2017

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This paper uses stock market returns (2007-2015) and confirms the existence of Halloween effect anomaly after the 2008 financial crisis. Findings suggest that the Halloween effect can still be observed in 34 out of the 35 countries. A more aggressive trading strategy of shorting the market during summer and taking a long position in winter yields 4.77% more than the buy-and-hold strategy. A new explanation is offered for the persistence of the Halloween effect. A positive feedback between investors' belief and behavior causes the market to underperform in the summer and recover in the winter, resulting in a self-fulfilling prophecy.

INTRODUCTION

Volatility in the stock market creates opportunities for investors while simultaneously exposing them to tremendous financial risks. The unpredictable nature of the stock market makes it so difficult for investors to beat the market. However, finance literature has also documented many anomalies, with some being persistent, suggesting that there exists some predictability in the stock market. The degree to which predictability can be discerned affords investors the potential for greater returns. Finance researchers develop predictive models to identify trading opportunities. Using a data set from 1977 to 1998, Bouman and Jacobsen (2002) identify one such predicting model referred to as the Halloween indicator, whereby the equity market return in the months of November through April is substantially higher than that of May through October. They find the presence of this anomaly in 36 out of the 37 countries, which include both developed and emerging markets.

The seminal work of Bouman and Jacobsen (2002) spurred a debate in the literature regarding stock market efficiency, and extended the research on a growing body of literature on calendar anomalies in general. Most prominent among these recognized calendar anomalies is the January effect, whereby stocks tend to rally in the first month of the year. The January effect has been found to exist in continental Europe markets (Canestrelli and Ziemba, 2000), the United Kingdom (Arsad and Coutts, 1997), Australia (Officer, 1975), Japan (Ziemba, 1991), and Thailand (Holden, Thompson, & Ruangrit, 2005).

Additional calendar anomalies include the Monday effect, turn-of-the-month effect, and the holiday effect. Andrade, Chhaochharia and Fuerst (2013) present two challenges to these market trends in that they are difficult to trade around given the significant transaction costs associated with trying to capture these arbitrage opportunities, and that in most cases the market opportunities have dissipated since each of these has been identified.

In response to the findings presented by Bouman and Jacobsen's (2002), Jacobsen and Visaltanachoti (2009) re-evaluate Halloween indicator in terms of specific U.S. sectors and industries. They find that the Halloween indicator differs across 17 sectors and 49 industries. Specifically, the effect was "almost absent in sectors and industries related to consumer consumption but [strong] in production sectors and industries" (p. 439). Jacobsen and Zhang (2012) conduct the most comprehensive research study on the subject to include all available years in all countries for which data was available. They analyze more than 300 years of market information, and show that the Halloween indicator can be observed over the previous three centuries. Investors utilizing the "sell in May and go away" strategy during this period would have beaten the buy-and-hold strategy by more than 80% of the time.

Andrade, Chhaochharia, and Fuerst (2013) validate the existence of the Halloween indicator. They find that not only can the Halloween indicator still be observed in the stock market, but that trading strategies could be employed to capture the effect in foreign currency valuations, credit markets, and volatility risk premiums.

Despite the strong evidence presented by Bouman and Jacobsen (2002), Jacobsen and Zhang (2012), and Andrade, Chhaochharia, and Fuerst (2013), several scholars have postulated alternative explanations for the Halloween indicator. Most notably, Lucey and Zhao (2008) present contradictory evidence that attributes the difference in the two halves of the year to the January effect. They note that, specifically for markets with a smaller capitalization, the January effect is more pronounced. This higher than average single month return skews the data in favor of the November through April time period. To refute the January effect, Bouman and Jacobsen (2002) remove January from their data set and the results "reject the hypothesis that the [Halloween indicator] is the January effect in disguise" (p.1627). Jacobsen and Zhang (2012) identify the January effect as a regular occurrence beginning in 1830, but this anomaly alone does not explain the November through April return premiums.

Some argue that the Halloween effect is a result of data mining (Maberly & Pierce, 2004). In response to the data mining claim, Jacobsen and Zhang (2012) analyze the entire available data set spanning 300 years and their results refute the notion that the Halloween effect is a data-driven result. They show that the anomaly exists in markets across the globe in both developed and emerging markets and has remained consistent over time. Data mining could not explain a phenomenon that remains a pervasive reality.

