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Agricultural commodity markets and the Turn of the month effect

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Abstract: The Turn of the month (ToM) effect is a calendar anomaly when the majority of returns of an asset are concentrated into several days around the end of the old month and the start of the new one. Until now, the investigation of the ToM effect has mainly been focused on the stock markets. However, this paper investigates the presence of the ToM effect in eight key agricultural commodity markets (cocoa, coffee, corn, cotton, rice, soybean, sugar, wheat), using three different alternatives of the ToM window, during the 2001–2021 time period. The results show a statistically significant ToM effect in the rice, coffee, and sugar markets. Further results show that the ToM pattern changed during the COVID-19 pandemic, and that, in the case of commodities with a statistically significant ToM effect, the ToM effect can be efficiently used to beat the buy & hold investment strategy convincingly.

Keywords: abnormal return; calendar anomaly; investment strategy; market efficiency

Numerous studies have confirmed that financial markets are impacted by various calendar anomalies such as the Halloween effect (Bouman and Jacobsen 2002; Andrade et al. 2013), the Day of the week effect (Philpot and Peterson 2011), the Holiday effect (Lakonishok and Smidt 1988; Ariel 1990), or the Turn of the month (ToM) effect (Ariel 1987; Arendas and Kotlebova 2019). The existence of these anomalies is in contradiction to the Efficient Markets Hypothesis (Fama 1965), as they can be used for generating abnormal returns.

One of the most famous calendar anomalies is the ToM effect. The ToM effect is a calendar anomaly when an asset tends to record the majority of returns during the ToM period that covers only several trading days before the end of the old month and after the start of the new one. One of the first studies that investigated the ToM effect was conducted by Ariel (1987). Ariel found out that between 1963 and 1981, on the US stock markets, on average, positive returns were recorded only during the ToM periods. During the Rest of the month (RoM) periods, the returns were close to zero. Only a year later, Lakonishok and Smidt (1988) investigated the returns of the Dow Jones Industrial Average and found that between 1897 and 1986, on average, the cumulative returns recorded during the last trading day of the old month and first three trading days of the new one equalled 0.473%, compared to 0.061% recorded over a common average 4-day period.

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The findings of Ariel, Lakonishok and Smidt were also confirmed by McConnell and Xu (2008), who concluded that between 1897 and 2005, technically, all the positive returns could be booked during a period covering the last four trading days and the first three trading days of a month. Liu (2013) focused on the S & P 500 (stock index) between 2001 and 2011 and confirmed the presence of the ToM effect too.

Studies by Cadsby and Ratner (1992), Agrawal and Tandon (1994), Kunkel et al. (2003), Kayacetin and Lekpek (2016), Aziz and Ansari (2017), Chen et al. (2018), Arendas and Kotlebova (2019), Singh et al. (2021), Vasileiou (2021), Lee and Ryumi (2022), Kumar (2022) and numerous others discovered the ToM effect on other markets than the US stock markets.

Although numerous studies have confirmed the existence of the ToM effect, the reasons for its existence are not completely clear. There are several theories explaining it. According to Ogden (1990), the calendar anomaly is related to the increased liquidity around the end of the month induced by the standardisation of payments. Burnett (2017) added that this effect is more robust during periods of higher investors' confidence. Maher and Parikh (2013) supposed that the ToM effect is caused by institutional investors whose activity grows towards the end of each month. Also, Nilsson (2015) concluded that asset price behaviour is impacted by the window-dressing activities of institutional investors that occur during the ToM period. Moreover, according to Nikkinen et al. (2009), the ToM effect is related to the increased volume of US macroeconomic news usually released during the ToM period.

The ToM effect is not a new phenomenon; however, we are unaware of any study investigating the presence of the ToM effect on agricultural commodity markets, despite some other calendar anomalies that have already been confirmed by Arendas (2017) or Burakov and Feidin (2018). This paper aims to fill this gap, investigate the presence of the ToM effect in key agricultural commodity markets, and determine whether the ToM effect is strong enough to be successfully exploited by a simple investment strategy. Investigating this aspect of the agricultural commodity markets could be useful for the market participants, whether the producers of the affected commodities or the traders and investors.

