Knowledge E
enriching | engaging | empowering

Conference Paper

Impact of Brexit on Construction Stocks listed on Bursa Malaysia

Senthil Kumar, Mohd Ridzuan Darun, and Mohammad Aslam

Faculty of Industrial Management, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Pahang, Malaysia

Abstract

The British exit from the European Union (Brexit) referendum conducted in the United Kingdom (UK) about remaining in the European Union (EU) has had a profound effect on the world economy. Stock markets across the globe bore the brunt and pound sterling weakened sharply on this announcement. However, not all the economies were affected in the same way and the effect ranged from no impact to high impact. Economies which had considerable exposure to the UK, were affected. Though Malaysia does not have highly significant trade connections with the UK, the construction sector has moderate exposure to UK investments. In this study, construction companies' stock price movement during the Brexit announcement was analyzed using the Event Study Methodology. Ten publicly traded construction companies were randomly selected and their stock returns were compared with the KCI Market Index returns. The returns were very volatile and showed a negative trend during the first few days around the Brexit announcement indicating that there was an insignificant short-term impact. However, the shock was quickly absorbed and the stock returns stabilized in a few days implying that the Brexit announcement did not have a significant long-term impact on construction company stocks in Malaysia.

Keywords: brexit, event study, bursa Malaysia, Malaysian construction industry.

Corresponding Author:
Senthil Kumar
senthilkumar@ump.edu.my

🔓 **OPEN ACCESS**

1. Introduction

The Brexit referendum was conducted on 23rd June 2016 to decide if the UK should remain or leave the European Union (Thomson, 2016). In a rather unexpected development, the UK decided to leave the European Union (EC, 2016). Consequently, stock markets in the United States, Japan, South Korea, Australia, China, Taiwan, India and Southeast Asian countries crashed due to the uncertainty created by the impending exit. It was reported that the estimated losses in just four days around the announcement were about 3 trillion dollars and the US alone accounted for more than 1.3 trillion dollar losses (David, 2016). The oil prices and the currency markets were highly affected, as well. The pound sterling suffered its worst decline since 1985 and was traded at 11% lower rates before making a marginal recovery (Kirka & Lee, 2016).

The uncertainty was slowly ingested due to numerous reasons and the financial markets recovered in a few weeks. **First**, the decision had arrived and it ceased to contribute as a source of speculation. The UK and other economies had come to accept the imminent 'Brexit'. **Second**, the UK was already a detached member of the European Union, which had even refused to accept the common currency (Kauko, 2016). Its economy contributed to only 2.5% of the global GDP, which is much smaller than the collective contribution of the EU. **Third,** the withdrawal from the union was a long drawn process and was unlikely to happen in a haste. Hence, it was generally perceived that the exit would not pose a serious threat to the financial stability of the world in the future.

In general, the short-term impact of Brexit in some economies, particularly in their stock markets, was profound and in the other markets, the impact was rather ambiguous. In the case of Malaysia, it appears that the impact of Brexit on the stock market has not been analyzed. Hence, this study was conceived to examine the short-term term effects of Brexit announcement on Bursa Malaysia to explore the future course of action and to take preventive measures against financial shocks in the future. Malaysia's trade exposure to the UK is quite limited and only the construction industry has some exposure to investments from the UK. Hence, only the construction company stock returns were analyzed. The primary notion of this study is to probe the behavior of construction company stock returns around Brexit announcement (23rd June 2016) through event study analysis.

2. Literature Review

2.1. Brexit impact

Numerous *ex-ante* studies have been done on the potential impact of Brexit on financial markets and other domains. In general, the results indicated that the outcome of Brexit would be unfavorable and significant market reactions were expected on the day of poll results. (Bianchetti, Galli, Ricci, Salvatori, & Scaringi, 2016) used Johansen-Ledoit-Sornette model to detect possible bubbles and reported that there were no bubble signals in equity and currency markets. Hence, it was concluded that there would not be any crashes or sharp rises in equity markets and currency markets. However, bubble signals were found in the domains of rates, credit and real estate. The central bank's Financial Market Committee (BNM, 2016) cautioned that the impact and volatility of Brexit could spill into the financial markets. Japan Centre for Economic Research also

warned that Malaysia is likely to face the biggest effect of Brexit, among other Southeast Asian countries. It had the most credit from British banks and made higher Foreign Direct Investments in the UK, compared to other major South East Asian economies. It was observed that, Malaysia's GDP growth was declining and the rate was expected to decrease further as the exports to the UK and EU were about 7% of its GDP.

