



## **Easter attack 2019 and Hotel and Travel sector in Sri Lanka: An event study approach**

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### **Abstract**

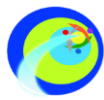
In this paper, the impact of the Easter Sunday Attack on the Hotel and Travel Sector in Sri Lanka has been investigated by using the Event Study Methodology following the Efficient Market Hypothesis (EMH). The Market Model is used in analyzing the Abnormal Returns of stocks by using daily stock prices on thirty-three (33) companies belong to Hotel and Travel Sector in CSE and for the Market Return data, daily ASPI is considered. This empirical study's major objective is to measure and quantify the effects of the Easter Sunday attack on the Hotel and Travel Sector with the Market Efficiency by using Graphical presentation of Average Abnormal Return and Cumulative Average Abnormal Return and t - Statistics Analysis. Consistent with the observed findings, the market has been identified as an efficient and negatively responded market regarding Easter Sunday Attack's event since the quick drop on the event day. Practically, the investors of Hotel and Travel Sector Companies will be able to trade securities in a market where the possibility of beating was eliminated.

*Keywords: easter Sunday attack 2019, efficient market hypothesis, event study methodology, hotel and travel sector and Sri Lanka*

### **Introduction**

Sri Lanka is considered an extremely persecuted country by the thirty years of brutal war since the 19th century, causing the loss of thousands of lives. On 21<sup>st</sup> April 2019, Sri Lanka experienced great destruction caused by terrorism again ten years after the Civil war ended. Eight (8) suicide bombs in different places all over Sri Lanka; (3) took place in most famous hotels in Colombo, another (3) has blasted in Catholic Churches in which Catholics were attending the Easter service. Other than that, the last two (2) bombings had been exploded in a Housing Complex and a Guest House. The attack was capable of killing about 250 civilians and damaging the physical property in which bombings occurred.

In this study, the Event Study methodology is used as the analyzing tool of the event of Easter Sunday Attack to solve the research problem states that the Stock Prices of Hotel and Travel Sector's Informational Efficiency regarding a Civil Disturbance event. Accordingly, the main research objective of this study is to find out whether the Sri Lankan Hotel and Travel Sector



has been affected by the Easter Attack as well as check whether a significant impact has happened on Stock prices just after the Event and it will be achieved by following Research Objectives, (1) Has the Easter Sunday Attack affected the stock prices of the listed companies belong to the Hotel and Travel Sector in Colombo Stock Exchange? if so, in which degree? (2) How did the Easter Sunday Attack affect the listed companies' stock prices belong to the Hotel and Travel Sector in Colombo Stock Exchange on Event Day?

### Literature Review

Fama (1970) has observed the concept of the Efficient Market Hypothesis (EMH) to check whether stock prices have responded efficiently for the new information. In the Sri Lankan context, Abeysekera (2001) has concluded that CSE does not provide evidence for Weak Form Efficiency. Jayakodi (2017) argued that different industries in CSE experienced the impact of terrorist attacks in a heterogeneous manner, depending on the nature of the attack. Simultaneously, Mackinlay (1997) has practically pointed out the Event Study methodology.

### Methodology

The study focuses on the Easter Attack on 21<sup>st</sup> April 2019 in order to test the event's impact on the Hotel and Travel Sector in which listed 33 companies. The Event Study Methodology is the method which considers the 23<sup>rd</sup> April 2019 as the Event Day because 21<sup>st</sup> April was a Sunday and on 22<sup>nd</sup> April, the government has imposed a whole country curfew. Figure 1 shows the Event Timeline showing the Event day, Event Window, and the Estimation Window. Accordingly, the Daily closing Stock Prices are used for Stock returns of Selected companies, and for calculating the Market Return, daily ASPI is considered. Stock price data and Market Index (ASPI) data are extracted from CSE Data Library, while the source for the news related to Easter Attack is BBC News and Daily News. Although there are two expected methods for Normal Return, Mean Adjusted Return Model and Market Model and the results from both techniques are somewhat similar, the market model is mostly preferred because it does not impose any restrictions. The Market Model is shown by equation 1, which is used in obtaining the Actual Return of  $i^{\text{th}}$  security and it provides the base in calculating the Abnormal Return ( $AR_i$ ) for each day shown by Equation 2.

$$\widehat{R}_{i_T} = \alpha_i + \beta_i R_{m_T} + \varepsilon_{i_T} \quad (1)$$

Where,



$\widehat{R}_{i_T}$  = Normal Return of Security i for period t  
 $R_{m_T}$  = Return of Market Portfolio for the period of t  
 $\varepsilon_{i_T}$  = Zero Mean Disturbance Term  
 $AR_{i_T} = R_{i_T} - \widehat{R}_{i_T}$  (2)

Where,

$\widehat{R}_{i_T}$  = Normal Daily Stock Return on T  
 $R_{i_T}$  = Actual Daily Stock Return on T  
 $AR_{i_T}$  = Abnormal Return on T

