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Political cycles in the Australian stock market since Federation

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Abstract

This paper examines the presence of a political cycle in Australian monthly stock returns from January 1901 to December 2005. The period selected includes fifty-nine Liberal-National (or their antecedents) and Labor ministries and forty-seven elections. The political cycle is defined in terms of the party or coalition in power, ministerial tenure and election information effects. The market variables are defined in terms of returns, excess returns over inflation and excess returns over interest rates. Descriptive analysis indicates that mean returns and excess returns over inflation are nearly 85 percent higher and excess returns over interest rates 193 percent higher under Liberal-National ministries. Put differently, the market premium for Liberal-National ministries averages between 3.2 and 5.2 percent over comparable Labor ministries. Returns under Labor ministries are also characterised by extremely volatile, negatively skewed values. But after time-variation in risk is taken into account with a GARCH-M specification, while returns and excess returns over inflation are higher under Liberal-National ministries, there is no significant variation in excess returns over interest rates between governments. This suggests most of the variation in political risk is reflected in interest rates.

JEL classification: G14; C12

Keywords: presidential puzzle; political cycle; returns and excess returns; elections

1. Introduction

Anecdotal evidence abounds of the link between securities markets and politics. In the financial media, most economic and social policy is scrutinised concerning possible market reactions, while industry and consumer groups comment on anticipated and hoped for changes in policy. At election time, politicians are frequently accused of pork-barrelling, with firms and investors alike anticipating the heady mix of tax breaks, consumption and production subsidies, and fiscal and monetary stimulation that accompanies changes in the political party in power. At the same time, parties are routinely pigeon-holed as pro- or anti-business and pro- or anti-investor, reflected in some way in the flow and source of political donations.

At least three empirical questions arise from such observations. First, does market behaviour differ when governments are drawn from different political parties? That is, is

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stated ideology reflected in actual policy, and does this systematically vary in its influence on market participants. Second, is this political influence constant or changing with the ebb and flow of mandated terms in office and efforts to secure re-election? Put differently, is ideology of any form implemented in a different way in business and investor policy at the beginning of terms of an office that at the end? Finally, if the differences in markets are taken as given, do markets react suddenly with the announcement of elections results, or are expectations developed more gradually with the benefit of political comment and opinion polls?

The purpose of this paper is to add to this intriguing body of work the results of an analysis of the Australian federal political cycle and its impact on the Australian equity market. To the author's knowledge this is the first work of its kind in Australia. The paper itself is divided into five main areas. Section 2 briefly reviews the relevant literature. Section 3 provides a snapshot of Australian political history. Section 4 explains the data collection employed in the analysis and presents the empirical methodology. Section 5 presents the results. The paper ends with a brief conclusion.

2. Literature review

The analysis of political cycles in stock market returns has been almost exclusively conducted in the United States, and therein the context of presidential elections. Part is generic, to the extent that institutional rigidities in the political cycle – mandated terms in office for example – impose structure upon market returns. Herbst and Slinkman (1984), for example, examined the period from 1926 to 1977 and found a 48-month cycle during which returns were higher than average, peaking in November during presidential elections. Likewise, Huang (1985) used data from 1832 to 1979 and discovered that stock returns were systematically higher in the last half of a political term than in the first, as did Hensel and Ziemba (1995), though with small and large-caps only. On this basis, Hensel and Ziemba (1995) suggested that "…these findings are consistent with the hypothesis that political re-election campaigns create policies that stimulate the economy and are positive for stock returns".

But the larger part of this research focuses on differences in political ideology and the differential impact of the political cycle on stock returns. Herein the focus of interest is on the apparent preference of the market for right-of-centre presidents (i.e. Republicans). Niederhoffer et al. (1970), for instance, showed that US stock market movements around election dates were consistent with a pro-Republican bias on Wall Street, though evidence

was not forthcoming on any longer-term relationship between Republican presidents and stock returns. Similarly, Riley and Luksetich (1980) concluded that the market prefers Republicans, and the market tends to rise following presidential elections. Dobson and Dufrene (1993) extended this analysis outside of the United States, concluding that in equity market terms US presidential elections invoke significant structural changes, with international markets becoming more highly correlated. Other studies concerning the posited positive market effect of Republican presidencies have been undertaken by Allvine and O'Neil (1980), Hobbs and Riley (1984), Foerster and Schmitz (1997), Johnson and Chittenden (1999), Booth and Booth (2003) and Bohl and Gottschalk (2005), while Nordhaus (1975), MacCrae (1977), McCallum (1978), Hibbs (1977), Beck (1982a; 1982b), Havrilesky (1987), Alesina and Sachs (1988) and Haynes (1989) address politico-business cycles more broadly.

Most recently, Santa-Clara and Valkanov (2003) have re-examined the 'presidential puzzle' sometimes arising in this research: that is, real returns are higher under Democratic presidents, contradicting the conventional wisdom that Republicans are good for markets in a manner unexplained by considerations of risk. Using data since 1927, Santa-Clara and Valkanov (2003) found average excess returns for value-weighted market indexes over three-month Treasury bills of about 2 percent under Republicans and 11 percent under Democrats. Further, a decomposition of returns revealed that the difference was due to real market returns being 5 percent higher under Democrats and real interest rates almost 4 percent lower. Responding to the question of whether the difference in average returns was due to a difference in expected (a Democratic risk premium) or unexpected (surprises in the economic policies of the party in the presidency) returns, Santa-Clara and Valkanov (2003) concluded that presidential parties capture variations in returns that are largely uncorrelated to what is explained by business cycle fluctuations, and hence must be associated with systematic differences in political policies.

Outside of the United States, the United Kingdom and New Zealand are the only other national contexts known for the analysis of political cycles in stock returns. The UZ and New Zealand are interesting in that while these have a two-party system in common with the United States (Labour and Conservative, Labour and Nationals, respectively), unlike the United States, the prime minister (as leader of the Executive) always controls the dominant party in the elected house (House of Commons, House of Representatives, respectively). For

this reason, as in Australia, there is a clearer connection between the political ideology of the elected party and the implementation of economic and social policy. In New Zealand, Cahan et al. (2005) concluded that the presidential puzzle was reversed, and that New Zealand market returns were lower under left-leaning Labour governments than under National party governments. This lay at odds with parallel analysis that suggested that market risk was actually higher under the former.