Brexit may cause different border controls as separation of the UK primarily from European Union and secondarily from whole Europe. This would restrict export-import and free movement of goods & services. Tielmann and Schiereck (2017) found an overall negative effect on logistic sectors. Logistic companies based in the UK have relatively poorer performance than logistic companies based on Continental Europe after Brexit. Uncertainty and speculation had worsened the scenario causing harm to the UK economy. Steinberg (2019) tried to measure the uncertainty impact on trade policies after Brexit. It was observed that total consumption-equivalent welfare cost, attributable to Brexit, for UK households ranged from 0.4% and 1.2%. However, less than one-fourth this cost was attributed to risk or uncertainty. Schiereck, Kiesel, and Kolaric (2016) studied the stock market and Credit Default Swap (CDS) market response around Brexit. In the case of stock market response, their findings pointed out the short-run drop in stock prices for Brexit announcement. Bashir et al. (2019) investigated the vigorous link of the stock price with the exchange rate for Britain and the other four countries in the European Union surrounding Brexit event. They opined that direction of co-movements between them demonstrated a different pattern for the pre and post period and most European stock markets tended to be negatively correlated with exchange rate in the long term after Brexit. Hall and Wójcik (2018) explored financial geography settings with Brexit. They opined that geographical shifting from London would bring uncertainty to business since London had dominated in financial activity and was the *de facto* financial capital of the Eurozone. Providing strong business service depends on the location of the financial sector and hence, business services were expected to be negatively affected as London's role as the International Finance Center would be reduced. Domestic sales rather than foreign sales oriented firm stocks showed more negative abnormal return after Brexit. However, internationally exposed firms did not have any relevant pricing effect in the post-Brexit days. A high degree of market efficiency was noticed when there was a quick adjustment of stock prices to reflect firm-level internationalization (Oehler, Horn, & Wendt, 2017). Nearly $3 trillion was wiped off from the global markets and most firms had negative returns following Brexit referendum as there had been homogenous negative expectation all around. However, it was noticed that the changes were heterogeneous and not homogenous.

In addition, firms reliant on import oriented intermediates also performed poorly (Davies & Studnicka, 2018). Other studies by (Oliver, 2016) and (Kauko, 2016) were broader *ex ante* studies which analyzed the strategic impact of Brexit. Rana's (2016) study was *ex post* but it dwelled on scenarios, broader dimensions and suggestions.

2.2. Malaysia and UK economic ties

As the British economy was expected to shrink, the trade relations between the UK and Malaysia were likely to be affected. The HMT (2016) anticipated that a vote to leave the EU would have a negative impact on UK Gross Domestic Product (GDP) and the real estate Industry. In the worst-case scenario, GDP would have declined to around 3.6% after two years and house prices would have fallen by 10% when compared the no-Brexit outcome. A relatively weaker economic condition would increase uncertainty and reduce the confidence of the investors.

Although the Malaysian economy is not susceptible to direct threats from Brexit, it may be affected by the indirect diversified effect that is not reflected by the markets and would ultimately pose a risk. Investors may mutely observe for quite some time and desist from participating in the market. This weak appetite of investors may affect the overall market attitude and ultimately impose a domino effect on the currency. However, Malaysia would experience a positive outcome when the UK tries to expand its trading relationship beyond Eurozone. It would only have a short-term effect on financial markets marked with uncertainty and volatility. Although Ringgit has been affected, the investment from Britain to Malaysia is expected to continue. Malaysia does not have strong economic ties and exposure to the UK unlike the European countries. At most, the negotiation between Malaysia-EU free trade agreement could be paused and delayed but will eventually progress later. On the contrary, if the UK did not leave there wouldn't be any impact on the Eurozone and the world at large. Trade and investments would simply continue on a regular basis without any interruption (The Sun Daily, 2016).

In addition, Malaysia is not exposed to adverse direct trading effects of Brexit. Only indirect and spillover effect was anticipated since the UK is not among the top ten significant trading partners of Malaysia. Although the British recession and reduced demand for Malaysian products may happen, it would not be a great threat to the Malaysian economy. Nevertheless, the indirect effects could be quite serious. Many forecasters predicted Brexit to have a hazy effect on UK, Europe and the world economy together with chances of global financial turmoil. Economic impact on Malaysia would be very less as trade between these two countries had significantly reduced (Khor, 2016)

from the 1990 scenario where the UK was the fourth biggest trading partner of Malaysia behind Singapore, the United States and Korea.

In the short term, foreign direct investment from Europe will remain unaffected due to the very nature of the medium. However, capital market investments such as stocks and debentures were likely to be affected by temporary phenomena. The number of Malaysian firms with exposure to the UK is quite less and just limited to property development, regulated assets and casinos (The Star Online, 2016). Hence, the null hypothesis is that Brexit announcement did not have a significant impact on construction company stocks in Malaysia.

3. Methodology

Event study tool is commonly applied for analyzing the impact on stocks for various events in the finance world (Kumar, Panda and Radzi, 2016). The impact of the public announcement on stock prices is gauged by measuring the difference between actual and expected stock returns. This difference is an abnormal stock return and a positive value indicates that the public announcement was viewed favorably by the markets and vice versa. The result date of vote in the UK parliament for Brexit was considered as the event day (23 June 2016) i.e. 'day zero'. Daily closing stock price data of construction companies and closing value of KLCI index were used for computing daily stock returns and market returns respectively in event study analysis. KLCI Index and Stocks of construction companies not traded in holidays were ignored and the event day was fixed for the next trading day. A typical estimation period may be about -120 to - 30 days before the event. Here, the clean period was chosen as 90 trading days with the consideration that if the reference period was too short, it might not serve as a valid benchmark. The event window was chosen as ±30 trading day.