To perform an analysis for Hotel and Travel Sector, the Average Abnormal Returns (AAR<sub>i</sub>) for each day can be calculated as equation 3.

$$AAR_{i_T} = \frac{1}{N} \sum_{i=1}^N AR_{i_T} \quad (3)$$

Where,

$AAR_{i_T}$  = Average Abnormal Return on T  
 $N$  = Number of Shares / Companies  
 $AR_{i_T}$  = Abnormal Return on T

The Cumulative Average Abnormal Returns (CAAR<sub>i</sub>) for each day are calculated by aggregating AAR<sub>i</sub> s through the time as equation 4.

$$CAAR_{i_T} = \sum_{T=T_0}^{T_2} AAR_{i_T} \quad (4)$$

Where,

$AAR_{i_T}$  = Average Abnormal Return on T  
 $CAAR_{i_T}$  = Cumulative Average Abnormal Return on T

To test whether CAAR<sub>s</sub> are significant during the event period, Schimmer and Muller, 2015, introduced a formula for t-statistic as equation 5.

$$t - \text{statistic } (t) = \frac{CAAR_{i_T}}{\sigma_{AAR_T} / \sqrt{T}} \quad (5)$$

Where,

$CAAR_{i_T}$  = Cumulative Average Abnormal Return on T



$\sigma_{AAR_T}$  = Standard Deviation of Daily Average Abnormal Return on T

$\sqrt{T}$  = Square Root of the total number of days from T<sub>0</sub> to T<sub>2</sub>

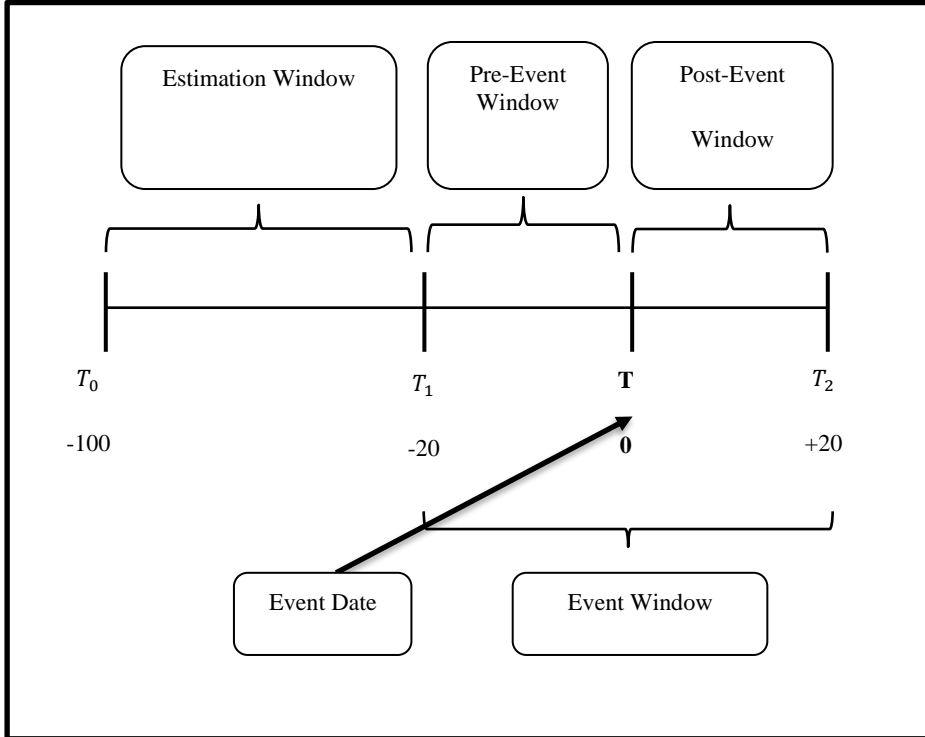


Fig 1. Event Timeline

## Results and Discussions

Drakos (2004) has concluded that the Travel and Tourism Sector are more sensitive to the terrorist attacks. Figure 1 shows that CAAR declined from day -58 to -19 with negative -0.008, although CAAR was rising during -81, -58 window, caused by AAR was continuously getting negative. In accordance with figure 2, a sudden drop has happened on -1 day, and after that, CAAR was declining in the rest of the Event Window. CAAR had a significant quick drop at a 5% level by the event day, but CAARs show significant and continuous declining rest of the event window.