In the United Kingdom, Manning (1989) showed that British Telecom shares, though not the market as a whole, reacted to opinion polls surrounding the 1987 General Election in the face of impending nationalisation, while Peel and Pope (1983), Gwilym and Buckle (1984) and Thompson and Ioannidis (1987) examined the connection between the stock market and business support for Tory (Conservative) governments. But most recently, Hudson et al. (1998) found that while short-term price movements reacted to opinion polls in the run-up to and including elections, there was no statistically significant evidence of a difference in nominal or real returns between Tory and Labour governments.

3. A snapshot of Australian political history

Two groups conventionally dominate the Australian political spectrum at the federal level. The first is a conservative coalition of parties made up of the Liberal Party and the Nationals (including the Country Liberal Party). Collectively, these are known as the Coalition. The second comprises a single social democratic party, the Australian Labor Party. There have been fifty-nine ministries since Federation in 1901, with the Coalition and its antecedents accounting for thirty-eight (64 percent) and the Labor Party twenty-one (36 percent).

Originally formed by the merger of the Protectionist and Free Trade parties in 1910, the Liberal Party has undergone several reformations – including as the Nationalist Party in the late 1910s and 1920s and the United Australian Party in the 1930s and early 1940s – culminating in its present-day incarnation founded by Sir Robert Menzies in 1944. The Liberal Party is regarded as a centre-right party and broadly represents the interests of business, the suburban middle classes and urbanised regions. Since the October 2004 election, the Liberals account for seventy-four of the one hundred and fifty House of Representatives seats (47 percent), and from July 2005, thirty-two of the seventy-six seats in the Senate (42 percent). For the purposes of this analysis, the Liberal Party's antecedents, including the

Protectionist, Free Trade, Tariff Reform, Nationalist Labour, Nationalist and United Australia parties, are viewed as ideologically similar.

The Nationals are a conservative party that traditionally represent rural and regional interests. Originally known as the Country Party, and later the National Party of Australia, it has held seats in the federal parliament since 1919. While the party has witnessed the steady erosion of its rural support base in recent years, it still holds the balance of power for the Coalition with twelve seats in the House of Representatives (16 percent) and six in the Senate (8 percent). It is joined by the Country Liberal Party, which is the representative of both parties in the Northern Territory, holding a single seat in both the House of Representatives and the Senate.

The opposing party active at the federal level is the Australian Labor Party, a centre-left party founded by the trade union movement in 1890 [by providing for the direct affiliation of trade unions, the Australian Labor Party is more like labour parties in the UK and New Zealand, and less like progressive parties such as the Democrats in the United States (ALP 2006)]. Historically, support for either the Coalition or the Labor Party was viewed as class based, with the middle class supporting the Coalition and the working class supporting Labor. In recent years, this has been a less important factor: in the 1970s and 1980s Labor gained a significant bloc of middle class support and the Coalition enjoyed some working class support. Indeed, part of the current electoral success of the Coalition is attributed to its appeal to disaffected working class Labor voters. The Labor Party has endured a number of debilitating splits in its long history, most notably with Prime Minister Billy Hughes and the conscription debate during WWI leading to the creation of Nationalist Labor in 1917, and the formation of the anti-communist Democratic Labor Party in 1955. The ALP currently accounts for sixty seats in the House of Representatives (40 percent) and twenty-eight in the Senate (37 percent).

Parties other than these have enjoyed limited success in Australia. These currently include the Australian Greens, a left-wing environmental party, and the Australian Democrats, middle-class centrists – both with four seats in the Senate – and Family First, a Christian-influenced party appealing to social conservatives with a single Senate seat. In the past, the minor parties have also included the centrist Democratic Labor Party from the mid-1950s until the mid-1970s and the rightist One Nation party during the 1990s. The proportional representation system often allows minor parties to win seats in the Senate and, on occasion,

the balance of power in the upper house, but they have usually been unable to win seats in the House of Representatives (lower house) given its electorate-based preferential voting system, along with the nationwide dominance and broad-based appeal of the Coalition and Labor parties.

4. Empirical methodology

4.1 Data and variable specification

Table 1 provides details of the fifty-nine Australian federal ministries since Federation on 1 January 1901 [Federation refers to the process whereby the six self-governing colonies of New South Wales, Victoria, Queensland, South Australia, Western Australia and Tasmania joined together in a federal system of government]. All information is drawn from the Australian Electoral Commission (2006a; 2006b). The duration of these ministries ranges from less than one month to eighty-two months, with the Australian Labor Party (ALP) accounting for 21 ministries across 389 months and the Liberal-National coalition and its antecedents for 38 ministries over 869 months. The starting and ending months of each ministerial term and the dates of the federal elections are also provided in Table 1.

The information in Table 1 is used to define the political cycle variables in this analysis. The four political cycle variables are as follows. To start with, two dummy variables are specified that take a value of one for months the Coalition is in power and zero otherwise (C_t), while the second takes a value of one if the Labor Party is in power and zero otherwise (L_t). The next two political variables are included to take account of whether the return on equities varies across the term in office. Rather than using dummy variables to identify whether a day falls in, say, the first or second half of the period in office as in Hudson et al. (1998), a continuous variable (T_t) is specified as a simple linear trend taking a value of one on the first month in office, two on the second month, and so on. This variable is reset at the beginning of the next ministries' term in office. An additional dummy variable is included which takes a value of one for months that include an election and zero otherwise (E_t).

The market data employed in the study are end-of-month closing prices from the Australian Stock Exchange (ASX) and its predecessors over the period January 1901 to December 2005. This sample encompasses 1,258 months and represents the complete period since Federation for which monthly data is available [daily data from the ASX is also available, but only since 1958]. The capitalization-weighted All Ordinaries Price Index is

used. Currently, the index includes the top ASX-listed stocks by capitalization, covering about 92 percent of domestic companies by market value. To be included in the index, stocks must have an aggregate market value of at least 0.02 percent of all domestic equities, and maintain an average turnover in excess of 0.5 percent of quoted shares each month. The long-term index includes base recalculations by Global Financial Data (2006).

