

Effects of Easter and Yom Kippur on Quarterly Earnings and Returns

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I examine whether Easter and Yom Kippur affect quarterly operating earnings and stock returns of airline and hotel firms. Easter (Yom Kippur) is determined by the lunar phases, and falls in either March or April (September or October). This shift between months may impact airline and hotel firms because of the consumers' traveling behaviors associated with each holiday. Using seasonal random walk models, I find that airline (hotel) firms have higher (lower) operating earnings in quarters with Easter (Yom Kippur) compared to prior year same quarters without Easter (Yom Kippur). Three-month buy-and-hold raw returns for both holidays show similar results.

INTRODUCTION

In the 2016 4th quarter earnings call, MGM Resorts International (NYSE: MGM) CEO Jim Murren gave an interesting reason for the firm's disappointing performance: "The Company's domestic resorts were impacted by a lower number of convention room nights compared to the prior year quarter, primarily driven by the October holiday calendar shifts..." (NASDAQ, 2016). The holiday referred in the press release is Yom Kippur, considered the holiest day in the Jewish calendar. The Jewish calendar is a lunisolar calendar, and Yom Kippur falls either in September or October of the Gregorian calendar. This study examines the effects of two lunisolar calendar-based holidays, Easter and Yom Kippur, on firm performances and stock returns for firms in airline and hotel industries. Most holidays, which are fixed to a certain day such as 4th of July or to a certain day of a certain week of a certain month such as Thanksgiving, do not affect seasonal quarterly earnings because, for example, the effect of Christmas is similar to the quarter including December year after year. On the other hand, Easter falls either in March and April, and Yom Kippur in September and October. This may affect quarterly earnings for firms, which have quarter ends at the end of March or September.

I focus on airline and hotel firms because these two holidays may affect the business and personal travels, and subsequently affect the firm performances in those industries. On one hand, the dates of these holidays are known in advance, and firms have time to shift marketing and/or sales strategies to make up for earnings that are not captured when the holiday is not included in the quarter. On the other hand, not having normal business in one week/weekend out of 13 weeks/weekends of a quarter may have a significant impact. Airline and hotel firms may be affected by personal travelers, who visit families for holidays and also by business travelers, who may not travel for work if they or their clients observe religious holidays. Furthermore, hotel firms that rely on business travelers and convention/conference customers can also experience a significant impact if trade and professional organizations stay away from scheduling meetings, conventions, and conferences on a week with Yom Kippur in the middle. Using June-end quarters for Easter and December-end quarters for Yom Kippur, I examine the prior year and

current year to see whether the contemporaneous quarter (1) includes the holiday in the current year, but did not include in the prior year, (2) does not include the holiday in the current year, but did include in the prior year, and (3) includes (does not include) the holiday in the current year, and also included (did not include) in the prior year.

I find that airline firms have higher quarterly operating earnings in June-end quarters when Easter is in April, compared to the same quarter prior year when Easter was in March. I also find that hotel firms have lower quarterly earnings in December-end quarters when Yom Kippur is in October, compared to the same quarter prior year when Yom Kippur was in September. I find that 3-month buy-and-hold raw returns follow the similar patterns, as well as buy-and-hold abnormal returns for airline firms in June-end quarters.

TABLE 1
EASTER AND YOM KIPPUR DATES 1996-2016

	Easter		Yom Kippur	
	<i>March</i>	<i>April</i>	<i>September</i>	<i>October</i>
1996		4/7	9/23	
1997	3/3			10/11
1998		4/12	9/30	
1999		4/4	9/20	
2000		4/23		10/9
2001		4/15	9/27	
2002	3/31		9/16	
2003		4/20		10/6
2004		4/11	9/25	
2005	3/27			10/13
2006		4/16		10/2
2007		4/8	9/22	
2008	3/23			10/9
2009		4/12	9/28	
2010		4/4	9/18	
2011		4/24		10/8
2012		4/8	9/26	
2013	3/31		9/14	
2014		4/20		10/4
2015		4/5	9/23	
2016	3/27			10/12