Since the Brexit referendum, which was conducted on 23 June 2016, was in favor of leaving the European Union, the time period surrounding the announcement viz. May, June, July and Augusts 2016 was considered for analysis. The FTSE Bursa Malaysia KLCI Index was used for computing market return and among the listed construction companies in Bursa Malaysia, 10 construction companies' stock were selected randomly for this study. They are UEM Sunrise Bhd (UMSB), YTL Corporation Bhd (YTLS), IJM Corporation Bhd (IJMS), Gamuda Bhd (GAMU), Malaysian Resource Corporation Bhd (MYRS), WCT Holdings Bhd (WCTE), WCE Holdings Bhd (WCEH), Hock Seng Lee Bhd (HSLB), Mudajaya Group Bhd (MJYA) and Muhibbah Engineering (MUHI). Historical data used in this study was obtained from Investing.com.

Typical canonical form of the model is given below:

$r_{jt} = R_{jt} - (\alpha + \beta R_{mt} + \varepsilon_{jt})$

Where,

r_{jt} = Abnormal return for construction stock j at time t

R_{jt} = Actual return of construction stock j at time t

α = Intercept of the market model regression (Ordinary Least Squares estimate)

β = Beta in the market model regression (Ordinary Least Square estimate)

R_{mt} = Return of market index KLCI on day t

ε_{jt} = Error term of stock j's return

The average abnormal return was calculated as $AAR_t = \sum_{t=0}^{n} r_{it}/n$

Where, n = Number of stocks in the event study

The statistical significance of AAR was computed as t = AAR/S.D

Where, t = Student's t statistic value and S.D = Standard Deviation of average returns

4. Results

Stock returns have been analyzed from three perspectives i.e. analysis of daily average abnormal returns, analysis of average abnormal returns in various event windows and patterns of stock behavior.

4.1. Daily average abnormal returns (AAR)

On the day of Brexit Referendum average abnormal returns declined to -0.70% from 0.45% on the day before announcement (Appendix-1). This further declined to -0.92% one day after the announcement. Negative returns of -1.00% were observed two days before 'day zero'. Interestingly, the returns were 0.06% the previous day. This probably indicates that there was some speculation two days ahead of the announcement and that could have resulted in adverse stock market reaction. On the event day, the maximum gain of 0.47% was made by IJMS and maximum loss of -2.14% was incurred by UMSB. Maximum AAR of 1.80% was observed 12 days after the event day and the maximum loss of -1.38% was observed 19 days before event day. In general, construction stocks appear to have lost value in the few days around the Brexit announcement. This construction sector behavior is similar to logistic sector behavior in the study of Tielmann and Schiereck (2017) who found an overall negative effect on logistic sectors and UK based logistic companies with significantly poorer performance than those from

Continental Europe. This finding also corroborates with the findings of Schiereck et al. (2016) which indicated short-run loss around Brexit announcement.

Abnormal returns of construction stocks in various event windows are presented in Appendix-2. Maximum returns of 0.76% were experienced by GAMU in the (-1, 0) event window. The maximum loss of 2.14% was experienced by UMSB in the (0, 0) event window. Overall, the maximum average returns of 0.06% were observed in the (0, +20) event window. Minimum average returns of -0.81% were observed in the (0, +1) event window. Returns in the other event windows show a declining trend indicating that the market reaction was generally adverse for Brexit announcement.

4.2. Pattern analysis of AAR

The AAR values of construction stocks are provided in Appendix-1 and the same has been charted in Figure 1. The AAR had declined from 0.45% to -0.70% on the day of the announcement. It was also observed that the AAR further declined to -0.92% one day after the announcement. Negative returns of -1.00% were observed two days before 'day zero' and negative returns of -0.45%, -0.17%, -0.40%, -0.29%, -0.65% and -0.32% was observed on the second day, fourth day, fifth day, tenth day, fourteenth day and fifteenth day after announcement. This was followed by high volatility in stock returns in Figure-1.
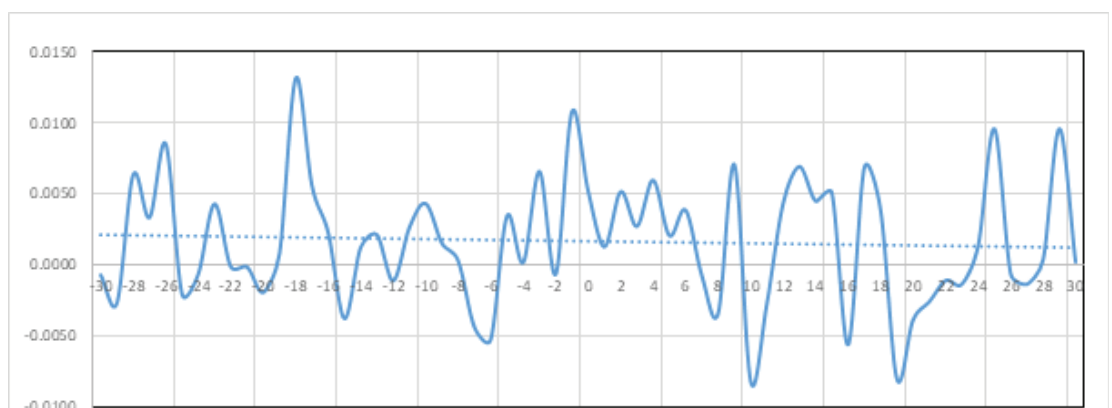