MATERIAL AND METHODS

We investigated the presence of the ToM effect in eight key agricultural commodity markets (cocoa, coffee, corn, cotton, rice, soybean, sugar, and wheat). The investigated period covers two decades between January 2001 and December 2021. The price data were retrieved from Yahoo Finance databases which capture the long-term future prices from the Chicago Board of Trade (CBOT) (corn, rice, soybean, wheat) and Intercontinental Exchange (ICE) (cocoa, coffee, cotton, sugar) commodity exchanges. The descriptive statistics are presented in Table 1. The prices are quoted for tonnes (t), pounds (lb), bushels (bu), and hundredweights (CWT) in US dollars (USD) and US cents (USc).

Suppose the ToM effect affects a particular market. In that case, the average daily returns recorded during days around the ToM period (the last trading days of an old month and the first trading days of a new month) must be higher than the average daily returns recorded over the RoM period. However, there is no consensus regarding the length of the ToM period. For example, Lakonishok and Smidt (1988) used a 4-day period consisting of the last trading day of an old month and the first three trading days of a new month. McConnell and Xu (2008) used a 7-day period consisting of the last 4 trading days of an old month

Table 1. Descriptive statistics

Commodity	Minimum	Maximum	Average	Median	SD
Cocoa (USD/t)	753.00	3 774.00	2 271.51	2 340.00	609.81
Coffee (USc/lb)	41.50	304.90	128.52	121.42	50.87
Corn (USc/bu)	186.25	831.25	397.54	368.00	155.00
Cotton (USc/lb)	28.52	215.15	71.38	66.91	26.01
Rice (USD/2 000 CWT)	343.00	2 446.00	1 128.80	1 170.00	370.26
Soybean (USc/bu)	418.50	1 771.00	971.93	954.00	319.35
Sugar (USc/lb)	4.99	35.31	14.48	13.71	5.74
Wheat (USc/lb)	244.75	1 425.25	525.96	503.50	176.32

Source: Authors' own calculations

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and the first 3 trading days of a new month. Liu (2013) concluded that the ToM effect is the strongest during a period covering the last 4 trading days of an old month and the first 2 trading days of a new month. Kayacetin and Lekpek (2016) focused on the last trading day of an old month and the first two trading days of the new one. Arendas and Kotlebova (2021) investigated three alternatives of the ToM window, consisting of 1, 2, and 3 trading days before and after the beginning of a new month.

However, all of the abovementioned studies focused on the stock markets. It is possible to assume that the agricultural commodity markets may behave differently. Therefore, this paper investigated three alternatives to the ToM window. The first one is inspired by the pioneers of the ToM effect investigation, Lakonishok and Smidt (1988), and it covers the last trading day of the old month and the first three trading days of the new one (1 + 3). The remaining two windows were set empirically based on the available data. The first covers only the first three trading days of the new month (0 + 3), and the second covers the last and the first trading day (1 + 1).

The investigation of the presence of the ToM effect and its attributes is focused on the following hypotheses:

H_1: There is a ToM effect present on the agricultural commodity markets over the investigated period.

H_2: The observed ToM effect is statistically significant.

H_3: With the agricultural commodities with a statistically significant ToM effect, the observed patterns were not disrupted during the COVID-19 pandemic.

H_4: With agricultural commodities with a statistically significant ToM effect, a simple ToM-based investment strategy can generate abnormal returns (beat the buy & hold investment strategy).

To confirm or reject the abovementioned hypotheses, the following steps were used:

i) Based on the daily closing prices, the daily returns for the 8 investigated agricultural commodities are calculated [Equation (1)]:

$$R_x = \frac{\left(P_x - P_{x-1}\right)}{P_{x-1}} \tag{1}$$

where: R_x – return generated on day x; P_x – closing price on day x; P_{x-1} – closing price on the previous day.

ii) The daily returns are divided into two groups. The first one includes returns recorded during the trading days included in the ToM window, and the second one includes returns recorded during the trading days not included in the ToM window (the RoM window).

