The Other January Effect: Evidence Against Market Efficiency?

Ben R. Marshall
Massey University
B.Marshall@massey.ac.nz

Nuttawat Visaltanachoti*
Massey University
N.Visaltanachoti@massey.ac.nz

Abstract

The Other January Effect (OJE), which suggests positive (negative) equity market returns in January predict positive (negative) returns in the following 11 months of the year, underperforms a simple buy-and-hold strategy before and after risk-adjustment. Even the best modified OJE strategy, which benefits from several ex-post adjustments, does not generate statistically or economically significant excess returns. When the OJE is tested with a method that is consistent with investor experience it is clear the OJE is no more profitable than an 11-month strategy that uses November or December as the conditioning month.

JEL Classification: G10, G11, G12, G14
Keywords: Other January Effect, January Barometer, Seasonality, Return Predictability, Quantitative Investment

First Version: 29 September 2007
This Version: 2 February 2010

* Corresponding Author. Department of Economics and Finance, Massey University, Private Bag 102904, NSMC, Auckland, New Zealand, Tel: 64 9 4140800 Ext. 9460, Fax: +64 9 441 8177, N.Visaltanachoti@massey.ac.nz. We thank seminar participants at the 2009 New Zealand Finance Colloquium, Massey University, Victoria University, Canterbury University, the Australian National University, AUT University, and especially Henk Berkman, Utpal Bhattacharya, Glenn Boyle, Roberto Gutierrez, Ben Jacobsen, Martin Lally, Wayne Mikkelson, Kuntara Pukthuanthong, Richard Roll, Larry Rose, Tom Smith, Jeffrey Stangl, Laura Starks, Russ Wermers, Jeff Wongchoti, and Fei Wu for valuable comments.

The Other January Effect: Evidence Against Market Efficiency?

Abstract

The Other January Effect (OJE), which suggests positive (negative) equity market returns in January predict positive (negative) returns in the following 11 months of the year, underperforms a simple buy-and-hold strategy before and after risk-adjustment. Even the best modified OJE strategy, which benefits from several ex-post adjustments, does not generate statistically or economically significant excess returns. When the OJE is tested with a method that is consistent with investor experience it is clear the OJE is no more profitable than an 11-month strategy that uses November or December as the conditioning month.

JEL Classification: G10, G11, G12, G14
Keywords: Other January Effect, January Barometer, Seasonality, Return Predictability, Quantitative Investment

First Version: 29 September 2007
This Version: 2 February 2010

1. Introduction

The Other January Effect[1], which suggests positive (negative) returns in January predict positive (negative) returns in the remaining 11 months of the year, is shown to be a remarkably simple yet powerful prediction tool in recent studies by Brown and Luo (2006), Cooper, McConnell, and Ovtchinnikov (2006), Stivers, Sun, and Sun (2009), and Sturm (2009).[2] We build on these important papers by investigating whether the Other January Effect (hereafter OJE) can be implemented by investors to earn risk-adjusted excess returns. In doing so, we are effectively considering whether the OJE is evidence against the efficient market hypothesis. As Schwert (2003, p. 942) notes, "if anomalous return behavior is not definitive enough for an efficient trader to make money trading on it, then it is not economically significant". Fama (1991, p. 1575) describes this version of the efficient market hypothesis, which dates back to Jensen (1978), as "economically more sensible."

To be sure, we are not criticizing previous OJE papers. These show that, on average, 11-month returns following positive Januaries are larger than 11-month returns following negative Januaries, and that this "spread" cannot be explained by standard asset pricing models. We verify this result before turning our attention to the question of whether the OJE can be used to earn economic profits, which is something these earlier OJE papers have not addressed. If the OJE market timing technique can be used to exploit market inefficiency, then portfolio managers, individual equity investors, the management of listed companies looking to raise additional equity and private companies considering an IPO should all take the sign of the January return (and the corresponding 11-month OJE return prediction) into account when

[1] The Other January Effect is referred to as the "January Barometer" by financial media. We follow recent papers and use the term the "Other January Effect" throughout this paper. Ironically, the "Other" January Effect (named the January Barometer at the time) was, according to Cooper, McConnell, and Ovtchinnikov (2006), documented by Hirsch as early 1974 yet the January effect was not documented until Rozeff and Kinney (1976).

[2] All four papers find evidence of OJE predictive ability in US indices. Brown and Luo (2006) find negative Januaries give more useful predictions than positive Januaries. Stivers, Sun, and Sun (2009) show the power of the OJE has declined over time and it is less useful internationally. Sturm (2009) finds the OJE is particularly powerful in the first year of presidential terms.

making their decisions. Alternatively, if the OJE does not generate economic profits then those currently using the OJE should reconsider their faith in this timing tool.

Our approach is consistent with many other strands of the return predictability literature, where an original study which documents predictability is followed by subsequent work which considers implementation issues. For example, Cooper, Gutierrez, Marcum (2005) test whether the predictability of book-to-market equity, size, momentum, and beta, as shown by previous authors, can be used by an investor to form a portfolio that outperforms a passive index. Lesmond, Schill, and Zhou (2004) show an investor who attempts to exploit the momentum predictability documented by Jegadeesh and Titman (1993) incurs large transaction costs, which erode the majority of profits.[3] More recently, Chordia, Goyal, Sadka, Sadka, and Shivakumar (2009) question whether the predictability of post-earnings announcement drift, as documented by Ball and Brown (1966), can be profitably exploited by investors due to the transaction costs incurred.

On the face of it, the OJE would appear to be compelling evidence against market efficiency. Previous papers report average differences in 11-month returns following positive and negative Januaries that are frequently in excess of 10%. Moreover, unlike many "anomalies", the OJE is easy to implement. It only gives one signal per year so transaction costs are considerably lower than those in many quantitative strategies. Most interpret it to relate to market indices so short positions can be easily created. Finally, the information required to open a position, namely the January return, is readily available. These last two features imply the gross profits generated by the OJE need not be very large to offset the costs incurred in implementing it.

We therefore suggest it is somewhat surprising to discover, as we do, that the OJE is not evidence against market efficiency. We show the OJE cannot be implemented to earn risk-

[3] Korajczyk and Sadka (2004, p. 1072) also note that accounting for transaction costs results in a large decline in the "apparent profitability" of many momentum strategies, although these do not fully account for the profits attributed to some momentum strategies.

adjusted excess returns. OJE returns are neither economically nor statistically significantly different to buy-and-hold returns, and OJE strategy Sharpe Ratios are inferior to buy-and-hold Sharpe Ratios. It seems clear that followers of the OJE interpret it as implying that a negative January indicates an 11-month return that is negative rather than one that is simply less than the 11-month return following positive Januaries. Hensel and Ziemba (1995a, p. 188) quote Hirsch (1986), who appears to have been the first to propose the OJE, as follows "The supposition is that: If the market rises in January, then it will also rise during the rest of the year; but if it falls in January, then there will be a decline during the rest of the year." This implies the most logical way to exploit the OJE is to observe the January return and take an 11-month long (short) position following positive (negative) Januaries. It also seems clear the OJE was intended to be implemented by remaining out of the equity market in January while the January return is being observed.[4] However, so as not to be accused of testing a "straw man" version of the OJE, we also test three major variations of the standard long T-bills in January then long (short) 11-month equity market position following positive (negative) Januaries OJE strategy. These include: 1) staying long (short) the equity market for 12 months (February – January) following an OJE signal, 2) always being long the equity market in January and long (short) the equity market for February – December based on the actual January return, and 3) always being long the equity market in January, being long the equity market for February – December following a positive January, and being long T-bills for 11 months following negative Januaries.

Variation one and two helps the OJE by letting it sometimes and always respectively capture the January return, which tends to be positive on average due to the January Effect. Variation three further improves the OJE by limiting losses on its short positions. We acknowledge these variations, which are made after observing how the OJE performed,

[4] Proponents of the OJE never suggest an investor should remain invested in January, which is unsurprising given the January Effect was not known when the OJE was first proposed.

involve data mining bias[5] but we feel their inclusion strengthens our argument regarding the OJE not being evidence against market efficiency.[6] Neither the standard OJE strategy nor any of its modified versions generate returns on that are statistically or economically significantly different from buy-and-hold returns. It is also not possible for an investor to profitably adopt the OJE in international equity indices.