Figure 1: Pattern of Average Abnormal Return.

5. Discussion

In general, several studies have indicated a negative outcome in the Brexit fallout. Although there was no bubble estimation signal in equity and currency markets, a bubble signal was found in the domains of interest rate, credit and real estate. The

impact and volatility of Brexit spilled into the financial markets for a short period. Malaysia is expected to face more effects of Brexit compared to other Southeast Asian countries. It has availed higher credit from British banks and has made higher FDI in the UK compared to its neighbors. Different border controls would restrict export-import and free movement of goods & services. Some specific sector like the construction sector could be affected very negatively because they are exposed to the UK economy. Uncertainty and speculation have also played a vital role and it had a negative impact on the foreign exchange rate as well. Since the geographical spread of Finance contributes to higher uncertainty, sector internalization may be attempted to reduce the risk exposure. In the case of Malaysia, the expectation was homogeneous, i.e., negative outcome. This was true on the event day as the construction companies' stocks experienced negative returns. Negative returns were observed during the next few days indicating the market reaction was generally unfavorable. However, the long-term outcome was heterogeneous, as many construction company stocks had recovered the losses after the first few days.

6. Conclusion and Implications

On the day of Brexit announcement, the average abnormal return of construction stocks declined and the further decline was observed in the following days. Negative returns were observed two days before the event day. Intriguingly, the returns were positive on the previous day. This probably indicates that there was some speculation two days ahead of the announcement that leads to adverse market reaction later. In general, construction stocks appear to have lost value in the few days around the Brexit announcement. Abnormal returns of construction stocks in various event windows after the event show a declining trend indicating that the market reaction was generally adverse for announcements. Overall, the market movement in the days around Brexit could be described as volatile with a negative trend. Hence, the prospective and current investors should be careful while making investment decisions during high impact events such as Brexit.

7. Limitation

This study considers only a few construction company stocks listed on Bursa Malaysia and hence it cannot be generalized for other industries or other countries.

8. Recommendation for Policy Maker

Capital market agencies need to ensure that information relating to events with a major potential impact is available to all investors. This would help the typical investors to avoid risk and capital loss.

