THE TURN OF THE MONTH EFFECT CONTINUED: A COMPARISON OF SMALL CAP STOCKS AND LARGE CAP STOCKS

by

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ABSTRACT

The purpose of this paper is to investigate whether the turn of the month effect occurs in small cap and large cap stocks and if it occurs in both categories, to determine whether there is a difference in the magnitude. My research, for the period of 1963-2008, based on the CRSP value weighted index, shows that there is a significant turn of the month effect in small and large cap stocks, however the effect is larger in small cap stocks. Furthermore, this effect is not limited to a short time period, instead it is persistent. While a number of explanations have been put forward for why this phenomenon exists, there has been no satisfactory explanation yet.

DEDICATION

I wish to dedicate this project to my family, who have always given me their full support.

ACKNOWLEDGEMENTS

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1 INTRODUCTION: A BACKGROUND ON CALENDAR EFFECTS

While many academics and investment professionals continue to maintain that the stock markets are efficient, there are anomalies that have persisted that challenge this assertion. The conventional wisdom is that if certain patterns are occurring in markets, these patterns will be identified, the profits will be arbitraged away, and the markets will quickly return to being efficient. However, the persistence of some recurring patterns suggests that the markets are not completely efficient. This leads to the question, when does an anomaly end and when does it become the rule?

The best known and most researched calendar anomaly is the "January effect", which was first documented by Wachtel in 1942. The "January effect" refers to the fact that stocks in January generally increase in price. Other researchers who have studied the January effect at length include Reinganum (1983), and Haugen (1996).

Another calendar anomaly that has been the subject of much research is the Monday effect or the weekend effect. This was first documented by French in 1980. French discovered that the mean return for Monday was negative, while it was positive for the other days of the week.

Another calendar anomaly that has come into sharp focus is the monthly effect. This effect was first identified and investigated in detail by Ariel (1987) who investigated it using the Center for Research in Security Prices (CRSP) value-weighted and equally weighted stock index returns for the years 1963 to 1981. This effect demonstrates that stock returns in the first half (FH) of the month (defined as the previous trading day before the first trading day of the month and the first nine trading days of the month; listed as -1 to +9) are substantially higher than they are during the last half (LH) of the month (defined as the eight trading days preceding the last trading day of the month; listed as –9 to -2). His findings demonstrated that all of the returns in the market occurred in the first half, while the returns in the last half of the month were negative.

Subsequently, Lakonishok and Smidt (1988) also investigated monthly effects on stock returns, however their study resulted in slightly different findings than Ariel. They discovered that days -1 to +3 (defined as the last trading day of the previous month and the first three trading days of the current month) at what they refer to as the turn of the month account for almost all the positive returns to the Dow Jones Industrial Average for the period of 1897 to 1986.

More recently, McConnell and Xu (2008) have expanded upon Lakonishok's findings and examined data (CRSP and International data) up to 2006, and determined that the turn of the month effect persists.

The purpose of my research is to determine whether a significant turn of the month effect occurs in the smallest (defined as the lowest 10th decile in Ken French's data library – referred to in the paper as small cap stocks) cap stocks

and the largest cap stocks (defined as the highest 10th decile in Ken French's

data library – referred to in the paper as large cap stocks) and if the effect occurs

in both categories of stocks, to determine whether the magnitude is significantly

different. Additionally, I review some of the possible explanations for the turn of

the month effect.

Section 2 of this paper deals with the literature review, section 3 covers

the data and methodology, section 4 discusses the results and section 5 covers

conclusions and suggestions for future research.

2 LITERATURE REVIEW

2.1 Initial Research

The first researcher to document a monthly effect in stock returns was

Ariel (1987). He examined data from the Center for Research in Security Prices

(CRSP) value-weighted and equally-weighted stock index returns for the period

of 1963 to 1981. He found, that for both indexes, returns are substantially higher

in the first-half (FH) of the month than they are in the last-half (LH) of the month.

He defined the first half of the month as being the first nine trading days of the

current month plus the last trading day of the previous month (- 1 to + 9) and the

last half as the eight trading days preceding the last trading day of the month (-9

to -2).

His results reveal an extraordinary pattern. For the equally weighted-

index, the first half of the trading month produces a cumulative return of

2,552.40% and for the value-weighted index, the first half of the month produces

a cumulative return of 565.40%. On the other hand, for the last half of the trading

month, the equally-weighted index produces a return of -0.25% while the value

weighted index produces a return of -33.80%. Thus, for both indexes, all the

positive returns occurred in the first half of month and the returns were negative

in the last half of the month. See table 1 below.