Another possible explanation for the Halloween indicator anomaly is that November through April has a higher risk profile that naturally leads to a higher return. Bouman and Jacobsen (2002) show that risk, as measured by standard deviation, is actually higher in May-October than in November-April period for most countries in their sample.

A final explanation for the Halloween indicator is that during the summer months, investors take more vacation and this affects their trading strategy. Using the paid annual leave allowances of each country and estimated the outbound travel for each country by month, Bouman and Jacobsen (2002) find that vacation schedules could help explain the Halloween effect, but offer only a theoretical explanation as the quantitative evidence could not conclusively prove the connection.

This paper revisits the Halloween effect and investigates whether this anomaly can still be observed during and after the 2008 financial crisis. During this tumultuous period in financial history, housing prices in the U.S. fell by 30 percent over a three year period, which propagated a slew of foreclosures and mortgage defaults (Papagianis & Gupta, 2012). The crisis has been described as a "once in a lifetime event" (Russo & Katzel, 2011, p. 11) and continues to affect the global economy. The impact has been seen on global credit markets, gross domestic product of both developed and emerging nations, and the net worth of citizens, and the employment rates around the world. The importance of this time period was succinctly stated by Ben Bernanke, the Chairman of the Federal Reserve, "as a scholar of the Great

Depression, I honestly believe that September and October of 2008 was the worst financial crisis in global history" (Russo & Katzel, 2011, p. 11).

Given the extreme impact of the 2008 financial crisis, it would be interesting to study if the Halloween effect has survived or diminished in the fallout. It is extremely difficult and costly to identify a winning trading strategy in current stock market environment, especially during a bear market. If the Halloween Indicator effect continued to present during and after the financial crisis, it would be a treat rather than a trick to those who construct trading strategies focused on taking advantage of this anomaly.

This paper contributes to the literature in several different ways. First, we examine the existence of the Halloween effect during and after the most recent global financial crisis. We find that from May 2007 to October 2015, the Halloween indicator anomaly still presented in 34 out of the 35 countries examined. Statistical significance was found in only six of those countries however. The Halloween effect has not been arbitraged away over the years since its first discovery and is likely to persist in the near future.

Second, we propose an aggressive trading strategy that exploits the underperformance of the stock market in summer months. We name our strategy "summer short" and it includes shorting the market from May through October and taking a long position in the market in the winter months. This strategy beats the "sell in May and go away" strategy by 3.20% each year and the traditional buy-and-hold strategy by 4.77%. In this sense, the Halloween indicator is more a treat than a trick if utilized properly.

Third, this paper offers a new explanation of the Halloween indicator anomaly. This seasonal phenomenon is no longer a secret and investors should have become well aware of this anomaly. If investors in aggregate believe that the stock market will go down in May and rise again in November, they would liquidate their portfolios as summer approaches and return to the market after Halloween. This creates a positive feedback between investors' belief and behavior, causing the stock market to underperform in the summer months and recover in the winter months, thus making Halloween effect a self-fulfilling prophecy.

The rest of this paper is organized as follows. Section 2 describes the data and methodology used in this study. Section 3 presents the empirical results. Section 4 discusses the implication of our findings to investors and offers a possible explanation of the Halloween effect. We conclude in Section 5.

Data and Methodology

Bouman and Jacobsen (2002) use data from 37 countries over a period of 1977 to 1998. This study analyzes stock market returns of 35 of the original countries from 2007 to 2015 using a regression model that includes a seasonal dummy variable for the months of the Halloween indicator. Each month in November through April is assigned a value of 1 and May through October assigned a value of 0. This method allows for comparison of the mean market returns for each period. Our analysis is based on the following Halloween dummy regression model:

$$r_{it} = \mu_i + \alpha_i HI_t + \varepsilon_{it} \quad (1)$$

where r_{it} represents the stock market index return of a given country i for a specific month t. The variable μ_i represents the y-intercept for that country, while the α_i is the Halloween indicator coefficient to be esti mated. HI_t is the Halloween indicator dummy variable which takes the value of 1 in the winter months (N ovember – April) and 0 in the summer months (May – October). ε_{it} represents the error term. If the coeffic ient α_i is significantly positive, then the Halloween effect is present.

