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Is the "sell in May and go away" adage the result of an election-year effect?

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Abstract

Purpose – The purpose of this paper is to provide a plausible explanation for the "sell in May" anomaly observed in US stock markets. A heretofore unexplained strategy of selling stock in May and not returning to the market until November has been shown to outperform a simple strategy of buying and holding stock all year long.
Design/methodology/approach – The authors compare the seasonal performance of three US size-based portfolios for the May–October and November–April periods considering whether or not they were in years with US congressional elections, which occur every two years.
Findings – While the sell-in-May effect appears to persist in the long run, the authors find that the anomaly is not present in non-election years. There is no significant difference between the May–October and November–April stock returns in non-election years. The observed sell-in-May effect is driven by poor stock returns in the May–October periods leading up to US presidential or congressional elections and subsequent strong performance in the November–April periods immediately following elections.
Originality/value – The paper offers an election-year effect as an explanation of the sell-in-May anomaly that has been observed in the US stock market. Other possible explanations of the effect, such as seasonal affective disorder, the weather, and daylight savings time, have not gained widespread acceptance.

Keywords Market efficiency, Seasonality, Anomalies, Elections, Halloween effect, Sell in May
Paper type Research paper

1. Introduction

This paper provides a new hypothesis to explain the so-called "sell-in-May and go away" calendar effect in the US stock market. Bouman and Jacobsen (2002) found that stock market returns during the months of May–October significantly underperform relative to returns during the months of November–April, even after the January effect is considered. This is also called the Halloween effect because investors are advised to return to the market right after the end of October.

Our analysis suggests that most of the sell-in-May phenomenon can be attributed to an election effect tied to US national elections that occur twice in a four-year cycle (presidential, congressional and most gubernatorial[1] elections). If the sell-in-May effect is really an election-year effect, then the sell-in-May anomaly should be present in even-numbered years, when national elections are held, and absent in odd-numbered years. This is what we find. Contrary to the tenets of the sell-in-May adage, the returns over the May–October period during non-election years are economically strong and positive. Furthermore, there is no significant difference between the May–October and November–April returns of non-election years. This paper shows that most of the strongly positive November–April returns occur immediately following an election. All of these results hold even when the well-known January effect is considered. Investors would be ill-advised to follow the "sell-in-May" adage blindly, especially in non-election years.

While the sell-in-May anomaly still persists (Andrade *et al.*, 2013), a significant and legitimate concern is that no widely accepted rationale has previously been provided for its existence.

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Several researchers suggest that these seasonal stock market returns could be tied to factors such as seasonal affective disorder (SAD), the weather, or daylight savings time (Kamstra *et al.*, 2000, 2002, 2003, 2009; Cao and Wei, 2005; Garrett *et al.*, 2005), but these arguments have not gained widespread acceptance and have been challenged by others (Pinegar, 2002; Jacobsen and Marquering, 2008, 2009; Gregory-Allen *et al.*, 2010; Khaled and Keef, 2014).

Our hypothesis is that the sell-in-May effect is really a rolling two-year election effect. The USA holds national congressional elections on all even-numbered years, with presidential elections simultaneously taking place with every other congressional election. The results of these elections have the potential to change the direction of both the US and global economies, or at least to introduce uncertainties to its directionality. US elections are held on the Tuesday following the first Monday in November, which is shortly after Halloween and about the beginning of November. It is possible that market uncertainty or trepidation in the months leading up to national elections acts as a drag on returns. This could be the reason for poor May–October returns in election years and the "sell-in-May and go away" adage. Election results are revealed in early November, clearing up any lingering uncertainty and potentially leading to a coiled-up relief rally. Alternatively, the prospects of new legislative action could lead to a post-election market rally. In either case, the post-election months of November–April would generate relatively high returns compared to the pre-election months. Once the market is unencumbered by concerns of the past elections or their aftermath, it is free to move normally, at least until the next election cycle comes around.

2. Literature review

While the adage of "sell-in-May and go away" has reportedly been around for many years, the first major academic work on the matter was done by Bouman and Jacobsen (2002). They find significant differences between the May–October and the November–April stock returns in 36 of 37 countries, with data covering the January 1970 to August 1998 period. Returns in the sell-in-May period of May–October average 6.0 percent and are significantly lower than the post-Halloween November–April period returns of 17.1 percent.