Table 1
Nineteen Year Cumulative Returns (1963-1981)

	Equally-weighted index	Value-weighted index
First half of trading month	2552.40%	565.40%
Last half of trading month	-0.25%	-33.80%
Nineteen years	2545.90%	339.90%

From: Ariel page 165

In a later study, Lakonishok and Smidt (L&S) (1988), defined the turn of

the month as being the last trading day of the previous month to the third trading

day of the current month (- 1 to + 3). They examined the Dow Jones Industrial

Average for the period of 1897 to 1986, and found that on average, the four days

at the turn of month accounted for all the positive returns to the DJIA over the

above period and in fact the returns were negative over the other trading days.

They discovered that the average cumulative return over the turn of the month

period is 0.473% while it is 0.349% over the full month. Hence, their findings

suggest that the higher returns during the first half are attributable to the fact that

the first half contains the turn of the month days, while the last half of the month

does not. See Table 2.

Table 2
Daily rates of return of the DJIA around
the turn of the month, in percent

Day				
	-1	1	2	3
1897-1986	0.122	0.084	0.127	0.14
Mean (1,052 obs.)				

From: Lakonishok (pg. 418-419)

Pham (2005) followed a similar methodology to Ariel and examined the CRSP value weighted index and the equal weighted index for the period for 1963-1981, and his results are unsurprisingly very similar to what Ariel discovered. However, when he extends his study to the period of 1982-2003, he finds mixed results. For the value weighted index, he finds that there is no significant difference between the average daily returns at the last half of the month and the average daily returns at the first half of the month. (1963-81: First Half: 0.086%, Last Half: -0.028%; 1982-2003: First Half: 0.068%; Last Half: 0.025%; 1963-2003: First Half: 0.077%, LH: -0.002%). On the other hand, for the equally weighted index, he finds that the returns are significantly higher for the first half of the month than they are for the second half of the month. (1963-81: First Half: 0.137%, Last Half: -0.009%; 1982-2003: First Half: 0.141%, Last Half: 0.051%; 1963-2003: First Half: 0.139%, Last Half: 0.021%). Pham defines the turn of the month effect as being days -1 to +4, which is similar to a method that Ariel used (however Ariel focused more extensively on the first half versus last half, than he did on the turn of the month effect) and determined that there was a turn of the month effect for both indexes in all three time periods. His results

were as follows: for the value weighted index for the period of 1963-81, the average return at the turn of the month return was 0.111%, for 1982-2003 it was 0.134% and for 1963-2003 it was 0.122%. For the equal weighted index for the period of 1963-81, the average return at the turn of the month was 0.174%, for the period 0f 1982-2003 it was 0.223% and for the period of 1963-2003, it was 0.199%. Hence, using his definition for the turn of the month, there is a very noticeable turn of the month (TOM) effect across both indexes and all time periods examined. Pham then examined the TOM effect in the S&P/TSX index over the period of 1977-2002. He discovered a strong TOM effect when compared to the average return. The average daily return over the TOM over this period was 0.144% while the overall mean return over this period was 0.033%. Furthermore, the returns over the first half of the month were significantly above the returns over the last half of the month over this time period (FH: 0.073%; LH: -0.017%).

In a recent study, McConnell and Xu (2008) built on Lakonishok's research. They used CRSP daily returns for the US market and found that stock returns for the period of 1987-2005 showed a similar pattern to returns for earlier periods. In other words, the turn of the month effect persists. They followed Laknonishok's methodology, whereby the turn of the month was defined as the last trading day of the previous month plus the first three trading days of the current month (-1 to +3). The determine that over the period of 1987-2005, for the value weighted CRSP Index the mean daily return over the TOM days is 0.15% while it is 0.00% for the other days, which is a difference of 0.15%. For the

same period, for the equal weighted index, they find that the average daily return

over the TOM is 0.25%, while it is 0.05% over the other days, which is a

difference of 0.20%. Hence, they show that the TOM effect that Lakonishok had

found earlier up to 1986, has persisted into 2005. See Table 3. They also show

that the turn of the month effect is not caused by a few extreme months or

outliers. When the most extreme one percent of observations were eliminated

from the study, the results were virtually unchanged.

