results indicating that there are no significant return and return volatility differences between Democratic and Republican presidential regimes. Similar results are obtained when Australian political regime differences are examined.

The paper's finding that stock market return and return volatility is indistinguishable between political parties is at odds with some of the recent literature, cited above, documenting risk and return differences under Democratic vs. Republican presidencies (Deitrick and Goldfarb, 2012; Leblang and Mukherjee, 2005; Santa-Clara and Valkanov, 2003). Leblang and Mukherjee (2005), for instance, find a statistically significant negative relationship between the volatility of daily Dow Jones Industrial Average (DJIA) stock market returns and Democratic presidencies during their sample period 1896 to 2001. Santa-Clara and Valkanov

(2003) find that the Centre for Research in Security Prices (CRSP) value-weighted excess monthly stock market return is 9% higher per annum under Democratic vs. Republican presidencies, and CRSP equal-weighted returns are 16% higher during the sample period January 1927 through December 1998.[1] To explain why this paper's empirical results refute some of the recent empirical literature, the research design of stock market political regime studies is investigated and revisited.

Political regime studies examine whether differences in stock market returns or return volatility can be explained using a dummy explanatory variable that equals 1 if a particular party (e.g. a Democratic president in the US or an Australian Labor Party prime minister) is in power during the observation period, and 0 otherwise. This regression test appears to be straightforward, especially since it is similar to a simple difference in means test and thus apparently innocuous, having been widely used in the political science, economics, and finance literature. What is not so obvious, however, is that a political regime dummy explanatory variable can be highly persistent (i.e. autocorrelated) in time series regression analysis, causing the regression error term to inherit the explanatory variable persistence, and thus violating the ordinary least squares (OLS) assumption of independently distributed regression errors. This causes the standard error of the regression coefficient estimate to be biased downward, and a spurious statistical relationship can occur whereby a significant relationship appears where none is actually present (see Ferson et al., 2003; Granger and Newbold, 1974; Paye, 2006; Yule, 1926).[2]

The regression error persistence problem can be especially serious when daily or monthly return observations are used in political regime studies since the dummy variable run of zeroes or ones will be at least four years for each US presidential regime, and potentially longer for Australian prime ministers, thus inducing extreme explanatory variable persistence. The presidential regime literature is therefore revisited to demonstrate that daily stock return and return volatility differentials between Democratic and Republican presidencies in past studies are statistically indistinguishable once either simulation analysis or a bootstrapping procedure is used to correct statistical inference to take account of the persistence properties of the presidential regime dummy variable. This provides further evidence against rational expectation theoretical models, which imply that stock market returns and return volatility will be lower under Democratic presidencies (see e.g. Leblang and Mukherjee, 2005).

To further reinforce these empirical findings, the theoretical assumptions underpinning the Leblang and Mukherjee (2005) rational expectations model of lower volatility under Democratic presidential regimes are empirically tested, and rejected. Leblang and Mukherjee (2005) hypothesize that traders will rationally anticipate the results of elections, thus leading to reduced stock market trading and therefore return volatility when Democrats are expected to win presidential elections, as investors anticipate lower dividend growth and returns due to higher inflation. The rational expectations model is thus dependent upon higher inflation expectations as well as lower dividend growth, total returns, and trading volume under Democrats. Empirical tests reject the model's assumption that inflation, dividend growth, and trading volume are significantly different under Democratic vs. Republican administrations, thus refuting the assumptions of the Leblang and Mukherjee (2005) model.

The rest of the paper is organized as follows. The first section reviews the empirical and theoretical literature on presidential regime stock market return and return volatility differences. The second section motivates and outlines the empirical tests used in the paper to test for political regime differences, taking account of the influence on statistical inference of the political regime dummy variable that is employed to test for differences. The third section implements the paper's empirical tests on US and Australian samples, and reconciles the test results with the existing presidential regime literature. The final section contains a summary.