Acknowledgment

Appendix 1 Daily Average Abnormal Returns

DAY	Trading Date	UMSB	YTLS	IJMS	GAMU	MYRS	WCTE	WCEH	HSLB	MJYA	MUHI	AAR	SD	T
-30	11-May-16	-0.0005	0.0254	-0.0004	-0.0046	-0.0069	0.0001	0.0001	-0.0021	0.0019	-0.0010	0.0012	0.0089	0.1359
-29	12-May-16	-0.0144	0.0031	0.0068	-0.0046	0.0056	-0.0092	0.0005	-0.0064	0.0376	-0.0160	0.0003	0.0153	0.0186
-28	13-May-16	0.0359	-0.0126	0.0207	0.0030	0.0358	0.0112	0.0026	0.0180	-0.0111	0.0072	0.0111	0.0169	0.6545
-27	16-May-16	-0.0002	0.0038	-0.0122	0.0092	-0.0187	-0.0086	0.0492	-0.0141	-0.0041	-0.0096	-0.0005	0.0194	-0.0274
-26	17-May-16	-0.0145	-0.0079	-0.0188	-0.0105	-0.0013	-0.0321	-0.0211	-0.0032	0.0239	0.0015	-0.0084	0.0152	-0.5516
-25	18-May-16	-0.0022	-0.0083	-0.0011	-0.0037	-0.0177	0.0040	-0.0154	-0.0464	-0.0185	-0.0241	-0.0133	0.0147	-0.9061
-24	19-May-16	0.0127	0.0071	0.0090	0.0110	0.0024	0.0125	0.0010	0.0011	-0.0158	0.0054	0.0046	0.0085	0.5487
-23	20-May-16	0.0164	-0.0039	0.0070	0.0019	0.0128	0.0200	-0.0041	0.0370	0.0027	-0.0020	0.0088	0.0130	0.6749
-22	23-May-16	-0.0069	0.0022	-0.0024	-0.0013	-0.0046	-0.0043	-0.0051	-0.0128	-0.0048	0.0142	-0.0026	0.0070	-0.3663
-21	24-May-16	-0.0073	-0.0014	-0.0146	0.0017	-0.0078	0.0045	-0.0038	-0.0201	0.0055	0.0049	-0.0039	0.0087	-0.4433
-20	25-May-16	-0.0057	0.0028	0.0095	-0.0029	-0.0038	-0.0097	0.0004	-0.0070	0.0124	-0.0078	-0.0012	0.0074	-0.1573
-19	26-May-16	0.0102	-0.0006	-0.0120	-0.0069	0.0006	-0.0937	-0.0047	0.0005	-0.0173	-0.0139	-0.0138	0.0292	-0.4709
-18	27-May-16	-0.0461	0.0141	-0.0111	0.0051	-0.0135	-0.0649	0.0113	0.0046	-0.0216	0.0186	-0.0104	0.0274	-0.3778
-17	30-May-16	0.0097	-0.0087	0.0253	0.0030	-0.0008	0.0706	-0.0040	0.0028	-0.0214	-0.0005	0.0076	0.0252	0.3014
-16	31-May-16	0.0055	0.0144	0.0009	0.0076	0.0121	0.0080	0.0066	0.0135	-0.0067	-0.0206	0.0041	0.0107	0.3846
-15	1-Jun-16	0.0100	-0.0071	0.0023	0.0076	-0.0619	-0.0206	-0.0047	-0.0055	-0.0010	-0.0237	-0.0104	0.0211	-0.4962
-14	2-Jun-16	0.0055	-0.0030	-0.0017	-0.0149	-0.0590	0.0034	0.0059	0.0110	0.0054	0.0204	-0.0027	0.0218	-0.1230
-13	3-Jun-16	-0.0067	-0.0041	-0.0023	0.0133	0.0241	-0.0042	0.0165	-0.0013	-0.0134	0.0233	0.0045	0.0135	0.3356
-12	6-Jun-16	-0.0050	-0.0018	-0.0131	-0.0064	0.0091	-0.0211	-0.0056	-0.0091	-0.0179	-0.0031	-0.0074	0.0086	-0.8591
-11	7-Jun-16	0.0245	0.0167	0.0013	0.0002	0.0179	0.0187	-0.0055	-0.0088	0.0264	-0.0070	0.0084	0.0137	0.6155

