The Pre-Holiday Premium of Ariel (1990) Has Largely Become A Small-Firm Effect Out of Sample[*]

Kuan-Cheng Ko
National Chi Nan University, Taiwan
kcko@ncnu.edu.tw

Nien-Tzu Yang[**]
National United University, Taiwan
nanzy@nuu.edu.tw

Abstract

Arial (1990) showed that the average returns of U.S. market indices on trading days prior to holidays are 9 to 14 times higher, a phenomenon that was independent of other calendar effects and the small-firm effect. We first confirm his results. Extending the sample to 1983-2019, we find that the pre-holiday effect now exists only among small firms. For large firms, the differences in returns between pre-holidays and non-pre-holidays have become insignificant, and especially after 1990.

JEL Classification: G12; G14
Keywords: Pre-holiday effects; Stock returns; Seasonality

In the 1980s, numerous calendar anomalies were published in the academic literature. One of these puzzling findings is the abnormally higher returns on trading days prior to holidays. This anomaly was firstly observed by Fields (1934), who showed a high proportion of price increases in the Dow Jones Industrial Average (DJIA) on trading days before long holiday weekends. Lakonishok and Smidt (1984) found higher returns for both high and low size-sorted portfolios on the last trading days prior to New Year's Day and Christmas. In a more comprehensive examination, Ariel (1990) found that the returns of the Center for Research in Security Prices (CRSP) equally-weighted (EW) and value-weighted (VW) indices on trading days before eight holidays were 9 to 14 times higher than the average non-pre-holiday return over the 1963-1982 period. He further showed that the pre-holiday premium was not a manifestation of the small-firm effect or other calendar anomalies.

Ariel's (1990) findings have been confirmed and extended by follow-up studies. Lakonishok and Smidt (1988) examined ninety years of data on DJIA daily returns from 1897 to 1986 and confirmed the existence of the pre-holiday premium. Kim and Park (1994) extended Ariel's (1990) analyses to three major stock exchanges in the U.S. (NYSE, AMEX, and NASDAQ), the U.K., and Japan and showed that the pre-holiday effect was present in these markets, too. They further showed that the small-firm effect was not present on pre-holidays. Subsequent studies also examined the futures markets (Fabozzi, Ma, and Briley, 1994; Dzhabarov and Ziemba, 2010), international markets (Cadsby and Ratner, 1992; Chong, Hudson, Keasey, and Littler, 2005), cross-listings (Tannous and Zhang, 2008), school holidays (Fang, Lin, and Shao, 2018), and corporate announcement effects (Autore and Jiang, 2019).

We extend Ariel's (1990) sample to December 2019. This adds 37-year data. We first replicate Ariel's (1990) analyses from the 1963-1982 period and confirm his main findings. Both

CRSP EW and VW indices exhibited higher returns on trading days before holidays than on non-pre-holidays. Second, the frequency of positive return days among pre-holidays was higher than that on non-pre-holidays. Third, the small-firm effect was not the main cause of the pre-holiday premium.

When we extend the sample to 1983-2019, the ratios of pre-holiday returns to non-pre-holiday returns for both CRSP EW and VW indices are lower compared with the 1963-1982 period. We find that the anomaly greatly diminishes, especially in large firms and after 1990 when we control for weekend and turn-of-the-year effects, the CRSP WW index no longer shows a significant premium on pre-holidays. (Neither do Dow Jones Industrial Average (DJIA) and the Standard & Poor's (S&P) 500.) In addition, the weekend and turn-of-the-year effects have also lost their effectiveness in large firms after 1983.

The disappearance of the pre-holiday effect among large firms is in line with the observations of Schwert (2003) and McLean and Pontiff (2016) that the return predictability of asset-pricing anomalies declines substantially after their publications. The persistence of the pre-holiday effect among small firms is also consistent with the argument of limits of arbitrage.

1. Data

We follow Ariel (1990) by examining the CRSP daily stock index returns. In addition to CRSP EW and VW indices, we also obtain daily returns with dividends reinvested on DJIA and S&P 500 indices from Dow Jones and CRSP, respectively.