The data set used by Bouman Jacobsen (2002) came from the MSCI index for each country. The current study uses information from the World Federation of Exchanges (WFE). Data were collected beginning with the time period of May 2007 and include market returns through October 2015. This allows eight winter periods (November through April) and nine summer periods (May through October). Information on the stock market indices from this data set is available on 35 of the original 37 countries studied in Bouman and Jacobsen (2002). The 35 countries includes Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Denmark, Finland, France, Germany, Greece, Hong Kong, Indonesia, Ireland, Italy, Japan, Jordan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Philippines, Portugal, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, and USA. We

exclude Russia and United Kingdom because the stock market data for these two countries are not available from the World Federation of Exchanges website. 33 of these countries have 101 monthly data while Jordan has 92 and New Zealand has 44 monthly observations.

We estimate the Halloween dummy regression model using pooled data across all countries as well as country-by-country data. The pooled regression analysis allows us to test if the Halloween effect is present in the global equity market as a whole. The country-by-country analyses provide us a detailed picture of the Halloween effect for each country. A significantly positive α_i means that for country i, the stock market return in winter months (November through April) is higher than that in summer months (May through October), indicating the presence of the Halloween effect.

If the Halloween effect indeed exists, an investor can take advantage of it by shorting the stock market during the summer months instead of "selling in May and going away". So we propose a new aggressive trading strategy which includes a long position in the stock market from November to April and a short position in May through October. We then compare the returns from our trading strategy with the "sell in May and go away" strategy and the traditional buy-and-hold strategy over our sample period.

The buy-and-hold strategy is calculated as if an investor invests all of his/her funds in the market beginning in time period 1 (May 2007) and does not liquidate any holdings during the entire sample period (until October 2015). The returns are then calculated on an annualized basis. This strategy serves as a control and basis of comparison for the other two.

The Halloween strategy involves taking a long position in the stock market at the beginning of each November and then liquidating the entire portfolio by the end of the following April. The investor places his/her funds in low risk treasury bonds in summer months and then reinvests entirely in the stock market at the beginning of November. The return for this strategy are again calculated on an annualized basis.

The new strategy, which we name the summer short, involves a long position in the stock market during the winter months and a short position during the summer months. An investor takes a long position in the market at the beginning of each November and liquidates the long position at the end of the following April, just like the Halloween strategy. However, instead of investing in treasury bonds, the investor would use the fund taken out of the stock market as margin to short the market from May until October. For calculation purposes, returns for winter months in each country are calculated using the actual return on the stock market while returns in summer months are calculated using an inverse of the market return. This inverse represents the profit an investor would make if he/she takes a short position in the stock market. If the market declines in the summer months, the short position gains, and vice versa. In November, the investor covers the short position and takes a long position again in the stock market until the following April.

Figure 1 summarizes the positions taken by each of these trading strategies during the summer and winter months. Longing a market portfolio means that an investor puts all investment fund into a market portfolio or a broad market index EFT. Shorting a market index means that the investor uses fund taken out of the market portfolio as the margin to short sell a broad market index ETF. Longing Treasury bonds simply means buying treasury bonds.

TABLE 1
SUMMARY OF TRADING STRATEGIES

Strategy	November - April	May - October
Buy and Hold	Long a market portfolio	Long a market portfolio
Halloween Strategy	Long a market portfolio	Long Treasury bonds
Summer Short	Long a market portfolio	Short a market index

Following Bouman and Jacobsen (2002), we do not include transaction costs associated with market participation in our analysis. The transaction costs to enter and exit a position are estimated to be around 0.1% (Solnik, 1993) and would not significantly impact the results of these trading strategies.

RESULTS

We first calculate the average return in each month for each country over the entire sample period (May 2007 - October 2015). The results are presented in Table 2. The average summer month (May through October) returns are less than the average winter month (November through April) returns for all countries except Spain. That is, the Halloween effect was present in 34 out of the 35 countries studied. Globally, the average equity market return over the summer months is -0.39%, and is 1.26% during the winter months. This result is compelling, as the winter months delivered a return that was 9.90% higher than the summer months each year.