2. Presidential regime stock market return and volatility differences

Popular interest in stock market performance under Democratic and Republican presidencies is immense, and is consistently highlighted in well-known periodicals, including *The Stock Trader's Almanac* (Hirsch and Hirsch, 2005). Academic interest has also been strong, including Herbst and Slinkman (1984), who document a four-year stock market cycle that is related to US presidential elections, and Huang (1985), who finds that stock market returns are almost 10% per annum higher on average under Democratic vs. Republican presidencies (see also Hensel and Ziemba, 1995).

2.1. Recent empirical literature

Santa-Clara and Valkanov (2003) and Leblang and Mukherjee (2005), amongst others, test for Democratic and Republican presidential regime stock return and return volatility differences using a dummy variable regression model. The presidential party dummy variable DD_t is set to $DD_t = 1$ if a Democratic president is in power at time t, and $DD_t = 0$ otherwise. Stock market index return or return volatility r_t is regressed on the presidential regime dummy variable using the model

$$r_t = \alpha + \beta DD_t + u_t \tag{1}$$

The null hypothesis that presidential regimes are unrelated to stock market returns or return volatility implies $\beta = 0$, whereas return or return volatility is higher (lower) under Democratic presidencies if the presidential regime regression coefficient β is significantly positive (negative).

Santa-Clara and Valkanov (2003) test the regression model in equation (1) using monthly CRSP value-weighted and equal-weighted stock market excess returns and find that returns are significantly higher under Democratic presidencies in three of the four excess return series they examine during the sample period January 1927 through December 1998. Santa-Clara and Valkanov (2003) control for potential confounding factors such as the business cycle, and extensively examine the robustness of their findings through checks such as sub-sample testing to ascertain the significance of their results.

Leblang and Mukherjee (2005) estimate regression model in equation (1) uses daily capital returns as well as a 20-day rolling volatility estimate for the DJIA during the time period 26 May 1896 through 31 December 2001. Leblang and Mukherjee (2005) find that stock market return volatility is a statistically significant 2% lower under Democratic vs. Republican administrations, even after carefully controlling for potentially confounding factors such as the presence of divided governments, presidential elections, wars, stock market crashes, and interest rates.

The importance and the surprise element of the Santa-Clara and Valkanov (2003) and Leblang and Mukherjee (2005) findings have not gone unnoticed in the popular press, with a headline in Money.com proclaiming that "Despite 'market friendly' Republican policies, stocks rise more and volatility dips under Democrats" (Twin, 2004). The Santa-Clara and Valkanov (2003) and Leblang and Mukherjee (2005) papers have been cited over 200 times in the popular press, and there has even been a link to the Santa-Clara and Valkanov (2003) paper on the Democratic National Party website, thus indicating the considerable relevance of presidential regime stock market research in the political arena.

More recently, empirical studies have looked at individual stocks rather than the aggregate stock market. These studies indicate that party policies favour or work against particular companies so

that the companies' stocks can be purchased as potential risk hedges against each party's policies (see e.g. Goldman et al., 2006; Knight, 2006). Knight (2006) provides an ex ante identification of stocks that are more likely to do better under Democratic (Republican) policies, and finds significant out-performance over time by Democratic (Republican) stocks when Gore (Bush) moved ahead in opinion polls during the 2000 presidential election. Goldman et al. (2006) find a similar result for stocks with politically connected board members during the 2000 presidential election year.

2.2. Theoretical models of political regime return and return volatility differences

As mentioned above, the importance and the surprise element of the Santa-Clara and Valkanov (2003) and Leblang and Mukherjee (2005) empirical findings regarding presidential regime stock market return and return volatility differences have encouraged political theorists to explore the theoretical underpinnings of these findings.

Leblang and Mukherjee (2005) hypothesize that stock market traders rationally anticipate the results of elections, and expect higher inflation and lower dividend growth when Democrats are expected to win the presidency, thus leading to expectations of poor stock market performance during Democratic presidencies. They also assume that share trading volume will be reduced when Democrats are expected to win office due to the anticipation of poor stock market returns, and further assert that low share trading volumes during Democratic presidencies will be associated with reduced stock market volatility. Leblang and Mukherjee (2005) empirically test theoretical implications of their model using US and British samples, and find share return volatility and share trading volume evidence that is consistent with their rational expectations model.