We follow Ariel (1990) by considering eight holidays: (1) New Year's Day, (2) Presidents' Days, (3) Good Friday, (4) Memorial Day, (5) July Fourth, (6) Labor Day, (7) Thanksgiving, and (8) Christmas. For the replication period, there are 160 pre-holidays and 4,860 non-pre-holidays.

The first pre-holiday is December 31, 1962, and the last pre-holiday is December 23, 1982. For the extended 37-year period from January 1983 to December 2019, there are 296 pre-holidays and 9,032 non-pre-holidays, respectively. The first pre-holiday is December 31, 1982, and the last pre-holiday is December 24, 2019.

2.   Replication and out-of-sample extensions of Ariel (1990)

[Insert Table 1]

Panel A of Table 1 shows that the average returns of pre-holidays and non-pre-holidays from 1963 to 1982 are 0.49% and 0.06% for the CRSP EW index, and 0.37% and 0.03% for the CRSP VW index, respectively. The corresponding t-statistics for the differences in returns between pre-holidays and non-pre-holidays are 9.12 and 7.03, respectively. In addition, the ratios of pre-holiday returns to non-pre-holiday returns are 8.6 and 14.4 for CRSP EW and VW indices. The fractions of positive returns are reported in Panel B of Table 1. Trading days prior to holidays have more positive returns (86% and 76% for EW and VW indices) than others (60% and 54% for EW and VW indices).

The last two columns extend the sample to 1983 to 2019. The average pre-holiday returns of CRSP EW and VW indices decline to 0.37% and 0.14%, respectively. The pre-holiday premium of the CRSP VW index has declined substantially. The corresponding t-statistics for the differences in returns between pre-holidays and non-pre-holidays are 6.76 and 1.92, respectively. Because some holidays are also on weekend or the New Year's Day, the pre-holiday premium is affected by weekend and turn-of-the-year effects. We show in Table 2 that the significance of the pre-holiday premium of the CRSP VW index disappears when we control for the two confounding day effects. We next focus on two subperiods post 1990 and 1995. Below we summarize the

3

average pre-holiday returns of CRSP EW and VW indices, as well as their differences. The *t*-statistics for the differences in VW returns between pre-holidays and non-pre-holidays are 1.19 and 1.23 for the two subperiods, respectively. The pre-holiday premium of the CRSP VW index completely vanished after 1990 without controlling for other day effects.

	1983-2019	1990-2019	1995-2019
EW	0.37%	0.35%	0.35%
VW	0.14%	0.11%	0.12%
EW−VW	0.23%	0.24%	0.23%

Panel B of Table 1 shows that the fractions of positive returns for CRSP EW and VW indices on pre-holidays also decline to 77% and 59 % (they were 86% and 76% during the replication period). The former (77%) is still statistically significant, and the latter (59%) is no longer significant.

In untabulated results, we focus our examinations on two indices that contain only large firms, DJIA and S&P 500 and show that they earn significant premia on pre-holidays from 1963 to 1982 but not from 1983 to 2019. From 1983 to 2019, the *t*-statistics for the differences in returns between pre-holidays and non-pre-holidays are 0.64 and 0.93 for DJIA and S&P 500, respectively.

[Insert Table 2]

Ariel (1990) also examined the difference in returns between CRSP EW and VW indices (denoted as EW−VW) controlling for other calendar effects. Table 2 reports the regression results of CRSP VW index returns. The pre-holiday effect exists in CRSP VW index returns from 1963 to 1982 but not from 1983 to 2019. From 1963 to 1982, the coefficient on the pre-holiday dummy is significant at 0.29; it is 0.30 without including the dummy of pre-New Year's Day based on Ariel's (1990) specification. EW−VW has an insignificant coefficient on the pre-holiday dummy and a significant coefficient on the dummy of pre-New Year's Day during the 1963-1982 period, indicating that the pre-holiday effect is independent of the small-firm effect. From 1983 to 2019,

the difference between EW and VW indices is higher at 0.07% on pre-holidays with a *t*-statistic of 2.32. Small firms had higher pre-holiday premium than large firms after controlling for other calendar effects in the extended period. Further, weekend and turn-of-the-year effects are now concentrated among small firms.