A series of monthly market returns are first calculated where $R_t = 100\ln(P_t/P_{t-1})$ where P_t is the index level at the end of month t. The market index and monthly returns for the sample period are presented in Figure 1 and Table 1 includes the mean return by ministry. Two measures of excess return are also calculated. The first represents the difference between the monthly market return and the monthly inflation rate as represented by the Australian consumer price index (R_t-I_t). The second is the difference between the monthly market return and the monthly yield on an Australian three-month Treasury bill (R_t-Y_t) [Australian three-month Treasury bills have only been issued since July 1928]. Both long-term series on inflation and interest rates are obtained from Global Financial Data (2006). The mean monthly excess return over inflation and excess return over interest by ministry are included in Table 1.

4.2 Descriptive analysis

Figure 2 plots the mean monthly return by ministry. As shown, mean monthly returns (ministry in brackets) are highest during Holt (35), Hawke (50) and Fraser (44) and lowest during Page (19), Whitlam (42) and Fraser (47). The mean returns in Table 1 range between -2.35 and 4.75 percent. There is a similar ranking and range between returns and excess returns over inflation. Excess returns over interest rates, however, range between -3.23 and 4.12 percent with the lowest mean excess returns during Fraser (47), Whitlam (42) and Page (19) and the highest during Fadden (23), Holt (35) and Fraser (44).

Table 2 includes descriptive statistics by Liberal-National and Australian Labor Party for returns, excess returns over inflation and excess returns over interest rates. As shown, mean returns are higher for Liberal-National (0.5743) than Labor (0.3121), as are excess returns over inflation (0.5712 and 0.3080) and excess returns over interest rates (0.2075 and -0.2222). However, the volatility of returns (as measured by standard deviation) is higher for the Labor Party than Liberal-National (5.2298 and 3.2828 for returns, 5.2300 and 3.2830 for excess returns over inflation and 5.7046 and 3.7340 for excess returns over interest rates). This

would indicate that all three measures of market return are lower and more uncertain under Labor ministries than Liberal-National ministries. Tests for equality of means and variances fail to reject the null hypothesis of equality of means for Liberal-National and Labor governments, but do reject the null hypotheses for the equality of variances.

By and large, the distributional properties of the nominal returns series during ministries also appear non-normal. Given that the sampling distribution of skewness is normal with mean 0 and standard deviation of $\sqrt{6/T}$ where T is the sample size, then returns (-2.1009), excess returns over inflation (-2.1015) and excess returns over interest (-2.2378) are significantly negatively skewed. Interestingly, the degree of skewness for Liberal-National ministries is always significantly less than that for Labor ministries. The kurtosis or degree of excess across all returns is mostly large, indicating leptokurtic distributions with many extreme observations for returns (29.5504), excess returns over inflation (29.5526) and excess returns over interest (30.2093). Given the sampling distribution of kurtosis is normal with mean 0 and standard deviation of $\sqrt{24/T}$ where T is the sample size, then all estimates are once again statistically significant at any conventional level. However, once again the degree of kurtosis for Liberal-National ministries is always less than during Labor ministries. Clearly, returns during Labor ministries are characterised by more volatile, extreme and negative values than comparable Liberal-National ministries. Finally, the Jarque-Bera statistics reject the null hypotheses of normality at the .01 level for all series.

4.3 Model specification

The descriptive analysis of Australian market returns is suggestive of non-normality and ARCH behaviour. A formal Lagrange multiplier test is applied and the results presented in Table 3. As shown, the models fail to reject the null hypothesis of no ARCH errors in favour of the alternative that the conditional error variance is given by an ARCH process. These distributional properties indicate that generalized autoregressive conditional heteroskedastistic (GARCH) models can be used to examine the dynamics of the return generation process. Autoregressive conditional heteroscedasticity (ARCH) models and generalised ARCH (GARCH) models that take into account the time-varying variances of time series data have already been widely employed.

The specific GARCH(p,q)-M model used is considered appropriate for several reasons. First, the capital asset pricing model (CAPM) and the arbitrage pricing theory (APT) establish

the well-known (positive) relationship between asset risk and return. At a theoretical level, asset risk in both CAPM and APT is measured by the conditional covariance of returns with the market or the conditional variance of returns. ARCH models are specifically designed to model and forecast conditional variances and by allowing risk to vary over time provide more efficient estimators and more accurate forecasts of returns than those conventionally used to model conditional means.

Second, an approach incorporating GARCH(p,q) can quantify both long and short-term memory in returns. While ARCH allows for a limited number of lags in deriving the conditional variance, and as such is considered to be a short-term memory model, GARCH allows all lags to exert an influence and thereby constitutes a longer-term memory model. This reflects an important and well-founded characteristic of asset returns in the tendency for volatility clustering to be found, such that large changes in returns are often followed by other large changes, and small changes in returns are often followed by yet more small changes. The implication of such volatility clustering is that volatility shocks today will influence the expectation of volatility many periods in the future and GARCH(p,q) measures this degree of continuity or persistence in volatility.

Such model assumptions are generally consistent with Australian market behaviour. Certainly investors are not indifferent to the volatility of the investments they hold - as uncertainty in return varies, so does the risk premium required by investors. In addition, these assumptions directly link the volatility clustering observed in markets with two pertinent explanations. To start with, the irregular news arrival process can at least, in part, explain volatility clustering, even when the market incorporates such information perfectly and immediately. At the macro level nominal interest rates, business cycles, industrial production and other indicators have already been proposed as sources of this clustering. However, it is also the case that if market participants have heterogenous beliefs and there are lags in the absorption of information, volatility clustering may also occur. This appears especially likely in political markets since they are conventionally regarded as being less homogenous and informationally efficient than their financial counterparts.