iii) To evaluate whether the ToM effect is statistically significant, i.e. whether there is a statistically significant difference between the average ToM and the average RoM returns, the Welch test is used. As the RoM periods include notably more trading days than the ToM periods, the Welch test is more appropriate than a simple *t*-test, as it is better suited for testing data samples of different sizes. Based on the central limit theorem, given the large data samples, it is not necessary to test for the normality of distribution. The Welch test is based on the following formula [Equation (2)]:

$$t = \frac{A_1 - A_2}{\sqrt{V_1 - V_2}} \tag{2}$$

where: A_1, A_2 – average values of the compared datasets; V_1, V_2 – variances of the two datasets.

iv) For the cases where the Welch test confirmed statistical significance, an ordinary least squares (OLS) regression was performed to verify the results. In the regression model, the daily returns are the dependent variable, and the independent variable is a dummy variable that shows whether the particular day belongs to the ToM window, which is as follows [Equation (3)]:

$$R_t = \alpha + \beta\, ToM + \varepsilon_t \tag{3}$$

where: R_t – return on day t; α – intercept representing the average return recorded during the RoM period; β – regression coefficient; *ToM* – binary dummy variable for the ToM period; ε_t – error term.

v) For the investigated agricultural commodities with a statistically significant ToM effect, a closer analysis of the ToM effect during the two-year pre-pandemic period (2018, 2019) and the two-year pandemic period (2020, 2021) is performed, to evaluate whether there are any apparent differences in the ToM pattern during the two investigated periods.

vi) In the cases of a statistically significant ToM effect, several simple investment strategies were investigated. The first one is based on investing only during the ToM windows and staying out of the market during the RoM windows, the second one assumes investing during the RoM windows and staying out of the market during the ToM windows, and the third

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Table 2. The Turn of the month effect – alternative 1 (–1; 3)

Commodity	ToM (–1; 3)	RoM (–1; 3)	Difference between ToM and RoM	Welch test (two-tailed *P*-value)
	(%)			
Cocoa	–0.037	0.060	–0.097	0.14722
Coffee	**0.151**	**0.020**	**0.131**	**0.07396***
Corn	0.088	0.023	0.065	0.32439
Cotton	0.059	0.021	0.038	0.54246
Rice	**0.207**	**–0.009**	**0.216**	**0.00029*****
Soybean	0.072	0.022	0.049	0.37307
Sugar	0.104	0.017	0.087	0.30484
Wheat	0.075	0.031	0.043	0.55896

*, **, *** statistical significance at α = 0.1, 0.05, and 0.01, respectively; bold – statistically significant
Source: Authors' own calculations

one is the simple buy & hold strategy of buying in January 2001 and selling in December 2021.

RESULTS AND DISCUSSION

The data show that for the vast majority of investigated agricultural commodities and ToM windows, the average ToM period returns are higher than the average RoM period returns. However, the differences are not statistically significant in all the cases.

Table 2 shows the results of the ToM effect investigation for the ToM window consisting of the last trading day of the old month and the first three trading days of the new month. During the investigated period, in the case of all eight agricultural commodities, except for cocoa, the average daily ToM period returns are positive and higher than the average daily RoM period returns. The most significant difference can be seen in the case of rice (0.216 percentage points). In the case of cocoa, the average daily ToM returns are 0.097 percentage points lower than the average daily RoM returns. Based on the results of the Welch test, the differences are statistically significant in the case of rice, at α = 0.01, and in the case of coffee, at α = 0.1.

The differences are slightly different for the second alternative of the ToM window, which includes only the new month's first three trading days (Table 3). In this case, once again, the most significant difference between the average daily ToM and RoM returns can be observed with rice, however, there are as many as three commodities (soybean, cocoa, cotton) with the ToM returns lower than the RoM returns. Rice is the only commodity with statistically significant differences between the ToM and RoM returns. During the investigated period, the differences were statistically significant at α = 0.05.