BACKGROUND

While two holidays most associated with travels, Thanksgiving and Christmas, are fixed to the third Thursday of November and 25th of December, respectively, Easter and Yom Kippur are holy days that are determined by both the lunar phase and solar time. Easter, as observed in the United States, falls on the first Sunday on the Gregorian calendar after the first full moon on or after the spring equinox. This usually falls either in March or April on the Gregorian calendar. Yom Kippur is considered the holiest day of the Jewish calendar, and falls either in September or October. It spans two days of the Gregorian calendar, because the Jewish calendar counts a day from a sundown to a sunset (e.g., Yom Kippur in 2016 is on October 11, which starts at sundown and ends at sunset the next day). The Jewish calendar is arranged to ensure that Yom Kippur does not fall on Friday or Sunday.¹

I focus on the firms in airline and hotel industries because the timing of these holidays may affect personal and business travels, and subsequently affect the firms' quarterly earnings. Holidays can affect airline and hotel firms in a number of ways. Depending on the type of holidays, travelers may fly more for personal travels around holidays, but less for business travels. Travelers may also stay more at hotels for one type of holidays (e.g., three-day weekends), but less at hotels for other type of holidays (e.g., Thanksgiving and Christmas, when families may prefer to stay with families, rather than at nearby hotels). Also, business travelers may stay away from traveling to meet clients or to attend conferences/conventions around holidays.

I use two samples, one for Easter and another for Yom Kippur. The Easter sample and the Yom Kippur sample consist of June-end quarters and December-end quarters, respectively. By using seasonal random walk models, I examine whether the inclusion or exclusion of Easter/Yom Kippur this year, compared to last year's exclusion or inclusion, has an effect on quarterly firm performance, compared to when the holiday is included or excluded both in this year's quarter and in the same quarter prior year. Table 1 shows the dates for Easter and Yom Kippur from 1996 to 2016. The switch between March and April for Easter and the switch between September and October for Yom Kippur seem to not follow any obvious pattern (e.g., switch every year, every other year, etc.), thus the inclusion/exclusion of Easter/Yom Kippur is not capturing some other pattern, which may have an effect on quarterly firm performance.

SAMPLE SELECTION

My two samples, one for Easter and one for Yom Kippur, both span 20 years from 1997 to 2016. The Easter sample includes June-end quarters, which are 1st quarters for March 31st fiscal year-end firms, and 2nd, 3rd, and 4th quarters for December 31st, September 30th, and June 30th fiscal year-end firms, respectively. The Yom Kippur sample includes December-end quarters, which are 1st quarters for September 30th fiscal year end firms, and 2nd, 3rd, and 4th quarters for June 30th, March 31st, and December 31st fiscal year end firms, respectively. Both samples have two subsamples for airline firms and hotel firms. Airline firms have SIC of 451 (Air Transportation, Scheduled, and Air Courier), and hotel firms have SIC of 701 (Hotels and Motels). Table 2 shows the numbers of firms and firm-year observations. For the Easter sample, I have 66 (81) firms and 641 (450) firm-year observations for airline (hotel) firms that have necessary Compustat data for firm performance tests variables. For stock returns tests, I have 41 (38) firms with 349 (238) firm-year observations for airline (hotel) firms with necessary CRSP data for monthly stock return variables. For the Yom Kippur sample, I have 65 (64) firms with 547 (373) firm-year observations for airline (hotel) firms for firm performance tests and 46 (41) firms with 289 (199) firm-year observations for airline (hotel) firms for stock returns tests.