The GARCH(p,q)-M model is described by the following:

$$r_{s,t} = \alpha_{s,k} \sum_{k=1}^{n} x_{s,k} + \gamma_{s,0} h_{s,t} + \varepsilon_{s,t} \tag{1}$$

$$h_{s,t} = \beta_{s,0} + \beta_{s,i} \sum_{i=1}^{p} \varepsilon_{s,t-i}^{2} + \gamma_{s,j} \sum_{j=1}^{q} h_{s,t-j} \tag{2}$$

$$\varepsilon_{s,t} \left| \Omega_{s,t-1} \sim N\left(0, h_{s,t}\right) \right. \tag{3}$$

where the variables in the mean equation (1) are as follows: $r_{s,t}$ is the market return at time t (where $s = Rt$, R_t-I_t and R_t-Y_t), $x_{s,k}$ are the set of k political factors expected to influence $r_{s,t}$ (where $x = C_t$, L_t, T_t and E_t), $h_{s,t}$ measures the return volatility or risk of the market portfolio s at time t, and $\varepsilon_{s,t}$ is the error term which is normally distributed with zero mean and a variance of $h_{s,t}$, as described by the distribution in (3). The sensitivity of the market portfolio s at t to the political factors is measured by the n parameters of $\alpha_{s,k}$.

The conditional variance $h_{s,t}$ follows the process described in (2) and for the sth market portfolio is determined by the past squared error terms (ε^2_{t-1}) and past behaviour of the variance (h_{t-1}), $\beta s,_0$ is the time-invariant component of risk for the sth market portfolio, $\beta s,_i$ are the ARCH parameter(s) and $\gamma_{s,j}$ are the GARCH parameter(s). Heteroskedasticity consistent covariance matrices are estimated following Bollerslev and Wooldridge.

5. Empirical results

The estimated coefficients and standard errors for the conditional mean return and variance equations are presented in Table 2. Different GARCH-M(p,q) models were initially fitted to the data and compared on the basis of the Akaike and Schwarz Information Criteria (results not shown) from which a GARCH(1,1) model was deemed most appropriate for modelling the monthly return process for the market returns. Nonetheless, this particular specification has generally been shown to be a parsimonious representation of conditional variance that adequately fits most financial time series.

The estimated coefficients and standard errors of the GARCH-M(1,1) parameters are presented in Table 3. Nine separate models with three different independent variables across three different sample periods are estimated: returns (columns 4, 5 and 6) (R_t), excess returns over inflation (columns 7, 8 and 9) (R_t-I_t) and excess returns over interest rates (columns 10, 11 and 12) (R_t-Y_t) and the full sample from January 1901 to December 2005 (uppermost panel), another from January 1901 to December 1949 (middle panel) and a further from January 1950 to December 2005 (lower panel). The breakpoint for splitting the sample is

somewhat arbitrary, but does divide the sample into two fairly equal periods, and takes allowance of the post-war shift from the Labor Party to the more than twenty year dominance of the Liberal-Nationals. The independent variables for the nine models are common. The independent variables are dummy variables for Liberal-National (C_t) and Labor (L_t) governments, a political term trend (T_t), and dummy variables for election months (E_t).

The political cycle hypotheses are tested as follows. As a rule, the market return for Coalition governments is expected to be higher than the market return for Labor governments. Moreover, it is hypothesised that returns vary within a given ministerial term, such that returns may increase or decline during the term of office. Further, it is hypothesised that returns in a month when an election is held may be higher or lower than returns during the same political term, but the direction may be dependent upon whether the election comprises a shock. Santa-Clara and Valkanov (2003: 1863), for example, argued that "…if the observed difference in returns is due to a difference in expected returns, the change in the level of the market at the time that the information is revealed should be quite large". Two hypotheses are tested. The first is a test of the joint hypothesis that all four political parameters are significant in influencing market returns (H_N: $\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 = 0$; H_A: $\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 \neq 0$) the second is that the estimated coefficient on Liberal (including the Nationals) is equal to the estimated coefficient for the Labor Party (H_N: $\alpha_1 = \alpha_2$; H_A: $\alpha_1 > \alpha_2$). If the first null hypothesis is rejected, then market returns exhibit a form of political cycle, related to either the party in power and/or the tenure of power and/or election effects. If the second is rejected, then the parties have a differential impact upon market returns.

All of the models in Table 3 are highly significant, with tests rejecting the null hypotheses of joint insignificance of the four political cycle variables at the .01 level. The coefficient on Liberal-National is always positive and higher than Labor, with the exception of returns and excess returns over inflation for the period January 1950 to December 2005, and significant at the .10 level or lower, with the exception of excess returns over interest in the period up to December 1949. The coefficient on Labor is also mostly significant, with the exception of excess returns over interest for the period 1901-2005, excess returns over inflation and excess returns over interest up until 1949 and excess returns over interest since 1950. However, only in the case of returns and excess returns over inflation for the entire sample period and for the period until 1949 does a Wald test reject the null hypothesis of equality for the Liberal-National and Labor coefficients in favour of the alternative hypothesis that the coefficient for

Liberal-National is greater than that for Labor. For the remaining coefficients, the coefficient for the term in office is always negative, but never significant, while the coefficient for election months is always positive and significant, indicating that returns are higher during months in which an election is held. Finally, while the relationship between return and volatility in models like this is far from clear empirically, in none of the models is the variance term in the mean equation significantly negative.

6. Concluding remarks

The present study employs a number of different procedures to test for a political cycle in the Australian stock market since Federation in January 1901. A comparison of mean returns provides some evidence to support the conjecture that returns, excess returns over inflation and excess returns over interest rates depend upon the political affiliation of the ministry in power: more specifically, throughout Australian political history, market returns, however defined, are generally higher under Liberal-National ministries than Labor ministries. Moreover, there is strong evidence that the returns under Liberal-National ministries are more normally distributed than returns under Labor ministries which are characterised by volatile, extreme, and mostly negative, values. Such risk differences potentially arise from the different parties' economic and social policies, uncertainty among investors about these policies, or doubt among voters concerning future election outcomes.

Modelling the political cycle using ARCH techniques is also suggestive of higher returns under Liberal-National than Labor ministries. For returns and excess returns over inflation, the returns for Liberal-National ministries are higher than Labor ministries for the full sample and for the period before December 1949, however, the evidence concerning a premium for Liberal-National ministries in terms of excess returns over interest rates is less significant. This indicates that much of the difference between different political parties is tied up with macroeconomic factors such as interest rates, and reflects opinion that political risk is mostly reflected in these rather than stock returns. Moreover, the estimated coefficients for the Labor party are higher in the period since 1950 (though not significantly), suggesting that any pro- or anti-bias by business and/or investors has lessened in more recent decades.