The most interesting aspect is the results for the third alternative of the ToM window, which includes only the last trading day of the old month and the first trad-

Table 3. The Turn of the month effect – alternative 2 (1; 3)

Commodity	ToM (1; 3)	RoM (1; 3)	Difference between ToM and RoM	Welch test (two-tailed *P*-value)
	(%)			
Cocoa	–0.060	0.058	–0.118	0.12673
Coffee	0.124	0.032	0.092	0.27403
Corn	0.055	0.032	0.023	0.74481
Cotton	0.020	0.030	–0.011	0.87675
Rice	**0.149**	**0.013**	**0.136**	**0.03303****
Soybean	0.031	0.032	–0.001	0.98145
Sugar	0.056	0.030	0.026	0.79038
Wheat	0.095	0.031	0.064	0.42575

** statistical significance at α = 0.05; bold – statistically significant
Source: Authors' own calculations

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Table 4. The Turn of the month effect – alternative 3 (–1; 1)

Commodity	ToM (–1; 1)	RoM (–1; 1)	Difference between ToM and RoM	Welch test (two-tailed *P*-value)
	(%)			
Cocoa	**–0.096**	**0.056**	**–0.152**	**0.09362***
Coffee	0.178	0.031	0.147	0.13560
Corn	0.156	0.022	0.133	0.17853
Cotton	0.081	0.023	0.058	0.51641
Rice	**0.264**	**0.008**	**0.257**	**0.00336*****
Soybean	0.111	0.023	0.088	0.26362
Sugar	**0.241**	**0.012**	**0.230**	**0.08675***
Wheat	0.074	0.036	0.038	0.72900

*, *** statistical significance at α = 0.1 and 0.01; bold – statistically significant

Source: Authors' own calculations

ing day of the new month (Table 4). The results show that, in all the cases, except for cocoa, the average daily ToM returns are higher than the average daily RoM returns. Moreover, in all the cases except for wheat, the differences are higher than the first two alternatives of the ToM window. They are statistically significant in the case of rice at α = 0.01 and sugar at α = 0.1. What is also interesting, in the case of cocoa, the RoM returns are statistically significantly higher than the ToM returns at α = 0.1.

Based on the results presented above, it is possible to accept hypothesis H_1: 'There is a Turn of the month effect present on the agricultural commodity markets over the investigated period.' Except for the cocoa market in all three alternatives of the ToM window and the soybean and cotton market at the (1; 3) ToM window, in all the cases, the ToM period returns were higher than the RoM period returns during the 2001–2021 period. However, hypothesis H_2: 'The observed Turn of the month effect is statistically significant', is valid only for rice (all three ToM window alternatives), coffee (–1; 3), and sugar (–1; 1).

Table 5 shows the differences in the ToM pattern during the two-year pre-COVID-19 and the two-year COVID-19 period. Although the calendar anomalies show dynamic patterns and their strength tends to change over time, hypothesis H_3 assumes that a major change in the ToM pattern in the cases of the analysed agricultural commodities did not accompany COVID-19. However, as the results in Table 5 show, hypothesis H_3: 'With agricultural commodities with a statistically significant ToM effect, the observed patterns were not disrupted during the COVID-19 pandemics' cannot be accepted. The pre-COVID-19 and post-COVID-19 results differ substantially in all of the investigated cases. In the case of rice (–1; 3), rice (1; 3), and coffee (–1; 3), the differences between the average ToM and RoM period returns increased, which indicates the strengthening of the ToM effect. However, in the case of rice (–1; 1), coffee (–1; 3), sugar (–1; 1), and cocoa (–1; 1), the differences decreased, which indicates the weakening of the ToM effect. However, it is too early to conclude whether we are discussing a long-term or temporary trend.

Table 5. The Turn of the month effect (%) – comparison of the pre-COVID and COVID period

Commodity	pre-COVID-19 (2018–2019)			COVID-19 (2020–2021)		
	ToM	RoM	difference between ToM and RoM	ToM	RoM	difference between ToM and RoM
Rice (–1; 3)	0.137	0.006	0.131	0.238	0.001	0.237
Rice (1; 3)	0.053	0.028	0.025	0.261	0.010	0.251
Rice (–1; 1)	0.366	–0.004	0.371	0.175	0.032	0.143
Coffee (–1; 3)	0.070	0.012	0.058	–0.126	0.197	–0.323
Sugar (–1; 1)	0.715	–0.086	0.801	0.358	0.057	0.301
Cocoa (–1; 1)	–0.038	0.088	–0.125	–0.331	0.052	–0.383

Source: Authors' own calculations

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Table 6. The results of the regression analysis