[Insert Figure 1]

In Figure 1, we compare the cumulative returns of the CRSP index between trading days prior to and after holidays. This is the return difference between one trading day prior to the holiday and one trading day after the holiday. We also use the average return of non-pre-holidays as an alternative benchmark. We average the return differences across the eight holidays in each year. The figure plots the cumulative returns from 1962 to 2019.

On December 23, 1982, the last pre-holiday of 1982, the cumulative return difference between pre- and post-holidays (non-pre-holidays) of the CRSP VW index is 5.8% (7.0%). The corresponding value is 5.9% (8.9%) for the CRSP EW index. The pre-holiday premium existed for both CRSP EW and VW indices during Ariel's (1990) sample period. From 1983 to 2019, the cumulative return differences between pre- and post-holidays (non-pre-holidays) are 9.2% (10.9%) for the CRSP VW index and 15.9% (21.7%) for the CRSP EW index at the end of 2019. The pre-holiday premium for the CRSP VW index has declined substantially post Arial (1990). Figure 1 shows that it continued through 1990, and then completely vanished when using post-holiday returns as the benchmark. The cumulative return differences in the CRSP VW index between pre- and non-pre-holidays were flat since 1990 and became slightly upward after 2008. The CRSP EW index continued to outperform its benchmarks and the CRSP VW index on pre-holidays during the extended period. Thus the pre-holiday premium has largely become a small-firm effect.

References

Autore, D. M. and D. Jiang. 2019. "The Preholiday Corporate Announcement Effect." *Journal of Financial Markets*. 45: 61−82.

Cadsby, C. B. and M. Ratner. 1992. "Turn-of-Month and Pre-Holiday Effects on Stock Returns: Some International Evidence." *Journal of Banking & Finance*. 16: 497−509.

Chong, R., R. Hudson, K. Keasey, and K. Littler. 2005. "Pre-Holiday Effects: International Evidence on the Decline and Reversal of a Stock Market Anomaly." *Journal of International Money and Finance*. 24: 1226−1236.

Dzhabarov, C. and W. T. Ziemba. 2010. "Do Seasonal Anomalies Still Work?" *Journal of Portfolio Management*. 36: 93−104.

Fabozzi, F. J., C. K. Ma, and J. E. Briley. 1994. "Holiday Trading in Futures Markets." *Journal of Finance*. 44: 307−324.

Fang, L., C. Lin, and Y. Shao. 2018. "School Holidays and Stock Market Seasonality." *Financial Management*. 47: 131−157.

Fields, M. J. 1934. "Security Prices and Stock Exchange Holidays in Relation to Short Selling." *Journal of Business*. 7: 328−338.

French, K. 1980. "Stock Returns and the Weekend Effect." *Journal of Financial Economics*. 8: 55−69.

Gibbons, M. and P. Hess. 1981. "Day of the Week Effects and Asset Returns." *Journal of Business*. 54: 579−596.

Kim, C.-W. and J. Park. 1994. "Holiday Effects and Stock Returns: Further Evidence." *Journal of Financial and Quantitative Analysis*. 29: 145−157.

Lakonishok, T. and S. Smidt. 1984. "Volume and Turn-of-the-Year Behavior." *Journal of Financial Economics*. 13: 435−456.

Lakonishok, T. and S. Smidt. 1988. "Are Seasonal Anomalies Real? A Ninety-Year Perspective." *Review of Financial Studies*. 1: 403−425.

McLean, R. D. and J. Pontiff. 2016. "Does Academic Research Destroy Stock Return Predictability?" *Journal of Finance*. 71: 5−32.

Roll, R. 1983. "Vas Ist Das?" *Journal of Portfolio Management*. 9: 18−28.

Schwert, G. W. 2003. "Anomalies and Market Efficiency." In Constantinides, G. M., M. Harris, and R. M. Stulz. eds.: *Handbook of the Economics of Finance* (Elsevier, Amsterdam).