Gourevitch et al. (2008) reverse the sign of the prevailing explanation of the influence of partisanship on stock markets by theorizing that left-leaning governments, rather than frightening investors (as traditionally argued), instead adopt policies and regulations that will increase the capitalization of the stock market. The resulting financial development leads to higher investment that increases the demand for labour, thus benefiting the supporters of left-leaning political parties. Gourevitch et al. (2008) find that left-leaning governments around the world are associated with higher stock market capitalizations than other governments, as their model predicts. Gourevitch et al. (2008) further argue that the positive correlation they find between left-leaning governments and stock market capitalization is "…consistent with recent theories emphasizing an emerging coalition of workers and owners against managers in favour of greater transparency and shareholder protection" (Gourevitch et al., 2008: 1).

2.3. Alternative theoretical perspectives implying no regime differences, and hypotheses

A study by Musto and Yilmaz (2003) helps to provide an alternative theoretical perspective that implies presidential regime risk and return differences are unlikely to be strong and persistent. They analyse the effects of political party redistribution policy within a perfect market equilibrium framework, and find that investor hedging against wealth losses due to potential redistribution policy ameliorates the effects of redistribution policy. This makes it theoretically unlikely that political party redistribution policies would give rise to systematic and persistent effects on investors.

Recent empirical studies on individual stock political effects similarly indicate that party policies favouring or working against particular companies enable their stocks to be purchased as potential risk hedges against each party's policies (see e.g. Goldman et al., 2006; Knight, 2006). The emergence of presidential election prediction markets provides further potential for

Table 4. Descriptive statistics of US annual data.

Variable	*DD*	*IP* (%)	*GDP* (%)	*CPI* (%)	*NFPR* (%)	*R* (%)	*RR* (%)	*EXC* (%)	*S* (%)
Panel A: Descriptive statistics									
Mean	0.434	3.415	3.050	3.043	1.971	8.867	5.824	7.689	1.120
Median	0.000	3.612	3.248	2.691	2.194	12.218	8.946	8.609	0.939
Maximum	1.000	26.749	20.181	18.540	10.632	56.657	52.040	75.600	3.670
Minimum	0.000	–36.560	–13.187	–10.749	–12.854	–65.772	–55.023	–50.852	–2.450
SD	0.498	11.029	5.929	4.667	4.259	19.665	19.804	20.683	1.214
Obs.	113	113	113	113	113	113	113	113	113
Panel B: Auto-correlation									
1	0.793	–0.067	0.266	0.548	0.244	0.004	–0.004	–0.043	0.594
2	0.606	–0.155	0.029	0.196	–0.151	–0.189	–0.185	–0.184	0.269
3	0.419	0.024	–0.186	0.085	–0.120	0.024	0.026	0.026	0.103
4	0.232	–0.051	–0.191	0.091	–0.172	–0.068	–0.032	–0.059	0.036
5	0.081	–0.177	–0.156	0.131	–0.110	–0.136	–0.098	–0.108	0.114
6	–0.070	0.045	0.075	0.147	0.167	0.013	0.031	–0.006	0.192
Panel C: Correlations									
DD	1.000								
IP	0.122	1.000							
BC	–0.266	–0.605							
RBC	–0.203	–0.623							
BCM	–0.306	–0.392							
GDP	0.141	0.753	1.000						
CPI	0.263	0.244	0.122	1.000					
NFPR	0.096	0.820	0.756	0.304	1.000				
R	0.122	0.495	0.533	0.089	0.462	1.000			
RR	0.059	0.434	0.500	–0.147	0.388	0.972	1.000		
EXC	0.134	0.472	0.537	0.005	0.424	0.975	0.968	1.000	
S	–0.037	0.049	0.113	–0.180	–0.052	0.046	0.088	0.121	1.000