TABLE 2
SAMPLE SELECTION 1997-2016

Easter Sample	Airline (SIC 451)	Hotel (SIC 701)
<i>Firm Performance Tests</i>		
Number of Firms	66	81
Number of Firm-Year observations	641	450
<i>Stock Returns Tests</i>		
Number of Firms	41	38
Number of Firm-Year observations	349	238
Yom Kippur Sample	Airline (SIC 451)	Hotel (SIC 701)
<i>Firm Performance Tests</i>		
Number of Firms	65	74
Number of Firm-Year observations	547	373
<i>Stock Returns Tests</i>		
Number of Firms	46	41
Number of Firm-Year observations	289	199

METHODOLOGY

I test my hypotheses with seasonal random walk models. Serial correlation of quarterly earnings have been known to researchers for a long time (Foster, 1977; Griffin, 1977; Brown and Rozeff, 1978). Intuitively, the current year 4th quarter earnings should be associated with the prior 4th quarter earnings, because both quarters capture the same period of the operating cycle. I test the effects of Easter and Yom Kippur on quarterly operating earnings with the following models:

$$\begin{aligned} \text{Quarterly_Operating_Earnings}_{i,t} = & \alpha_0 + \alpha_1 \text{Quarterly_Operating_Earnings}_{i,t-1} \\ & + \alpha_2 \text{Easter_Included}_{i,t} + \alpha_3 \text{Easter_Excluded}_{i,t} + \varepsilon_{i,t} \end{aligned} \quad [1]$$

$$\begin{aligned} \text{Quarterly_Operating_Earnings}_{i,t} = & \beta_0 + \beta_1 \text{Quarterly_Operating_Earnings}_{i,t-1} \\ & + \beta_2 \text{YomKippur_Included}_{i,t} + \beta_3 \text{YomKippur_Excluded}_{i,t} + \varepsilon_{i,t} \end{aligned} \quad [2]$$

where:

Quarterly_Operating_Earnings = quarterly operating earnings (Compustat item OIBDPQ), scaled by beginning of the quarter total assets (ATQ).

Easter_Included = 1 if Easter is included in the contemporaneous quarter, but was not included in the same quarter prior year, otherwise zero.

Easter_Excluded = 1 if Easter is not included in the contemporaneous quarter, but was included in the same quarter prior year, otherwise zero.

YomKippur_Included = 1 if Yom Kippur is included in the contemporaneous quarter, but was not included in the same quarter prior year, otherwise zero.

YomKippur_Excluded = 1 if Yom Kippur is not included in the contemporaneous quarter, but was included in the same quarter prior year, otherwise zero.

Because the seasonal random walk model assumes that the expected value of the current year quarterly earnings is the prior year same quarter earnings, my Easter and Yom Kippur are also constructed by comparing this year's presence/absence of Easter or Yom Kippur to the prior year's presence/absence. For example, June-end quarter in 1997 is coded as 1 for *Easter_Excluded* because the prior year (1996) June-end quarter included Easter and the current year (1997) June-end quarter excludes Easter. Similarly, *Easter_Included* is coded as 1 for 1998, because the prior year (1997) quarter excluded Easter and the current year (1998) quarter includes Easter. The coefficients of *Easter_Included* and *Easter_Excluded* are compared to years, such as 1999 when the June-end quarters included Easter in both the contemporaneous year 1999 and the prior year 1998.

The models do not have a subscript for quarters, because each firm has one quarter per year. For example, although 9/30 fiscal year-end firms have their 1st quarter observations, and 12/31 fiscal-year-end firms have their 4th quarter observations in the Yom Kippur sample, each firm only has one quarter per year in each of the two samples, therefore the quarter subscript is not necessary. I run all models as ordinary least square models adjusting for standard errors by clustering firms (Petersen, 2009). All non-indicator variables are winsorized at 1% and 99% by year.

For Model [1], if quarterly earnings are higher when Easter is included, I expect α_2 to be positive and significant and α_3 to be negative and significant. One reason I expect to find this association would be that personal travelers fly more to spend Easter with their families, or have vacations over a longer weekend in areas where Good Friday is observed as a holiday. Because Easter is on a weekend, I do not expect it to impact business travels as much, thus I do not expect the signs to be the opposite. For Model [2], if quarterly earnings are lower when Yom Kippur is included, I expect β_2 to be negative and significant and β_3 to be positive and significant. I expect the signs to be opposite of the Easter sample because Yom Kippur mostly falls on a weekday, compared to Easter, which is always on Sunday, thus it affects more business travels during the week.