Of course, this study does suffer a number of limitations, all of which suggest future avenues for research. First, it has not been possible to distinguish between small and large caps in the Australian market. Hensel and Ziemba (1995), for example, identified that while

the returns of large caps were identical under different administrations in the US, a significant small cap effect existed under Democratic presidencies. Unfortunately, the use of a value-weighted index in the present analysis (and the unavailability of an equivalent equally-weighted index) infers the most direct focus is on large caps. Second, the monthly sampling frequency employed in this study means that many interesting aspects of the political cycle could not be full addressed. Though daily data is only available since January 1958, more frequent sampling would nevertheless allow attention to be given to the information effects of elections and election outcomes in the spirit of an event study [see, for instance, Santa-Clara and Valkanov (2003)].

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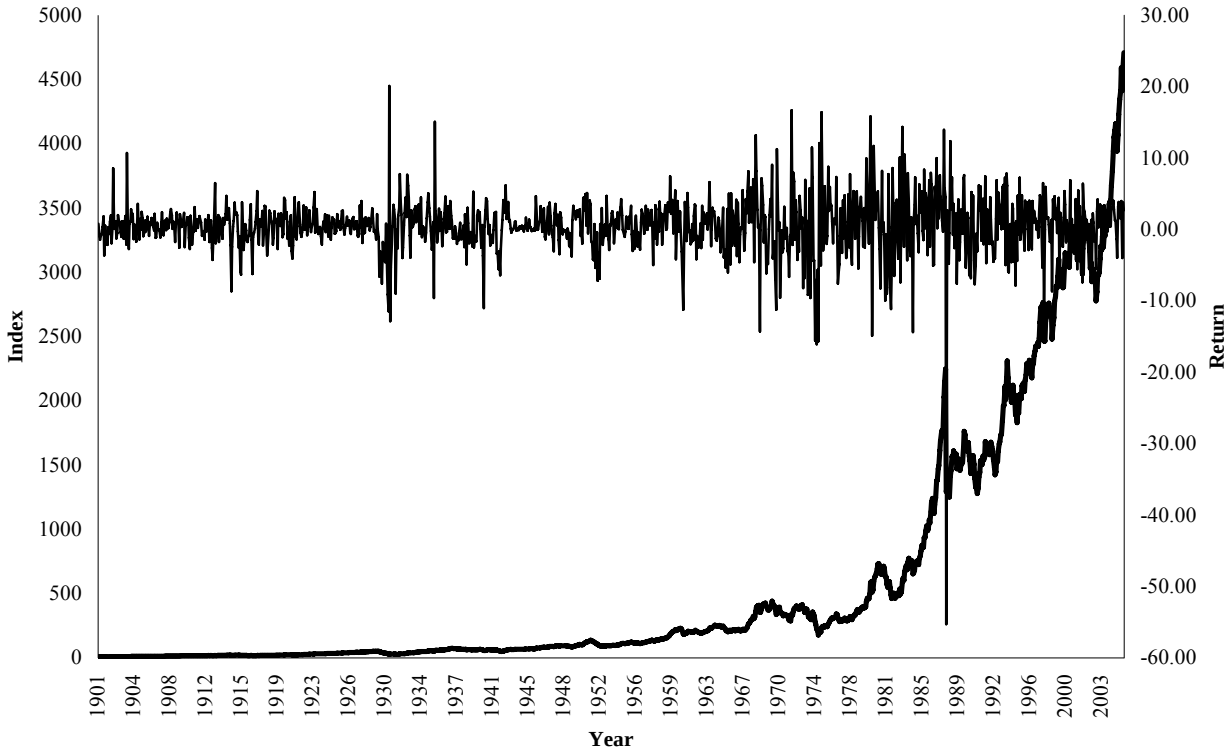
Table 1 Australian ministries and monthly market returns, January 1901 to December 2005