Panel A presents summary statistics for US Annual data over the period 1897 to 2010. *DD* is 1 if a Democratic president is in power during a particular month, and 0 otherwise; *IP* is the one-year log change in the annualized industrial production index; *GDP* is the one-year log change in real gross domestic product; *CPI* is the one-year log change in Consumer Price Index; *NFPR* is the one-year log change in non-farm payroll; *R* is the one-year log change in the CRSP value-weighted total return index; *RR* is the difference between the one-year log change in the CRSP value-weighted total return index and *CPI; EXC* is the difference between one-year rate of change in the CRSP value-weighted total return index and the three-month T-bill rate; and *S* is the difference between the 10-year T-bond and three-month T-bill rates. Panel B reports auto-correlations of the variables up to six lags; correlations among the variables are presented in Panel C.

as high under Democratic vs. Republican presidencies during the sample period 1897 through 2010. None of the other economic and stock return series display statistically significant differences.

What is the reason for the sharp distinction between the statistical significance of the results when using monthly vs. annual data? One factor can provide an explanation. It is the extreme persistence of the monthly Democratic presidency dummy variable (*DD*) explanatory variable, used to test for presidential regime differences in Table 3, as revealed in Panel B of Table 3.

Table 5. Democratic and non-Democratic presidency descriptive statistics of US annual data.

Variable	*IP* (%)	*GDP* (%)	*CPI* (%)	*NFPR* (%)	*R* (%)	*RR* (%)	*EXC* (%)	*S* (%)
Panel A: Descriptive statistics of Democratic sub-sample								
Mean	4.941	4.003	4.439	2.438	11.595	7.156	10.853	1.069
Median	5.202	3.725	2.702	2.474	13.654	8.946	11.333	0.920
Maximum	26.749	20.181	18.540	10.632	56.657	52.040	75.600	3.670
Minimum	–36.560	–12.491	–5.806	–12.854	–42.481	–43.188	–34.711	–2.450
SD	13.151	6.448	5.214	4.510	17.846	18.905	20.275	1.125
Obs.	49	49	49	49	49	49	49	49
Panel B: Descriptive statistics of Republican sub-sample								
Mean	2.246	2.321	1.974	1.613	6.778	4.804	5.266	1.159
Median	2.854	2.480	2.582	1.804	8.999	7.381	6.272	0.964
Maximum	26.510	17.595	11.156	10.071	40.664	41.410	48.956	3.620
Minimum	–22.996	–13.187	–10.749	–12.690	–65.772	–55.023	–50.852	–1.748
SD	9.015	5.437	3.915	4.056	20.847	20.554	20.822	1.286
Obs.	64	64	64	64	64	64	64	64
Independent variable	*IP*	*GDP*	*CPI*	*NFPR*	*R*	*RR*	*EXC*	*S*
Panel C: Univariate regressions								
Coefficient	2.696	1.681	2.465**	0.825	4.817	2.352	5.587*	–0.090
t-statistic	1.4	1.29	2.02	0.94	1.49	0.7	1.69	–0.27
R^2	0.0059	0.0111	0.0608	0.0004	0.006	–0.0055	0.0092	–0.0076
Obs.	113	113	113	113	113	113	113	113

This table reports descriptive statistics of US annual data. Panels A and B report summary statistics by dividing the full sample into Democratic and Republican sub-samples. *IP* is the one-year log change in the annualized industrial production index; *GDP* is the one-year log change in real gross domestic product; *CPI* is the one-year log change in Consumer Price Index; *NFPR* is the one-year log change in non-farm payroll; *R* is the one-year log change in the CRSP value-weighted total return index; *RR* is the difference between the one-year log change in the CRSP value-weighted total return index and *CPI; EXC* is the difference between one-year rate of change in the CRSP value-weighted total return index and the three-month T-bill rate; and *S* is the difference between the 10-year T-bond and three-month T-bill rates. The sample period is 1897 through 2010. Panel C reports critical values of OLS results from regressing the variables on a Democratic president dummy variable (*DD*) that equals 1 if a Democratic president is in power during a particular month, and 0 otherwise. R^2 denotes adjusted *R*-squared, and *t*-statistics are adjusted for auto-correlation and heteroskedasticity using Newey-West (1987). ** and * denote significance at 5% and 10% levels, respectively.