There are four factors that contribute to the underperformance of the OJE compared to a simple passive buy-and-hold strategy despite the predictive ability documented previously in the literature based on the simple spread approach. Firstly, the simple spread is not consistent with the average return earned by an investor over February – December periods. For instance, assume that during a three-year period January returns are positive in the first two years and the 11-month (February – December) returns are 8% for both these years. Assume the third year has a negative January return and an 11-month return of 1%. Based on these numbers the simple spread is 7% (8%-1%) but anyone adopting the OJE would experience an average return, or weighted spread of 5% ([8%×2/3 - 1%×1/3]). We show the actual average 11-month return earned by an OJE investor is lower than the 11-month spread.

Secondly, the simple spread approach does not consider the January return which a passive investor earns, but an OJE investor foregoes. Thirdly, the OJE gives inaccurate signals to short the market. 11-month returns following negative Januaries (i.e. periods when the OJE is short the market) are positive on average so a passive investor who is always long the market earns these returns but anyone adopting the OJE would incur losses on their short positions during these periods.

Even though they are positive on average, 11-month returns following negative Januaries are smaller than 11-month returns following positive Januaries. This raises the

[5] See Lo and MacKinlay (1990) and Sullivan, Timmermann, and White (1999, 2001).
[6] We only modify the OJE in ways that improve its performance. For instance, a strategy of always being short in January and long or short based on the OJE for the remaining 11 months would be more unprofitable than the original OJE strategy so we do not include it.

possibility of an investor being able to benefit from a modified OJE strategy which is always long the equity market in January, long the equity market for February – December following positive Januaries, and long T-bills for 11-month periods following negative Januaries.[7] This heavily modified OJE strategy is identical to the passive buy-and-hold approach at all times other than February – December periods following negative Januaries. The modified OJE investor is long T-bills during these periods while the passive investor is long the equity market. We find this modified strategy also does not out-perform the passive strategy. This represents the fourth factor behind the OJE not out-performing. Namely, 11-month T-bill returns have only been marginally larger than 11-month equity market returns during periods following negative Januaries so an investor following the modified OJE strategy would not have received profits that are either statistically or economically significantly larger than those earned by a buy-and-hold investor. Moreover, the investor following this modified OJE strategy would also not have earned statistically significant excess risk-adjusted returns.

After completing our analysis we become aware of a recent paper by Cooper, McConnell, and Ovtchinnikov (2009)[8] that also considers whether the OJE can be implemented to earn abnormal returns. There are numerous differences between our papers, including the conclusion. They conclude (p. 18) "the January Barometer does appear to provide useful information for would-be investors, or, at least historically, it would have contained useful information", whereas we conclude the OJE has not been a useful tool for investors. This difference in conclusions appears to be due to at least two factors. Firstly, we consider the statistical significance of the difference in raw and risk-adjusted returns to the data-mined modified OJE / T-bill strategy versus the buy-and-hold approach and find there is no statistical significance. Secondly, we have different interpretations of the economic

[7] We thank Richard Roll for pointing this out to us.
[8] We have been told this paper had been accepted by the *Journal of Investment Management*, but this version is not available online so we cite and quote the July 2009 working paper version, which is available at: http://ssrn.com/abstract=1436516

significance (or lack thereof in our case) of the less than 0.5% p.a. (pre-transaction cost adjustment) excess returns generated by the best of the modified OJE strategies.

Other differences include our inclusion of international results, which demonstrate the OJE cannot be profitably implemented internationally. We also use the Manipulation-Proof Performance Measure, which Ingersoll, Spiegel, Goetzmann, and Welch (2007) demonstrate overcomes deficiencies in Sharpe Ratio analysis. Our paper also contains a novel approach of comparing the profitability of the OJE with 11-month strategies based on other conditioning months, from an investor perspective, which demonstrates the OJE is no more profitable than an 11-month strategy using November or December as the conditioning month. Finally, we show the OJE does not add value when applied to individual stocks. We compare and contrast our results with those of Cooper, McConnell, and Ovtchinnikov (2009) throughout the paper.

The remainder of this paper is organized as follows. Section 2 provides evidence of the current focus on the OJE in the popular press and a discussion of the academic papers that have investigated the OJE. Our methodology and results are presented in Section 3. Section 4 concludes the paper.

2. Background on the OJE

In this section we provide evidence of the current focus on the OJE in the popular press, discuss the academic literature, and consider possible explanations for the existence of the OJE. As noted previously, many practitioners refer to the OJE as the "January Barometer" so we use this term in this section where we are quoting others.

2.1. Practitioner Focus

The OJE has been the subject of widespread media attention since its first mention by

Yale Hirsch in his Stock Traders' Almanac publication in the 1970s. Selections of the headlines of stories devoted to it in early 2009 are included below:

"History shows January to be a bellwether of year's returns (*Providence Journal*, 11 January, 2009).

"As goes January, so goes the year? S&P has worst January drop ever in month known to predict market direction" (Nick Godt, *MarketWatch*, 15 January 2009).

"'January Barometer Bodes Ill For '09. Or Does It?" (Rob O'Brien, *Barrons*, 30 January 2009).

"Bad January likely means bad '09 for stocks" (Kathleen Pender, *San Francisco Chronicle*, 3 February, 2009).

"January Barometer Says Rain" (Levi Folk, *National Post*, 3 February, 2009).

2.2. Academic Papers

Four recent papers have found the OJE is an effective prediction tool when applied to US equity indices.[9] In a very comprehensive study, Cooper, McConnell, and Ovtchinnikov (2006) consider the ability of the OJE to predict returns from the perspective of the simple spread between 11-month returns following positive and negative Januaries in the US and find it has substantial power. They focus on the 1940 – 2003 period but they consider the robustness of their result using NYSE data dating back to 1825. Cooper, McConnell, and Ovtchinnikov (2006) find the OJE does not appear to only be evident in portfolios of risky stocks. They show it works in small and large stocks, value and growth stocks and persists after adjustment for business cycle and macroeconomic variables, investor sentiment, and the presidential cycle in stock returns. Brown and Luo (2006) consider the performance of the OJE in the US over a very similar period (1941 – 2003) and also find it has predictive ability.

[9] The earlier evidence is less conclusive. Hensel and Ziemba (1995a) find the OJE is an effective market timer but Fuller (1978) finds it is ineffective. However these papers do not consider the risk-adjusted performance of the OJE so their conclusions are difficult to relate to those from more recent studies.

More recently, Stivers, Sun, and Sun (2009) find, using the simple spread approach, the power of the OJE in US indices has declined since it was published in the early 1970s but it is remains a useful market timing technique in the 1975 – 2006 period. Finally, Sturm (2009) shows (using the simple spread approach) the OJE is particularly powerful in the first year of the presidential cycle.

Hensel and Ziemba (1995b), Bohl and Salm (2007), Easton and Pinder (2007), and Stivers, Sun, and Sun (2009) consider the performance of the OJE in international markets. The consensus from this work is that the OJE has limited timing ability internationally. However, the question of whether the OJE can be profitably implemented in any international market has not been addressed. Rather, the three most recent papers apply the 11-month simple spread approach, which, as we explained in the introduction, is not consistent with investor experience. This paper shows the OJE cannot be profitably implemented in the US or any international market.

2.3. Explanations

Any anomaly which lacks a theoretical explanation is particularly exposed to the criticism that it is simply a statistical illusion so many researchers have turned their attention to potential explanations for anomalies. For instance, Hong and Stein (1999) develop the gradual information diffusion hypothesis where investors react slowly to information, as an explanation for the momentum effect. To the best of our knowledge there are no conclusive explanations for the OJE. However, we briefly discuss practitioner claims regarding the factors behind the OJE. Little and Albrecht (2006, p.3) state:

"The major marginal players in world equity markets are the major institutions. Powerful investment committees run these institutions. Calendar years for most start in January and the first investment results appear before these powerful committees in early February. These committees cannot afford to ignore what seems to be working. They launch funds in what seem to be "hot" areas and allocate assets to likely winners, pushing up prices in those sectors.

So – the argument goes – if you see what's been working at the end of January, you get an "inside feel" for what might work for the rest of the year."

Such behavior by investment committees appears consistent with Representativeness Bias, which was introduced by Kahneman and Tversky (1974). In other words, investors try and determine if it will be a positive year for the equity market via the use of the representativeness heuristic of January performance. However, the Little and Albrecht (2006) "institutional investment committee theory" is inconsistent with the recent finding that the power of the OJE in US indices has diminished in recent times (Stivers, Sun, and Sun, 2009) despite the significant increase in the proportion of the US equity market owned by institution over this time (Gompers and Metrick, 2003). We conclude that to the best of our knowledge there is no plausible theoretical explanation for the OJE.