Tannous, G. F. and Y. Zhang. 2008. "Cross-Listing and Trading on the Domestic Market: Evidence from Canada−US Partial Holidays." *Journal of Business Finance & Accounting*. 35: 1245−1275.
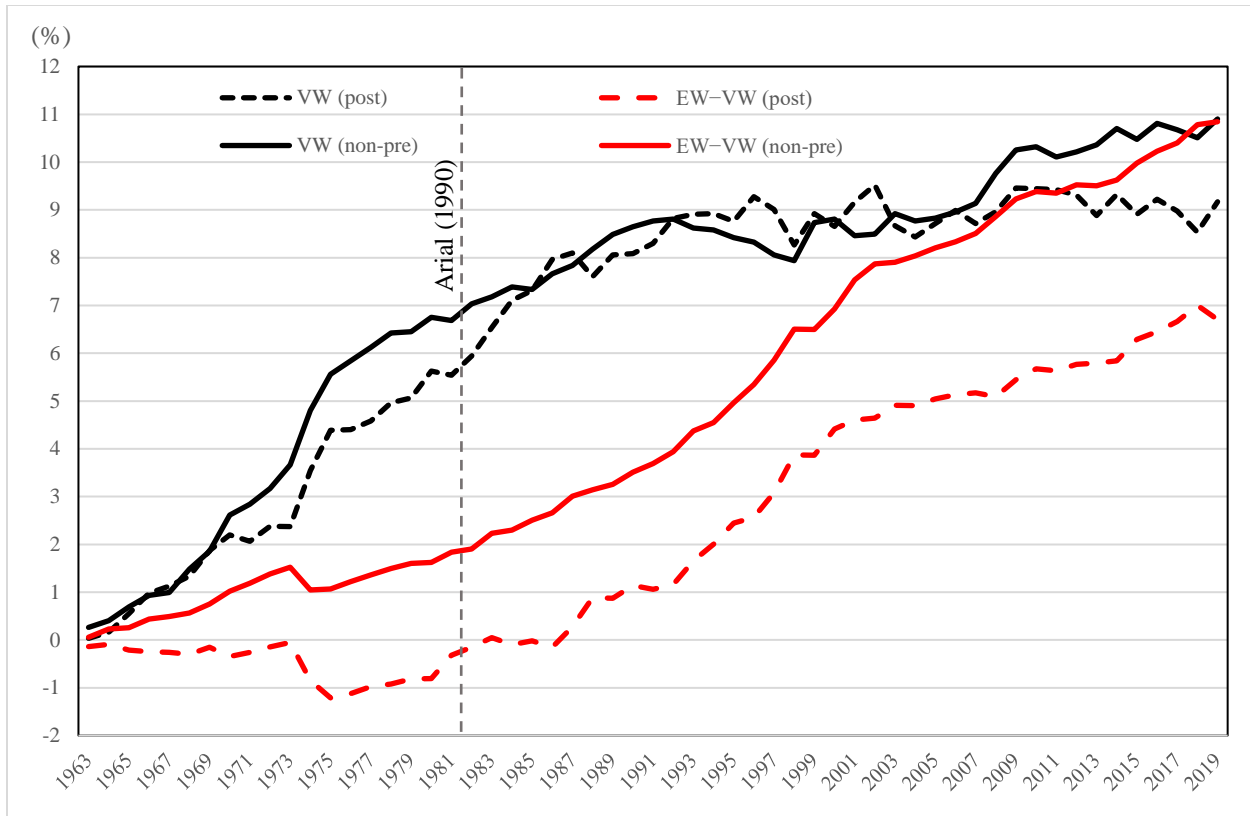
Figure 1: Cumulative return differences between pre-holidays and benchmarks

Description: This figure shows cumulative return differences of the CRSP VW index between pre-holidays and the benchmark since December 31, 1962. We use post-holidays and non-pre-holidays as the benchmark, respectively. For each holiday in each calendar year, we calculate the return difference of the CRSP VW index between one trading day prior to the holiday and one trading day after the holiday (the average of the non-pre-holidays within the year). We average the return differences across the eight holidays in each year and next compute the cumulative returns for the entire sample period from December 31, 1962 to December 24, 2019, in which December 31, 1962 is the first pre-holiday of 1963 and December 24, 2019 is the last pre-holiday of 2019. We repeat the same calculations for the CRSP EW index and compute the difference in returns between CRSP EW and VW indices (EW−VW). We plot the cumulative returns for the VW index and the EW−VW series.