Table 3

Daily VW & EW U.S. Stock Market Returns at the Turn of the Month, 1926-2005

Period	Day (-1,+3)	Other Days	Difference
CRSP VW Market Returns			
A. January 1987-December 2005			
Mean daily return (%)	0.15	0.00	0.15
B. January 1926-December 1986			
Mean daily return (%)	0.16	0.01	0.15
C. January 1926-December 2005			
Mean daily return (%)	0.16	0.01	0.15
CRSP WW Market Returns			
D. January 1987-December 2005			
Mean daily return (%)	0.25	0.05	0.20
E. January 1926-December 1986			
Mean daily return (%)	0.22	0.05	0.17
F. January 1926-December 2005			
Mean daily return (%)	0.23	0.05	0.18

From: McConnell and Xu (page 51)

2.2 International Studies

The turn of the month effect needs to be explored in international markets, as there is the possibility that the effect exists in the U.S. markets due to something specific about the U.S. and may be a U.S. only phenomenon. On the other hand, if the effect is shown to exist in international markets, this strengthens the case that the turn of the month effect is a global phenomenon and does not just exist in few markets. Hence, it would pose a challenge to the efficient market hypothesis on a global scale.

Cadsby and Ratner (1992) conducted research on the turn of the month effect (-1 to +3) in international markets and determined that the effect does exist in a number of markets. They examined both CRSP indices for the US market and the Canadian data was obtained from the Toronto Stock Exchange/University of Western Ontario equal-weighted index. For the U.S. market they examined data for the period of July 3, 1962 to December 31, 1987 and for the Canadian market, they examined data for the period of January 3, 1975 to December 31, 1987. Additionally, they used the following indexes for the following countries (time periods in brackets):

- Japan – Nikkei Index (01/05/1979 – 12/28/1988)

- Hong Kong - Hang Seng Index (01/02/1980 – 08/01/1989)

- UK – Financial Times 500 Share Index (08/16/1983 – 06/13/1988)

- Australia – All Ordinaries Index (01/02/1980 – 08/01/1989)

- Italy – Banca Commerciale Index (01/02/1980 – 08/01/1989)

- Switzerland – Swiss Bank Corporation Industrials Index (01/02/1980 – 08/01/1989

- West Germany – Commerzbank Index (01/02/1980 – 08/01/1989)

- France - Compangnie des Agents de Change General Index (01/02/1980 – 08/02/1989)

The raw data for each market was transformed into daily holding period returns. They observed that the difference between the turn of the month (TOM) and the not-turn of the month (NTOM) returns was significantly greater than zero at the 1% level for the U.S., Canada, Switzerland and West Germany. Furthermore, the difference was significant at the 5% level for the United Kingdom and Australia. However, there was no significant difference for Japan, Hong Kong, Italy and France. See Table 4 for more details.

Subsequently, Kunkel, Compton and Beyer (2003) conducted a study on the turn of the month effect in 19 countries for the period August 1, 1988 to July 31, 2000. This study was broader geographically than the earlier study as it covered eight European countries, six far East countries (Australia, Hong Kong, Japan, Malaysia, New Zealand and Singapore), two North American countries (Canada and the United States), two Latin American countries (Brazil and Mexico) and South Africa. The capitalization value of these 19 countries represented over 86% of the world's equity value as of December 1998. Their findings show that every country has positive mean TOM returns. Furthermore, in every country they find that the mean returns during the TOM period are greater than the mean returns during the rest of the month, and the t tests show

that these returns are significantly greater in 16 countries. The TOM effect was not found in Brazil, Hong Kong and Malaysia. They discovered that the 4-day TOM period accounts for an average of 87% of the monthly return across countries, with a range of 66% (United States) to 139% (Japan). In the international markets (ie. not including the United States), the 15 countries that demonstrated a TOM effect accounted for 77% of the foreign market capitalization value.

In a more recent study, McConnell and Xu examined the turn of the month effect in 34 countries using data from Thomson Datastream (-1 to +3). The starting period for the examination of this effect ranged from 1969 to 1990 and the end date for all countries was January 31, 2006. They found that for every country except Colombia, the average daily TOM return is higher than the average return over all the other days. When they tightened the standards and used a t-statistic for the difference between the mean TOM return and the mean return for all other days, they found a t-statistic greater than 1.95 in 28 of the country markets. They find that the countries that do not exhibit any meaningful turn of the month effect are: Argentina, Colombia, Italy and Malaysia. However, they find that in many countries the TOM effect is extraordinarily large. One such example is Greece, where the TOM return is 0.34 percent whereas the average daily return is 0.00 percent over all other trading days.