3. Test Procedures and Empirical Results

In this section we discuss our data, present our methodology and results and discuss their implications. We use the CRSP value-weighted index commencing in 1940 to ensure consistency with previous OJE papers. However, we also run tests using all CRSP history and find our results are even stronger.[10] We do not use the CRSP equally weighted index due to the implicit rebalancing assumption it contains. As Liu and Strong (2008) note, investors are unlikely to ever maintain an equally-weighted portfolio or index due to the frequent trading required and associated costs. Further, Fama (1998, p. 296) notes value-weighted series "give the right perspective on an anomaly because they more accurately capture the total wealth effects experienced by investors." We also consider the performance of the OJE in international indices. We source MSCI total return data in local currency for 17 developed

[10] CRSP data commences in 1926, but these data are very volatile during the 1930s due to the Great Depression. There is a lack of consensus on whether all available data should be used to protect against data mining criticisms, or whether these data from the 1930s should be treated as outliers and therefore excluded from analysis. For instance, Chordia and Shivakumar (2002) commence their analysis in 1925 or 1926, while Hong, Torous, and Valkanov (2007) use a start date of 1946.

markets from Datastream. We are careful to ensure our results are not driven by small sample issues so we only include countries that have data starting in 1970. This means our data set contains data for the developed markets of Australia, Austria, Belgium, Canada, Denmark, France, Germany, Hong Kong, Italy, Japan, Netherlands, Norway, Singapore, Spain, Sweden, Switzerland, the United Kingdom. All these data cover the 1970 – 2007 period. Our risk-free rate proxy is the relevant T-bill total return series from Global Financial Data.

3.1. Simple Spread Results

We start by replicating the simple spread results of previous studies to ensure our interpretation of the OJE is consistent with theirs.[11] The simple spread technique involves testing the statistical significance of the OJE by regressing 11-month (February – December) returns on a dummy variable that equals one if the return in January is positive and zero if the January return is negative.[12] As noted in Cooper, McConnell, and Ovtchinnikov (2006), the investment community appears to interpret the OJE based on raw returns so we use raw returns in our core analysis. The results presented in Appendix Table 1 Panel A relate to the 1940 – 2007 period. 11-month returns are, on average, larger following positive Januaries than negative Januaries. The null hypothesis of a spread of zero is strongly rejected for each series. Our results are very similar to those of Cooper, McConnell, and Ovtchinnikov (2006). For instance, the simple spread we document for the CRSP value-weighted series is 11.17% and theirs is 11.90%. The minor differences can be attributed to our different data ending points as we use four more years of data (2004 – 2007) than they do. Our Panel B

[11] Cooper, McConnell, and Ovtchinnikov (2006), Bohl and Salm (2007), Easton and Pinder (2007), Stivers, Sun, and Sun (2009), and Sturm (2009) all use the simple spread technique to measure the predictive ability of the OJE.

[12] Powell, Shi, Smith and Whaley (2007) show standard OLS regression techniques can generate spurious results if the dummy variable is persistent. We find dummy variable persistence does not account for the statistical significance of the OJE simple spread.

International results, which relate to the 1970–2007 period, are also consistent with the earlier literature. We find statistically a significant spread in just two of 17 international countries.[13]

3.2. Standard OJE and Modified Versions of the OJE

It seems clear the OJE implies that a negative January indicates an 11-month return that is negative rather than just less than the 11-month return following positive Januaries. Hensel and Ziemba (1995a, p. 188) quote Hirsch (1986), who appears to have been the first to propose the OJE, as follows "The supposition is that: If the market rises in January, then it will also rise during the rest of the year; but if it falls in January, then there will be a decline during the rest of the year." In one of the earliest academic studies on the OJE, Fuller (1978, p. 5) notes "Supposedly, the January Barometer works like this: If the stock market is up in the month of January, then the market will be up for the year, if the market is down in January, the year will be down." It therefore seems apparent the OJE suggests to short the market following negative Januaries, rather than investing in T-bills in these periods, so we refer to this as the "Standard" OJE. We then consider all possible variations of the OJE so as to prevent the criticism we are trying to implement a "straw man" version of the OJE.

One reason for the underperformance of the OJE relates to the requirement the return in January be observed before a signal to go either long or short the market is generated. An investor using the OJE would only earn the T-bill rate of return in January. However, as noted by Starks, Yong, and Zheng (2006) and many others, US equity market returns tend to be positive in January which means a buy-and-hold investor benefits from being in the market in January but someone following the OJE misses out on these returns. Streetlore makes it very clear the OJE makes a prediction for the remainder of the calendar year (February –

[13] Similar results are obtained if international indices in USD are used. In this case, just 3 countries have statistically significant spreads.

December) and is not advocating a position in the market in January, which is unsurprising given that the OJE was proposed (as early as Hirsch, 1974) before the January Effect had been discovered (e.g. Rozeff and Kinney, 1976). However despite this, we test modified versions of the OJE, which while combining knowledge of the OJE and the January Effect and therefore involving data mining bias, serve to emphasize out point regarding the OJE not being implementable for economic profits. The first modified strategy we test involves remaining invested for 12 months. If the market advances (declines) in January a long (short) position is opened in February and held until the end of the following January. This allows the OJE market timer to capture January returns in the year following an OJE long signal. We refer to this approach as the "12-month" strategy. Our second modified strategy is long the market every January and then goes long (short) for the next 11 months if the January return is positive (negative). This is effectively a January Effect and OJE strategy as it is created with the benefit of hindsight to capture the positive aspects of these two independent effects. We refer to this as the "JE + OJE" strategy.

A second reason for the underperformance of the OJE relates to signals to short the market. Right from when the OJE was first discussed in the investment community it has been clear a negative January indicates an 11-month return that is negative as opposed to just being less than the 11-month return following positive Januaries. Accordingly, the most logical way to exploit the OJE is to short the market following negative Januaries, rather than investing in T-bills in these periods. However, 11-month returns following negative Januaries are positive on average. An OJE investor who would be short the market during these periods would have their wealth eroded whereas a buy-and-hold investor who would be long the market would generate wealth during these periods.

We therefore test if a data-mined strategy (created based on the knowledge 11-month returns following negative return Januaries are positive on average) of always being long the

equity market each January (so as to benefit from the January Effect), being long the equity market for 11-month periods following positive Januaries and long T-bills for 11-month periods following negative Januaries is profitable. We refer to this as the "JE + OJE T-bill" strategy.

3.3. OJE Performance Measurement

The simple spread approach does not indicate whether the OJE can be implemented to out-perform a simple buy-and-hold approach and therefore cannot be used to pass judgement on whether the OJE is evidence against market efficiency. We investigate the profits accruing to someone implementing the OJE compared to buy-and-hold profits and also compare the risk-adjusted performance using Sharpe Ratios[14] and the recently developed Manipulation-Proof Performance Measure (hereafter MPPM) of Ingersoll, Spiegel, Goetzmann, and Welch (2007).[15] Ingersoll, Spiegel, Goetzmann, and Welch (2007) point out that Sharpe Ratios suffer from two weaknesses. Firstly, they are based around the assumption that return distributions are normal or lognormal. Secondly, they must be estimated using statistical techniques which assume independent and identically distributed variables.[16] The MPPM is given below:

$$\hat{\Theta} \equiv \frac{1}{(1-\rho)\Delta t} \ell n\left(\frac{1}{T}\sum_{t=1}^{T}\left[(1+r_t)/(1+r_{ft})\right]^{1-\rho}\right) \qquad (1)$$

[14] We apply the 1994 version of this ratio, which is mean of excess returns / standard deviation of excess returns.
[15] We also use the Jensen's (1969) Alpha approach and find quantitatively identical results, but we do not report these results due to the concern that this approach may not be adequately accounting for time-varying risk premia.
[16] The MPPM, which is not dependent on these limiting assumptions, generates a score which is "(1) increasing in returns (to recognize arbitrage opportunities), (2) concave (to avoid increasing the score via leverage or adding unpriced risk), (3) time separable to prevent dynamic manipulation of the estimated statistics, and (4) has a power form to be consistent with an economic equilibrium." (Ingersoll, Spiegel, Goetzmann, and Welch, 2007, p. 1506).