Interpretation: Until 1990, the pre-holiday returns were higher than post-holiday and non-pre-holiday returns for the CRSP VW index. After 2008, the CRSP VW index on pre-holidays had slightly higher returns than non-pre-holidays but not post-holidays. After 1990, only small firms consistently had higher pre-holiday returns than the benchmarks.

8

Table 1: Summary statistics: Replications and extensions

Description: Panel A reports the averages and standard deviations of CRSP EW and VW index returns for two subsamples consisting of pre-holidays and all other days, and a *t*-statistic for the differences of the averages. We also report the averages and standard deviations of all trading days. Panel B reports the fractions of positive return days among all trading days and pre-holidays, and *t*-statistics that test the equality of the positive return frequencies in these two groups of days. The replication period is from January 1963 to December 1982, and the extended period is from January 1983 to December 2019.

Interpretation: Compared with the replication period, the CRSP EW index shows significant while slightly weaker pre-holiday premium during the extended period. The pre-holiday premium of the CRSP VW index becomes much weaker in the extended period.

	Ariel (1990) Results (160 Pre-Holidays and 4,860 Non-Pre-Holidays)		Replications (160 Pre-Holidays and 4,860 Non-Pre-Holidays)		Extensions (296 Pre-Holidays and 9,032 Non-Pre-Holidays)	
	EW	VW	EW	VW	EW	VW
Panel A: Summary statistics						
Pre-Holiday Mean (R_p)	0.53%	0.36%	0.49%	0.37%	0.37%	0.14%
(Standard Deviation)	(0.66%)	(0.61%)	(0.58%)	(0.60%)	(0.75%)	(0.84%)
Non-Pre-Holiday Mean (R_N)	0.06%	0.03%	0.06%	0.03%	0.07%	0.04%
(Standard Deviation)	(0.79%)	(0.78%)	(0.72%)	(0.77%)	(0.89%)	(1.06%)
t-statistic for $R_p = R_N$	8.80	6.87	9.12	7.03	6.76	1.92
Panel B: Frequency of advances						
Positive Return (All Days)	2,954	2,700	2,991	2,714	5,550	5,116
(Fraction, $Perc_{all}$)	(0.56)	(0.54)	(0.60)	(0.54)	(0.60)	(0.56)
Positive Return (Pre-Holiday)	137	120	138	121	228	175
(Fraction, $Perc_p$)	(0.86)	(0.75)	(0.86)	(0.76)	(0.77)	(0.59)
t-statistic for $Perc_{all} = Perc_p$	6.83	5.17	6.18	5.26	5.53	1.42

Table 2: Dummy variable regressions: Replications and extensions

Description: We regress CRSP VW index returns and the differences in returns between CRSP EW and VW indices on pre-holiday dummy, day-of-the-week dummies, and pre-New Year's Day dummy. The replication period is from January 1963 to December 1982, and the extended period is from January 1983 to December 2019.
Interpretation: The pre-holiday premium of the CRSP VW index becomes insignificant in the extended period when we control for weekend and turn-of-the-year effects.

	The Ariel (1990) Results		Replications		Extensions	
	VW	EW−VW	VW	EW−VW	VW	EW−VW
Constant	0.03	−0.03 ***	0.02	−0.04 ***	0.06 **	−0.02 **
Pre-Holiday	0.30 ***	0.04	0.29 ***	0.00	0.11	0.07 **
Monday	−0.15 ***	0.03 **	−0.15 ***	0.05 ***	−0.07 **	−0.03 **
Wednesday	0.07 **	0.06 ***	0.08 **	0.07 ***	0.01	0.05 ***
Thursday	0.01	0.09 ***	0.02	0.10 ***	−0.02	0.08 ***
Friday	0.06 *	0.14 ***	0.07 **	0.15 ***	−0.02	0.14 ***
Pre-New Year's Holiday		0.50 ***	0.12	0.40 ***	−0.13	0.70 ***