Maberly and Pierce (2004) argue that the sell-in-May effect is explained by just a few outliers, but others argue that outliers only partially explain the phenomenon (Witte, 2010; Haggard and Witte, 2010; Haggard *et al.*, 2015). Lucey and Zhao (2008) examine the 1926–2002 period and find that the sell-in-May effect can be explained by the well-known January effect. Jones and Lundstrum (2009) examine periods where tradable securities matching the Bouman and Jacobsen (2002) sample period are available and find that a buy-and-hold strategy outperforms a sell-in-May strategy. Likewise, Dichtl and Drobetz (2014, 2015) question the existence of the sell-in-May effect, saying that it has disappeared in recent years.

Despite the challenges to Bouman and Jacobsen's (2002) work, several studies support the sell-in-May effect, with one suggesting that it "just won't go away" (Andrade *et al.*, 2013). There are significant differences between May–October and November–April returns for production sectors of the economy, but not for consumer protection sectors (Jacobsen and Visaltanachoti, 2009). Futures data show that the sell-in-May strategy outperforms a buy-and-hold strategy (Dzhabarov and Ziemba, 2010). The sell-in-May effect over the 1963–2008 period is supported, and there are interactions with other calendar effects (Swinkels and Van Vliet, 2012). *F*-tests of non-stationarity of the sell-in-May effect comparing the 1970–1998 period to the 1998–2009 in 18 different countries show no evidence of a change in the effect. The method used also has applications whenever sub-periods are considered (Haggard and Witte, 2012). Testing outside of Bouman and Jacobsen's sample period shows returns for November–April that are about 10 percent higher than the sell-in-May months (Andrade *et al.*, 2013). Also, in a recent nine-year period, returns in the November–April period were about 4.5 percent higher than in the May–October period (Kochman *et al.*, 2014).

While the authors are not aware of any other research that examines the sell-in-May effect in relationship to elections, there are several works related to the stock market performance and presidential election cycles, in general. A simple strategy of buying the market for the two years leading up to a presidential election and then selling for the first two years of the presidential term significantly outperformed a buy-and-hold strategy over a relatively short 1960–1978 sample period (Allvine and O'Neill, 1980), and this strategy is confirmed over an even longer period from 1832 to 1979 (Huang, 1985). Two- and four-year election cycles in the stock market are prevalent during the period from 1926 to 1977 (Herbst and Slinkman, 1984). Looking at the period from 1896 to 2011 also shows a strong negative performance in the second year of the presidential cycle (Sturm, 2014). In the 1948–2008 period, there is a 10 percent higher return in the second half of the presidential cycle compared to the first two years, but Kräussl *et al.* (2014) were unable to provide a satisfactory rationale for the differences. Significant negative performance of the US stock market in the second year of the presidential cycle also translates to 18 different countries (Foerster and Schmitz, 1997). On the other hand, looking at monthly market returns over a 104-year period reveals little or no support for an election cycle effect or for higher returns in the second half of the presidential term (Jones and Banning, 2009). There is some evidence that it may be tax legislation that is driving the presidential election cycle (Sturm, 2013). Also, a change in control between the parties produces the largest short-term pre- and post-presidential election stock market performance (Oehler *et al.*, 2013). Excess returns in the stock market are also significantly higher under democratic presidencies vs under republican presidencies (Santa-Clara and Valkanov, 2003).

3. Sample and methodology

This analysis focuses on monthly total return performance of US stocks in election years and off years. For the purposes of this paper, an election year is the May–October period leading up to a national congressional election (every two years) and the subsequent six-month November–April period following the election. An off year includes the 12-month May–April period in which there is no national congressional election. The sell-in-May period is the six months from May to October when the old adage advises investors to stay out of the market.

The study begins with the monthly returns of three value-weighted portfolios formed based on size for the period of July 1926 to December 2017. The return data used are from Kenneth French's data website and include all stocks on the New York Stock Exchange, the American Stock Exchange and NASDAQ which had positive market values as of June of each year, when new portfolios were constituted (French, 2018). The size breakpoints for portfolios are based on the New York Stock Exchange market capitalizations. The large-cap portfolio includes stocks in the top 30 percent of stocks by market capitalization. The middle 40 percent of stocks are classified as mid-cap stocks and the bottom 30 percent of stocks as small-cap stocks.

