REACTION OF GLOBAL STOCK MARKETS TO BREXIT

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Abstract

This study investigates the impact of anticipated Brexit announcement on short-term market response of major global stock markets. The results indicate that political news (Brexit) creates uncertainties in the global stock markets. We found that global stock markets generally responded negatively to the Brexit announcement on the first trading day and the day after the event except in China. We also found that announcements of opinion polls released immediately before the referendum did not have any significant effect on global stock market movements, raising questions about the quality of information contained in opinion polls.

Keywords: Brexit; Global stock markets; Market reaction; News.

1. Introduction.

The issue of what influences movements in stock prices has been a subject of attention in many academic studies. The link between public information and variations in stock prices has been identified as one of the well-established empirical facts. On 23rd June, 2016, the world was caught off-guard by the long racking decision by the United Kingdom to exit the European Union (EU), an event that has been popularly termed "Brexit". The

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immediate effect of the outcome on financial markets was swift and violent, running into weeks after the announcement and sending shockwaves to the global financial system. The uncertainties triggered a dramatic drop in the value of the Great British Pound (GBP) and the Euro (EUR) against the US dollar (USD). For instance, the GBP daily spot exchange rate quoted by Bank of England, a day after the referendum, dropped from 1.4798 to 1.3621 (-10%) against the USD and declined from 1.3039 to 1.2254 (-6%) against the Euro. The capital market was not spared the melt-down. The exit decision was of so much concern to the world because of possible spill-over effects on other markets and the potential of a recession in the UK.

Financial economist have long held the view that asset prices represent their true and 'fair value', such that existing prices always incorporate and reflect all relevant information. This view, known as the efficient market hypothesis, then stipulates that it is nearly impossible for investors to exploit perceived mispricing in the market. If this is true, then information contained in dramatic events such as Brexit should already be reflected in global stock prices, even before the event, such that no trading system or pattern would yield consistent rewards over and above risks. This theory has been subject to empirical tests, and in the main, the evidence, at least from the academic literature suggest that most markets, especially the mature financial markets seem to be efficient (Vega, 2006; Basistha & Kurov, 2008; Kontonikas, MacDonald & Saggu, 2013). However, not all, and most especially practitioners believe in this doctrine. In spite of the euphoria and subsequent disappointment, and the numerous media discussions and industry analysis, there is no specific empirical research on the extent of global stock market reaction to the announcement. In the light of the Brexit, it would be interesting to re-examine the efficiency of global stock markets around an important news event. To the best of our knowledge, there has not been any published study since the events of June 23, 2016, and this paper contributes to the debate on the efficiency and/or otherwise of global stock markets.

The contribution of this study is fourfold. First, to examine the short-run response of major global stock markets to Brexit. In doing this we concentrate on a sample of six major continental markets involving over 6,321 different securities: United Kingdom, Germany, Japan, China, United States of America and South Africa. Second, opinion polls, most especially in the UK and US, are considered to correctly predict the final verdicts of elections. If these polls, which were released few days before the Brexit announcement are credible, then capital markets might also respond to them on account of the efficient market hypothesis. The response could be seen in fluctuations of stock prices before the real Brexit announcement. Thus, the study treats the opinion polls as sources of information leakages, and therefore examine how they affect stock price movement prior to the Brexit. Third, markets react to information differently based on their efficiency. Advanced markets such as US and the UK are considered to be highly efficient and responds to information swifter while others emerging markets like China and South Africa respond slower. We, therefore investigate the swiftness, degree of

volatility and the longevity of these market reactions to the Brexit vote. Finally, we provide detailed theoretical and empirical explanations relating to the varying magnitude of market reactions generated by the abnormal returns. Our empirical result is expected to shed more light on several existing literature on market reaction to public information.

The next section present the data and the methodology. The empirical results and discussions are presented in section three while section four concludes the paper.