The persistence of the Democratic presidential dummy variable is greatly reduced when annual data are employed. For instance, the first-order auto-correlation of *DD* decreases from 0.983 in the monthly data to 0.793 in the annual data. This provides an initial indication that any differences found using monthly data may be spurious, and due to extreme persistence (note also the very low *R*-squares reported in Panel C of Table 3 of approximately 1% for most tests for differences). This possibility of spurious regression is explored more formally below.

CRSP value-weighted and DJIA Index return and return volatility results for presidential regime regression model (1) are reported in Panels A and B, respectively, of Table 6. The dependent variable in Table 6 is the annualized four-year presidential regime return or return volatility for the CRSP/Schwert and DJIA samples, respectively, and the independent variable is the Democratic president dummy

Table 6. US political regime return and volatility differential regression results under four-year intervals.

	α	$t(\alpha)$	β	$t(\beta)$	$\bar{R}^2$ (%)
Panel A: CRSP value-weighted index					
Return (%)	7.780***	4.067	2.197	0.767	−1.87
Volatility (%)	15.512***	11.568	1.428	0.933	−1.64
Panel B: DJIA index					
Return (%)	4.205	1.266	3.051	0.657	−2.77
Volatility (%)	16.653***	8.805	−1.490	−0.893	−2.69

The table reports OLS regression of annualized four-year differential returns and volatility on the presidential dummy variable

$$y_t = \alpha + \beta DD_t + u$$

where y_t denotes annualized four-year return and volatility over four-year interval t, expressed as a percentage; and DD_t is 1 if a Democrat is in office at time t (i.e. the beginning of the term), and 0 otherwise. The four-year interval is used in the analysis to minimize the influence of auto-correlation problems in the regression analysis. Regressions are estimated by OLS, and t-statistics are adjusted for auto-correlation and heteroskedasticity using Newey-West (1987). $\bar{R}^2$ denotes adjusted R^2. *** denotes significance at 1% level.

Panel A reports the results of annualized four-year return and volatility on the CRSP value-weighted index over the four-year interval. The annualized four-year returns are expressed as a percentage and are estimated using the monthly returns compiled by Schwert (1990) for the period March 1857 (the inauguration month of James Buchanan) through December 1925 and the CRSP value-weighted index for the period January 1926 through January 2005 (the month of the second inauguration of George W. Bush). The annualized four-year volatility is measured as the annualized standard deviation of returns on the monthly CRSP value-weighted index over the four-year interval, expressed as a percentage. The data are obtained from CRSP.

Panel B presents the regression results of annualized four-year return and volatility on the DJIA index over the four-year interval t. The annualized four-year returns are expressed as a percentage and are estimated using the daily DJIA index return over the period 4 March 1897 (the inauguration date of William McKinley) to 19 January 2001 (the date before the second inauguration of George W. Bush). Following Leblang and Mukherjee (2005), the annualized four-year volatility is measured as the average annualized 20-day moving standard deviation of return on the daily DJIA index over the four-year interval, expressed as a percentage. The data are obtained from Global Financial Data.

variable DD_t which equals 1 if a Democrat is president during the observation period, and 0 otherwise. The regression dummy variable is constructed using the presidential election result summary provided in Appendix 1. Both data samples indicate that there are no significant return or return volatility differences between Democratic vs. Republican presidential regimes, since the presidential dummy variable coefficient estimate β in Table 6 is insignificantly different from 0 in all four regression tests. The Table 6 results are therefore consistent with hypothesis 1, which implies that stock market performance will be statistically indistinguishable between Democratic and Republican presidencies.