The above studies provide strong evidence that the TOM effect is not specific to the U.S. markets, instead it is a global phenomenon.

2.3 Possible Explanations

There have been a number of potential explanations put forward regarding why the turn of the month effect exists, however no explanation, so far has been convincing. Ogden (1990) suggested that the effect occurred because most investors, in the United States, received wages, dividends, and other forms of compensation at the end of the month and attempted to invest these funds at the turn of the month, hence the increase in returns at the turn of the month. McConnell and Xu (2008) conducted two tests to determine whether Ogden's hypothesis was correct. They used CRSP data to examine daily NYSE trading volumes in shares and dollars, in order to determine whether there was a spike in trading volume at the turn of the month. Their research did not uncover any increase in volume at the turn of the month and in fact they noticed that volume is slightly lower at the turn of the month. Furthermore, they studied the flow of funds into equity mutual funds and determined that there was no discernible pattern regarding the flow of capital to equity mutual funds at the turn of the month. If Ogden's hypothesis was correct, they would have expected to see an increase in the flow of funds to equity mutual funds. Hence, while these tests could not rule out Ogden's hypothesis, neither of their tests provided support for it either.

Furthermore, they find that the turn of the month effect did not occur solely in small cap stocks. Instead, it occurred in stocks at various levels of market capitalizations. Thus, the effect is not confined to one segment of stocks.

Additionally, McConnell and Xu studied the level of volatility at the turn of the month to determine whether there was a higher standard deviation of returns for the CRSP value weighted and equal weighted portfolios. Traditional asset pricing models suggest a positive correlation between risk and return, thus if the turn of the month days produce greater returns, it would be expected that the market volatility is higher on those days. Their analysis did not reveal higher volatility at the turn of the month and they noted that volatility may be slightly lower at the turn of the month.

Hence, it appears that there is no solid explanation at this point for explaining why the turn of the month effect occurs.

3 DATA AND METHODOLOGY

I used the CRSP value weighted stock index returns from Ken French's data library for the period of July 1, 1963 to July 31, 2008, to determine whether the monthly effect and the turn of the month effects occur in small cap stocks when compared to large cap stocks and if that is the case, to determine whether the difference is significant. I use three sample periods in my study: the period of July 1, 1963 to December 30, 1981, the period of December 31, 1981 to July 31, 2008 and the entire period of July 1, 1963 to July 31, 2008. Additionally, I compared these results to the overall market return during these time periods. The first part of my research regarding the FH and LH of the month involved the use of descriptive statistics, while the second part which looked at the TOM and NTOM involved statistical analysis that used t-tests.

I began by examining the results for the first half and the last half of the month by using the same methodology as Ariel did, in his 1987 study. Ariel defined the first half of the month (FH) as the last trading day (-1) of the preceding month plus the first nine trading days of the current month (+9). Thus, these days are referred to as -1 to +9. He defines the last half of the month (LH) as the eight trading days preceding the last trading day of the month. Thus, these days are known as days -9 to -2. Additionally, I calculate the average returns for the TOM days for each period for both categories of stocks. I use Lakonishok's definition for the TOM which is, the last trading day of the preceding month (-1) plus the first three trading days of the current month (+3). I focused on Lakonishok's definition of the TOM as opposed to Pham's definition, as Lakonishok found that days -1 to +3 produced all the positive returns in a month. See Table 5.

McConnell and Xu subsequently, continued with this definition of the TOM for the period of 1987-2005. Hence, I have decided to follow this definition, as this definition was the focal point of the two studies described above.