RESULTS

Table 3 shows the descriptive statistics. For the Easter sample on Panel A, airline firms and hotel firms have positive mean (median) operating earnings (*Quarterly_Operating_Earnings*), scaled by beginning of the quarter total assets, at 0.014 (0.031) and 0.025 (0.025), respectively. Airline firms and hotel firms have mean (median) 3-month buy-and-hold raw returns (*BHRAW*) of 4.4% (-0.2%) and 5% (2.2%), respectively. Airline firms and hotel firms also have mean (median) 3-month buy-and-hold abnormal returns (*BHAR*) of 2.3% (-3.0%) and 2.9% (0.7%), respectively.

TABLE 3
DESCRIPTIVE STATISTICS

Panel A: Easter Sample	P25	Mean	Median	P75
Airline (SIC 451)				
<i>Quarterly_Operating_Earnings</i>	0.018	0.014	0.031	0.045
<i>BHRAW</i>	-15.1%	4.4%	-0.2%	13.2%
<i>BHAR</i>	-14.7%	2.3%	-3.0%	12.0%
Hotel (SIC 701)				
<i>Quarterly_Operating_Earnings</i>	0.018	0.025	0.025	0.035
<i>BHRAW</i>	-6.9%	5.0%	2.2%	14.8%
<i>BHAR</i>	-8.8%	2.9%	0.7%	12.8%
Panel B: Yom Kippur Sample	P25	Mean	Median	P75
Airline (SIC 451)				
<i>Quarterly_Operating_Earnings</i>	0.010	0.012	0.025	0.039
<i>BHRAW</i>	-6.8%	10.6%	10.2%	26.6%
<i>BHAR</i>	-14.3%	5.7%	3.1%	22.3%
Hotel (SIC 701)				
<i>Quarterly_Operating_Earnings</i>	0.009	0.018	0.020	0.031
<i>BHRAW</i>	-9.7%	3.2%	3.6%	17.5%
<i>BHAR</i>	-11.3%	-1.8%	-1.5%	10.9%

<i>Quarterly_Operating_Earnings</i>	=	quarterly operating earnings (Compustat item OIBDPQ), scaled by beginning of the quarter total assets (ATQ).
<i>BHRAW</i>	=	3-month buy-and-hold raw returns from April to June for airline firms and from October to December for hotel firms, using CRSP monthly returns data.
<i>BHAR</i>	=	3-month buy-and-hold abnormal returns (RET-VWRET) from April to June for airline firms and from October to December for hotel firms, using CRSP monthly returns data.

The means and medians are similar for the Yom Kippur sample on Panel B. Airline firms and hotel firms have positive mean (median) operating earnings (*Quarterly_Operating_Earnings*), scaled by beginning of the quarter total assets, at 0.012 (0.025) and 0.018 (0.020), respectively. The mean (median) 3-month buy-and-hold raw returns (*BHRAW*) for airline firms and hotels firms are 10.6% (10.1%) and 3.2% (3.6%), respectively. Finally, airline firms and hotel firms also have mean (median) 3-month buy-and-hold abnormal returns (*BHAR*) of 5.7% (3.1%) and -1.8% (-1.5%), respectively.

Effects of Easter and Yom Kippur on Quarterly Operating Earnings

Next, Table 4 and Table 5 show the main results of this study. Panels A and B of Table 4 show the effect of Easter on operating earnings of airline firms and hotel firms, respectively. I find that the coefficient of *Easter_Included* is positive and significant in Panel A, showing some evidence that when Easter is included in the contemporaneous quarter compared to not included in the same quarter prior year, airline firms have better firm performances. I do not find the coefficients of *Easter_Included* or *Easter_Excluded* to be statistically significant for the hotel firms in Panel B. One explanation is that consumers fly over the Easter weekend for family gatherings and stay with families, instead of staying at hotels.