TABLE 2
EQUITY MARKET AVERAGE RETURNS (IN %) BY MONTH FOR EACH COUNTRY (MAY 2007 TO OCT. 2015)

Country	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	May-Oct.	Nov.-Apr.	Difference
Argentina	5.31	-1.71	5.01	3.83	2.24	-0.85	1.26	1.47	4.00	0.03	-1.77	1.97	1.36	2.10	0.75
Australia	-1.43	1.66	0.61	1.67	-1.73	-2.25	2.12	0.02	-0.91	0.88	-2.55	1.02	-0.31	0.16	0.48
Austria	0.14	0.56	1.46	3.07	-0.37	-2.97	-0.12	-0.53	-3.37	-2.18	-2.41	1.35	-1.59	0.70	2.29**
Belgium	-1.03	1.92	1.03	1.58	-0.16	-2.17	0.25	0.50	-0.47	-1.74	-2.52	2.25	-0.63	0.54	1.17
Brazil	-1.92	2.00	1.65	3.91	-1.10	-2.62	-0.14	0.67	0.12	-0.30	-0.68	0.50	-0.56	0.91	1.47
Canada	0.12	1.11	0.58	1.71	1.11	-1.45	0.32	-0.33	-1.23	-0.82	-0.63	0.61	-0.40	0.58	0.98
Chile	0.22	1.55	0.53	2.55	1.23	0.52	-1.10	-0.69	-0.29	1.11	-1.93	0.36	0.13	0.55	0.42
Denmark	2.90	3.60	-0.12	3.44	1.08	-2.21	2.98	-1.37	-1.08	-1.66	-0.74	0.67	-0.38	1.62	2.00*
Finland	0.81	0.57	0.24	0.64	-0.85	-3.78	1.09	0.08	-0.12	-0.18	-0.82	0.70	-0.63	0.36	0.98
France	-0.81	1.29	1.02	2.30	-0.71	-2.82	1.47	-1.20	-0.74	-0.47	-1.12	1.33	-0.74	0.67	1.41
Germany	-1.36	0.87	1.82	2.26	-0.80	-1.94	1.49	-2.77	-0.09	0.54	0.77	1.87	-0.59	1.04	1.63
Greece	1.13	-0.28	3.28	-1.90	-3.28	-4.38	1.90	-4.74	0.42	-0.56	-5.65	-1.57	-1.77	-0.83	0.94
Hong Kong	-1.85	1.46	-1.21	5.27	-0.56	-1.34	3.83	-3.63	0.14	2.99	-1.63	0.42	0.24	0.41	0.17
Indonesia	-0.01	1.98	3.42	2.76	1.36	0.23	4.07	-3.84	0.56	-0.89	-1.06	3.35	0.25	1.74	1.49
Ireland	1.12	2.55	1.61	3.57	-0.77	-3.16	-1.71	-0.11	-2.21	-2.35	-2.20	2.00	-1.72	1.44	3.16***
Italy	0.78	-0.45	1.20	3.31	-2.18	-3.71	0.85	-1.17	-0.59	0.08	-3.09	0.70	-1.12	0.41	1.53
Japan	-1.07	2.35	0.44	3.22	-0.33	0.51	-0.39	-3.64	-1.38	-2.79	0.33	3.13	-1.34	1.40	2.74**
Jordan	0.97	-0.77	0.10	0.32	0.07	-0.73	-1.19	-1.93	-0.91	-2.20	-1.62	0.75	-1.15	-0.04	1.11
Korea	-1.41	0.13	3.63	3.37	0.18	-0.50	2.24	-2.68	1.78	-2.43	-1.50	2.14	-0.23	1.06	1.29
Malaysia	68.95	0.53	0.22	2.54	0.63	-0.07	1.49	-2.87	0.11	1.10	-1.07	1.96	0.06	12.19	12.12***
Mexico	-3.48	-0.36	3.87	0.75	1.95	-0.17	1.08	-0.88	0.03	0.24	1.19	2.64	0.38	0.77	0.39

TABLE 2 - (CONT.)