A similar story emerges when political regime regression model (1) is applied to Australian data, as reported in Tables 7 and 8.[4] Once again, in Table 7, monthly data descriptive statistics for a wide selection of economic variables are reported. The sample period is October 1923 through September 2013, a sample period when the Australian Labor Party and the Liberal Party or its right-of-centre antecedents have either been in power or leading the opposition.[5] The political regime dummy variable (DD) in regression equation (1) in Table 7 is adapted so that it equals 1 if a Labor Party prime minister is in power during a particular month, and 0 otherwise. Table 8 is equivalent to Table 7, but uses annual data, with the political regime dummy variable (DD) equalling 1 if a Labor Party prime minister is in power during most of the year, and 0 otherwise. When monthly data are employed in Table 7, the political regime dummy variable once again significantly explains real returns RR (see Panel E), but this time the left-of-centre party actually has

lower returns! The real return regression coefficient estimate (*RR*) becomes insignificant, however, when annual data is employed in Table 8. Once again, the political regime dummy variable (*DD*) is extremely persistent when monthly data are examined (0.981 in Panel B of Table 7), thus suggesting that the Australian monthly political regime results are potentially spurious, especially since the significance disappears when less persistent annual data are used.

The US results (Table 6) are in sharp contrast to the significant presidential regime return and return volatility differentials found by Santa-Clara and Valkanov (2003) and Leblang and Mukherjee (2005), where monthly and daily data samples are used, respectively, rather than the four-year

Table 7. Descriptive statistics of Australian monthly data.

Variable	*DD*	*IP*	*GDP*	*CPI*	*NFPR*	*R*	*RR*	*EXC*	*S*
Panel A: Descriptive statistics									
Mean	0.355	2.249	3.484	5.188	2.052	0.568	1.090	–0.611	0.818
Median	0.000	2.357	3.521	3.650	2.205	0.604	3.310	0.424	0.995
Maximum	1.000	12.095	8.673	16.209	5.316	22.269	51.281	47.756	5.586
Minimum	0.000	–8.322	–3.377	–0.334	–2.521	–42.446	–71.868	–60.467	–4.805
SD	0.479	3.151	2.161	3.691	1.680	4.231	20.532	18.809	1.774
Obs.	1088	414	636	588	285	1088	588	333	333
Panel B: Auto-correlation									
1	0.981	0.907	0.901	0.986	0.957	0.094	0.932	0.903	0.954
2	0.962	0.814	0.801	0.973	0.915	0.005	0.852	0.790	0.873
3	0.943	0.721	0.702	0.959	0.872	0.033	0.765	0.676	0.784
4	0.923	0.608	0.628	0.942	0.812	0.030	0.680	0.574	0.722
5	0.904	0.495	0.555	0.926	0.752	–0.037	0.596	0.468	0.667
6	0.885	0.382	0.482	0.909	0.692	0.003	0.520	0.371	0.616

	IP	*GDP*	*CPI*	*NFPR*	*R*	*RR*	*EXC*	*S*
Panel C: Descriptive statistics of Labor sub-sample								
Mean	2.582	3.043	5.801	1.894	0.385	–2.590	–0.560	0.703
Median	2.783	3.270	4.930	2.252	0.296	–1.486	–2.307	0.828
Maximum	12.095	7.820	16.209	5.316	22.269	51.281	47.756	5.586
Minimum	–8.322	–3.377	0.278	–2.521	–42.446	–71.868	–50.165	–4.805
SD	3.683	2.098	3.826	2.125	5.251	24.122	18.698	2.127
Obs.	208	258	243	144	386	243	207	207