2. Data and Methodology

Our initial sample consist of all firms listed on major stock exchanges in United States of America (US), United Kingdom (UK), China, Japan, Germany and South Africa (SA). Our choice of these countries is motivated by their geographical location, percentage of the global equity capitalization and the degree of integration with the UK capital market. For instance, the South African stock market is known to react relatively stronger to the UK market compared to other African markets. Due to missing observations and inconsistency in data, some firms have been eliminated from the sample. Our final sample is made up of 6,321 stocks distributed as follows: US (2055), UK (1434), China (698), Japan (774), Germany (1023) and South Africa (337). We collected daily stock prices of a sample of firms 315 days before and 15 days after the Brexit announcement summing up to 330 days. These span of data are chosen to meet the maximum requirement for analysing market reaction to an event based on our chosen methodology (event study).

This study employs the event studies in the spirit of Fama, Fisher, Jensen and Roll (1969) to measure stock price reaction to market information (such as any public announcements or events). The efficient markets hypothesis postulates that a market is efficient if "prices fully reflect all available information". The basic assumption is that, the capital market is sufficiently efficient to react to new information, either favourable or otherwise.

In finance research, event study is commonly used to either test the hypothesis that the market efficiently incorporates information (Fama, 1991) or examine the influence of some event on the wealth of firm's stockholders (Binder, 1998) by using some benchmark models (such as the market model, Capital Asset Pricing Model and the Arbitrage Pricing Theory) to generate abnormal returns. We adopt the market model to determine abnormal returns after the announcement since it is the most popular and properly captures stock returns considering its market risk. The market model shows a linear relationship between the returns of a stock and the returns on the market. For every stock *i* at time *t*, the normal return is estimated using

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

where R_{it} is the rate of returns of stock *i* at time *t*, R_{mt} is the market rate of return for day t, β_i is the systematic risk of stock *i*, α_i is the intercept and ε_{it} is the random error term for stock *i* at day *t* with the $E(\varepsilon_{it}) = 0$.

Secondly, we estimates the daily abnormal returns (AR) for the *i*th stock as follows

$$AR_{it} = R_{it} - (a_i + b_i R_{mt}) \tag{2}$$

where a_i and b_i are the *ordinary least square*s (OLS) parameter estimation of α_i and β_i respectively. We use 300 days as our estimation period (T). From equation 1, the abnormal return is obtained by subtracting the expected return from the real return. Any significant difference obtained is an indication of abnormal returns.

Many stocks listed on developed exchanges are not traded frequently and the reported closing prices usually represent previous trading instead of the actual close of day's trading (non-synchronous trading). This trading behaviour across various stocks, according to Scholes and Williams (1977), introduces an econometric problem of errors in variables when using the OLS to estimate the market model parameters. The authors, specifically, explain that the OLS estimators of the market model parameters are both inconsistent and bias. To address this problem, they introduced a consistent estimator of the alpha and beta referred to as the Scholes/Williams estimator. To avoid errors in our analysis that could be introduced by nonsynchronous trading and also as a robustness check, we provide an additional analysis using the Scholes/Williams estimator of the market model.

To test the significance of any abnormal returns, we use the standardised *t*-test (parametric). However, we also present an alternative test, non-parametric (generalised sign test) test for the purpose of comparison. The choice of these tests is motivated by their ability to capture efficiently any abnormal returns in stock movement. The *t* statistical test for the significance of the abnormal returns is based on the assumption that the individual AR*it* are independent and identically distributed. These assumptions are criticised by some researchers as unrealistic (Jaffe, 1974; Fama, 1976; Froot, 1989). They contend that the market model's prediction error for different firms on the market do not have identical variance and might not be independent across all firms. These identified problems with the market model cannot be ignored since it has the potential to give a bias result. For instance, stocks that are more volatile than the market are likely to have a higher β. To address these problems, we standardise the abnormal returns (SAR) by dividing the AR by its respective standard deviation which is also expected to eliminate any event-induced heterosdasticity (Jaffe, 1974; Patell, 1976; Boehmer, Masumeci & Poulson). Following Brown and Warner (1985), our t-test statistics is computed as:

$$SAR_{it} = \frac{AR_{it}}{\sigma(AR_{it})} \tag{3}$$

where

$$SAR_{it} = \frac{AR_{it}}{\sigma(AR_{it})} \tag{4}$$

$$\sigma(AR_{it}) = \sqrt{\frac{\sum_{t-T_0}^{T_j}\left[AR_{it} - \left(\frac{1}{T_j+1}\sum_{t=T_0}^{T_j} AR_{it}\right)\right]}{T_j - 1}} \tag{5}$$

and N is the number of sample stocks at time t while j (in this case 300 days) is the length of the estimation period. According to the same authors, the test is well specified and the test statistics is distributed unit normal for large number of stocks if the abnormal returns are independent and identically distributed with finite variance in the absence of abnormal performance. In their simulation analysis, they argue that any serial dependency correction have no detectable impact on the test.

Further, we want to ascertain the extent of the abnormal returns over an entire event window. To do so, we calculate the cumulative average SAR_{it} for each stock *i* over the event window to get the average accumulative average standardised abnormal returns (CAAR) using

$$CAAR_t = \frac{1}{N}\sum_{i=1}^{N}\left(\sum_{t=T_1}^{T_2} SAR_t\right) \tag{6}$$

where T_1 and T_2 are the start and end values of the event window respectively.

We report the CAAR for eight different event windows; (0, 1), (0, 2), (0, 5), (0, 10), (0, 15), (-1, 15), (-5, 15). The *t*-test for the significance of the CAARs is similar to that of ARs.

The generalised sign test (GS-test) is a test of the hypothesis that the fraction of event day abnormal returns having a particular sign (positive or negative) is equal to the fraction expected in the absence of abnormal returns. The generalised sign test statistics, according to Cowan (1992) is asymptotically N(0,1) distributed under the null hypothesis and is given as:

$$Z = \frac{\omega - N\hat{p}}{\sqrt{N\hat{p}(1-\hat{p})}} \tag{7}$$

where is the number of stocks in the event window for which the abnormal return is positive and N the total number of firms. Further, the fraction of AR expected to have a given sign using the number of days within estimation period is computed as

$$\hat{p} = \frac{1}{N}\sum_{i=1}^{N}\frac{1}{M_i}\sum_{i=T_0}^{T_1} S_t \tag{8}$$

where is the number of non-missing returns in the estimation period for stock event *i* and

$$S_{it} = \begin{cases} 1 & if\ AR_{it} > 0 \\ 0 & otherwise. \end{cases} \tag{9}$$

3. Results and discussions

In this section, we present and discuss the empirical results of our analysis in Tables 1 and 2. Our sample countries are, to a large extent, a fair representation of their geographical locations. Results are presented for all the six countries in our sample. Also, to have a clearer idea about the event on the global market, we combined all the stocks as a common market with a total of 6321 individual stocks. For the generation of abnormal stock returns, we used the market model, which was estimated using the ordinary least square (OLS). Even though the OLS estimate of the market model is widely used in event study, Scholes and Williams (1977) claimed the estimates could be bias and inconsistent due to nonsynchronous trading. As such, we also provide an alternative estimate of the market model parameters using the Scholes/Williams estimator as a robustness check. More so, we adopt two different significant tests (cross-sectional *t*-test and the generalised sign test) to check for consistency in our results.

Table 1 presents data on the generated abnormal returns of the samples as a result of the Brexit announcement on 23 June 2016 over a nine-day event window (-3, 4). The choice of this window is to help determine the immediate effect of the Brexit before and after the announcement. Among our sample, it was only the American market that was still trading on that 23rd while the other markets received the information on the 24th. Table 2 provides the cumulative average abnormal returns (CAAR) over different event windows for our sample. The event windows for our analysis are all within a three-weeks before and after the announcement boundary.

From Table 2, the test of significance of CAARs over all windows using either the OLS or the Scholes/Williams estimators generally show similar results. Further, the significance of abnormal returns using parametric standardised *t*-test and non-parametric generalised sign test produce parallel inference. Hence, to a large extent, we can infer that estimating the market model using OLS or the consistent Scholes/Williams estimator produces the same results while parametric and non-parametric test equally and perfectly capture abnormal returns for single event announcement across developed markets.