If the sell-in-May effect is present, then by definition, the mean monthly returns from May to October should be significantly less than the mean monthly returns from November to April. This is tested herein with the standard methodology used by Bouman and Jacobsen (2002) which employs regression analysis. In addition, all of the models use the Newey–West heteroscedasticity and autocorrelation consistent standard errors (and p-values). The regression equation is:

$$Return_t = \mu + \alpha_1 Season_t + \varepsilon_t, \tag{1}$$

where $Return_t$ is the monthly return for the value-weighted index; and $Season_t$ is a dummy variable that takes on a value of 1 for the months of November–April and 0 otherwise.

The constant term μ is the mean return for the six-month sell-in-May period, and α_1 is the mean return differential for the November–April period. The mean return for the November–April period is $\mu+\alpha_1$, so if α_1 is significant and positive, then this period's returns are significantly greater than the May–October period. The ε_t is an error term which captures unexplained variability.

The November–May period includes the month of January and is potentially impacted by the well-known January effect. Accordingly, we modify the basic regression equation to account for any potential confounding effects:

$$Return_t = \mu+\alpha_1 Season_t+\alpha_2 January_t+\varepsilon_t. \quad (2)$$

The dummy variable $January_t$ takes on a value of 1 for the month of January and 0 otherwise. The value of μ would remain unchanged compared to Equation (1), but the value and significance of α_1 is potentially impacted. If the value of α_1 is still significant, then this would be supportive of the sell-in-May effect, independent of the January effect.

If the observed sell-in-May effect is really an election effect, then the November–April periods in non-election years should not be significantly different than the prior May–October period. Furthermore, significant differences should show up in election years. The regression equation to test this hypothesis takes the form:

$$Return_t = \mu+\alpha_1 OffSeason_t+\alpha_2 PreElect+\alpha_3 PostElect+\varepsilon_t \quad (3)$$

where $OffSeason_t$ is the November–April period in non-election years. The $PreElect_t$ period is the May–October period in the year of the election, and the $PostElect_t$ period is the November–April period that includes the national election month (every two years, not just the presidential election). The constant μ reflects the mean value of May–November returns in just off years, when no national elections are held. We again adjust for any potential January effect with this equation:

$$Return_t = \mu+\alpha_1 OffSeason_t+\alpha_2 PreElect+\alpha_3 PostElect+\alpha_4 January_t+\varepsilon_t. \quad (4)$$

We have one last pair of regression models which differ only subtly, but importantly, from Equations (3) to (4):

$$Return_t = \mu+\alpha_1 OffSummer_t+\alpha_2 PreElect+\alpha_3 PostElect+\varepsilon_t, \quad (5)$$

where $OffSummer_t$ is the May–October period in non-election years. This means that the constant μ takes on the value of returns for November–April of non-election years. This allows us to use the standard regression format for direct comparisons of non-election, November–April periods to the election-year May–October and November–April returns. The differences in these comparisons are reflected in the coefficients on the *PreElect* and *PostElect* terms. If these coefficients are significant, it would provide additional support for an election effect. Consideration of the January effect results in this equation:

$$Return_t = \mu+\alpha_1 OffSummer_t+\alpha_2 PreElect+\alpha_3 PostElect+\alpha_4 January_t+\varepsilon_t. \quad (6)$$

4. Persistence of the sell-in-May effect

The seminal work that documented the sell-in-May effect in numerous international stock markets looked only at the years 1970–1998 (Bouman and Jacobsen, 2002). This paper focuses on just the US stock market, which allows an examination of data back to 1926. It is not clear, however, how long the sell-in-May effect has been around. Haggard and Witte (2010), for example, divide their sample data into equal periods and find no support for the sell-in-May effect for the 1926–1953 period.