	IP	*GDP*	*CPI*	*NFPR*	*R*	*RR*	*EXC*	*S*
Panel D: Descriptive statistics of Liberal/right-of-centre sub-sample								
Mean	1.914	3.786	4.756	2.214	0.668	3.682	–0.695	1.008
Median	2.118	3.843	3.139	2.205	0.706	5.601	1.884	1.159
Maximum	6.854	8.673	13.448	4.505	18.203	50.059	36.602	3.042
Minimum	–8.322	–2.524	–0.334	–0.009	–13.832	–52.727	–60.467	–4.536
SD	2.467	2.192	3.535	1.031	3.547	17.137	19.065	0.922
Obs.	206	378	345	141	702	345	126	126

Table 7. (Continued)

	IP	*GDP*	*CPI*	*NFPR*	*R*	*RR*	*EXC*	*S*
Panel E: Univariate regressions								
Coefficient	0.668	–0.744**	1.045*	–0.320	–0.283	–6.273*	0.135	–0.305
t-statistic	–1.19	–2.36	1.71	–0.84	–0.88	–1.83	0.03	–0.97
R^2	0.0088	0.0271	0.0178	0.0056	0.0001	0.0210	–0.0030	0.0040
Obs.	414	636	588	285	1088	588	333	333

Panel A presents summary statistics for Australian monthly data over the period October 1923 to September 2013. DD is 1 if a Labor prime minister is in power during a particular month, and zero otherwise; *IP* is the 12-month log change in the industrial production index, expressed as a percentage; *GDP* is the 12-month log change in real gross domestic product, expressed as a percentage; *CPI* is the 12-month log change in Consumer Price Index, expressed as a percentage; *NFPR* is the 12-month log change in non-farm payroll, expressed as a percentage; *R* is the one-month percentage rate of change in the ASX All Ordinaries Index, expressed as a percentage; *RR* is the difference between the 12-month log change in the ASX All Ordinaries Index and CPI, expressed as a percentage; *EXC* is the difference between 12-month log change in the ASX All Ordinaries Index and the three-month T-bill rate (EXC), expressed as a percentage; and *S* is the difference between the 10-year T-bond and three-month T-bill rates, expressed as a percentage.
While Panel B reports auto-correlations of the variables up to six lags, Panel C and Panel D report summary statistics by dividing the full sample into Labor and Liberal/right-of-centre sub-samples. Panel E reports critical values of OLS results from regressing the variables on a Labor prime minister dummy variable (*DD*). R^2 denotes adjusted *R*-squared, and *t*-statistics are adjusted for auto-correlation and heteroskedasticity using Newey-West (1987). * and ** denote significance at 10% and 5% levels, respectively.

Table 8. Descriptive statistics of Australian annual data.

Variable	*DD*	*IP*	*GDP*	*CPI*	*NFPR*	*R*	*RR*	*EXC*	*S*
Panel A: Descriptive statistics									
Mean	0.378	2.253	3.500	5.191	2.061	5.638	0.943	–0.006	0.807
Median	0.000	2.483	3.552	3.461	2.023	8.523	5.349	2.515	1.244
Maximum	1.000	12.095	7.836	15.100	5.039	46.828	38.556	38.913	5.586
Minimum	0.000	–7.034	–2.340	–0.250	–2.247	–53.262	–56.881	–37.378	–4.511
SD	0.488	3.107	2.143	3.776	1.702	17.941	22.319	19.777	2.091
Obs.	90	35	52	49	24	90	49	28	28
Panel B: Auto-correlation									
1	0.775	–0.088	0.036	0.777	0.280	–0.120	–0.134	–0.353	0.293
2	0.550	–0.104	–0.004	0.602	–0.244	–0.154	–0.145	–0.138	–0.322
3	0.324	–0.103	0.025	0.503	–0.379	0.059	0.096	0.084	–0.079
4	0.194	–0.035	–0.011	0.417	–0.221	–0.096	–0.102	–0.259	0.159
5	0.063	–0.197	0.179	0.391	0.136	–0.053	–0.036	0.018	–0.145
6	–0.068	0.033	–0.146	0.340	0.149	–0.105	–0.055	0.209	–0.389