DAY	Trading Date	UMSB	YTLS	IJMS	GAMU	MYRS	WCTE	WCEH	HSLB	MJYA	MUHI	AAR	SD	T
-10	8-Jun-16	0.0226	-0.0050	-0.0136	0.0029	0.0031	0.0008	-0.0098	0.0014	-0.0160	0.0013	-0.0012	0.0109	-0.1135
-9	9-Jun-16	0.0096	-0.0017	0.0050	-0.0073	-0.0117	0.0034	0.0123	0.0203	0.0129	0.0039	0.0047	0.0097	0.4821
-8	10-Jun-16	-0.0158	0.0106	0.0056	0.0039	0.0088	0.0104	0.0283	0.0034	-0.0031	-0.0039	0.0048	0.0115	0.4176
-7	13-Jun-16	-0.0042	-0.0054	0.0005	-0.0138	0.0023	-0.0064	0.0071	-0.0076	-0.0104	-0.0163	-0.0054	0.0072	-0.7490
-6	14-Jun-16	-0.0045	-0.0108	-0.0049	0.0138	-0.0153	0.0327	0.0011	0.0017	0.0018	0.0154	0.0031	0.0142	0.2190
-5	15-Jun-16	0.0080	-0.0201	-0.0157	-0.0139	0.0088	-0.0139	0.0163	-0.0118	-0.0019	0.0031	-0.0041	0.0126	-0.3259
-4	16-Jun-16	0.0073	0.0138	0.0040	0.0037	-0.0072	0.0069	-0.0242	-0.0133	-0.0096	0.0073	-0.0011	0.0119	-0.0955
-3	17-Jun-16	0.0083	0.0122	0.0083	-0.0155	0.0216	-0.0451	0.0106	0.0097	0.0020	-0.0057	0.0006	0.0191	0.0325
-2	20-Jun-16	-0.0311	-0.0129	-0.0037	0.0053	0.0004	0.0000	-0.0212	0.0034	-0.0255	-0.0152	-0.0100	0.0129	-0.7760
-1	21-Jun-16	0.0156	0.0217	-0.0015	0.0187	-0.0107	0.0296	0.0112	-0.0064	-0.0213	-0.0114	0.0045	0.0170	0.2666
0	23-Jun-16	-0.0214	-0.0136	0.0047	-0.0036	-0.0109	-0.0149	0.0006	-0.0121	-0.0022	0.0029	-0.0070	0.0087	-0.8082
1	24-Jun-16	-0.0018	-0.0215	0.0016	-0.0018	-0.0135	-0.0103	-0.0093	-0.0037	-0.0344	0.0031	-0.0092	0.0116	-0.7885
2	27-Jun-16	-0.0036	-0.0042	-0.0105	-0.0025	-0.0052	-0.0113	-0.0150	0.0019	0.0120	-0.0068	-0.0045	0.0076	-0.5950
3	28-Jun-16	0.0528	0.0089	-0.0019	-0.0026	0.0164	-0.0100	0.0059	0.0052	0.0152	0.0062	0.0096	0.0172	0.5593
4	29-Jun-16	-0.0283	0.0072	0.0115	-0.0022	0.0033	-0.0122	0.0001	0.0100	-0.0062	-0.0005	-0.0017	0.0118	-0.1456
5	30-Jun-16	-0.0332	0.0165	0.0073	0.0043	-0.0192	-0.0076	-0.0056	0.0088	0.0007	-0.0117	-0.0040	0.0148	-0.2691
6	1-Jul-16	0.0005	-0.0325	-0.0064	0.0053	-0.0022	0.0037	0.0069	0.0029	0.0230	-0.0004	0.0001	0.0139	0.0062
7	4-Jul-16	-0.0002	0.0069	-0.0061	-0.0004	0.0223	-0.0124	0.0001	0.0038	-0.0064	-0.0053	0.0002	0.0096	0.0251
8	5-Jul-16	0.0057	0.0019	0.0010	0.0015	-0.0150	-0.0052	0.0012	-0.0041	-0.0070	0.0335	0.0014	0.0127	0.1068
9	8-Jul-16	-0.0015	0.0032	0.0046	0.0065	0.0061	-0.0040	0.0067	-0.0094	0.0307	-0.0191	0.0024	0.0130	0.1822
10	11-Jul-16	-0.0010	-0.0061	-0.0092	-0.0048	-0.0073	0.0075	-0.0053	0.0096	-0.0069	-0.0057	-0.0029	0.0064	-0.4592
11	12-Jul-16	0.0005	-0.0006	0.0025	-0.0087	0.0284	0.0192	0.0008	0.0005	-0.0097	0.0086	0.0042	0.0118	0.3333
12	13-Jul-16	0.0494	0.0137	0.0004	0.0006	0.0662	0.0022	0.0003	-0.0014	0.0217	0.0269	0.0180	0.0235	0.7660
13	14-Jul-16	0.0075	0.0150	0.0044	-0.0123	-0.0033	-0.0108	0.0013	0.0022	0.0376	-0.0102	0.0031	0.0149	0.2108
14	15-Jul-16	-0.0345	0.0035	0.0067	0.0015	-0.0189	-0.0152	0.0051	-0.0035	0.0071	-0.0169	-0.0065	0.0141	-0.4636
15	18-Jul-16	0.0162	-0.0080	-0.0184	-0.0037	-0.0014	0.0045	0.0006	-0.0061	-0.0191	0.0027	-0.0032	0.0106	-0.3068
16	19-Jul-16	-0.0082	-0.0242	0.0141	0.0079	0.0266	0.0257	0.0062	0.0006	-0.0005	0.0043	0.0053	0.0151	0.3474
17	20-Jul-16	0.0110	-0.0187	-0.0173	-0.0082	0.0093	-0.0133	-0.0098	0.0414	0.0656	0.0090	0.0069	0.0275	0.2502
18	21-Jul-16	0.0061	0.0192	0.0036	-0.0011	0.0034	-0.0005	0.0018	0.0155	-0.0167	0.0066	0.0038	0.0097	0.3890
19	22-Jul-16	0.0008	0.0296	0.0026	-0.0004	-0.0079	0.0190	0.0116	0.0006	0.0075	-0.0046	0.0059	0.0114	0.5138
20	25-Jul-16	-0.0125	-0.0069	-0.0010	0.0109	-0.0254	-0.0069	-0.0108	0.0029	-0.0160	-0.0197	-0.0085	0.0108	-0.7883
21	26-Jul-16	-0.0097	-0.0025	-0.0215	-0.0055	0.0145	0.0224	0.0068	0.0026	0.0200	0.0080	0.0035	0.0138	0.2555
22	27-Jul-16	-0.0020	-0.0079	0.0048	0.0006	0.0078	0.0037	0.0007	-0.0057	-0.0021	0.0073	0.0007	0.0053	0.1382
23	28-Jul-16	0.0068	-0.0036	0.0013	-0.0084	0.0051	0.0021	-0.0041	0.0132	0.0107	-0.0107	0.0012	0.0079	0.1559
24	29-Jul-16	-0.0120	0.0087	-0.0016	0.0020	0.0053	-0.0163	-0.0041	-0.0090	-0.0294	-0.0107	-0.0067	0.0113	-0.5957
25	1-Aug-16	-0.0140	0.0045	0.0162	0.0022	-0.0184	-0.0076	-0.0002	-0.0031	-0.0505	-0.0117	-0.0082	0.0179	-0.4597
26	2-Aug-16	0.0163	-0.0036	-0.0045	-0.0085	-0.0029	-0.0174	0.0013	0.0188	0.0027	-0.0066	-0.0005	0.0110	-0.0410
27	3-Aug-16	0.0150	-0.0113	-0.0112	0.0071	0.0188	0.0060	0.0018	0.0041	-0.0014	0.0155	0.0044	0.0104	0.4257
28	4-Aug-16	0.0569	0.0071	0.0004	0.0026	0.0289	0.0277	0.0003	0.0040	-0.0139	-0.0133	0.0101	0.0218	0.4620