TABLE 4

Effect of Easter on Quarterly Firm Performance of Airline and Hotel Firms			
Panel A: Airline Firms		Airline	
<i>DV = Quarterly_Operating_Earnings_t</i>		Coeff.	P-value
<i>Intercept</i>		-0.006	(0.505)
<i>Quarterly_Operating_Earnings_{t-1}</i>		0.736	(0.000) ***
<i>Easter_Included</i>		0.022	(0.014) **
<i>Easter_Excluded</i>		0.012	(0.495)
Adj R ²		0.621	
N		641	
Panel B: Hotel Firms		Hotel	
<i>DV = Quarterly_Operating_Earnings_t</i>		Coeff.	P-value
<i>Intercept</i>		0.016	(0.002) ***
<i>Quarterly_Operating_Earnings_{t-1}</i>		0.377	(0.038) **
<i>Easter_Included</i>		-0.003	(0.136)
<i>Easter_Excluded</i>		-0.001	(0.695)
Adj R ²		0.166	
N		450	

Note: ***, **, and * denote two-tailed significances at 0.01, 0.05, and 0.10 levels, respectively.

Quarterly_Operating_Earnings = quarterly operating earnings (Compustat item OIBDPQ), scaled by beginning of the quarter total assets (ATQ).

Easter_Included = 1 if Easter is included in the contemporaneous quarter, but was not included in the same quarter last year, otherwise zero.

Easter_Excluded = 1 if Easter is not included in the contemporaneous quarter, but was included in the same quarter last year, otherwise zero.

Table 5 shows the effect of Yom Kippur on operating earnings of airline and hotel firms. Panel A shows that the coefficients of *YomKippur_Included* and *YomKippur_Excluded* are not significant for airline firms. For hotel firms however, the coefficient of *YomKippur_Included* is negative and significant in Panel B. The reason why hotel firms are affected by Yom Kippur but not by Easter may be because Yom Kippur falls mostly on weekdays. This would affect business travelers, who do not stay at hotels on Yom Kippur, and conference/convention organizers, who avoid scheduling their events during the week of Yom Kippur. This result shows some evidence of confirming the reason given by the MGM Resorts International CEO for poor performance of 2016 Q4.

TABLE 5

Effect of Yom Kippur on Quarterly Firm Performance of Airline and Hotel Firms

Panel A: Airline Firms		Airline	
<i>DV = Quarterly_Operating_Earnings_t</i>		Coeff.	P-value
<i>Intercept</i>		0.003	(0.624)
<i>Quarterly_Operating_Earnings_{t-1}</i>		0.763	(0.000) ***
<i>YomKippur_Included</i>		0.002	(0.633)
<i>YomKippur_Excluded</i>		0.006	(0.512)
Adj R ²		0.698	
N		547	
Panel B: Hotel Firms		Hotel	
<i>DV = Quarterly_Operating_Earnings_t</i>		Coeff.	P-value
<i>Intercept</i>		0.015	(0.000) ***
<i>Quarterly_Operating_Earnings_{t-1}</i>		0.335	(0.009) ***
<i>YomKippur_Included</i>		-0.007	(0.053) *
<i>YomKippur_Excluded</i>		0.000	(0.813)
Adj R ²		0.153	
N		373	

Note: ***, **, and * denote two-tailed significances at 0.01, 0.05, and 0.10 levels, respectively.

Quarterly_Operating_Earnings = quarterly operating earnings (Compustat item OIBDPQ), scaled by beginning of the quarter total assets (ATQ).

YomKippur_Included = 1 if Yom Kippur is included in the contemporaneous quarter, but was not included in the same quarter last year, otherwise zero.

YomKippur_Excluded = 1 if Yom Kippur is not included in the contemporaneous quarter, but was included in the same quarter last year, otherwise zero.

Effects of Easter and Yom Kippur on 3-month Stock Returns

Furthermore, I examine the stock returns for these quarters of airline and hotel firms. Based on the results that airline firms have higher operating earnings in June-end quarters when Easter is included compared to the prior year's exclusion, I examine 3-month (April to June) stock returns for the airline firms. Similarly, I examine the 3-month (October to December) stock returns for hotel firms, which have lower operating earnings when Yom Kippur is included in October compared to exclusion in the previous year.

$$BHRAW_{i,t} = BHRAW_{i,t-1} + Easter_Included_{i,t} + Easter_Excluded_{i,t} + \varepsilon_{i,t} \quad [3]$$

$$BHRAW_{i,t} = BHRAW_{i,t-1} + YomKippur_Included_{i,t} + YomKippur_Excluded_{i,t} + \varepsilon_{i,t} \quad [4]$$

where:

$BHRAW$ = 3-month buy-and-hold raw returns from April to June for airline firms and from October to December for hotel firms, using CRSP monthly returns data (RET).