Examining the sell-in-May effect over a longer period first requires identifying when the anomaly is present. In this analysis, the end of the Great Depression in December 1941, which coincides with the beginning of the Second World War, is chosen as a logical break point to subdivide the data for further testing because of its significant economic impact[2]. Table I shows average monthly portfolio returns for the periods of July 1926–December 1941 and January 1942–December 2017. The data are broken down by returns for May–October and November–April, and the winter period without January. Since the January effect is well known in the finance literature, it is shown separately, as well. Panels A, B and C show the portfolio returns for large-cap, mid-cap and small-cap stocks, respectively.

The monthly average returns in Table I argue strongly against the presence of a sell-in-May effect during the 1926–1941, the pre-Second World War period. In fact, the May–October returns are at least twice as high as the November–April returns, which is the exact opposite of the reported sell-in-May effect. This is true for all three stock size categories. The regression results of Equations (1) and (2), shown in Panel A of Table II, also provide no evidence of a seasonality effect in the 1926–1941 time period.

During the 1942–2017 period, the months of November–April outperformed the months of May–October by an average of at least 2-1, even with January excluded. This is the exact opposite of what is seen in the pre-Second World War data. As shown in Table I, this outperformance is present across large-cap, mid-cap and small-cap stock returns, and it strongly suggests the presence of the sell-in-May effect.

The coefficient on *Season* shows the average difference in returns between the May–October and November–April periods. As can be seen in Panel B of Table II, the coefficient on *Season* is positive and significant across all size portfolios, both with and without the January-effect dummy. During the months of November–April, large-cap stocks, for example, returned an average of 0.852 percent per month more than they did during May–October, after factoring in the January effect. The findings are even more pronounced for mid- and small-cap stocks. The *Season* coefficients are significant with *p*-values below 0.01 in all six regressions, which is what would be expected if there is a sell-in-May effect.

Since the focus of this work is on explaining the sell-in-May effect, the balance of the paper only addresses the period where the effect is evident. Accordingly, the remaining tests use the 1942–2017 period because there is no support for the sell-in-May effect in the pre-Second World War years. Figure 1 shows average total returns by month from 1942 to 2017 for the three size-based portfolios. Consistent with extant literature, the average

	May–October	November–April	November–April, ex-January	January
Panel A: large-cap portfolio returns				
1926–1941	0.94	0.21	−0.01	1.34
1942–2017	0.60	1.38	1.45	1.06
Panel B: mid-cap portfolio returns				
1926–1941	1.21	0.59	−0.01	3.58
1942–2017	0.49	1.92	1.83	2.37
Panel C: small-cap portfolio returns				
1926–1941	1.58	0.73	−0.52	6.97
1942–2017	0.40	2.18	1.70	4.61

Table I.
Sell-in-May returns comparisons for different time periods

Notes: This table shows the average monthly percentage returns for size portfolios using data from Kenneth French's website. The December 1941 break point corresponds to the end of the Great Depression/the beginning of the Second World War

	Large-cap stock returns		Mid-cap stock returns		Small-cap stock returns	
	Without January effect	With January effect	Without January effect	With January effect	Without January effect	With January effect
Panel A: 1926–1941						
Season	−0.754	−0.982	−0.727	−1.329	−0.975	−2.217
t-stat	−0.689	−0.883	−0.486	−0.898	−0.459	−1.078
January		1.385		3.647		7.533
t-stat		1.023		1.677*		2.493**
Panel B: 1942–2017						
Season	0.787	0.852	1.432	1.342	1.780	1.295
t-stat	3.290***	3.505***	4.359	4.024***	4.518***	3.274***
January		−0.391		0.540		2.913
t-stat		−0.718		0.797		3.546***

Notes: This table presents the regression results of Equations (1) and (2) with monthly portfolio returns as the dependent variable to see if the Bouman and Jacobsen (2002) sell-in-May effect is supported in the USA over the longer period of 1926–2017, considering different size-based portfolios. The December 1941 break point corresponds to the end of the Great Depression/the beginning of the Second World War. The *Season* dummy is 1 for the months of November–April, and 0 for the months of May–October. A *January* dummy (1 in January and 0 otherwise) is included in some regressions to isolate the sell-in-May effect from the January effect. The coefficients on *Season* are negative for the 1926–1941 period, which is the opposite of that predicted by the sell-in-May effect, and insignificant. The coefficients on *Season* are positive and statistically significant in the 1942–2017 period for all the three size portfolios, both with and without the January dummy. This shows that the November–April period returns significantly more than the April–October period. The *t*-statistics are based on Newey-West standard errors. *,**,***Significant at the 10, 5 and 1 percent levels, respectively