Table 5
Definitions

Period	Abbreviation	Trading Days
First Half	FH	-1 to +9
Last Half	LH	-9 to -2
Turn of the Month	TOM	-1 to +3
Not turn of the month	NTOM	+4 to -2

Subsequently, I computed the t-test values, over the three time intervals, for the small cap stocks, large cap stocks and overall market returns to determine whether the turn of the month effect is significant, and to note any differences in magnitude and patterns. I use a method described by Cadsby (1992), in which the TOM days are assigned a value of 1 and the NTOM days are assigned a value of 0. Cadsby used the following formula:

$R_t = a + bD_{TOM} + e_t,$ $\qquad$ t= 1,...,T

where

R_t $\qquad$ = holding period return on the index for day t,

D_{TOM} $\quad$ = dummy variable which equals one for TOM days and zero otherwise,

e_t $\qquad$ = a zero mean, random disturbance term

This regression formula tests the null hypothesis that the difference between TOM and NTOM returns equals zero. In the formula, a = is the average daily return for non-turn of the month (NTOM) days and b = difference between the average return in TOM and NTOM days. I perform a regression using Excel to determine the various t-values.

For all three sample periods, I determine the average return for each day, then I calculate the average over the FH and the average over the LH. I then compare the various results to determine whether there is a significant difference between the FH and LH and if there is a big difference between the small cap

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stocks and the large cap stocks. Additionally, I do the same with the t-test values for all three sample periods.

4 RESULTS

The results in the tables show that for all three periods, for both sizes of stocks, the FH of the month produces higher returns than does the LH of the month. Furthermore, the results show that for the period of the 1963-1981, for the small cap stocks, the difference between the FH and the LH is 0.147% and for the large cap stocks, the difference between the FH and the LH is 0.100%. However, for the period of 1982-2008, the difference has dropped sharply. For the lowest 10 percent, the difference has fallen to 0.055%, while for the highest 10 percent, the difference has fallen to 0.013%. Furthermore, for the period of 1963-2008, for small cap stocks, the difference between the FH and the LH is 0.093% and for large cap stocks, the difference between the FH and the LH is 0.050%. Thus, there has been a noticeable drop in the difference between the FH and LH over the two time periods, for the lowest 10 percent and the highest 10 percent. See tables 6 and 7 for more details.

Table 6

Small cap stocks (CRSP Value Weighted Index)

Returns are in percent

Day		1963-1981	1982-2008	1963-2008
-9		-0.051	-0.026	-0.037
-8		-0.135	0.039	-0.032
-7		0.001	-0.026	-0.015
-6		0.006	0.031	0.021
-5		-0.049	-0.015	-0.030
-4		-0.033	0.032	0.006
-3		0.019	0.020	0.021
-2		0.045	0.072	0.061
-1		0.261	0.385	0.335
1		0.161	0.036	0.088
2		0.101	0.104	0.103
3		0.165	0.079	0.115
4		0.123	0.122	0.123
5		0.065	0.006	0.030
6		0.050	-0.039	-0.002
7		0.108	-0.013	0.037
8		0.093	-0.014	0.030
9		0.093	0.045	0.065
Daily mean over -1 to +9		**0.122**	**0.071**	**0.092**
Daily mean over -9 to -2		**-0.025**	**0.016**	**-0.001**

Table 7

Large Cap stocks (CRSP Value Weighted Index)

Returns are in percent

Day		1963-1981	1982-2008	1963-2008
-9		-0.090	0.067	-0.009
-8		-0.095	0.021	-0.024
-7		0.005	-0.064	-0.038
-6		-0.058	-0.008	-0.034
-5		-0.016	0.012	0.007
-4		0.037	0.084	0.066
-3		0.027	0.068	0.050
-2		-0.040	0.095	0.045
-1		0.129	0.050	0.082
1		0.037	0.241	0.157
2		0.083	0.113	0.101
3		0.183	0.045	0.101
4		0.059	0.030	0.042
5		0.021	-0.037	-0.013
6		0.053	-0.024	0.008
7		0.071	-0.021	0.017
8		0.049	0.012	0.027
9		0.033	0.067	0.053
Daily mean over -1 to +9		**0.072**	**0.048**	**0.058**
Daily mean over -9 to -2		**-0.029**	**0.034**	**0.008**