In effect, the $\hat{\Theta}$ statistic is an estimate of the excess returns certainty equivalent of a portfolio (over and above the risk-free asset) generated after adjusting for risk. The portfolio's un-annualized return at time t is r_t, and the risk-free rate is rf_t. T is the total number of observations, and Δt is the length of time between observations. Together these two variables annualize the measure. ρ is risk aversion coefficient. Higher values of ρ penalise risk more strongly. In accordance with Ingersoll, Spiegel, Goetzmann, and Welch (2007) we test three different risk-aversion coefficients (ρ = 2, ρ = 3, ρ = 4) (see Ingersoll, Spiegel, Goetzmann, and Welch, 2007, for more details).

We test the statistical significance of the difference between each of the OJE strategy profits and buy-and-hold profits using two alternative approaches. The first is the standard t-test, using estimated standard errors from the delta method, and the second is a non-parametric bootstrap approach.[17] This involves measuring the profits to all possible 12-month buy-and-hold approaches. The first starts in January 1940, the next starts in February 1940, and the last starts in January 2007. These are then randomly selected (with replacement) 1,000 times and compared to the profits of the OJE strategy. The proportion of times that the profits are larger to a buy-and-hold approach than the OJE strategy is the p-value for the null hypothesis that the OJE does not generate profits that are statistically significantly different to buy-and-hold profits.

Our first approach to measuring the statistical significance of the difference between OJE strategy Sharpe Ratios (MPPM measures) and buy-and-hold Sharpe Ratios (MPPM measures) follows Cooper, Guitierrez and Marcum (2005). We estimate the mean of excess OJE return (μ_{OJE}), variance of excess OJE return (σ^2_{OJE}), mean of excess buy-and-hold return (μ_{BH}), variance of excess buy-and-hold return (σ^2_{BH}) and the covariance of the four estimators using GMM with the robust HAC covariance estimator as recommended by Andrews (1991).

[17] We thank Russ Wermers for suggesting this to us.

Like Cooper, Guitierrez and Marcum (2005), we perform a statistical test in Sharpe Ratio difference using the delta method (Greene 1997, theorem 4.16, page 124). Hence the standard errors of the difference in Sharpe Ratio is $\sqrt{C\Sigma C^T}$, where Σ is the covariance matrix of the four estimators; C is the vector of partial derivatives of the difference in Sharpe ratio; C^T is the transpose of vector C.

Our second approach to measuring the statistical significance of the difference between OJE strategy Sharpe Ratios (MPPM measures) and buy-and-hold Sharpe Ratios (MPPM measures) is based on the bootstrap procedure described early. The difference being that we resample buy-and-hold strategy Sharpe Ratio and MPPM statistics and compare these to their OJE equivalents.

3.4. OJE US Performance

Neither the standard OJE nor any of its modified versions generate excess raw or risk-adjusted returns that are statistically or economically larger than the returns to a simply buy-and-hold strategy in the US. As the Table 1, Panel A results show, average yearly buy-and-hold returns are 12.68% during the 1940 – 2007 period, compared to 8.82% for the standard OJE strategy. The modified OJE strategies of maintaining a position for 12-months ("12-month") and always being long Januaries before entering 11-month positions ("JE + OJE") have higher returns than the standard OJE approach as they benefit from adjustments to ensure they exploit the January Effect. However, their mean returns are both lower than the buy-and-hold returns. The "JE + OJE T-bill" strategy which is always long in January and long the equity market (T-bills) for 11-month periods following positive (negative) Januaries has an average return of 13.09%, which is 0.41% larger than the average buy-and-hold return. This difference is not statistically significant and does not seem economically significant

either. After all, the JE + OJE T-bill returns do not account for the transactions costs that would have been incurred on the 23 round-trip trades required to implement this strategy.

Our results are broadly consistent with those of Cooper, McConnell, and Ovtchinnikov (2009). They report average buy-and-hold returns of 11.94% p.a and JE + OJE T-bill average returns of 12.79% p.a. The difference between our results is due to their inclusion of 2008 results. The market declined in January 2008 and fell approximately 35% in the February – December 2008 period. This reduces their average buy-and-hold returns by more than their average JE + OJE T-bill returns as this strategy was in T-bills for the February – December 2008 period. Our conclusions remain unchanged regardless of whether 2008 is included or 2008 and 2009 are included. The OJE performed particularly poorly in 2009. The January return was negative so the standard OJE signalled a short position and the JE + OJE T-bill signalled an 11-month T-bill position. However, the equity market increased approximately 35% during the February – December period, which lead to strong gains for the buy-and-hold investor. The OJE and its modified versions have an even weaker relative performance to the buy-and-hold approach when start points prior to 1940 are adopted, which reinforces our conclusions, so we do not report these results.

Our conclusions regarding the lack of statistical or economic significance of OJE outperformance compared to a simple buy-and-hold strategy hold when risk-adjusted performance is considered. In Panel B of Table 1 we report Sharpe Ratio results and in Panel C we report Manipulation-Proof Performance Measure (MPPM) results. Statistical significance is determined using the method advocated by Cooper, Guitierrez and Marcum (2005), which we refer to as "Delta" and a non-parametric bootstrap approach. The Sharpe Ratio results reveal that the Standard OJE, the 12-month and the JE + OJE strategies each have lower Sharpe Ratios than the buy-and-hold approach. These differences are (not) statistically significant based on the bootstrap (Delta) approach. The JE + OJE T-bill strategy

Sharpe Ratio is not statistically significantly larger than the buy-and-hold Sharpe Ratio based on either the bootstrap or Delta techniques. Panel C has MPPM for the three different levels of risk aversion considered by Ingersoll, Spiegel, Goetzmann, and Welch (2007). The results are very similar to their Sharpe Ratio equivalents. The Standard, 12-month and JE + OJE strategies all underperform the buy-and-hold approach in MPPM risk-adjusted terms. This underperformance is (not) statistically significant based on the bootstrap (delta) approaches. The JE + OJE T-bill strategy MPPM statistics are not statistically significantly different to the equivalent buy-and-hold MPPM statistics based on either the Delta or bootstrap approaches.

Modifying the OJE to ensure it benefits from the January Effect and does not suffer from the inaccurate short signals it generates improves its performance. However, these improvements are not sufficient to result in statistically or economically significant out-performance versus a buy-and-hold approach. The JE + OJE T-bill strategy is identical to a buy-and-hold approach in all respects except for 11–month periods following negative January returns. The JE + OJE T-bill strategy is invested in T-bills in these periods whereas the buy-and-hold approach is long the equity market. The lack of statistical significance of the difference between these two approaches therefore implies that 11-month T-bill returns following negative Januaries are only marginally higher than 11-month equity returns on average.

[Insert Table 1 About Here]

3.5. OJE International Performance

Our international simple spread results indicate the OJE has limited timing ability in international equity indices. Using MSCI total return developed market indices for the 1970 – 2007 period, we find just two (U.K. and Spain) of 17 countries have statistically significant

different 11-month returns in periods following positive and negative Januaries. These results, which are presented in Appendix 1, are broadly consistent with those of previous researchers (e.g. Stivers, Sun, and Sun, 2009). However, the simple spread market timing measurement approach is not consistent with investor experience so it is possible that the standard OJE or a heavily modified OJE strategy can be profitably implemented internationally. Our Table 2 results indicate this is not the case. Neither the standard OJE nor any modified OJE strategies generate returns that are statistically significantly greater than buy-and-hold returns internationally.

We assume an investor who wants to pursue the OJE internationally uses a portfolio approach, which involves allocating their funds evenly across the 17 markets each year. This allows us to calculate an average international OJE return each year and compare it to the average international buy-and-hold return. We adopt the standard OJE strategy and the three modified versions that we test in US. Our methodology is also identical to what we applied in the US.

Our Table 2 results indicate that neither the standard OJE nor any of its modified versions add value internationally. The standard OJE has average returns less than half of those of the buy-and-hold approach and each of the modified OJE strategies have average returns that are less than those to the buy-and-hold strategy. The risk-adjusted performance of the OJE and its modified versions is either inferior to or not statistically significantly different from the buy-and-hold strategy. We conclude there is no evidence the OJE adds value internationally.

[Insert Table 2 About Here]

We have thus far ignored transaction costs. The OJE requires fewer trades than other quantitative strategies, such as momentum, so transactions costs are likely to be less of an

issue, however they remain an important factor for investors to consider. The S&P 500 futures contract did not begin trading on the Chicago Mercantile Exchange until 1982[18] so anyone wanting to implement the OJE prior to this point would have had to do so by replicating the index using traded stocks. The transactions costs incurred by an investor adopting the standard OJE or any of its modified versions would have resulted in further under-performance compared to that of a buy-and-hold investor.