Table II.
Test of the sell-in-May effect (without election year partitioning)

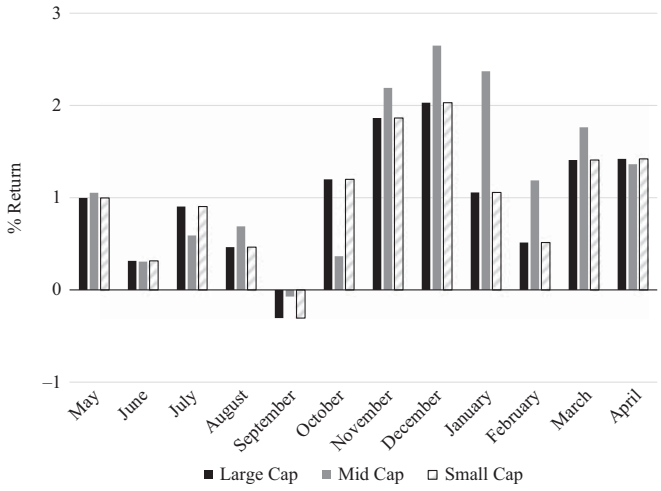

Figure 1.
Average monthly returns by market cap, 1942–2017

returns for the months of May–October noticeably trail the months from November–April. The figure also supports the notion of a "September swoon" (Haug and Hirschey, 2011), and June, July and August are also particularly lean months for stocks. The well-known January effect can clearly be seen for small-cap stocks in Figure 1, as well.

5. Results

The next step is to examine whether or not the sell-in-May effect is in fact an election-year effect. As noted above, there is no evidence of a sell-in-May effect prior to the Second World War, so data for subsequent tests begin with 1942. Figure 2 shows the average monthly returns of large-cap stocks over the 1942–2017 period broken down by whether they were in an election year or an off year. In off years, large-cap stocks have average returns of about 1.2 percent over May, June and July, compared to just 0.3 percent for the same period in election years. It does not appear that selling large-cap stocks in May in non-election years would be a productive investment strategy, on average. Additionally, the post-election, November–April returns are noticeably higher than for off years, especially in the months of January and April. The differences between election and off-year returns are even more pronounced for mid-cap and small-cap stocks, as seen in Figures 3 and 4, respectively.

Table III presents the average monthly returns for the May–October and November–April periods broken down by election and off years for each of the three

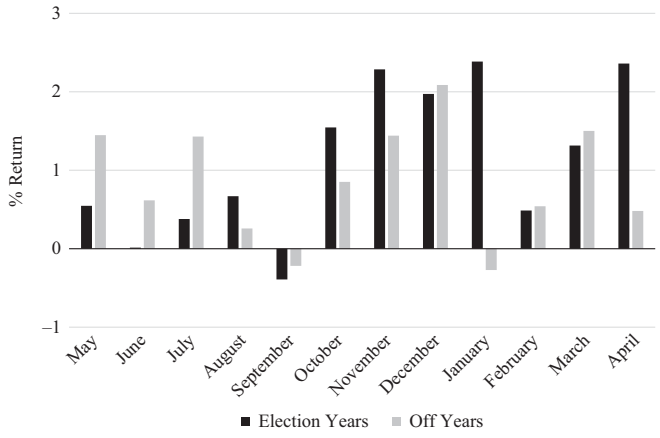

Figure 2.
Average monthly returns of large-cap stocks for election and off years, 1942–2017