We observe from the results in Table 1 and 2 that Brexit created high volatility on the stock market across all countries. For instance, the average abnormal returns for UK firms at the close of trading on the 24/06/2016 (the event day) was significantly negative (-4.30%) at 1% significant level for both t-test and GS-tests. It must be noted that the Brexit announcement was made deep into the night of the voting day after close of trading. Thus, the effect of the event could only be felt starting the next trading day. The AAR was also significantly negative (-3.51%) at 1% level on the second day after the event as well. The market recovered after day 2 with significant rise in AARs. Before the event, the investment community was quite optimistic the poll was going to favour "*Bristay*" based on results from opinion polls released few days prior to the voting. The significant abnormal returns at 5% level recorded for t_{-1} (0.52%) and t_{-2} (0.26%) may suggest possible effect of those opinion polls. Besides, the CAARs for all event windows examined including but not limited to those in Table 2 are all significantly negative. The total number of positive ARs within the windows improves as the windows increase after the event which is evidence of market recovering as exhibited in Figure 1.

The results from Table 1 and 2 on US ARs and CAARs are similar to that of the UK. On the event day, the US market closed trading with a non-significant negative abnormal returns. Even though the negative performance is not significant enough to be attributed to Brexit, this result is expected because the announcement was released when the market was almost running-up its trading. The effect was rather heavily felt in the next two consecutive trading days with significant abnormal returns of -3.81% and -2.63% respectively. The Scholes/Williams estimate of the market model for America captures significant CAARs for almost all windows. However, the OLS estimates report significant negative CAARs for windows (0, 1), (0, 2) and (0, 5) and positive CAARs for wider windows. The number of positive returns increase resulting in an improve CAAR as the window broadens positively, giving a signal of market recovery.

Table 1: Abnormal returns and test statistics on and around Brexit announcement

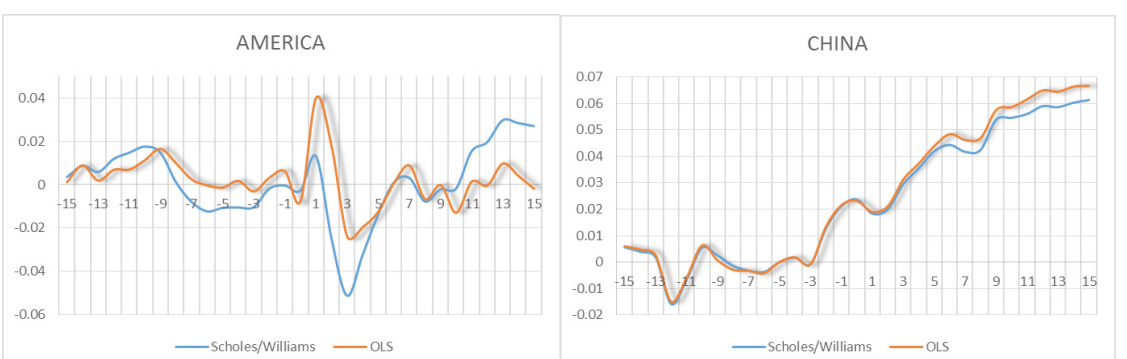
Day		-3	-2	**-1**	**0**	1	2	3	4
US (N=2055)	AAR (%)	0.85	0.14	0.23	**-1.09**	-3.81	-2.63	1.89	1.87
	t-test	0.79	0.13	1.21	**-1.45**	-3.46**	-2.33*	1.65	1.62
	GS-test	1.51	1.13	1.61	**-2.19***	-6.19**	-4.24**	2.01*	2.21*
CHINA (N=698)	AAR (%)	-0.27	1.43	0.81	**-0.06**	0.45	0.22	1.01	0.61
	t-test	-1.01	5.37**	2.06*	**-0.59**	2.55*	1.98*	3.79**	2.29*
	GS-test	-1.51	2.08*	2.21*	**-1.11**	2.17*	2.60*	8.91**	10.99**
GERMANY (N=1023)	AAR (%)	0.39	0.40	0.00	**-1.79**	-1.16	0.67	-0.11	0.33
	t-test	1.62	1.39	0.035	**-7.48****	-3.63**	3.57**	-0.28	0.28
	GS-test	0.67	1.69	0.02	**-3.07****	-1.99*	1.97*	-0.18	0.18
JAPAN (N=774)	AAR (%)	1.99	0.64	0.84	**-5.73****	1.89	0.57	1.66	1.56
	t-test	2.48*	1.60	1.22	**-7.25****	8.93**	1.17	1.73	1.73
	GS-test	1.99*	1.72	1.07	**-4.97****	5.05**	1.63	1.25	1.25
SA (N=337)	AAR (%)	-0.37	0.59	0.38	**-0.82**	-1.12	0.76	0.89	0.79
	t-test	-1.38	2.23*	1.43	**-3.09****	-4.24**	2.87**	3.35**	2.35*
	GS-test	-1.72	2.78**	1.78	**-3.86****	-5.29**	3.58**	4.18**	2.18*