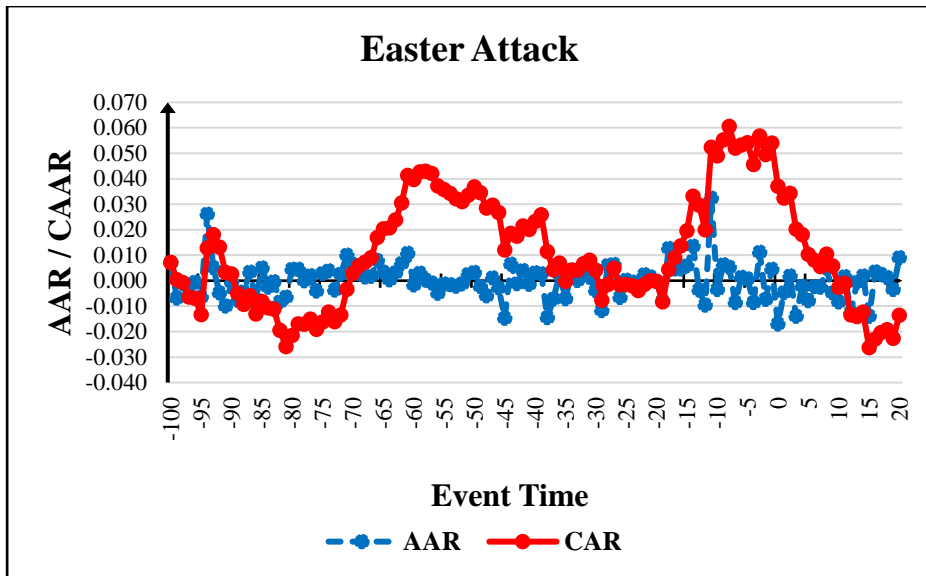


Fig 2. 80 days Estimation Window (-100, -20) and 41 days Event Window (-20, +20)

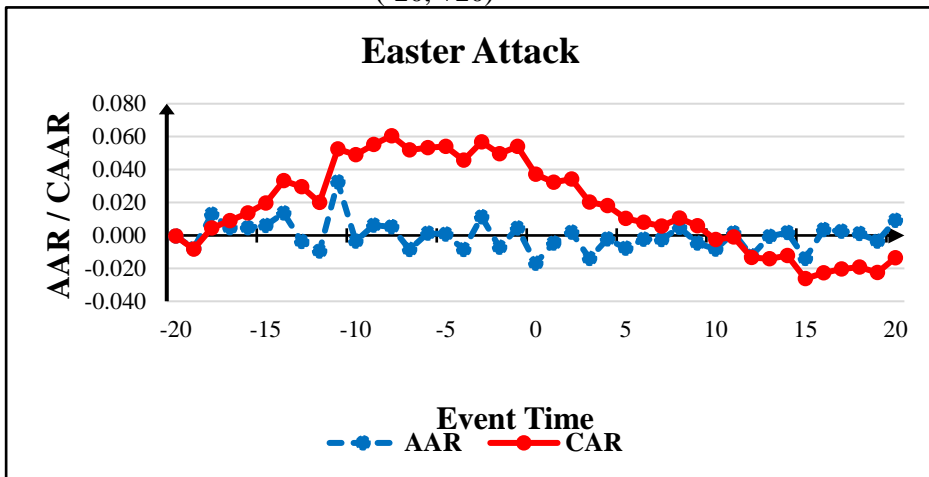


Fig 3. 41 days Event Window (-20, +20)

According to table 1, the quick drop in CAAR on Event Day was significant at 5%, but the significance has remained until day +5. Although the stock price was absorbed the information quickly, continuously price has been changing even after the event day.

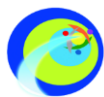


Table 1. t - test results for -10, +10 window

Event Time	CAAR	t-test	Significance/Not Significant at 5%	Event Time	CAAR	t-test	Significance/Not Significant at 5%
-10	0.0490	11.4065***	Significant	1	0.0324	4.9888***	Significant
-9	0.0552	9.1473***	Significant	2	0.0343	4.3483***	Significant
-8	0.0605	30.5689***	Significant	3	0.0203	3.6249***	Significant
-7	0.0520	5.8462***	Significant	4	0.0181	2.4748**	Significant
-6	0.0533	34.3492***	Significant	5	0.0103	2.3975**	Significant
-5	0.0541	13.7743***	Significant	6	0.0081	1.1379*	Not Significant
-4	0.0456	7.5905***	Significant	7	0.0056	1.6679*	Not Significant
-3	0.0568	8.8450***	Significant	8	0.0105	1.3831*	Not Significant
-2	0.0495	15.9546***	Significant	9	0.0057	1.1539*	Not Significant
-1	0.0540	7.5474***	Significant	10	-0.0026	-0.3379	Not Significant
0	0.0371	3.4702***	Significant				

\*\*\* Significance at 1%, \*\* Significance at 5% \*Significance at 10%

## Conclusions and Recommendations

This paper concludes although the results show that the significant quick drop in CAAR (0.054-0.037) by event day, the continuous declining trend in CAAR does not provide evidence for semi-strong form efficiency in Hotel and Travel Sector since the post-event window CAARs are significant at 5%. That means, if considerable time is taken for adjusting stock prices, the stock market will not be a semi-strong efficient market. However, it is crystal clear that the Hotel and Travel Sector has been affected by Easter Attack negatively as per the behavior of CAAR. Further studies can be recommended to find the exact impact of an attack by keeping control of the news other than terrorist attacks possible to release.

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