3.6. OJE Versus Other Conditioning Month Investor-Experience-Consistent Spreads

In Section 3.4 we demonstrate that neither the standard OJE nor any modified versions of the OJE can be implemented by investors to earn economic profits. This raises the question of why this is so given the difference in 11-month average returns following positive and negative Januaries (simple spread) is over 10% in each of the indices we consider (see Appendix 1). Part of the explanation relates to the OJE suffering (versus the buy-and-hold approach) from being out of the market in January yet this is not the full explanation. Much of the discrepancy relates to the fact the simple spread is not consistent with investor experience.

Our Table 3 results demonstrate that disregarding the number of positive and negative January returns (which drive the number of observations used in constructing the 11-month returns following positive and negative Januaries) means a relatively large difference between the simple spread and investor experience can emerge. For instance, assume in a 3 year period there are two positive Januaries followed by 8% 11-month returns and one negative January followed by a 1% 11-month return. Based on these numbers the simple spread is 7% (8%-1%) but anyone adopting the OJE investor would experience an average return (or weighted spread) of 5% ([8%×2/3 - 1%×1/3]).[19]

[18] http://www.cmegroup.com/company/history/cmegroupinformation.html

[19] The difference in the returns implied by the spread and those experienced by an investor remains intact regardless of whether discrete or continuous compounding is used.

We generate our Table 3 results by concluding our analysis with each of the 12 months in 2006 as conditioning months, because with our data ending in December 2007 we are unable to calculate 11-month returns for 2007 conditioning months other than January. This accounts for the minor differences in the OJE simple spreads in Appendix 1 and Table 3. During the 1940 – 2006 period, the OJE simple spread in the VW series is 11.38% yet the weighted spread is 8.49%. There is also large variation in the simple spread and the weighted spread in 11-month returns when the other calendar months are used as conditioning months. The simple spread understates the spread experienced by the investor when ten of the 11 other conditioning months are used, with some of the differences being relatively large. For instance, when December is the conditioning month the simple spread is -3.47%, yet the weighted spread is 5.75%.[20] This reflects the fact an investor using the month of December to generate 11-month trading signals earns an average of 9.92% over 82% (55/67) of time periods yet only loses an average of 13.39% on average in 18% (12/67) of time periods.

The fact the January weighted spread is a lot closer in magnitude to the weighted spreads generated by other conditioning months raises the possibility that it is not statistically different from the other weighted spreads. We test this by estimating a system of 12 equations which regress the following 11-month return on the conditional month dummy as illustrated in equation 2. As disturbances maybe correlated between equations, we efficiently estimate the system using the seemingly unrelated regressions (SUR) model:

$$R_{Feb\text{-}Dec,t} = \alpha_1 + \beta_1 D_{Jan,t} + \epsilon_{1,t}$$

…

$$R_{Jan\text{-}Nov,t} = \alpha_{12} + \beta_{12} D_{Dec,t} + \epsilon_{12,t} \qquad (2)$$

[20] We realize that the dummy variable approach is popular in empirical research. While it never represents investor experience if the sample is imbalanced, we suggest the discrepancy between the spread and investor experience is a bigger issue in this setting because our observations are skewed towards positive Januaries. Of the 68 year there are 45 positive Januaries versus 23 negative Januaries in the VW series.

Where β_1, … β_{12} are the January … December simple spreads respectively, and the January ... December weighted spreads are as follows[21]:

$$[\alpha_1 \times (N_{JanPos} - N_{JanNeg}) + \beta_1 \times N_{JanPos}] / (N_{JanPos} + N_{JanNeg})$$

...

$$[\alpha_{12} \times (N_{DecPos} - N_{DecNeg}) + \beta_{12} \times N_{DecPos}] / (N_{DecPos} + N_{DecNeg}) \quad (3)$$

In Table 3, we present the Wald system p-values for the null hypotheses that the magnitude of the January weighted spread is not different to the weighted spread from each of the other 11 conditioning. These results indicate we cannot reject the null hypothesis that the OJE 11-month weighted spread equals the November or December weighted spread. These results suggest the weighted spread experienced by investors who follow the OJE is not unique. In unreported results, we formally account for the possibility that data mining bias could have contributed to the apparent success of the OJE using the White (2000) and Hansen (2005) techniques. These results only strengthen our conclusions so we omit them for the sake of brevity.

[Insert Table 3 About Here]

3.7. The Predictive Ability of the OJE in Individual Stocks Based on Simple Spreads

We now focus on the results generated from applying the OJE to individual stocks. We begin this section with a stylized example of how the simple spread approach means entirely different levels of OJE performance in individual stocks can result in an identical

[21]We illustrate how we arrive at the weighted spread using the January weighted spread as an example. We run:
$R_{Feb\text{-}Dec,t} = \alpha_1 + \beta_1 D_{Jan,t} + \epsilon_{1,t}$
If Jan>0 then $D_{Jan} = 1$ so the average $R_{Feb\text{-}Dec} = \alpha_1 + \beta_1$
If Jan<0 then $D_{Jan} = 0$ so the average $R_{Feb\text{-}Dec} = \alpha_1$
The simple spread is $(\alpha_1 + \beta_1) - \alpha_1 = \beta_1$
The weighted spread weights these coefficients with the number of positive and negative years which leaves:
$[(\alpha_1 + \beta_1) \times N_{JanPos} - \alpha_1 \times N_{JanNeg}] / (N_{JanPos} + N_{JanNeg})$ or $[\alpha_1 \times (N_{JanPos} - N_{JanNeg}) + \beta_1 \times N_{JanPos}] / (N_{JanPos} + N_{JanNeg})$

view of the accuracy of the OJE if one solely considers an index. We realize most interpret the OJE as applying to the market in general rather than individual stocks. However, we believe there should be a pattern of the individual stocks that have positive (negative) January returns being those stocks that have positive (negative) 11-month returns if there is a behavioral reason behind the OJE.[22] In order to illustrate that a difference in the 11-month market returns following positive and negative January market returns does not necessarily imply the same pattern in individual stocks we consider a simple setting where there are just four stocks (see Table 4 Panel A), although our logic applies equally well to settings where there are numerous stocks. Under Scenario A the OJE is 100% accurate in individual stocks. Each time a stock records a positive (negative) return in January it goes on to record a positive (negative) return for the remaining 11 months of the year. A market index would also show the OJE was accurate in this particular year (i.e. the January market return is positive at 1% and the February – December market return is also positive at 10%) We assume an equally weighted market index to keep things simple but our logic holds for a market weighted index as well. In Scenario B the OJE is 100% inaccurate. Each time a stock records a positive January return it goes on to experience a negative February – December return and vice versa. However, despite the inaccurate performance at the stock level, the OJE still has precisely the same performance at the index level. As in Scenario A, the index gains 1% in January and 10% for the year. Finally, in Scenario C the OJE is accurate in individual stocks 50% of the time, yet its performance at the market index level is identical to Scenarios A and B. We contend this indicates the performance of the OJE in an index (based on simple spread) does not imply anything about its performance in individual stocks.

We present the 11-month return results for individual stocks that have positive and negative January returns in Table 4. This analysis includes all stocks in the CRSP database

[22] For instance, the momentum effect, which Hong and Stein (1999) suggest occurs as a result of investor under-reaction, has been shown to exist in stock indices (e.g. Chan, Hameed, and Tong, 2000) and individual stocks (e.g. Jegadeesh and Titman, 1993; Rouwenhorst, 1998).

over the 1940 - 2007 period. Over the 68 year period we study, the mean 11-month return for stocks with a positive return in January is 11.25%, compared to 10.15% for stocks with a negative January return. This difference is not statistically significant. In the sub-samples of years where the market is up in January and down in January the 11-month returns for stocks with a positive January are slightly higher than the 11-month returns for stocks with a negative January, but these differences are also not significant.[23] The median results in Panel C also strongly indicate there is no statistically significant difference between 11-month returns for stocks with positive and negative January returns. None of the positive – negative 11-month return differences are statistically significant based on the non-parametric Kruskal-Wallis test. We suggest our results provide strong evidence that the statistically significant simple spread at the market index level (see Appendix 1) does not hold at the individual stock level.