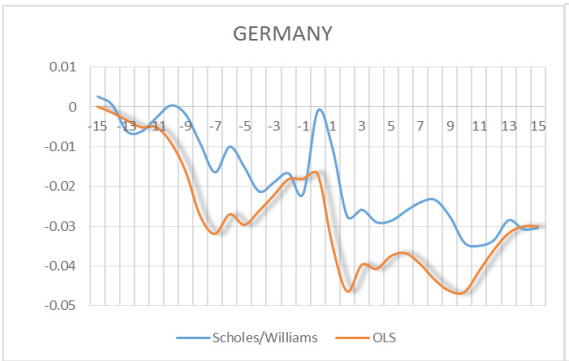
Table 1 Continued									
UK (N=1434)	AAR (%)	-0.08	0.26	0.52	**-4.30**	-3.51	1.09	1.59	0.96
	t-test	-1.21	2.78*	2.11*	**-27.99****	-21.50**	10.27**	15.06**	2.00*
	GS-test	-0.16	0.52	1.01	**-8.48****	-6.90**	2.15*	3.13**	1.99*
GLOBAL (N=6321)	AAR (%)	-0.199	0.51	0.24	**-2.11**	-1.10	0.20	0.73	0.93
	t-test	-1.05	0.50	1.20	**-2.68****	-2.23*	1.51	1.55	1.75
	GS-test	-0.41	1.05	0.50	**-4.38****	-2.28*	1.23	1.51	1.60

*and** represent significance at 5% and 1% respectively

Once again, the results from Germany, Japan and South Africa are similar as shown in Tables 1 & 2 and Figure 1. The post announcement effect was severe for Germany and South Africa possibly due to close cross-listing, trade and bilateral relations with Britain compare to Japan. For example, while the post-announcement negative effect on Japan was felt only on the event day (AR of -5.75%), the German and South African markets recovered after day 1. More so, due to Germany's role in spear-heading the activities of the EU, the market progressively recorded more negative CAARs when the event windows are extended (see Table 2 and Figure 1).

Figure 1: Cumulative average abnormal returns (CAAR) for all countries using OLS and Scholes/Williams estimators.