DAY	Trading Date	UMSB	YTLS	IJMS	GAMU	MYRS	WCTE	WCEH	HSLB	MJYA	MUHI	AAR	SD	T
29	5-Aug-16	-0.0190	-0.0057	-0.0150	-0.0045	0.0103	-0.0186	0.0055	-0.0076	-0.0152	-0.0099	-0.0080	0.0098	-0.8109
30	8-Aug-16	0.0080	-0.0056	0.0116	0.0058	0.0248	-0.0186	0.0162	0.0198	0.0281	0.0039	0.0094	0.0142	0.6638

Appendix 2 Average Abnormal Return in different run up window

Event Window	UMSB	YTLS	IJMS	GAMU	MYRS	WCTE	WCEH	HSLB	MJYA	MUHI	MEAN	SD	t
(-30,0)	0.0005	0.0006	-0.0006	0.0001	-0.0028	-0.0036	0.0017	-0.0019	-0.0036	-0.0017	-0.0011	0.0019	-0.6075
(-25,0)	0.0003	0.0003	-0.0005	0.0004	-0.0039	-0.0028	0.0008	-0.0020	-0.0061	-0.0013	-0.0015	0.0022	-0.6628
(-20,0)	-0.0002	0.0006	-0.0006	0.0000	-0.0041	-0.0052	0.0023	-0.0005	-0.0061	-0.0016	-0.0015	0.0027	-0.5664
(-15,0)	0.0014	-0.0007	-0.0015	-0.0004	-0.0050	-0.0013	0.0024	-0.0016	-0.0046	-0.0005	-0.0012	0.0023	-0.5074
(-10,0)	-0.0005	-0.0010	-0.0010	-0.0005	-0.0010	0.0003	0.0029	-0.0011	-0.0067	-0.0017	-0.0010	0.0024	-0.4317
(-5,0)	-0.0022	0.0002	-0.0006	-0.0009	0.0003	-0.0062	-0.0011	-0.0051	-0.0098	-0.0032	-0.0029	0.0033	-0.8764
(-4,0)	-0.0043	0.0042	0.0024	0.0017	-0.0014	-0.0047	-0.0046	-0.0038	-0.0113	-0.0044	-0.0026	0.0045	-0.5786
(-3,0)	-0.0071	0.0018	0.0020	0.0012	0.0001	-0.0076	0.0003	-0.0014	-0.0118	-0.0074	-0.0030	0.0050	-0.5989
(-2,0)	-0.0123	-0.0016	-0.0002	0.0068	-0.0071	0.0049	-0.0031	-0.0051	-0.0163	-0.0079	-0.0042	0.0072	-0.5827
(-1,0)	-0.0029	0.0040	0.0016	0.0076	-0.0108	0.0073	0.0059	-0.0093	-0.0118	-0.0043	-0.0013	0.0076	-0.1657
(0,0)	-0.0214	-0.0136	0.0047	-0.0036	-0.0109	-0.0149	0.0006	-0.0121	-0.0022	0.0029	-0.0070	0.0087	-0.8082
(0,+1)	-0.0116	-0.0176	0.0032	-0.0027	-0.0122	-0.0126	-0.0043	-0.0079	-0.0183	0.0030	-0.0081	0.0077	-1.0494
(0,+2)	-0.0089	-0.0131	-0.0014	-0.0026	-0.0099	-0.0122	-0.0079	-0.0046	-0.0082	-0.0003	-0.0069	0.0045	-1.5470
(0,+3)	0.0065	-0.0076	-0.0015	-0.0026	-0.0033	-0.0116	-0.0044	-0.0022	-0.0024	0.0013	-0.0028	0.0048	-0.5751
(0,+4)	-0.0005	-0.0047	0.0011	-0.0025	-0.0020	-0.0117	-0.0035	0.0003	-0.0031	0.0010	-0.0026	0.0038	-0.6793
(0,+5)	-0.0059	-0.0011	0.0021	-0.0014	-0.0048	-0.0110	-0.0039	0.0017	-0.0025	-0.0011	-0.0028	0.0039	-0.7230
(0,+10)	-0.0029	-0.0030	-0.0003	0.0000	-0.0023	-0.0070	-0.0012	0.0012	0.0017	-0.0003	-0.0014	0.0025	-0.5669
(0,+15)	0.0005	-0.0006	-0.0005	-0.0014	0.0029	-0.0048	-0.0003	0.0003	0.0035	0.0005	0.0000	0.0023	-0.0038
(0,+20)	0.0002	-0.0005	-0.0003	-0.0007	0.0025	-0.0025	-0.0003	0.0031	0.0046	0.0001	0.0006	0.0021	0.2957
(0,+25)	-0.0010	-0.0004	-0.0003	-0.0009	0.0025	-0.0019	-0.0003	0.0024	0.0017	-0.0006	0.0001	0.0015	0.0910
(0,+30)	0.0016	-0.0010	-0.0008	-0.0007	0.0047	-0.0022	0.0006	0.0033	0.0015	-0.0008	0.0006	0.0022	0.2844