No.	Ministry by prime minister	Party or coalition	Start date		End date		Term in office	Return	Excess return inflation	Excess return interest	No.	Ministry by prime minister	Party or coalition	Start date		End date		Term in office	Return	Excess return inflation	Excess return interest
1	Barton	P	Jan	1901	Sep	1903	33	0.1648	0.1636	–	31	Menzies	L-CP	Jan	1956	Dec	1958	23	0.9110	0.9094	0.8277
2	Deakin	P	Sep	1903	Apr	1904	7	1.3060	1.3094	–	32	Menzies	L-CP	Dec	1958	Dec	1963	61	0.8166	0.8153	0.5531
3	Watson	ALP	Apr	1904	Aug	1904	4	1.1946	1.1991	–	33	Menzies	L-CP	Dec	1963	Jan	1966	25	-0.4123	-0.4148	-0.7389
4	Reid-McLean	FT-P	Aug	1904	Jul	1905	10	0.5907	0.5901	–	34	Holt	L-CP	Jan	1966	Dec	1966	10	-0.3654	-0.3680	-0.7471
5	Deakin	P	Jul	1905	Nov	1908	40	0.6270	0.6253	–	35	Holt	L-CP	Dec	1966	Dec	1967	12	2.8128	2.8105	2.4395
6	Fisher	ALP	Nov	1908	Jun	1909	7	0.4449	0.4435	–	36	McEwen	L-CP	Dec	1967	Jan	1968	1	1.0697	1.0667	0.6947
7	Deakin	P-FT-TR	Jun	1909	Apr	1910	11	0.6518	0.6512	–	37	Gorton	L-CP	Jan	1968	Feb	1968	2	1.2247	1.2241	0.8497
8	Fisher	ALP	Apr	1910	Jun	1913	38	0.2678	0.2636	–	38	Gorton	L-CP	Feb	1968	Nov	1969	20	1.2455	1.2426	0.8634
9	Cook	L	Jun	1913	Sep	1914	15	0.2017	0.1967	–	39	Gorton	L-CP	Nov	1969	Mar	1971	16	-1.1646	-1.1687	-1.6097
10	Fisher	ALP	Sep	1914	Oct	1915	13	0.0708	0.0580	–	40	McMahon	L-CP	Mar	1971	Dec	1972	21	1.0240	1.0191	0.6208
11	Hughes	ALP	Oct	1915	Nov	1916	12	-0.9614	-0.9590	–	41	Whitlam	ALP	Dec	1972	Dec	1972	1	0.1340	0.1305	-0.1868
12	Hughes	NL	Nov	1916	Feb	1917	4	-0.0764	-0.0743	–	42	Whitlam	ALP	Dec	1972	Jun	1974	17	-2.1957	-2.2062	-2.7069
13	Hughes	N	Feb	1917	Jan	1918	10	0.7861	0.7835	–	43	Whitlam	ALP	Jun	1974	Nov	1975	17	-0.1934	-0.2051	-0.9147
14	Hughes	N	Jan	1918	Feb	1923	61	0.7374	0.7343	–	44	Fraser	L-CP	Nov	1975	Dec	1975	2	4.7483	4.7294	4.1233
15	Bruce-Page	N-CP	Feb	1923	Oct	1929	81	0.5748	0.5739	-0.3064	45	Fraser	L-CP	Dec	1975	Dec	1977	24	0.3083	0.2989	-0.3599
16	Scullin	ALP	Oct	1929	Jan	1932	26	-1.4572	-1.4500	-1.8972	46	Fraser	L-CP	Dec	1977	Nov	1980	34	2.4109	2.4036	1.6484
17	Lyons	UAP	Jan	1932	Nov	1938	82	0.8421	0.8413	0.6512	47	Fraser	L-CP	Nov	1980	May	1982	18	-2.0766	-2.0848	-3.2398
18	Lyons	UAP	Nov	1938	Apr	1939	5	-0.6098	-0.6129	-0.7556	48	Fraser	L-CP	May	1982	Mar	1983	10	-0.0958	-0.1052	-1.2049
19	Page	CP-UAP	Apr	1939	Apr	1939	1	-2.3546	-2.3542	-2.5004	49	Hawke	ALP	Mar	1983	Dec	1984	21	1.9400	1.9357	1.0421
20	Menzies	UAP	Apr	1939	Mar	1940	10	0.7158	0.7147	0.5700	50	Hawke	ALP	Dec	1984	Jul	1987	32	3.1143	3.1075	1.8613
21	Menzies	UAP	Mar	1940	Oct	1940	8	-0.6397	-0.6449	-0.7673	51	Hawke	ALP	Jul	1987	Apr	1990	32	-0.8725	-0.8787	-2.0415
22	Menzies	UAP	Oct	1940	Aug	1941	10	-0.0031	-0.0071	-0.1282	52	Hawke	ALP	Apr	1990	Dec	1991	21	0.3457	0.3426	-0.6141
23	Fadden	CP-UAP	Aug	1941	Oct	1941	1	2.4532	2.4501	2.3282	53	Keating	ALP	Dec	1991	Dec	1991	1	-1.7532	-1.7532	-2.3782
24	Curtin	ALP	Oct	1941	Sep	1943	24	0.1583	0.1534	0.0333	54	Keating	ALP	Dec	1991	Mar	1993	14	0.1941	0.1932	-0.3048
25	Curtin	ALP	Sep	1943	Jul	1945	21	0.2633	0.2634	0.1620	55	Keating	ALP	Mar	1993	Mar	1996	35	0.9065	0.9040	0.3863
26	Forde	ALP	Jul	1945	Jul	1945	1	-0.1958	-0.1985	-0.2791	56	Howard	L-NPA	Mar	1996	Oct	1998	32	0.4531	0.4524	-0.0158
27	Chifley	ALP	Jul	1945	Nov	1946	15	0.9726	0.9678	0.8893	57	Howard	L-NPA	Oct	1998	Nov	2001	37	0.5766	0.5738	0.1459
28	Chifley	ALP	Nov	1946	Dec	1949	38	0.4341	0.4275	0.3551	58	Howard	L-NPA	Nov	2001	Oct	2004	35	0.4128	0.4108	0.0045
29	Menzies	L-CP	Dec	1949	May	1951	16	2.0631	2.0518	2.0006	59	Howard	L-NS	Oct	2004	–	–	14	1.5575	1.5551	1.0985
30	Menzies	L-CP	May	1951	Jan	1956	68	-0.1591	-0.1649	-0.2382	All	Various	Various	Jan	1901	Dec	2005	1260	0.4931	0.4898	0.0615