GERMANY
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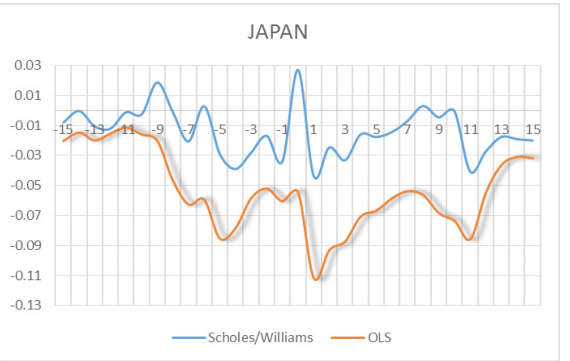
Scholes/Williams
OLS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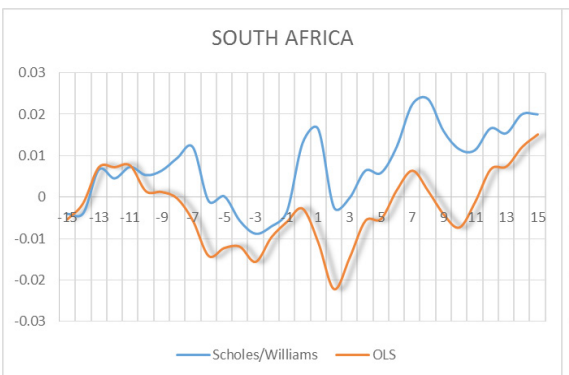
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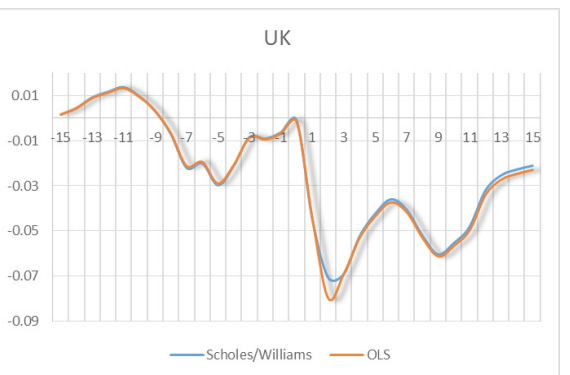
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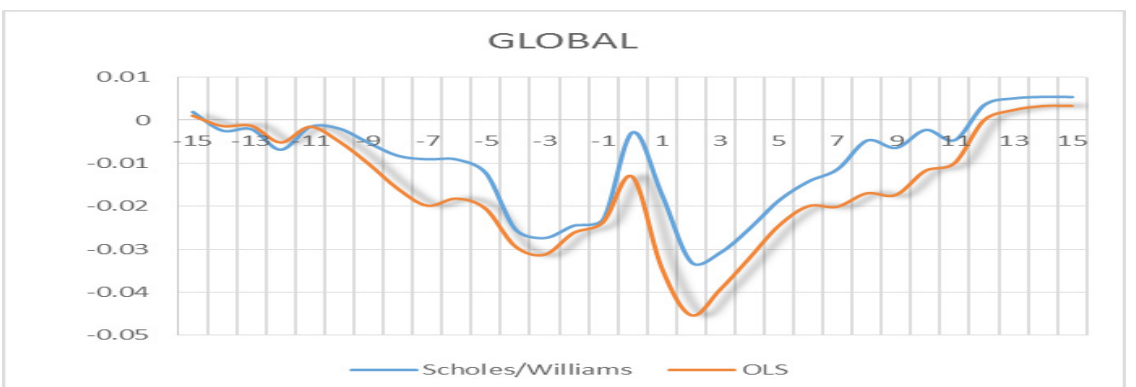
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Scholes/Williams
OLS

Table 2: Cumulative abnormal returns for various countries using the OLS and Scholes/Williams estimators