Commodity	α	β	β (*P*-value)	*F*	R^2	SD
Rice (–1; 3)	–0.00009	0.00216	0.00032***	12.95161	0.00246	0.01716
Coffee (–1; 3)	0.00020	0.00131	0.07434*	3.18570	0.00061	0.02094
Rice (1; 3)	0.00013	0.00136	0.04317**	4.09059	0.00078	0.01717
Rice (–1; 1)	0.00008	0.00257	0.00143***	10.18396	0.00193	0.01716
Sugar (–1; 1)	0.00012	0.00230	0.01943***	5.46614	0.00104	0.02094
Cocoa (–1; 1)	0.00056	–0.00152	0.09322*	2.81889	0.00054	0.01926

α – intercept representing the average return recorded during the RoM period; β – regression coefficient
Source: Authors' own calculations

To verify the results of the Welch test, a regression analysis was performed for cases where the Welch test indicated a statistically significant ToM effect, similar to the study of Maher and Parikh (2013). As shown in Table 6, which contains the primary outcomes of the regression analyses, although the *P*-values differ slightly, the regression analyses confirm the results of the Welch test. The dummy variable that shows whether a particular return was recorded during the ToM or the RoM window is statistically significant in all six cases. Although R^2 is very low in all cases, it is not a problem, as we do not use regression analyses to make any predictions. We only use them to determine whether the dummy variable is statistically significant.

Figure 1 shows the potential of the ToM effect to be utilised as a part of an investment strategy. It shows the cumulative results of investing only during the ToM periods, the cumulative results of investing only during the RoM periods, and the overall returns recorded by buying at the beginning of 2001 and selling at the end of 2021. As can be seen, in the case of rice, in all three ToM windows, a simple strategy of investing during the ToM periods and staying out of the market during the RoM periods would be more efficient than the buy & hold investment strategy. The same can be said about sugar and the (–1; 1) ToM window. The reason is simple, during the ToM windows, significant positive returns were recorded, during the RoM windows, negative returns were recorded. This finding is similar to the findings of Ariel (1987), Lakonishok and Smidt (1988), or McConnell and Xu (2008), who observed similar behaviour in the stock markets.

In the case of coffee (–1; 1), investing only during the ToM windows would not suffice to beat the buy & hold

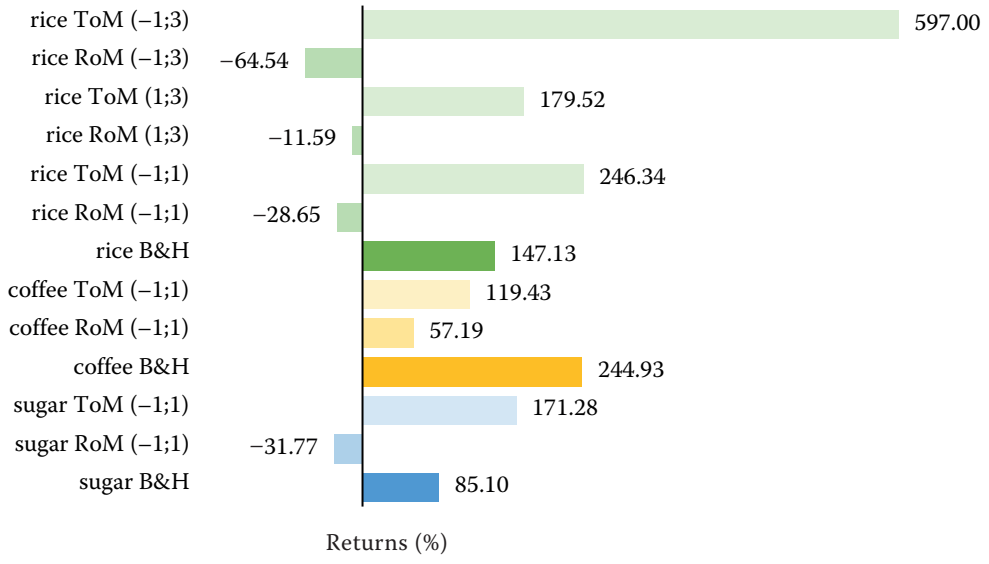

Figure 1. Comparison of the ToM (Turn of the month), RoM (Rest of the month), and B&H (buy & hold) returns (Jan 2001 – Dec 2021)

Source: Authors' own calculations

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strategy, as positive returns (although smaller) were also recorded during the RoM windows. However, the cumulative RoM return of 57.19% recorded over 21 years is not too impressive. It equals an average annual return of only 2.177%. Under normal market conditions, this return can be beaten relatively easily by investing in money or bond markets. It means that the investment strategy proposed by Kunkel and Compton (1998) was based on switching between the stock market (in this case, the coffee market) during the ToM windows and money markets during the RoM windows, which would be efficient.