Country	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	May-Oct.	Nov.-Apr.	Difference
Netherlands	-1.40	0.97	1.16	1.85	0.22	-2.13	1.73	-2.15	-1.08	-0.79	-1.59	2.78	-0.70	0.63	1.33
New Zealand	3.56	1.61	2.53	1.71	-0.79	-1.65	2.45	0.07	2.41	3.14	0.31	0.91	0.94	1.77	0.83
Norway	-2.37	2.50	1.14	3.35	-0.41	-2.04	1.40	-2.12	-1.38	0.05	-1.83	3.37	-0.75	1.03	1.78*
Philippines	0.02	2.21	2.74	1.90	1.66	-0.40	2.86	-1.08	1.23	0.54	-1.24	0.45	0.80	1.01	0.21
Portugal	-0.23	1.54	1.35	1.90	0.18	-2.96	-1.22	-0.63	-1.16	-1.23	-1.84	0.65	-1.17	0.56	1.73*
Singapore	26.36	-0.82	2.45	2.97	1.29	-0.75	3.24	-4.45	-0.72	-1.64	-1.32	1.31	-0.50	5.16	5.66***
South Africa	-0.81	1.71	1.36	1.65	1.07	-1.83	1.80	-0.20	-0.37	2.36	0.30	1.13	0.47	0.89	0.42
Spain	-1.87	-1.08	0.05	1.33	-2.03	-0.60	2.25	-1.20	0.77	0.11	-2.52	1.07	-0.12	-0.50	-0.39
Sweden	-0.27	3.42	0.71	2.93	-0.74	-3.05	2.60	-2.31	-0.83	-0.54	0.02	2.04	-0.81	1.47	2.29**
Switzerland	-1.61	1.15	0.69	1.01	-0.16	-2.60	1.87	-0.39	-0.01	0.43	-0.56	0.03	-0.14	0.12	0.26
Taiwan	-2.09	3.00	2.97	2.80	0.92	-1.94	0.67	-2.50	-0.06	-1.58	-2.13	3.11	-0.75	1.28	2.02*
Thailand	-0.98	3.56	1.87	3.29	0.53	0.95	1.83	-0.58	0.57	-1.97	-0.99	2.44	0.22	1.53	1.31
Turkey	-2.50	-1.51	3.99	6.51	-1.29	-0.36	5.97	-3.05	2.68	0.22	-2.48	1.81	0.70	0.97	0.27
USA	-1.87	0.73	1.85	2.89	-0.47	-1.66	1.38	-1.38	-0.31	0.03	-0.24	1.21	-0.40	0.76	1.16
All Country Average	2.34	1.13	1.58	2.46	-0.09	-1.62	1.45	-1.47	-0.13	-0.36	-1.34	1.44	-0.39	1.26	1.65*

*, **, and *** denote the significance of paired t-test of summer and winter mean returns at the 10%, 5%, and 1% respectively.

The strength of the Halloween effect varies widely across regions as seen in Table 3. The average monthly return from May to November in European countries is -0.68%, with no country having a positive market return in summer months during our sample period. During the winter months, by contrast, the monthly average return in Europe is 0.83%, representing an average of 1.51% (or 9.06% annually) stock market improvement over the summer months. Spain is the only European country where the market returns are higher in summer than in winter months. Despite having the highest summer month return (-0.13%) of all European nations, the average winter return for Spain is -0.50%.

TABLE 3
AVERAGE SUMMER AND WINTER RETURNS BY REGION

Region	May - October	November - April	Difference
Europe	-0.68%	0.83%	1.51% (9.06% annualized)
America	0.16%	1.21%	1.05% (6.30% annualized)
Asia	-0.11%	2.48%	2.59% (15.54% annualized)

The Halloween effect is weakest in North and South America, with a return difference of only 1.05% a month in winter and summer months. Asian countries represent the largest swing in this seasonal pattern. The average monthly return from May to October is -0.11% and from November to April is 2.48%, representing a persistent over-performance of 2.59% per month or 15.54% annually in the winter over the summer months. The Halloween indicator is most pronounced in Malaysia with a return difference of 12.12% and Singapore with 5.66% from summer to winter.

Table 4 reports the pooled and country by country estimates of the Halloween dummy regression model in Equation (1). The sixth column shows the Halloween coefficient estimates in percentage (%). Since the independent variable is a dummy that takes one for winter months and 0 for the summer months, the coefficient estimates for this Halloween dummy variable are algebraically identical to the return differences between winter and summer months. For the pooled regression, the coefficient estimate is 1.65% and is significant at the 1% level, meaning that the mean monthly return for the November -April period is 1.65% higher than that for the May - October period. Country by country analysis shows that the Halloween indicator coefficients are positive in 34 of the 35 countries, reaffirming the prevalent existence of the Halloween effect.