References

[1] Bashir, U., Zebende, G. F., Yu, Y., Hussain, M., Ali, A., & Abbas, G. (2019). Differential market reactions to pre and post Brexit referendum. *Physica A: Statistical Mechanics and its Applications, 515*, 151-158.

[2] Bianchetti, M., Galli, D., Ricci, C., Salvatori, A., & Scaringi, M. (2016). Brexit or Bremain? Evidence from bubble analysis. *arXiv preprint arXiv:1606.06829.*

[3] BNM. (2016). Bank Negara Malaysia. Press release - Statement by Financial Market Committee on Brexit. Retrieved from http://www.bnm.gov.my/index.php?ch=en_press&pg=en_press&ac=4200&lang=en.

[4] David, J. E. (2016). Brexit cost investors $2 trillion, the worst one day drop ever. Retrieved from https://www.cnbc.com/2016/06/26/brexit-cost-investors-2-trillion-the-worst-one-day-drop-ever.html.

[5] Davies, R. B., & Studnicka, Z. (2018). The heterogeneous impact of Brexit: Early indications from the FTSE. *European Economic Review, 110*, 1-17.

[6] EC. (2016). The Electoral Commission. EU referendum results. Retrieved from https://www.electoralcommission.org.uk/find-information-by-subject/elections-and-referendums/past-elections-and-referendums/eu-referendum/electorate-and-count-information.

[7] Hall, S., & Wójcik, D. (2018). 'Ground Zero'of Brexit: London as an international financial centre. *Geoforum*.

[8] HMT. (2016). Her Majesty Treasury. Regional output and house price impacts. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/524923/Regional_breakdown_of_output_and_house_price_impacts_from_leaving_the_EU___.pdf.

[9] Kauko, K. (2016). What would Brexit mean for the financial markets?

[10] Khor, M. (2016). Brexit: What happens next? Retrieved from http://www.twn.my/title2/wto.info/2016/ti160703.htm.

[11] Kirka, D., & Lee, Y. (2016). Stocks crash as UK vote to quit EU shocks investors. Retrieved from http://bigstory.ap.org/article/d4930c2180b143d685213a75e916bee8/british-vote-leaving-eu-rocks-world-financial-markets.

[12] Kumar, S., Panda., S., & Radzi, S. (2015), Bank Merger Announcements and Stoc Returns: An Indian Perspective, *12th Annual World Congress of Academy for Global Business Advancement, eds. Kishwar, J. et al, Gambang,12 (1),* 1027 - 1034

[13] Oehler, A., Horn, M., & Wendt, S. (2017). Brexit: Short-term stock price effects and the impact of firm-level internationalization. *Finance Research Letters, 22*, 175-181.

[14] Oliver, T. (2016). Oliver, T. (2016, April). European and international views of Brexit. Retrieved from https://www.tandfonline.com/doi/full/10.1080/13501763.2016.1174534.

[15] Rana, P. B. (2016). Brexit and Its Aftermath-Brexit's impact on Asia.

[16] Schiereck, D., Kiesel, F., & Kolaric, S. (2016). Brexit:(Not) another Lehman moment for banks? *Finance Research Letters, 19*, 291-297.

[17] Steinberg, J. B. (2019). Brexit and the macroeconomic impact of trade policy uncertainty. *Journal of International Economics, 117*, 175-195.

[18] TheStarOnline. (2016). Limited number of Malaysian firms with exposure to UK. Retrieved from https://www.thestar.com.my/business/business-news/2016/06/25/limited-number-of-msian-firms-with-exposure-to-uk/.

[19] TheSunDaily. (2016). Brexit's indirect ramifications are largest risk to Malaysian economy.. Retrieved from http://www.thesundaily.my/news/1850125.

[20] Thomson, I. (2016). The EU Referendum, 23 June 2016. In The United Kingdom and the European Union. A guide to information sources. Retrieved from https://www.cardiff.ac.uk/__data/assets/pdf_file/0007/257029/EU-Referendum-2016-Part2.pdf.

[21] Tielmann, A., & Schiereck, D. (2017). Arising borders and the value of logistic companies: Evidence from the Brexit referendum in Great Britain. *Finance Research Letters, 20*, 22-28.