[Please Insert Table 4 About Here]

3.8. The Performance of Momentum Trading Strategies that use January as the Conditioning Month

Since the seminal work of Jegadeesh and Titman (1993) many authors have shown that momentum trading strategies have the ability to predict returns. These strategies involve measuring the stock performance over a formation period and buying strongly performing stocks (winners) and short-selling poorly performing stocks (losers). Jegadeesh and Titman (1993) show momentum strategies add value across a range of formation and holding periods from 3 to 12 months. The OJE is similar to momentum in some ways but it is also different in

[23] It is important to note that the average 11-month return following positive and negative Januaries in Panel B of Table 4 cannot be equated to the 11-month returns for the VW market index from Appendix 1. Firstly, in Appendix 1 a long (short) position is opened in periods when the market index is greater (less) than zero in January, but in Table 4 a long (short) position is created in individual stocks based on performance of the stock in January. This means there are years when the market is down in January so an 11 month short position is established yet there are some stocks with positive January returns so a long position is created in those stocks. Secondly, Table 4 is based on equal stock weights.

that unlike momentum trading strategies OJE strategies are not self financing. In any given year the OJE will signal either a long or short position for the February – December period (based on the performance of the market in January). Conversely, momentum strategies involve being simultaneously long winner stocks and short loser stocks.

We use a modified momentum strategy to give insight into the usefulness of January returns for predicting future returns. We suggest that if returns in January are poorer predictors of future returns than the returns of other months of the year there is further reason to question the predictive ability some have attributed to the OJE. The first step is to determine if a one-month formation / 11-month holding period momentum trading strategy has predictive power. Using all stocks in the CRSP database over the 1940 – 2007 period we show it is. The results in Appendix 4 show the winner – loser 11-month spread is 2.40% and this is statistically significant at the 1% level. When either February, March, April, May, July or September are used as the formation month the momentum strategy is particularly powerful. However, this is not the case when January is the formation month. In this instance the spread between winner and loser returns is not statistically significant. We interpret this as suggesting returns in January are not useful at conveying information pertaining to returns for the following 11 months of the year.[24]

4. Conclusions

The Other January Effect (OJE) suggests positive (negative) returns in January are said to predict positive (negative) February – December returns. We consider if the OJE market timing technique can be implemented to earn risk-adjusted excess returns. This issue

[24] Doran, Jiang, and Peterson (2008) provide a possible explanation for the poor performance of the OJE in individual stocks and momentum strategies that use January as the formation month. These authors find a strong positive relation between idiosyncratic volatility and returns in January even though the relation is negative in other months. Based on the work of Barberis and Huang (2008) and Thaler (1985) they suggest investors have a predisposition towards selecting stocks with lottery features at the turn of the year. These stocks perform well in January but under-perform for the remainder of the year.

should be of interest to portfolio managers, individual equity investors, and the management of listed companies looking to raise additional equity and private companies considering an IPO. If the OJE market timing technique can be used to profit from market inefficiency, then they should all pay attention to the sign of the January return before making their decision. On the other hand, if the OJE does not generate economic profits then proponents of the OJE should reconsider their faith in this indicator.

This paper shows the OJE cannot be implemented to earn statistically and economically significant risk-adjusted excess returns. The OJE is therefore not evidence against market efficiency. Consistent with earlier work, we find 11-month returns are, on average, larger following positive Januaries than negative Januaries (i.e. the simple spread is positive), but there are four factors behind these translating into superior profits for an investor adopting the OJE.

Firstly, the simple spread between the average 11-month returns following positive and negative Januaries does not represent the 11-month returns earned by an OJE investor. We demonstrate the weighted spread (which is consistent with investor experience) between 11-month returns following positive and negative Januaries is smaller than the simple spread. Secondly, the OJE requires the January return to be observed prior to a signal being generated to go long or short the market. January returns tend to be larger than the monthly returns of other months in the US so remaining out of the market in January incurs a relatively large opportunity cost. Thirdly, 11-month returns following negative Januaries are positive on average. The OJE is short the market during these periods so losses are incurred. This results in it underperforming a simple strategy that is long the equity market every February to December. Fourthly, a data-mined OJE strategy of always remaining long the market in January, taking a 11-month long position following positive Januaries, and investing in T-bills (or a combination of T-bills and the equity market) following negative Januaries still does not

significantly (either statistically or economically) out-perform a 12-month passive buy-and-hold strategy. This is due to 11-month T-bill returns only being marginally larger than 11-month equity returns on average following negative Januaries. Our results are robust. The OJE cannot be implemented to earn risk-adjusted excess returns in portfolios of stocks of different sizes or international indices. Moreover, we show that when the OJE is tested with techniques that are consistent with investor experience it is not a superior 11-month return predictor to strategies based on November or December as the conditioning month.

In summary, we suggest practitioners should think twice before using the OJE as a market timing tool. There is no evidence it provides useful information. The academic community should also be aware that the OJE is not able to earn excess returns and is therefore not evidence against the commonly expressed version of efficient market hypothesis which recognizes the importance of economic significance.

References

Andrews, Donald K, 1991, Heteroskedastic and autocorrelation consistent covariance matrix estimation. *Econometrica*, 59:817–58.

Ball, Ray., and Philip Brown, 1966, An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, 6(2), 159-178

Barberis, Nicholas., and Ming Huang, 2008, Stocks as lotteries: The implications of probability weighting for security prices, *American Economic Review* 98, 2066-2100.

Bohl, Martin T., and Christian A. Salm, 2008, *The other January Effect: Nothing more than a statistical artifcat*. Working Paper, Westfalische Wilhelms-University Munster, Germany.

Brown, Lawrence D., and Liyu Luo, 2006, The January Barometer. Further evidence, *Journal of Investing*, Spring, 25-31.

Chan, Kalok., Hameed, Allaudeen., and Wilson Tong, 2000, Profitability of momentum strategies in the international equity markets, *Journal of Financial and Quantitative Analysis* 35(2), 153-172.

Chordia, Tarun., Goyal, Amit, Sadka, Gil, Sadka, Ronnie, and Lakshmanan Shivakumar, 2009, Liquidity and the post-earnings announcement drift, *Financial Analysts Journal* 65(4), 18-32.

Chordia, Tarun., and Lakshmanan Shivakumar, 2002, Momentum, business cycle, and time-varying expected returns, *Journal of Finance* 57(2), 985-1019.

Cooper, Michael J., Gutierrez, Roberto C. and Bill Marcum, 2005, On the predictability of stock returns in real time. *Journal of Business* 78, 469-499.

Cooper, Michael J., McConnell, John J., and Alexei V. Ovtchinnikov, A., 2006, The other January Effect. *Journal of Financial Economics* 82, 315-341.

Cooper, Michael J., McConnell, John J., and Alexei V. Ovtchinnikov, A., 2009, What's the best way to trade using the January Barometer? *Journal of Investment Management* – forthcoming.

Doran, James., Jiang, Danling, and David Peterson, 2008, Gambling in the New Year? The January idiosyncratic volatility puzzle. Working paper online at: http://mpra.ub.uni-muenchen.de/8165/

Easton, Stephen A., and Sean M. Pinder, 2007, A refutation of the existence of the other January Effect. *International Review of Finance* 3-4 (7), 89-104.

Fama, Eugene F., 1991, Efficient capital markets II. *Journal of Finance* 46, 1575-1617.

Fama, Eugene F., 1998, Market Efficiency, Long-term Returns, and Behavioural Finance. *Journal of Financial Economics* 49, 283-306.

Fama, Eugene F., and Kenneth R. French, 1993, Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics* 33, 3–56.

Ferson, Wayne., and Schadt, Rudi, 1996, Measuring Fund Strategy and Performance in changing economic conditions. *Journal of Finance* 51(2), 425-461.

Fuller, Russell J., 1978, The January Barometer: What's its batting average. *Journal of Portfolio Management* Winter, 5–7.

Greene, William. H. 1997. Econometric analysis. Englewood Cliffs, NJ: Prentice-Hall.

Hansen, Peter, 2005, A test for superior predictive ability. *Journal of Business and Economic Statistics*, 23(4), 365-380.

Hensel, Chris R.. and William T. Ziemba, 1995a, The January Barometer. *Journal of Investing*, Summer, 67-70.

Hensel, Chris R. and William T. Ziemba, 1995b, The January barometer: European, North American, Pacific and worldwide results. *Finanzmarkt und Portfolio Management* 9 (2), 187–196.

Hirsch, Yale., 1974, Stock trader's almanac. The Hirsch Organization, Nyack, NY.

Hirsch, Yale., 1986, Stock trader's almanac. The Hirsch Organization, Nyack, NY.

Hong, Harrison, and Jeremy Stein, 1999, A unified theory of underreaction, momentum trading, and overreaction in asset markets, *Journal of Finance* 54, 2143-2148.