The eighth column shows the t-values of the corresponding coefficient. For comparison, we also provide the Halloween coefficient estimates and t-values reported in Bouman and Jacobsen (2002) for each country in the fifth and seventh columns. Our coefficient estimate for each country is very similar to Bouman and Jacobsen (2002). But our sample period is about one decade apart from their sample period. This means that the Halloween effect has not been arbitraged away and is likely to persist in the near future. Among 34 countries where the Halloween indicator can be observed, Austria, Denmark, Ireland, Japan, Sweden, and Taiwan have statistically significant coefficient estimates.

The presence of the Halloween indicator in 34 out of the 35 countries is economically significant. Had an investor employed the Halloween strategy in these nations, the returns would have been higher than the buy-and-hold strategy. Table 5 shows the annualized returns of the buy-and-hold, Halloween strategy, and summer short strategies in each country from May 2007 to October 2015. The average annual return from the buy-and-hold strategy is 1.60% over this eight-year period. Utilizing the Halloween strategy would have given an investor 3.17% return, which represents a 1.57% improvement over the buy-and-hold strategy.

TABLE 4
POOLED AND COUNTRY BY COUNTRY HALLOWEEN DUMMY REGRESSION MODEL (MAY 2007 TO OCTOBER 2015)

Market	*N*	Mean	Standard Deviation	Original a_i (Bouman & Jacobsen, 2002)	a_i	Original *t-value* (Bouman & Jacobsen, 2002)	*t-value*
A. Pooled Analysis							
Global	3469	0.40%	11.67%		1.65		4.18***
B. Country by Country Analysis							
Argentina	101	1.73%	9.52%	0.51	0.72	0.11	0.38
Australia	101	-0.10%	4.39%	0.96	0.50	2.71	0.57
Austria	101	-0.50%	6.58%	1.57	2.28	1.36	1.75*
Belgium	101	-0.06%	5.05%	2.31	1.15	4.67	1.14
Brazil	101	0.14%	6.56%	6.50	1.48	1.7	1.13
Canada	101	0.07%	3.96%	1.14	0.98	2.12	1.24
Chile	101	0.32%	4.12%	1.49	0.43	1.13	0.53
Denmark	101	0.59%	5.45%	0.34	1.98	0.64	1.84*
Finland	101	-0.16%	5.90%	2.20	0.99	1.54	0.84
France	101	-0.08%	5.18%	2.31	1.42	3.62	1.38
Germany	101	0.17%	5.65%	1.38	1.65	2.44	1.48
Greece	101	-1.34%	10.87%	3.34	0.96	1.77	0.44
Hong Kong	101	0.29%	6.81%	0.84	0.22	0.72	0.16
Indonesia	101	0.97%	6.58%	2.67	1.47	1.15	1.13
Ireland	101	-0.21%	6.47%	2.60	3.15	2.57	2.50**
Italy	101	-0.41%	6.12%	2.70	1.55	3.56	1.27
Japan	101	-0.02%	5.68%	1.52	2.71	2.62	2.45**
Jordan	92	-0.60%	3.99%	1.05	1.08	1.36	1.31
Korea	101	0.40%	5.65%	1.03	1.25	0.62	1.11
Malaysia	101	5.82%	55.18%	2.59	12.14	1.71	1.11
Mexico	101	0.56%	4.78%	1.26	0.39	0.76	0.40
Netherlands	101	-0.07%	5.57%	1.88	1.33	3.58	1.20
New Zealand	44	1.30%	2.28%	-0.45	0.95	-0.4	1.40
Norway	101	0.09%	6.40%	1.23	1.79	1.51	1.41
Philippines	101	0.90%	5.66%	2.64	0.21	1.67	0.18
Portugal	101	-0.35%	5.65%	1.65	1.73	1.48	1.55
Singapore	101	2.20%	21.36%	1.84	5.64	2.05	1.33
South Africa	101	0.65%	4.54%	0.76	0.45	0.89	0.50
Spain	101	-0.30%	6.21%	1.88	-0.38	2.92	-0.31
Sweden	101	0.27%	5.16%	2.17	2.29	3.32	2.27*
Switzerland	101	-0.02%	3.91%	1.08	0.27	2.01	0.35
Taiwan	101	0.22%	6.07%	5.57	2.01	2.63	1.67*
Thailand	101	0.87%	6.39%	2.73	1.27	1.39	1.00
Turkey	101	0.83%	8.17%	1.81	0.27	0.63	0.16
USA	101	0.15%	5.05%	0.93	1.17	1.95	1.16