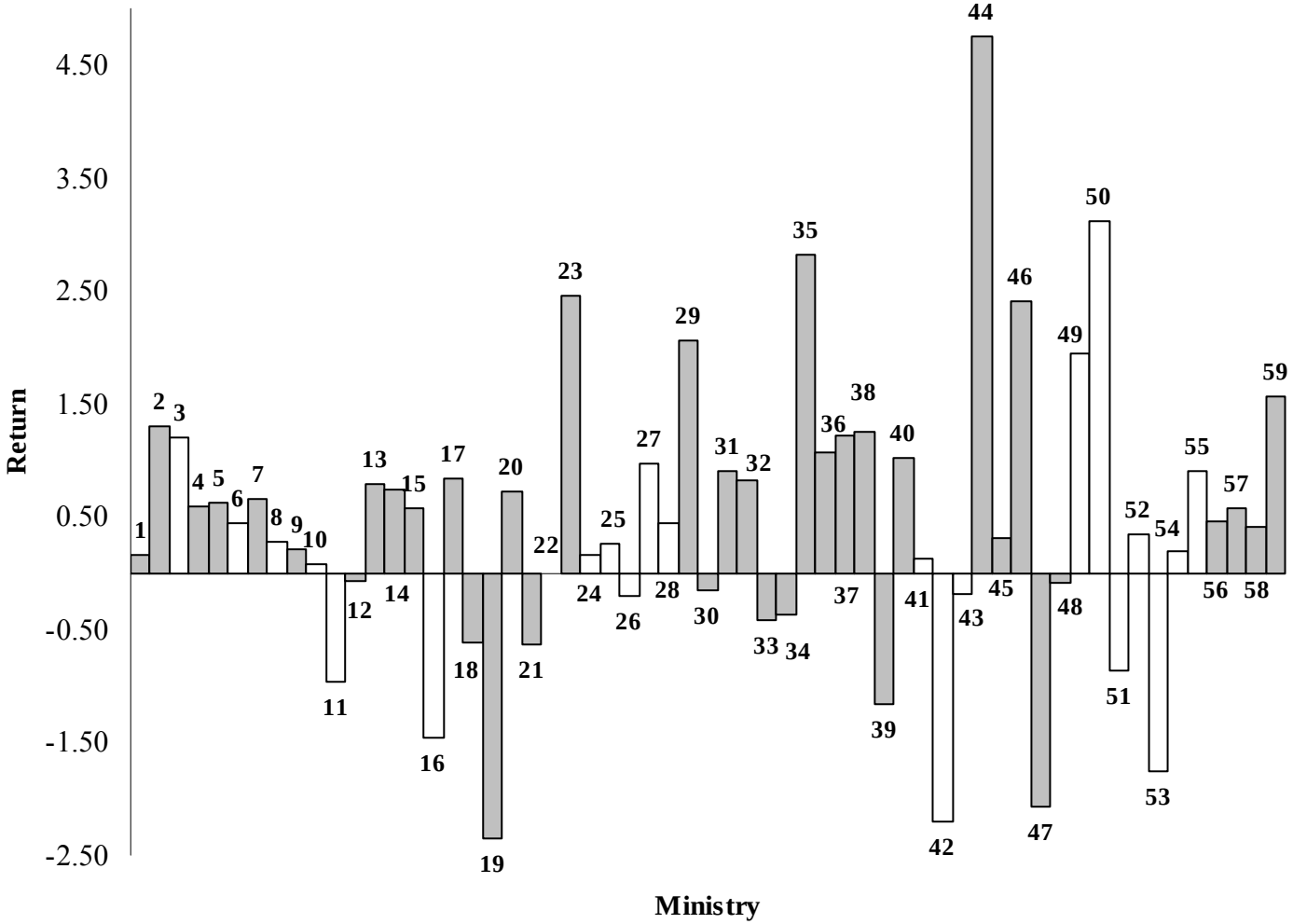
Source: Australian Electoral Commission (2006a; 2006b). Notes: Return – monthly percentage return, Excess return over inflation – monthly excess percentage return over monthly inflation, Excess return over interest – monthly excess percentage return over monthly 3-month T-bill yield (since 1928 only). Term in office is in months. The Australian Parliament consists of two houses, the Senate – selected by voters within a state - and the House of Representatives – selected by voters within an electorate. The party or coalition of parties that has a majority in the House of Representatives forms the Government. In most cases, new governments are formed after general elections, but could also be formed if the majority party changes its leader, loses its majority (e.g. as a result of a by-election), or is defeated in an important vote. House of Representative elections were held in Dec 1903, Dec 1906, Apr 1910, May 1913, Sep 1914, May 1917, Dec 1919, Jan 1922, Feb 1922, Nov 1925, Dec 1925, Nov 1928, Dec 1928, Oct 1929, Dec 1929, Dec 1931, Sep 1934, Sep 1934, Oct 1937, Oct 1937, Sep 1940, Aug 1943, Sep 1946, Dec 1949, Apr 1951, May 1954, Dec 1955, Nov 1958, Dec 1961, Nov 1963, Nov 1966, Oct 1969, Dec 1972, May 1974, Dec 1975, Dec 1977, Oct 1980, Mar 1983, Dec 1984, Jul 1987, Mar 1990, Mar 1993, Mar 1996, Oct 1998, Nov 2001 and Oct 2004. Protectionist (P), Australian Labor Party (ALP), Free Trade (FT), Tariff Reform (TR), Nationalist Labour (NL), Nationalist (N), Country Party (CP), United Australia Party (UAP), Liberal Party (L), National Party of Australia (NPA), Nationals (NS). The starting (ending) date for each ministry is to the nearest non-overlapping month, i.e. if the previous ministry ended on 23 October (day-of-month not shown in table) that ministry ends in October and the following ministry starts in November.

Figure 1
Monthly market index and returns, January 1901 to December 2005



Notes: Returns only. Sample period January 1901 to December 2005. Figures show the end-of-month value of the index (left-hand side axis) and monthly returns (right-hand side axis).

Figure 2
Mean monthly returns by ministry, January 1901 to December 2005



Notes: Returns only. The numerical identifier for each ministry corresponds to Table 1. Australian Labor Party (ALP) ministries are shown in white. Protectionist (P), Free Trade (FT), Tariff Reform (TR), Nationalist Labour (NL), Nationalist (N), Country Party (CP), United Australia Party (UAP), Liberal Party, National Party of Australia (NPA) and Nationals (NS) ministries are included in the non-ALP category. The term in office varies by ministry.

Table 2
Comparison of monthly returns by party and coalition, January 1901 to December 2005

	Statistic	All parties and coalitions	Liberal-National (C_t)	Australian Labor Party (L_t)
Returns (R_t)	Number	1258	869	389
	Mean	0.4950	0.5743	0.3121
	Median	0.5632	0.6646	0.2550
	Maximum	20.1057	16.7232	20.1057
	Minimum	-55.2449	-14.8877	-55.2449
	Std. Dev.	4.4896	3.2828	5.2298
	Skewness	-2.1009	-0.1200	-3.0428
	Kurtosis	29.5504	6.7279	35.7443
	Jarque-Bera	2.80E+04	5.06E+02	1.80E+04
	Probability	0.0000	0.0000	0.0000
Excess return (R_t-I_t)	Number	1258	869	389
	Mean	0.4913	0.5712	0.3080
	Median	0.5622	0.6653	0.2469
	Maximum	20.1192	16.7157	20.1192
	Minimum	-55.2511	-14.8951	-55.2511
	Std. Dev.	4.4897	3.2830	5.2300
	Skewness	-2.1015	-0.1212	-3.0432
	Kurtosis	29.5526	6.7274	35.7463
	Jarque-Bera	2.80E+04	5.06E+02	1.80E+04
	Probability	0.0000	0.0000	0.0000
Excess return (R_t-Y_t)	Number	928	613	315
	Mean	0.0615	0.2075	-0.2222
	Median	0.2361	0.3818	0.0593
	Maximum	19.6161	16.2999	19.6161
	Minimum	-56.1932	-15.7577	-56.1932
	Std. Dev.	4.5029	3.7340	5.7046
	Skewness	-2.2378	-0.2499	-3.0274
	Kurtosis	30.2093	5.6153	32.0431
	Jarque-Bera	2.95E+04	1.81E+02	1.16E+04
	Probability	0.0000	0.0000	0.0000