Hong, Harrison, Torous, Walter., and Rossen Valkanov, 2007, Do industries lead stock markets?, *Journal of Financial Economics* 83, pp. 367-396.

Ingersoll, Jonathan, Spiegel, Matthew, Goetzmann, William, and Ivo Welch, 2007, Portfolio performance manipulation and manipulation-proof performance measures, *Review of Financial Studies* 20(5), 1503-1546.

Jegadeesh, Narasimhan, and Sheridan Titman, 1993, Returns to buying winners and selling losers: Implications for stock market efficiency. *Journal of Finance* 48, 65-91.

Jensen, Michael, 1969, Risk, the pricing of capital assets, and the evaluation of investment portfolios. *Journal of Business* 42,167–247.

Jensen, Michael, 1978, Some anomalous evidence regarding market efficiency. *Journal of Financial Economics* 6, 95-101.

Kahneman, Daniel, and Amos Tversky, 1974, Judgement under uncertainty: Heuristics and biases. *Management Science*, 185, 1124-1131.

Korajczyk, Robert A. and Ronnie Sadka, 2004, Are momentum profits robust to trading costs? *Journal of Finance*, 59(3), 1039-1082.

Lesmond, David, Schill, Michael, and Chunsheng Zhou, 2002, The illusory nature of momentum profits. *Journal of Financial Economics*, 71, 349-380.

Little, Ian. and Bruce Albrecht, 2006, *The fallacy of the price earnings ratio ("PER")*, *Global Thematic Investors Newsletter*, April 2006, 1-14.

Liu, Weimin. And Norman Strong, 2008, Biases in decomposing holding period returns. *Review of Financial Studies* 21(5), 2233-2274.

Lo, Andrew, and A. Craig MacKinlay, 1990, Data-mining biases in tests of financial asset pricing models. *The Review of Financial Studies*, 3, 431–467.

Powell, John, Shi, Jing, Smith, Tom., and Robert Whaley, 2007, The persistent presidential dummy. *Journal of Portfolio Management* Winter, 133-143.

Rouwenhorst, K.Geert, 1998, International momentum strategies. *Journal of Finance* 53, 263-284.

Rozeff, Michael, and William Kinney, 1976, Capital market seasonality: The case of stock returns. *Journal of Financial Economics* 3, 379-402.

Schwert, G.William., 2003. Anomalies and market efficiency. In Constantinides, G., Harris, M., Stulz, R., (Eds.) Handbook of the Economics of Finance. (North Holland: Amsterdam).

Sharpe, William F., 1966, Mutual fund performance. *Journal of Business* 39,119–38.

Sharpe, William F., 1994, The Sharpe ratio. *Journal of Portfolio Management* 21(1),49-58.

Starks, Laura T., Yong, Li, and Lu Zheng, 2006, Tax-loss selling and the January Effect: Evidence from municipal bond closed-end funds. *Journal of Finance* 61(6), 3049-3067.

Stivers, Chris., Sun, Licheng, and Yong Sun, 2009, The other January effect: International, style, and sub-period evidence. *Journal of Financial Markets* 12, 521-546.

Sullivan, Ryan., Timmermann, Allan., and Halbert White., 1999, Data snooping, technical trading rule performance, and the bootstrap. *Journal of Finance*, 54(5), 1647-1691.

Sullivan, Ryan., Timmermann, Allan., and Halbert White., 2001, Dangers of data mining. The case of calendar effects in stock returns. *Journal of Econometrics*, 105, 249-286.

Sturm, Ray, 2009, The 'other' January effect and the presidential election cycle. *Applied Financial Economics*, 1-9.

Thaler, Richard H., 1985, Mental accounting and consumer choice, *Marketing Science* 4, 199-214.

White, Halbert., 2000, A reality check for data snooping, *Econometrica*, 68, 1097–1126.

Table 1. OJE US Performance

	BH	Standard	12-month	JE + OJE	JE + OJE T-bill
Panel A: Mean					
Mean	12.68%	8.82%	9.07%	10.57%	13.09%
Difference in Mean		-3.86%	-3.61%	-2.11%	0.40%
P-value (Difference in Means)		0.171	0.213	0.492	0.883
P-value (Bootstrap)		0.022	0.035	0.143	0.453
Panel B: Sharpe Ratios					
Sharpe	0.479	0.269	0.270	0.320	0.567
Difference in Sharpe		-0.210	-0.210	-0.159	0.088
P-value (Delta)		0.235	0.236	0.371	0.632
P-value (Bootstrap)		0.033	0.034	0.095	0.265
Panel C: Manipulation-Proof Performance Measure (MPPM)					
ρ =2	5.25%	1.73%	1.73%	2.50%	6.22%
ρ =3	3.89%	0.26%	0.15%	0.56%	5.24%
ρ =4	2.47%	-1.34%	-1.53%	-1.51%	4.22%
Difference ρ =2		-3.52%	-3.52%	-2.75%	0.97%
Difference ρ =3		-3.63%	-3.74%	-3.32%	1.35%
Difference ρ =4		-3.81%	-4.00%	-3.98%	1.75%
P-value ρ =2 (Delta)		0.229	0.238	0.384	0.714
P-value ρ =3 (Delta)		0.248	0.241	0.327	0.629
P-value ρ =4 (Delta)		0.265	0.243	0.278	0.560
P-value ρ =2 (Bootstrap)		0.033	0.033	0.091	0.321
P-value ρ =3 (Bootstrap)		0.043	0.037	0.064	0.268
P-value ρ =4 (Bootstrap)		0.056	0.045	0.045	0.232

This table contains the raw and risk-adjusted returns of a simple buy-and-hold strategy (BH), the standard OJE strategy and the three modified OJE strategies. "Standard" is the OJE as it was intended. This involves observing the January return then entering an 11-month long (short) position following positive (negative) Januaries. "12-month" is a strategy of holding long (short) position for 12 months following positive (negative) Januaries. "JE + OJE" is a strategy of always being long the equity market in January and then opening 11-month long or short positions based on the January return. "JE + OJE T-bill" is a strategy of always being long the market in January, and holding long 11-month equity (T-bill) positions following positive (negative) Januaries. All data relates to the 1940–2007 period. Our equity series is the CRSP VW total return series and our risk-free rate data is the Total Return T-bill series from Global Financial Data. In all instances, we compare the performance of the OJE or modified OJE strategy to the buy-and-hold strategy. MPPM refers to the Manipulation-Proof Performance Measure (MPPM) of Ingersoll, Spiegel, Goetzmann, and Welch (2007). The "Delta" p-values represent the approach used by Cooper, Guitierrez and Marcum (2005). The "Bootstrap" p-values refer to a non-parametric bootstrap approach.

Table 2. OJE International Performance

	BH	Standard	12-month	JE + OJE	JE + OJE T-bill
Panel A: Mean					
Mean	15.41%	7.10%	7.99%	10.29%	14.84%
Difference in Mean	20.17%	13.01%	14.20%	15.78%	15.73%
P-value (Difference in Means)		-8.31%	-7.42%	-5.11%	-0.57%
P-value (Bootstrap)		0.035	0.066	0.222	0.892
Panel B: Sharpe Ratios					
Sharpe	0.397	-0.016	0.047	0.189	0.481
Difference in Sharpe		-0.413	-0.350	-0.209	0.083
P-value (Delta)		0.075	0.132	0.371	0.724
P-value (Bootstrap)		0.009	0.024	0.126	0.283
Panel C: Manipulation-Proof Performance Measure (MPPM)					
ρ =2	4.04%	-1.76%	-1.12%	0.62%	4.94%
ρ =3	2.26%	-2.64%	-2.06%	-0.54%	3.97%
ρ =4	0.42%	-3.55%	-3.01%	-1.74%	2.98%
Difference ρ =2		-5.80%	-5.16%	-3.42%	0.90%
Difference ρ =3		-4.90%	-4.32%	-2.80%	1.71%
Difference ρ =4		-3.97%	-3.43%	-2.16%	2.56%
P-value ρ =2 (Delta)		0.129	0.182	0.395	0.817
P-value ρ =3 (Delta)		0.221	0.283	0.507	0.673
P-value ρ =4 (Delta)		0.344	0.413	0.625	0.546
P-value ρ =2 (Bootstrap)		0.051	0.077	0.164	0.324
P-value ρ =3 (Bootstrap)		0.247	0.291	0.420	0.142
P-value ρ =4 (Bootstrap)		0.188	0.225	0.320	0.205

This table contains the raw and risk-adjusted returns of a simple buy-and-hold strategy (BH), the standard OJE strategy and the three modified OJE strategies. Our results represent the outcome for an investor who used the OJE to time 17 international markets. "Standard" is the OJE as it was intended. This involves observing the January return then entering an 11-month long following positive (negative) Januaries. "12-month" is a strategy of holding long (short) position for 12 months following positive (negative) Januaries. "JE + OJE" is a strategy of always being long the equity market in January and then opening 11-month long or short positions based on the January return. "JE + OJE T-bill" is a strategy of always being long the market in January, and holding long 11-month equity (T-bill) positions following positive (negative) Januaries. All data relates to the 1970–2007 period. Our equity series are MSCI total return series in local currency from Datastream and our risk-free rate data is the Total Return T-bill series from Global Financial Data. In all instances, we compare the performance of the OJE or modified OJE strategy to the buy-and-hold strategy. MPPM refers to the Manipulation-Proof Performance Measure (hereafter MPPM) of Ingersoll, Spiegel, Goetzmann, and Welch (2007). The "Delta" p-values represent the approach used by Cooper, Guitierrez and Marcum (2005). The "Bootstrap" p-values refer to a non-parametric bootstrap approach.