Other variables are defined the same as above.

Additionally, I compare the 3-month buy-and-hold raw returns to CRSP decile ranked value-weighted returns including dividends (VWRETD) to examine whether Easter/Yom Kippur inclusion/exclusion affect 3-month buy-and-hold abnormal returns.

$$BHAR_{i,t} = BHAR_{i,t-1} + Easter_Included_{i,t} + Easter_Excluded_{i,t} + \varepsilon_{i,t} \quad [5]$$

$$BHAR_{i,t} = BHAR_{i,t-1} + YomKippur_Included_{i,t} + YomKippur_Excluded_{i,t} + \varepsilon_{i,t} \quad [6]$$

where:

$BHAR$ = 3-month buy-and-hold abnormal returns (RET-VWRET) from April to June for airline firms and from October to December for hotel firms, using CRSP monthly returns data.

Other variables are defined the same as above.

The results of these tests are shown in Table 6. Panel A shows the evidence of the effect of Easter on airline firms' 3-month buy-and-hold raw returns. The coefficient of *Easter_Included* is positive and significant and the coefficient of *Easter_Excluded* is negative and significant. This suggests that airline firms have higher returns in quarters with Easter compared to the prior year's quarters without Easter, and lower returns in quarters without Easter compared to the prior year's quarters with Easter. In the next column, the results are similar when the dependent variable is the buy-and-hold abnormal returns (*BHAR*). For airline firms, not only do Easter quarters seem to have higher raw returns, they also yield abnormal returns.

TABLE 6
EFFECT OF EASTER AND YOM KIPPUR ON STOCK RETURNS OF AIRLINE AND HOTEL FIRMS

Panel A: Easter-Airline	DV = $BHRAW_t$			DV = $BHAR_t$		
	Coeff.	P-value		Coeff.	P-value	
<i>Intercept</i>	0.053	(0.019)	**	0.029	(0.148)	
$BHRAW_{t-1} / BHAR_{t-1}$	-0.197	(0.000)	***	-0.111	(0.015)	**
<i>Easter_Included</i>	0.167	(0.000)	***	0.114	(0.015)	**
<i>Easter_Excluded</i>	-0.207	(0.000)	***	-0.163	(0.000)	***
Adj R ²	0.174			0.092		
N	349			349		
Panel B: Yom Kippur-Hotel	DV = $BHRAW_t$			DV = $BHAR_t$		
	Coeff.	P-value		Coeff.	P-value	
<i>Intercept</i>	0.114	(0.001)	***	0.015	(0.636)	
$BHRAW_{t-1} / BHAR_{t-1}$	0.165	(0.004)	***	0.073	(0.278)	
<i>YomKippur_Included</i>	-0.184	(0.000)	***	-0.030	(0.469)	
<i>YomKippur_Excluded</i>	-0.063	(0.157)		-0.047	(0.250)	
Adj R ²	0.101			-0.001		
N	199			199		

Note: ***, **, and * denote two-tailed significances at 0.01, 0.05, and 0.10 levels, respectively.

- $BHRAW$ = 3-month buy-and-hold raw returns from April to June for airline firms and from October to December for hotel firms, using CRSP monthly returns data.
- $BHAR$ = 3-month buy-and-hold abnormal returns (RET-VWRET) from April to June for airline firms and from October to December for hotel firms, using CRSP monthly returns data.
- Easter_Included* = 1 if Easter is included in the contemporaneous quarter, but was not included in the same quarter last year, otherwise zero.
- Easter_Excluded* = 1 if Easter is not included in the contemporaneous quarter, but was included in the same quarter last year, otherwise zero.
- YomKippur_Included* = 1 if Yom Kippur is included in the contemporaneous quarter, but was not included in the same quarter last year, otherwise zero.
- YomKippur_Excluded* = 1 if Yom Kippur is not included in the contemporaneous quarter, but was included in the same quarter last year, otherwise zero.