The most striking findings occur for the TOM effect and for the difference between the TOM and overall monthly mean. For the period of 1963-1981, for small cap stocks, the average TOM returns are 0.172% and for large cap stocks, the average TOM returns are 0.108%. For the period of 1982-2008, for small cap stocks, the average TOM returns are 0.151% and for large cap stocks, the average TOM returns are 0.112%. For the overall period of 1963-2008, for small cap stocks the average TOM returns are 0.160% and for large cap stocks, the

average TOM returns are 0.110%. Additionally, there are substantial differences between the TOM average and the monthly average. For the period of 1963-81, for small cap stocks, the difference is 0.115%, while for large cap stocks, the difference is 0.081%. For 1982-2008, for small cap stocks, the difference is 0.105% while for the large cap stocks, the difference is 0.070%. Furthermore, for the period of 1963-2008, for the small cap stocks, the difference is 0.109% and for large cap stocks, the difference is 0.075%. These findings are in line with Lakonishok's findings that the turn of the month produces all the positive returns for the month, while the rest of the trading days produce substantially lower returns (including other days in the first half). Furthermore, my results indicate that the turn of the month effect is quite significant for all time periods in the study. While it fell slightly for small cap stocks, it was still substantially higher than the monthly average. Furthermore, the TOM average increased slightly for large cap stocks, for the time periods of 1963-1981 to 1982-2008. Moreover, while the TOM effect occurs for small cap stocks and large cap stocks, it is much more accentuated for small cap stocks. Thus, these results provide support for the view that the turn of the month is real, as it has occurred over a substantial amount of time and it is more pronounced in small cap stocks.

The t-test results provide a greater level of support that there is a turn-of-the month effect. The test results for small cap stocks at the TOM for the period of 1963-81, is t=4.88, for the period of 1982-2008, t = 6.06 and for the period of 1963-2008, t = 7.78. Furthermore, the slope is much larger than the intercept. For the period of 1963-1981, the slope is 0.143 and the intercept is 0.028, for

1982-2008, the slope is 0.137 and the intercept is 0.016 and for the period of

1963-2008, the slope is 0.139 and the intercept is 0.02.

For large cap stocks, the t-test result for the period of 1963-81, is t = 3.22,

for the period of 1982-2008, t = 2.35 and for the period of 1963-2008, t = 3.71.

For the period of 1963-81, the slope is 0.097 and the intercept is 0.008, for the

period of 1982-2008, the slope is 0.077 and the intercept is 0.034 and for the

period of 1963-2008, the slope is 0.085 and the intercept is 0.024. For the overall

market return, for the period of 1963-81, t = 3.74, for the period of 1982-2008, t =

3.58 and for the period of 1963-2008, t = 5.05. For the period of 1963-81, the

slope is 0.107 and the intercept is 0.012, for the period of 1982-2008, the slope is

0.108 and the intercept is 0.029 and for the period of 1963-2008 the slope is

0.108 and the intercept is 0.022. See table 8 for details on the various results.

Table 8

Tests of significance of for Turn of the Month Returns

based on the regression

$R_t = a + bD_{TOM} + e_t,$ t= 1,...,T

Returns of various categories of stocks (In %)

Period		Market		Small Cap Stocks (CRSP VW Index)		Large Cap Stocks (CRSP VW Index)	
		Coefficients	t Stat	Coefficients	t Stat	Coefficients	t Stat
1963-1981							
	Intercept	0.012	0.99	0.028	2.17	0.008	0.63
	Slope	0.107	3.75	0.143	4.89	0.097	3.22
1982-2008							
	Intercept	0.029	2.18	0.017	1.72	0.035	2.45
	Slope	0.108	3.58	0.137	6.07	0.077	2.35
1963-2008							
	Intercept	0.022	2.37	0.021	2.73	0.024	2.40
	Slope	0.108	5.05	0.139	7.78	0.085	3.72

5 CONCLUSION

While many academics and financial practitioners, still profess that markets are efficient, many anomalies arise that challenge this notion. One such anomaly is the turn of the month effect. My research shows that the returns at the turn of the month are substantially larger than the returns during the other trading days and it shows no imminent signs of being eliminated. Furthermore, this effect has occurred over a very large sample period, hence it is difficult to dismiss it as a transitory occurrence. Furthermore, the turn of the month effect occurs in both small cap stocks and large cap stocks, however there is a bigger effect in small cap stocks than there is in large cap stocks. Furthermore, a review of the literature indicates that the turn of the month effect is a global phenomenon, hence it is not due to some quirk in the U.S. market.

What is much less apparent to researchers is why this effect occurs. Numerous theories have been put forward, however to date, none of them have received strong empirical support, and thus the causes of this phenomenon remain unclear. This may be an area requiring considerable research in the years to come.

Additionally, this effect defies the efficient market hypothesis, which states among other things, over time, the profits from predictable patterns will be arbitraged away. However, this predictable pattern does not appear to be disappearing. Hence, it poses a challenge for some of the traditional theories of finance.

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