	IP	*GDP*	*CPI*	*NFPR*	*R*	*RR*	*EXC*	*S*
Panel C: Descriptive statistics of Labor sub-sample								
Mean	2.759	3.079	5.414	1.994	2.326	–2.324	0.942	0.578
Median	2.761	3.447	4.581	2.252	6.628	2.843	–2.829	0.950
Maximum	12.095	6.232	15.100	5.039	46.828	38.556	38.913	5.586
Minimum	–1.066	–1.155	0.278	–2.247	–53.262	–56.881	–37.378	–4.511
SD	3.175	1.950	3.781	2.210	22.916	27.929	21.368	2.604
Obs.	18	21	21	13	34	21	17	17

(Continued)

Table 8. (Continued)

	IP	*GDP*	*CPI*	*NFPR*	*R*	*RR*	*EXC*	*S*
Panel D: Descriptive statistics of Liberal/right-of-centre sub-sample								
Mean	1.718	3.786	5.023	2.140	7.649	3.394	–1.471	1.161
Median	2.317	3.955	3.168	1.967	8.523	5.643	2.653	1.314
Maximum	6.492	7.836	13.448	3.622	39.899	27.179	23.378	2.355
Minimum	–7.034	–2.340	–0.250	0.710	–23.656	–30.924	–32.088	–0.545
SD	3.035	2.250	3.832	0.891	13.959	17.124	17.934	0.856
Obs.	17	31	28	11	56	28	11	11
Panel E: Univariate regressions								
Coefficient	1.041	–0.07	0.391	–0.146	–5.323	–5.717	2.413	–0.584
t-statistic	1.19	–1.34	0.23	–0.22	–1.45	–1.07	0.45	–0.87
R^2	–0.0005	0.0072	–0.0185	–0.0435	0.0098	–0.0045	–0.0346	–0.0134
Obs.	35	52	49	24	90	49	28	28

Panel A presents summary statistics for Australian annual data over the period 1923 to 2012. The variables are as described in Table 3, except *R* is the 12-month log return in the ASX All Ordinaries Index. Panel B reports auto-correlations of the variables up to six lags. Panel C and Panel D report summary statistics by dividing the full sample into Labor and Liberal/right-of-centre sub-samples. Panel E reports critical values of OLS results from regressing the variables on a Labor prime minister dummy variable (*DD*). R^2 denotes adjusted *R*-squared, and *t*-statistics are adjusted for auto-correlation and heteroskedasticity using Newey-West (1987).

return and return volatility observations used in this paper's study. The contrast in results emphasizes the data persistence problems that are encountered when monthly and daily data samples are employed in presidential regime studies, as will be demonstrated below to reconcile the results of Table 6 with the prior presidential regime literature, once hypothesis 2 is tested.

A test of hypothesis 2, used to examine whether poor presidential regime stock market performance is unlikely to persist, can be conducted by adapting presidential regime regression model (1) to provide further evidence in support of the dynamic activist voter model implications. To test hypothesis 2, presidential regime regression model (1) is modified to

$$r_t = \alpha + \beta_1 DB_{t-1} + \beta_2 RB_{t-1} + u_t \tag{2}$$

where r_t is the four-year annualized presidential regime stock return, and the dummy variable DB_{t-1} (RB_{t-1}) = 1 if a Democrat (Republican) president is in power and returns were below average during the prior Democratic (Republican) presidential regime (and 0 otherwise). The null hypothesis that poor stock market performance does not persist from one president to the next president from the same party implies $\beta_1 = 0$ and $\beta_2 = 0$, whereas poor stock market performance persists amongst Democratic (Republican) presidencies if $\beta_1 < 0$ ($\beta_2 < 0$).

Results for various configurations of regression model (2) are presented in Table 9 where the annualised four-year presidential regime return is used. All the prior presidential performance dummy variable regression coefficient estimates are insignificantly different from 0 ($\beta_1 = 0$ and $\beta_2 = 0$). Table 9 thus provides results that are consistent with hypothesis 2, since poor presidential regime performance is shown to be non-persistent. The Table 9 results are therefore consistent with