TABLE 5
ANNUALIZED RETURN IN PERCENTAGE OF BUY-AND-HOLD, HALLOWEEN, AND SUMMER SHORT TRADING STRATEGIES (MAY 2007 TO OCTOBER 2015)

Country	Buy-and-hold	Halloween Strategy	Summer Short	Summer Short over Buy-and-hold	Summer Short over Halloween Strategy
Argentina	16.44	20.26	-2.33	-18.77	-22.59
Australia	-2.31	-0.76	1.92	4.23	2.69
Austria	-8.38	-6.94	12.15	20.53	19.09
Belgium	-2.31	-0.92	5.58	7.89	6.51
Brazil	-0.98	1.66	6.49	7.47	4.83
Canada	-0.10	1.51	5.01	5.11	3.50
Chile	2.86	3.88	1.39	-1.47	-2.49
Denmark	5.36	5.94	10.26	4.90	4.32
Finland	-3.99	-2.80	4.10	8.08	6.90
France	-2.51	-1.04	7.20	9.70	8.24
Germany	0.10	2.09	8.26	8.16	6.17
Greece	-20.96	-18.78	-0.38	20.58	18.39
Hong Kong	0.72	4.29	-1.57	-2.30	-5.86
Indonesia	9.29	11.73	5.89	-3.40	-5.84
Ireland	-4.97	-5.19	18.04	23.01	23.23
Italy	-6.90	-6.09	7.61	14.51	13.70
Japan	-2.20	-0.78	15.46	17.65	16.24
Jordan	-7.87	-7.47	5.87	13.75	13.34
Korea	2.91	3.89	5.55	2.64	1.65
Mexico	28.90	30.64	28.21	-0.69	-2.43
Netherlands	5.53	6.02	0.62	-4.91	-5.40
New Zealand	-2.70	-1.08	6.38	9.08	7.46
Norway	16.41	17.41	4.71	-11.70	-12.70
Philippines	-1.54	-0.23	8.68	10.22	8.90
Portugal	9.26	10.73	-1.21	-10.48	-11.95
Singapore	-5.96	-4.24	9.09	15.05	13.33
South Africa	14.16	17.22	21.34	7.19	4.12
Spain	6.80	7.86	1.09	-5.71	-6.77
Sweden	-5.79	-3.79	-4.36	1.43	-0.57
Switzerland	1.67	3.16	12.78	11.11	9.62
Taiwan	-1.21	-0.45	0.72	1.93	1.17
Thailand	0.45	2.66	10.22	9.77	7.57
Turkey	8.12	9.72	4.83	-3.29	-4.89
USA	6.13	7.69	-2.89	-9.02	-10.58
Average	1.60	3.17	6.37	4.77	3.20

The more aggressive summer short strategy would yield an annualized return of 6.37%. It beats the Halloween strategy by 3.20% each year and the traditional buy-and-hold strategy by 4.77%. The summer short strategy would have been more profitable than the Halloween strategy in 23 out of the 35 countries and more profitable than the buy-and-hold strategy in 24 out of the 35 countries. In this sense, the Halloween effect, if incorporated properly into a trading strategy, can be more a treat than a trick.

Discussion

According to Jacobsen and Zhang (2012), the Halloween indicator anomaly can be observed dating back to the seventeenth century. Haggard and Witte (2010) confirm the existence of this anomaly in the US stock market in the period of 1954 - 2008. We show that the phenomenon still exists globally during and after the 2008 financial crisis. Despite its presence in 34 of the 35 countries studied here, fewer than half of the original countries studied by Bouman and Jacobsen (2002) maintain the claim of statistical significance. This decrease in statistical significance does not necessarily mean the Halloween effect will diminish in the near future.

Implications for Investors

The Halloween indicator puzzle sparked a debate in the literature that continues today. Some scholars have challenged the validity of its occurrence, while others have challenged the explanations. Still others have re-affirmed the reality of this seasonal market pattern and analyzed the anomaly in industry specific studies such as gold (Baur, 2013), security specific studies like mutual fund performance (Vidal-Garcia, 2014), or geographic focus (Bampinas, Fountas, & Panagiotidis, 2015).