Panel B shows that, for buy-and-hold raw returns, the coefficient of *YomKippur_Included* is negative and significant, showing that hotels firms have lower stock returns in quarters with Yom Kippur compared to prior year quarters without Yom Kippur. The abnormal returns results for Yom Kippur-hotel firms, show negative adjusted- R^2 suggesting that unlike other results, the abnormal returns do not seem to be serially correlated in that sample.

Taken as a whole, buy-and-hold raw returns follow similar patterns as those of operating earnings. Airline firms seem to yield positive abnormal returns when Easter is included in the quarters.

CONCLUSION

Researchers have known about serial correlations of quarterly earnings for at least four decades, and use seasonal random walk models for predicting quarterly earnings by using the prior year same quarter earnings as an expectation of the current year same quarter earnings. Researchers have also examined one-time exogenous shocks, such as the financial crisis, natural disasters, and man-made disasters, on the market. In this study I examine a somewhat different event that affects quarterly firm performances, namely two holidays, Easter and Yom Kippur, which are included in the March-end and September-end quarters in some years and in the June-end and December-end quarters in other years, respectively. I find that airline firms have higher earnings in the current year June-end quarters when Easter is included, compared to the prior year June-end quarters when Easter was not included. I also find that hotel firms have lower earnings in the current year December-end quarters when Yom Kippur is included, compared to the prior year December-end quarters when Yom Kippur was not included.

Furthermore, I find that airline firms have higher (lower) 3-month buy-and-hold raw returns in the current year June-end quarters when Easter is included (excluded), compared to the prior year June-end quarters when Easter was excluded (included). Similarly, I also find that hotel firms have 3-month buy-and-hold raw returns in the current year December-end quarters when Yom Kippur is included, compared to the prior year December-end quarters when Yom Kippur was not included. Lastly, airline firms yield positive 3-month buy-and-hold abnormal returns, compared to CRSP value-weighted decile returns, in the current year June-end quarters when Easter is included, compared to the prior year June-end quarters when Easter was excluded.

Taken together, the explanation, given by the MGM Resorts International CEO Jim Murren, in the 2016 Q4 earnings call that the reason for the poor quarterly performance was due to the fact that Yom Kippur was included in the quarter seems plausible according to the evidence found in this study. This is interesting because even though the dates of future Easter and Yom Kippur are known, firms do not seem to or be able to make up for the anticipated lower quarterly earnings by shifting marketing or implement other business strategies. While exogenous shocks to specific industries may be highly difficult to predict, the findings of this study may be of interest to some investors, who anticipate future holiday dates and trade accordingly.

ENDNOTES

1. Rosh Hashanah, Jewish new year's day, is arranged to ensure that Yom Kippur (which is 10 days after Rosh Hashanah) does not fall a day before or after weekly Shabbat. This ensures that there are not two consecutive days of Shabbat observance.

REFERENCES

- Brown, L. D., & Rozeff, M. S. (1979). Univariate time-series models of quarterly accounting earnings per share: A proposed model. *Journal of Accounting Research*, 179-189.
- Foster, G. (1977). Quarterly Accounting Data: Time-Series Properties and Predictive-Ability Results. *The Accounting Review*, 52(1), 1-21.
- Griffin, P. A. (1977). The time-series behavior of quarterly earnings: preliminary evidence. *Journal of Accounting Research*, 71-83.
- NASDAQ. (2017, February 16). *MGM Resorts International Q4 2016 Earnings Call*. Retrieved from <http://www.nasdaq.com/asp/call-transcript.aspx?StoryId=4046948&Title=mgm-resorts-international-mgm-q4-2016-results-earnings-call-transcript>
- Petersen, M. (2009). Estimating standard errors in finance panel data sets: comparing approaches. *The Review of Financial Studies*, 22(1), 435-480.