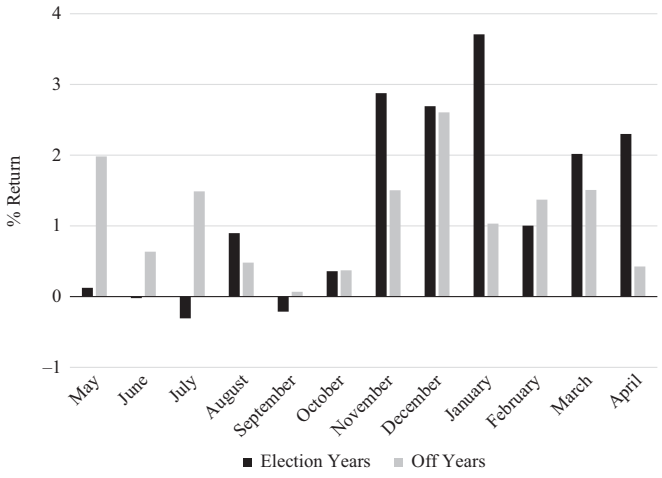

Figure 3.
Average monthly returns of mid-cap stocks for election and off-election years, 1942–2017

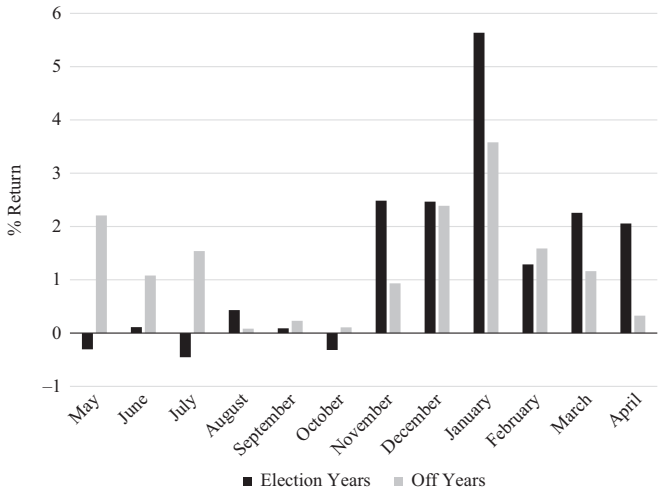

Figure 4.
Average monthly returns of small-cap stocks for election and off-election years, 1942–2017

	May–October	November–April	November–April, ex-January	January
Panel A: large-cap portfolio returns				
Off years	0.73	0.96	1.21	–0.27
Election years	0.46	1.80	1.68	2.39
Panel B: mid-cap portfolio returns				
Off years	0.84	1.41	1.48	1.03
Election years	0.14	2.43	2.18	3.71
Panel C: small-cap portfolio returns				
Off years	0.87	1.66	1.28	3.58
Election years	–0.07	2.70	2.11	5.64

Notes: This table shows the average monthly percentage returns for size portfolios using data from Kenneth French's website. "Off Years" are May–April periods in which there were no US congressional elections, and "election years" are May–April periods in which congressional elections (including the presidential election) were held

Table III.
Sell-in-May effect with election year partitioning, mean monthly percentage returns by market cap, 1942–2017

size portfolios. For large-cap stocks (panel A), average returns for November–April are 0.23 percent greater than May–October in off years, but this difference is 1.34 percent in election years. The differences for mid (panel B) and small-cap (panel C) stocks are even larger. The average May–October returns of mid- and small-cap stocks in election years are both near zero compared to average November–April election-year returns of 2.43 and 2.70 percent, respectively.

Next, regression analysis is used see if the sell-in-May effect is in fact present in both off years and election years from 1942 to 2017. Table III presents the results of regressions using Equations (3) and (4) on the returns of large-cap, mid-cap and small-cap stock returns. The coefficient on the *OffSeason* dummy, which is 1 for the November–April period in off years and 0 otherwise, is not significant in any of the cases, either with or without the inclusion of the *January* dummy. This means that there is no significant difference between the May–October and November–April periods for non-election (Off) years. This seasonal difference, which is found lacking in non-election years, is the foundation of the sell-in-May anomaly. On the

other hand, all of the coefficients on the *PostElect* dummy are significant at the $p = 0.05$ level or better, even with the January effect included. The coefficients on the *PostElect* dummy reflect differences in returns of 1.07 to 1.82 percent between the null case of May–October of off years and November–April of election years. So the seasonal difference is significant in election years, but not in non-election years[3] (Table IV).