Therefore, except for coffee, it is possible to accept hypothesis H_4: 'With agricultural commodities with a statistically significant ToM effect, a simple ToM-based investment strategy can generate abnormal returns (beat the buy & hold investment strategy).' If we apply the abovementioned strategy of switching between different markets during the ToM and RoM windows, the ToM effect can also be efficiently exploited in the coffee market.

It is also important to note that the results for cocoa are very interesting. Regardless of the investigated ToM window, the cocoa prices performed consistently better during the RoM periods than during the ToM periods. Moreover, cocoa recorded negative returns for all the investigated ToM window alternatives. This finding may be quite valuable, too, as cocoa's RoM returns are much higher than the RoM returns of the other investigated agricultural commodities. In the case of the (–1; 1) window, where the differences were statistically significant, investing only during the ToM windows would generate a 43.75% loss, while investing only during the RoM windows would generate a 491.06% gain. The 491% gain compares favourably to the 237.6% gain recorded by the buy & hold strategy. Moreover, switching between the rice, coffee, or sugar market during the ToM windows and the cocoa market during the RoM windows should lead to huge abnormal returns.

Unfortunately, we can only speculate why cocoa behaves so differently. It may be given by the very specific fundamentals of the commodity provided only in a relatively tiny region of the planet. Year after year, the Ivory Coast, Ghana, Cameroon and Nigeria, four African countries from the Guinea Bay, are responsible for around 75% of the global cocoa production. This may mean that the investors tend to overreact to information regarding the weather conditions and political situations in these countries, which may cause the different behaviour of the cocoa market in comparison to the other investigated agricultural commodities whose production is diversified geographically better.

Our results regarding the practical implications of the ToM effect on the agricultural commodity markets align with the findings of authors who focused on the ToM effect on the stock markets. For example, Kunkel and Compton (1998) successfully tested the strategy of switching between the stock market during the ToM windows and the money market during the RoM windows. Vasileiou (2018) proved the strategy of switching between stocks during the ToM windows and a bank account during the RoM windows to be also efficient. However, we see space for further research in this area.

CONCLUSION

Our results show that there is a ToM effect present in the agricultural commodity markets. Moreover, in the case of some commodities and some alternatives of the ToM window, the ToM effect is statistically significant [rice (–1; 3), rice (1; 3), rice (–1; 1), coffee (–1; 3), sugar (–1; 1)]. When comparing the two-year period during the COVID-19 pandemic (2020–2021) and the two-year period directly before the pandemic (2018–2019), notable changes in the ToM pattern occurred. However, it is too soon to conclude whether these changes are long-lasting or only short-term fluctuations in the ToM effect pattern. From the practical viewpoint, there are strong indications that the ToM effect can be used to generate abnormal returns. This finding may be useful, especially for investors.

As mentioned above, our results are very encouraging and indicate that the ToM effect present in the agricultural commodity markets could be used to generate abnormal returns. However, further research is needed to confirm this assumption. The logical next step is to test the strategies on commonly available financial instruments such as Contract for Differences (CFDs) or Exchange-traded funds (ETFs), also considering the transaction costs. Moreover, there is space for further 'fine-tuning' of the investment strategy by using different ToM windows for individual commodities and finding a proper investment asset for the RoM periods. This is where cocoa looks highly promising.

We also suspect that foreign exchange movements can explain at least a part of the ToM effect, as numerous fundamental news reports usually affect the currency markets around the end of a month. Therefore, another potential direction of the research is to investigate the presence of the ToM effect using daily returns adjusted for foreign exchange movements.

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REFERENCES

Agrawal A., Tandon K. (1994): Anomalies or illusions? Evidence from stock markets in eighteen countries. Journal of International Money and Finance, 13: 83–106.