Research on the subject is important in that it provides investors insights in how to approach the seasonal movements in the stock markets around the world. If this seasonal anomaly persists, investors can take advantage of it and design a winning trading strategy. The buy-and-hold strategy over time is profitable, but it comes at the opportunity cost of lower returns in the summer months. The Halloween strategy is more profitable, but it also carries an opportunity cost as there might be alternatives that offer a better return than treasury bonds. Our proposed summer short strategy allows an investor to capture both the rising market in winter months and the falling market in the summer, making it the most profitable among three trading strategies.

Self-fulfilling Prophecy Explanation

Several explanations have been offered to explain the Halloween effect. However, scholars are still debating why this market anomaly occurs over and over again. The phenomenon is no longer a secret, and perhaps never was. Why has it not been arbitraged away over the years since its first discovery? Fama (1998) claims that long-term market anomalies tend to disappear as part of an efficient market. Some investors will overreact while others will underreact, making an anomaly less likely to persist over a long time. But this clearly has not been the case with the Halloween effect.

The Halloween indicator is regularly referred to as a puzzle and is still a research question that intrigues the academic community. The explanations postulated in recent years include 1) the use of data mining to produce results consistent with the Halloween indicator, 2) higher returns in winter reflecting higher risks that some investors are not willing to take, 3) the high impact of the January effect, 4) interest rate changes by financial administrators, 5) sector specific anomalies such as agriculture driving the overall market in these directions, and 6) summer vacations limiting the trade volume of market indices. We think behavioral finance could offer a new explanation which helps inform the discussion on the subject.

Behavioral finance combines both cognitive and social psychology with finance and economics. Rational investors make decisions that collectively represent the aggregate of a market. We propose that the Halloween indicator could be the result of self-fulfilling prophecy by investors. Investors believe that the market will start going down in May and rise again in November, so they ride the rising stock market in the winter months and stay away from the market in the summer months. This positive feedback

between investors' belief and behavior causes the Halloween effect to occur year after year, making it a self-fulfilling prophecy.

The self-fulfilling prophecy explanation is different from the summer vacation explanation. Bouman and Jacobsen (2002) argue that investors tend to reduce their equity holdings before their summer vacations, usually between May and October, which in turn lowers the stock market's returns during summer months. We argue that, in anticipation of the summer sell off, investors begin to liquidate major legs of their portfolios in the beginning of May, which puts downward pressure on the stock market. Investors return to the market in the fall, creating higher demand for stocks and hence upward price movement.

We classify the explanations of the Halloween indicator into two categories, factor-based explanations, and behavior-base explanations. Some scholars show that external factors, such as interest rates, weather, or political climate may cause the seasonal pattern in stock market returns. Both self-fulfilling prophecy and summer vacation explanations attribute Halloween effect to investors' behavior. Table 6 summarizes the possible factor- and behavior-based explanations for the presence of the Halloween effect.

TABLE 6
POSSIBLE EXPLANATIONS OF THE HALLOWEEN EFFECT

Factor-based	Behavior-based
Interest Rates (Siddiqui, 2003)	Summer Vacations (Bouman & Jacobsen, 2002)
Weather (Jacobsen & Marquering, 2008)	Self-fulfilling prophecy (This paper)
January Effect (Lucey & Zhao, 2008)	
Impact of outliers (Rahman & Amri, 2011)	
Political climate (Powell *et al,* 2011)	

CONCLUSION

Finance research has shown that stock market returns during the winter months (November through April) are higher than that during the summer months (May through October), which is referred to as Halloween indicator. Using a Halloween dummy regression model, this paper finds that from May 2007 to October 2015, the Halloween indicator anomaly is still presented in 34 out of the 35 countries examined. Statistical significance was found in only six of those countries however. There is little evidence that the Halloween effect will diminish in the near future.

We propose a new trading strategy which utilizes a more aggressive arbitrage approach to exploit the Halloween effect. Our strategy which includes shorting the equity market from May through October and taking a long position in the market in the winter months would yield an annualized return of 6.37% during and after the 2008 financial crisis period. This strategy beats the Halloween strategy by 3.20% each year and the traditional buy-and-hold strategy by 4.77%.

This paper also offers a new explanation of the Halloween indicator anomaly. Under the assumption of efficient market theory and rational expectations, investors may have become well aware of this anomaly, and they believe that the stock market will go down in May and rise again in November. So

they liquidate their portfolios as summer approaches and return to the market after Halloween. This positive feedback between investors' belief and behavior causes the stock market to underperform in the summer months and recover in the winter months, thus making Halloween effect a self-fulfilling prophecy.

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