The regression results for Equations (5) and (6), which allow for comparisons to an implied null case of November–April of off years, are presented in Table V. The *PreElect* dummy is negative and significant at the 0.05 level or better for both mid- and small-cap stocks. This means that the average returns for the election-year May–October period are significantly lower than for the months of November–April of non-election years – about 1.2 and 1.3 percent lower for mid and small-cap stocks, respectively, when the January effect is considered. Likewise, the *PostElect* dummy variables for large and mid-cap stock returns are positive and significant at the 0.05 level, while the *PostElect* dummy for small-cap stocks is significant at the 0.10 level. The coefficients on the *PostElect* dummy show that the average monthly post-election November–April returns for the size portfolios range from 1.1 to 1.5 percent greater than the November–April returns of off years, even after accounting for the January effect. Again, the sell-in-May anomaly is driven by election-year returns[4].

6. Conclusion

Bouman and Jacobsen (2002) initiated an academic discussion of the sell-in-May effect for stocks which suggests a strategy of selling equities in May and not re-investing back in the market until November of the same year. They show significant differences in average monthly returns for May–October vs November–April. The current study, however, supports a conclusion that the sell-in-May effect observed in the US stock market is actually an election-year effect. The significant seasonal differences seen in the US stock market are driven by returns in election years.

This study examines the seasonal differences in returns for large-, mid- and small-cap stock returns in the USA, but also considers whether or not there were national

	Large-cap stock returns		Mid-cap stock returns		Small-cap stock returns	
	Without January effect	With January effect	Without January effect	With January effect	Without January effect	With January effect
OffSeason	0.233	0.298	0.570	0.480	0.789	0.303
t-stat	0.705	0.886	1.297	1.063	1.463	0.551
PreElect	−0.270	−0.270	−0.698	−0.698	−0.949	−0.949
t-stat	−0.719	−0.719	−1.426	−1.426	−1.640	−1.640
PostElect	1.070	1.135	1.595	1.505	1.824	1.338
t-stat	3.206***	3.410***	3.618***	3.428***	3.317***	2.469**
January		−0.391		0.540		2.913
t-stat		−0.721		0.800		3.550***

Notes: This table presents the regression results of equations (3) and (4) with monthly portfolio returns as the dependent variable to see if the Sell-in-May effect is over the 1942 to 2017 period when election years are factored in, considering different size-based portfolios. The *OffSeason* (non-election year) dummy is 1 for the months of November to April in years with no US congressional election for that November and 0 otherwise. The PreElect dummy is 1 for April to October periods immediately preceding a November election and 0 otherwise. The *PostElect* dummy is 1 for the months of November to April if there was a national election in that period and 0 otherwise. Absence of significance of *OffSeason* coefficients suggests that the Sell-in-May effect does not hold in non-election years. Furthermore, significance of the coefficients on either *PreElect* or *PostElect* supports an election effect. A *January* dummy (1 in January and 0 otherwise) is included in some regressions to rule out the possibility of the January effect influencing the results. The *t*-statistics are based on Newey–West standard errors. *,**,***Significant at the 10, 5 and 1 percent levels, respectively

Table IV.
Tests of the Sell-in-May effect with election years considered, 1942–2017

congressional elections. The analysis shows no significant differences whatsoever between the returns of the May–October and November–April periods in non-election years. In fact, the average monthly return of the May–October period in non-election years from 1942 to 2017 is quite stable across all three size portfolios – 0.73, 0.84 and 0.87 percent for large-, mid- and small-cap stocks, respectively. If the sell-May effect is truly seasonal, it should be reflected in both election and off years, but it is not.

This study finds that post-election performance is what is driving the significantly higher returns observed in US stocks for the November–April period. The post-election November–April returns are significantly higher than the returns during both May–October and November–April of non-election years. This is true for all three size portfolios, both with and without the January effect. In addition, the pre-election May–October returns of mid- and small-cap stocks are significantly below the non-election November–April period. Thus, the overall low May–October performance of US stocks is a combination of poor pre-election returns and lower relative comparisons to the post-election period returns.

The sell-in-May effect continues to be an ongoing anomaly, in large part, because there is no widely accepted theoretical rationale for its existence. We have attempted to bridge this gap with the notion of an election-year effect. Poor market performance every other summer leading up to the month of November might be a rational market response to a risk-off environment due to uncertainties surrounding the congressional, presidential and gubernatorial elections. Strong post-election returns for November through the subsequent April may be related to relief from the removal of uncertainty or mean reversion.