Table 3. Weighted Spread

	Positive Jan		Negative Jan		Simple	Weighted	SUR
	Return	N	Return	N	Spread	Spread	p-value
January	14.63%	44	3.25%	23	11.38%	8.49%	
February	12.29%	39	11.52%	28	0.77%	2.34%	0.00
March	9.91%	43	13.97%	24	-4.06%	1.36%	0.00
April	12.19%	44	10.31%	23	1.88%	4.47%	0.01
May	11.11%	44	13.65%	23	-2.54%	2.61%	0.00
June	14.15%	39	10.38%	28	3.77%	3.90%	0.00
July	11.91%	34	12.90%	33	-1.00%	-0.31%	0.00
August	12.42%	40	12.30%	27	0.12%	2.46%	0.00
September	14.87%	34	12.24%	33	2.63%	1.52%	0.00
October	12.18%	40	12.46%	27	-0.27%	2.25%	0.00
November	10.64%	50	11.22%	17	-0.58%	5.09%	0.25
December	9.92%	55	13.39%	12	-3.47%	5.75%	0.87

This table contains the simple spread and the spread experienced by investors (weighted spread). The January simple spread is the difference in 11-month returns, or β in the dummy variable regression $R_t = \alpha + \beta D_t + \epsilon_t$ where $D_t = 1$ if January return is positive and 0 otherwise and R_t is the 11-month (February – December) return. The January weighted spread is given by $[\alpha_1 \times (N_{JanPos} - N_{JanNeg}) + \beta_1 \times N_{JanPos}] / (N_{JanPos} + N_{JanNeg})$. The simple and weighted spread of other conditioning months are calculated in a similar fashion. The Wald p-values relate to a system of equations (estimated using SUR) where the null hypotheses that the magnitudes of the January weighted spreads are equal to the weighted spreads of each of the other 11 conditioning months are tested. We use the CRSP value-weighted index for the 1940 – 2007 period.

Table 4. Individual Stock Analysis

Panel A: Example of Disparity Between the Performance of the OJE in Individual Stocks and Indices

	Scenario A OJE works for ALL stocks		Scenario B OJE works for NO stocks		Scenario C OJE works for 50% of stocks	
	Jan	Feb - Dec	Jan	Feb - Dec	Jan	Feb – Dec
Stock 1	4%	25%	4%	-3%	4%	25%
Stock 2	3%	20%	3%	-2%	3%	-2%
Stock 3	-1%	-3%	-1%	25%	-1%	-3%
Stock 4	-2%	-2%	-2%	20%	-2%	20%
EW Index	1%	10%	1%	10%	1%	10%

Panel B: Mean Analysis

	All Years	Years with a Positive January Market Return	Years with a Negative January Market Return
N	68	55	13
Mean Positive January Stocks 11-Month Return	11.25%	14.50%	-2.46%
Mean Negative January Stocks 11-Month Return	10.15%	13.13%	-2.46%
Difference	1.10%	1.37%	-0.01%
p-value	0.752	0.719	0.999

Panel C: Median Analysis

	All Years	Years with a Positive January Market Return	Years with a Negative January Market Return
Median Positive January Stocks 11-Month Return	9.99%	13.85%	-7.29%
Median Negative January Stocks 11-Month Return	9.98%	12.61%	-5.92%
Difference	0.01%	1.24%	-1.37%
p-value	0.806	0.751	0.898

Panel A contains a stylized example of how the OJE can perform quite differently at the individual stock level (i.e. be 100% accurate, 50% accurate or 100% inaccurate) and yet still produce the same result at the market index level (i.e. being accurate for any given year). All data used in Panel B and C results are sourced from CSRP for the 1940-2007 period. We include all stocks in the CRSP database. P-values are generated using the basic t-test and the non-parametric Kruskal-Wallis test.

Appendix 1. OJE Simple Spread

	Positive Jan Return	N	Negative Jan Return	N	Simple Spread	t-statistic
			Panel A: US			
VW	14.42%	45	3.25%	23	**11.17%**	3.23
			Panel B: International			
Australia	11.21%	24	10.31%	14	0.90%	0.13
Austria	11.84%	22	9.54%	16	2.29%	0.25
Belgium	11.91%	29	10.09%	9	1.82%	0.23
Canada	8.65%	25	12.37%	13	-3.72%	-0.68
Denmark	14.03%	29	10.67%	9	3.36%	0.29
France	9.26%	27	16.73%	11	-7.47%	-0.82
Germany	11.56%	28	4.58%	10	6.97%	0.77
Hong Kong	19.93%	26	24.79%	12	-4.86%	-0.31
Italy	11.78%	27	0.49%	11	11.29%	1.15
Japan	9.08%	25	7.65%	13	1.43%	0.16
Netherlands	12.44%	28	6.72%	10	5.73%	0.81
Norway	18.67%	27	0.39%	11	18.28%	1.40
Singapore	12.86%	28	11.15%	10	1.71%	0.11
Spain	15.86%	27	1.54%	11	**14.33%**	1.78
Sweden	14.14%	29	18.23%	9	-4.09%	-0.36
Switzerland	12.12%	25	2.26%	13	9.87%	1.40
U.K.	15.92%	25	2.69%	13	**13.23%**	2.12

We calculate the average 11-month return from February to December following positive (negative) January returns and then calculate the spread as the difference in 11-month returns. The associated t-statistic is generated using the dummy variable regression $R_t = \alpha + \beta D_t + \epsilon_t$ where $D_t = 1$ if January return is positive and 0 otherwise and R_t is the 11-month (February – December) return. The null hypothesis is that the 11-month returns following positive Januaries are not different from 11-month returns following negative Januaries (i.e. the simple spread is not different from zero). VW is the CRSP value-weighted index. All data relates to the 1940–2007 period. In Panel B calculate the simple spread for developed markets in the MSCI. We use total return MSCI data sourced from Datastream. Coefficients that are statistically significant at the 10% level or more are highlighted in bold.

Appendix 2. One-Month Formation Period 11-Month Holding Period Momentum Profits

	Winner Return	Loser Return	Winner – Loser Return	t-statistic
All Months	15.80%	13.41%	**2.40%**	4.85
January	9.20%	6.90%	2.30%	1.27
February	15.10%	11.70%	**3.50%**	1.81
March	16.00%	13.40%	**2.60%**	1.73
April	17.80%	11.80%	**6.00%**	4.17
May	16.20%	12.50%	**3.70%**	2.87
June	16.80%	14.80%	2.00%	1.17
July	19.10%	13.10%	**6.00%**	3.60
August	16.00%	14.30%	1.70%	1.09
September	17.70%	14.40%	**3.30%**	1.92
October	17.10%	16.20%	0.90%	0.44
November	15.40%	14.00%	1.40%	0.74
December	13.30%	17.60%	**-4.40%**	-2.29

All data are sourced from CSRP for the 1940-2007 period. We set-up our momentum test based on Jegadeesh and Titman (1993). However, we consider a one month formation period and an 11-month holding period. The results relate to this strategy applied across all months in our sample and for each month used as the formation period. For instance, the January results pertain to the strategy of using January as the formation month and the February – December period as the holding period. We report average 11-month winner and loser returns and the difference between these returns. Differences that are statistically significant at the 10% level or more are highlighted in bold.