Andrade S.C., Chhaochharia V., Fuerst M.E. (2013): 'Sell in May and go away' just won't go away. Financial Analysts Journal, 69: 94–105.

Arendas P. (2017): The Halloween effect on the agricultural commodities markets. Agricultural Economics – Czech, 63: 441–448.

Arendas P., Kotlebova J. (2019): The turn of the month effect on CEE stock markets. International Journal of Financial Studies, 7: 1–19.

Ariel R.A. (1987): A monthly effect in stock returns. Journal of Financial Economics, 18: 621–628.

Ariel R.A. (1990): High stock returns before holidays: Existence and evidence on possible causes. The Journal of Finance, 45: 1611–1626.

Aziz T., Ansari V.A. (2017): The Turn of the Month effect in Asia-Pacific markets: New evidence. Global Business Review, 19: 214–226.

Bouman S., Jacobsen B. (2002): The Halloween indicator, 'sell in May and go away': Another puzzle. American Economic Review, 92: 1618–1635.

Burakov D., Freidin M. (2018): Is the Halloween Effect present on the markets for agricultural commodities? Agris On-line Papers in Economics and Informatics, 10: 23–32.

Burnett J.E. (2017): Liquidity and investor confidence in the turn-of-the-month regularity. Applied Economics Letters, 24: 273–278.

Cadsby C., Ratner M. (1992): Turn-of-month and pre-holiday effects on stock returns: Some international evidence. Journal of Banking & Finance, 16: 497–509.

Fama E. (1965): Random walks in stock market prices. Financial Analysts Journal, 21: 55–59.

Chen J., Frijns B., Indriawan I., Ren H. (2018): Turn of the Month effect in the New Zealand stock market. New Zealand Economic Papers, 53: 288–306.

Kayacetin V., Lekpek S. (2016): Turn-of-the-month effect: New evidence from an emerging stock market. Finance Research Letters, 18(C): 142–157.

Kumar S. (2022): Turn-of-the-month effect in cryptocurrencies. Managerial Finance, 48: 821–829.

Kunkel R.A., Compton W.S. (1998): A tax-free exploitation of the turn-of-the-month effect: C.R.E.F. Financial Services Review, 7: 11–23.

Kunkel R.A., Compton W.S., Beyer S.B. (2003): The turn-of-the-month effect still lives: The international evidence. International Review of Financial Analysis, 12: 207–221.

Lakonishok J., Smidt S. (1988): Are seasonal anomalies real? A ninety-year perspective. Review of Financial Studies, 1: 403–424.

Lee Y.K., Ryumi K. (2022): The turn-of-the-month effect and trading of types of investors. Pacific-Basin Finance Journal, 75: 101826.

Liu L. (2013): The Turn-Of-The-Month effect in the S & P 500 (2001–2011). Journal of Business & Economics Research, 11: 269–276.

Maher D., Parikh A. (2013): The turn of the month effect in India: A case of large institutional trading patterns as a source of higher liquidity. International Review of Financial Analysis, 28: 57-69.

Nikkinen J., Sahlström P., Takko K., Janne A. (2009): Turn-of-the-month and intramonth anomalies and US macroeconomic news announcements on the thinly traded Finnish stock market. International Journal of Economics and Finance, 1: 3–11.

Nilsson L. (2015): Turn-of-the-Month: Window dressing behavior. Available at https://ssrn.com/abstract=2648136 (accessed Jan 10, 2023).

Ogden J.P. (1990): Turn-of-Month evaluations of liquid profits and stock returns: A common explanation for the monthly and January effects. The Journal of Finance, 45: 12591272.

Philpot J., Peterson C.A. (2011): A brief history and recent developments in day-of-the-week effect literature. Managerial Finance, 37: 808–816.

Singh G., Bhattacharjee K., Kumar S. (2021): Turn-of-the-month effect in three major emerging countries. Managerial Finance, 47: 555–569.

Vasileiou E. (2018): Is the turn of the month effect an abnormal normality? Controversial findings, new patterns and… hidden signs(?). Research in International Business and Finance, 44: 153–175.

Vasileiou E. (2021): Turn-of-the-month effect, FX influence, and efficient market hypothesis: New perspectives from the Johannesburg stock exchange. Macroeconomics and Finance in Emerging Market Economies 9: 1–17.

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