Notes: Liberal-National includes all antecedent parties. Return – monthly percentage return, excess return over inflation – monthly excess percentage return over monthly inflation, excess return over interest – monthly excess percentage return over monthly 3-month T-bill yield (since 1928 only). Levene's test of equality of variances by category (Liberal-National and Australian Labor Party) is rejected for returns (statistic = 25.27, *p*-value = 0.00), excess returns over inflation (statistic = 25.30, *p*-value = 0.00) and excess returns over interest (statistic = 13.54, *p*-value = 0.00). A *t*-test for equality of means by category fails to be rejected for returns (statistic = 1.09, *p*-value = 0.28), excess returns over inflation (statistic = 1.08, *p*-value = 0.27) and excess returns over interest (statistic = 1.37, *p*-value = 0.16). The critical value for significance of at least 315 observations is 0.138 for skewness and 0.270 for kurtosis.

Table 3
Estimated coefficients and standard errors of political cycle models

			Returns (R_t)			Excess returns over inflation (R_t-I_t)			Excess returns over interest (R_t-Y_t)		
		Parameter	Coefficient	Std. error	*p*-value	Coefficient	Std. error	*p*-value	Coefficient	Std. error	*p*-value
January 1901-December 2005	Mean equation	γ	0.0042	0.0082	0.6148	0.0041	0.0082	0.6197	-0.0039	0.0092	0.6749
		α_1	0.6130	0.1304	0.0000	0.6111	0.1304	0.0000	0.6143	0.1872	0.0010
		α_2	0.3592	0.1507	0.0172	0.3569	0.1508	0.0179	0.3578	0.2229	0.1084
		α_3	-0.0003	0.0034	0.9405	-0.0002	0.0034	0.9444	-0.0064	0.0044	0.1408
		α_4	0.4871	0.2923	0.0956	0.4865	0.2921	0.0958	0.9381	0.4350	0.0311
	Variance equation	β_0	0.1744	0.0626	0.0053	0.1745	0.0626	0.0053	0.3143	0.1170	0.0072
		β_1	0.2014	0.0310	0.0000	0.2016	0.0310	0.0000	0.2373	0.0407	0.0000
		γ	0.8148	0.0232	0.0000	0.8147	0.0232	0.0000	0.7864	0.0285	0.0000
	Test statistics	ARCH-LM	1.0800	–	0.3719	1.0792	–	0.3727	0.5091	–	0.9080
		$\alpha_1+\alpha_2..= 0$	52.4846	–	0.0000	52.4846	–	0.0000	17.7348	–	0.0014
		$\alpha_1 = \alpha_2$	2.7735	–	0.0479	2.7803	–	0.0477	1.3701	–	0.1210
January 1901-December 1949	Mean equation	γ	-0.0044	0.0203	0.8267	-0.0044	0.0203	0.8273	0.0027	0.0134	0.8384
		α_1	0.5758	0.1568	0.0002	0.5739	0.1568	0.0003	0.4060	0.2983	0.1736
		α_2	0.3215	0.1659	0.0526	0.3192	0.1660	0.0545	0.2095	0.1709	0.2202
		α_3	0.0013	0.0036	0.7107	0.0014	0.0036	0.7075	-0.0052	0.0051	0.2998
		α_4	0.0470	0.3163	0.8819	0.0462	0.3160	0.8838	0.6334	0.4622	0.1706
	Variance equation	β_0	0.3460	0.1366	0.0113	0.3457	0.1365	0.0113	0.1604	0.1127	0.1548
		β_1	0.2508	0.0627	0.0001	0.2504	0.0627	0.0001	0.5702	0.2091	0.0064
		γ	0.7295	0.0564	0.0000	0.7298	0.0564	0.0000	0.6461	0.0711	0.0000
	Test statistics	ARCH-LM	14.6585	–	0.0000	14.5848	–	0.0000	7.8594	–	0.0000
		$\alpha_1+\alpha_2..= 0$	24.5405	–	0.0000	24.3881	–	0.0000	5.1960	–	0.2678
		$\alpha_1 = \alpha_2$	2.3806	–	0.0614	2.3893	–	0.0611	0.5000	–	0.2397
January 1950-December 2005	Mean equation	γ	-0.0042	0.0146	0.7743	-0.0042	0.0146	0.7714	-0.0097	0.0147	0.5087
		α_1	0.8774	0.2964	0.0031	0.8748	0.2964	0.0032	0.5696	0.3004	0.0580
		α_2	1.1855	0.5047	0.0188	1.1831	0.5046	0.0190	0.5044	0.5084	0.3211
		α_3	-0.0064	0.0090	0.4744	-0.0064	0.0090	0.4759	-0.0032	0.0090	0.7173
		α_4	1.5772	0.9041	0.0811	1.5758	0.9044	0.0815	1.5959	0.9175	0.0820
	Variance equation	β_0	0.6328	0.2810	0.0243	0.6350	0.2818	0.0242	0.5440	0.2537	0.0320
		β_1	0.1471	0.0357	0.0000	0.1474	0.0358	0.0000	0.1271	0.0321	0.0001
		γ	0.8335	0.0334	0.0000	0.8332	0.0335	0.0000	0.8547	0.0313	0.0000
	Test statistics	ARCH-LM	0.2988	–	0.9896	0.2988	–	0.9896	0.2806	–	0.9918
		$\alpha_1+\alpha_2..= 0$	20.0769	–	0.0005	19.9977	–	0.0005	12.1594	–	0.0162
		$\alpha_1 = \alpha_2$	-0.5981	–	0.2196	-0.5991	–	0.2195	0.0265	–	0.4353

Notes: Dependent variables are returns, excess returns over inflation and excess returns over interest. The GARCH-M models presented include the conditional variance in the mean equation along with dummy variables for Liberal and Labor ministries, a ministerial political cycle trend variable and a dummy variable for election months. The variance equation includes a constant, a first-order autoregressive GARCH term and a first-order moving average ARCH term. ARCH test – Lagrange multiplier test of null hypothesis of no ARCH errors versus the alternative hypothesis that the conditional error variance is given by an ARCH(12) process from a preliminary least squares regression.