While we document an election-year effect to explain the sell-in-May effect, more work still needs to be done on the topic. Additional research needs to be done to determine specific factors driving this apparent election-year effect. If it is market uncertainty, the level of this uncertainty could be measured against performance. Political polling, the party in power, or the Congressional division of power could be factors that might explain the pre-election drag on returns. Margins of election victory or party changes might be linked to strong

	Large-cap stock returns		Mid-cap stock returns		Small-cap stock returns	
	Without January Effect	With January effect	Without January Effect	With January effect	Without January Effect	With January effect
Off Summer	−0.233	−0.298	−0.570	−0.480	−0.789	−0.303
t-stat	−0.705	−0.886	−1.297	−1.063	−1.463	−0.551
PreElect	−0.503	−0.568	−1.268	−1.178	−1.737	−1.252
t-stat	−1.319	−1.451	−2.535**	−2.298**	−2.937***	−2.077**
PostElect	0.838	0.838	1.025	1.025	1.035	1.035
t-stat	2.318**	2.318**	2.219**	2.220**	1.805*	1.812*
January		−0.391		0.540		2.913
t-stat		−0.721		0.800		3.550***

Notes: This table presents the regression results of Equations (4) and (5) with monthly portfolio returns as the dependent variable to see if the sell-in-May effect is present when election years are factored in, considering different size-based portfolios. The *OffSummer* (non-election year) dummy is 1 for the months of May–October in years with no US congressional election for the following November and 0 otherwise. The *PreElect* dummy is 1 for May–October periods immediately preceding a November election and 0 otherwise. The *PostElect* dummy is 1 for the months of November–April if there was a national election in that period and 0 otherwise. Significance of the *PostElect* term means that the average return for the November–April period after elections is higher than the same period in non-election years. A *January* dummy (1 in January and 0 otherwise) is included in some regressions to rule out the possibility of the January effect influencing the results. The *t*-statistics are based on Newey–West standard errors. *,**,***Significant at the 10, 5 and 1 percent levels, respectively

Table V.
Tests of the election-year effect vs the Sell-in-May effect, 1942–2017

post-election returns. Possible links to the presidential cycle may also merit additional exploration. While works on the presidential cycle have focused on term years, there might be seasonal relationships that should be explored. Another area that needs additional study is the global sell-in-May anomaly. We have shown that the sell-in-May effect in the USA over the 1942–2017 period is likely an election effect, but we have not examined other markets. While US and international markets have proven to be highly correlated, this may or may not be the case with the election-year effect.

Notes

1. In total, 34 of the 50 states hold the elections for the Governor's office along with the midterm elections.
2. The data were also subdivided from 1942 to 1969 and 1970 to 2017, but these two sub-periods are comparable to the longer, combined 1942–2017 period.
3. While the authors believe the 1942–2017 period is most relevant because of the lack of a sell-in-May effect prior to 1942, Equations (3) and (4) are also examined for the entire 1926–2017 period. The *PostElect* dummy is significant at the $p = 0.05$ level or better for both large and mid-cap stocks, both with and without consideration of the January effect. For small-cap stocks, *PostElect* is significant at the $p = 0.05$ level without the January effect, but is not significant when the January effect is included. Inclusion of the Great Depression drives the change in results. The average monthly return for small-cap stocks from November–April, excluding January, is −0.52 percent from 1926 to 1941 compared to 1.70 percent from 1942 to 2017.
4. While the authors believe the 1942–2017 period is most relevant because of the lack of a sell-in-May effect prior to 1942, Equations (5) and (6) are also examined for the entire 1926–2017 period. The *PostElect* dummy is significant at the $p = 0.10$ level or better for both large and mid-cap stocks, both with and without consideration of the January effect. For small-cap stocks, *PreElect* is significant when the January dummy is excluded, but not when it is included. Inclusion of the Great Depression drives the change in results. The average monthly return for small-cap stocks from November–April, excluding January, is −0.52 percent from 1926 to 1941 compared to 1.70 percent from 1942 to 2017.

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