Event Window	CAAR	Pos : Neg	t-test	GS test	CAAR	Pos : Neg	t-test	GS test
	OLS				SCHOLES/WILLIAMS			
				AMERICA				
(-5,15)	3.93%	826 : 196	20.88**	19.07**	-0.16%	482 : 540	-0.81	-3.03**
(-1,10)	0.00%	541 : 481	0.01	1.24	-1.61%	392 : 630	-8.88**	-8.66**
(0, 15)	2.74%	758 : 264	16.13**	14.82**	-0.80%	457 : 565	-4.41**	-4.59**
(0, 10)	-0.14%	537 : 485	-0.82	0.99	-1.90%	366 : 656	-10.38**	-10.29**
(0, 5)	-1.33%	381 : 641	-9.64**	-8.77**	-1.85%	332 : 690	-13.22**	-12.42**
(0, 2)	-2.45%	174 : 848	-28.76**	-21.723**	-1.14%	271: 751	-14.87**	-13.81**
(0, 1)	-1.35%	161 : 861	-27.09**	-21.26**	-3.37%	510:971	-51.15**	-27.59**
				CHINA				
(-5,15)	6.98%	595 : 103	20.88**	17.20**	6.35%	583 : 115	18.59**	16.43**
(-1,10)	5.85%	567 : 131	19.69**	15.09**	5.46%	552 : 146	17.76**	14.08**
(0, 15)	5.31%	570 : 128	18.01**	15.30**	4.76%	554 : 144	15.71**	14.24**
(0, 10)	4.42%	544 : 154	15.89**	13.33**	4.11%	527 : 171	14.42**	12.19**
(0, 5)	2.39%	522 : 176	12.86**	11.66**	2.28%	513 : 185	12.08**	11.13**
(0, 2)	0.56%	441 : 257	4.92**	5.52**	0.56%	440 : 258	4.98**	5.59**
(0, 1)	-0.57%	312 : 386	1.48	1.91	-0.70%	231 : 467	1.90	1.49
				GERMANY				
(-5,15)	0.19%	594 : 428	0.30	1.92	-1.43%	475 : 547	-2.22*	-2.49*
(-1,10)	-2.41%	420 : 602	-4.92**	-5.97**	-0.86%	509 : 513	-1.79	-0.36
(0, 15)	-1.18%	495 : 527	-2.02*	-1.27	-1.41%	483 : 539	-2.40*	-1.99*
(0, 10)	-2.81%	399 : 623	-5.22**	-7.28**	-1.1%	512 : 510	-2.04*	-0.17
(0, 5)	-2.26%	426 : 596	-4.23**	-5.59**	-1.23%	503 : 519	-2.32*	-0.74
(0, 2)	-1.66%	337 : 685	-4.70**	-11.16**	-0.62%	497 : 525	-2.89**	-5.14**
(0, 1)	-0.13%	460 : 562	-2.40*	2.79**	-0.57%	386 : 636	-4.54**	-10.71**
				JAPAN				
(-5,15)	3.17%	554 : 220	11.79**	11.42**	0.15%	401 : 373	0.56	0.29
(-1,10)	-1.00%	332 : 442	-4.09**	-4.54**	2.35%	505 : 269	10.14**	7.78**
(0, 15)	2.11%	520 : 254	9.02**	8.98**	-0.22%	377 : 397	-0.90	-1.43
(0, 10)	-1.63%	281 : 493	-6.52**	-8.20**	1.23%	466 : 308	5.17**	4.97**
(0, 5)	-1.85%	244 : 530	-10.24**	-10.86**	0.09%	397 : 377	0.54	0.01
(0, 2)	-5.96%	47 : 727	-40.48**	-25.03**	-2.67%	132 : 642	-20.86**	-19.04**
(0, 1)	-0.23%	351 : 423	-2.21*	-3.17**	-4.4%	530 :721	-4.69**	-3.31**

Table 2 Continued								
SOUTH AFRICA								
(-5,15)	1.78%	194 : 143	2.93**	2.60*	0.79%	171 : 166	1.33	0.47
(-1,10)	1.14%	157 : 180	2.15*	-1.42	2.48%	199 : 138	4.72**	3.5**
(0, 15)	2.18%	190 : 147	3.79**	2.17*	2.71%	202 : 135	4.68**	3.85**
(0, 10)	0.55%	156 : 181	1.08	-1.53	2.3%	211 : 126	4.60**	4.83**
(0, 5)	0.40%	166 : 171	1.02	-0.44	1.34%	213 : 124	3.45**	5.05**
(0, 2)	-0.13%	150 : 187	-0.47	-2.18*	-2.35%	92 : 245	-8.45**	-8.53**
(0, 1)	-0.69%	105 : 232	-3.00**	-3.80**	-2.01%	97 : 240	-7.77**	-7.99**
UK								
(-5,15)	-0.35%	701 : 733	-0.88	-2.15*	-0.1%	699 : 735	-0.24	-1.98*
(-1,10)	-4.71%	516 : 918	-12.72**	-11.93**	-4.62%	532 : 902	-12.46**	-10.81**
(0, 15)	-1.61%	638 : 796	-4.47**	-5.48**	-1.47%	633 : 801	-4.06**	-5.47**
(0, 10)	-4.97%	498 : 936	-13.51**	-12.88**	-4.9%	506 : 928	-13.29**	-12.18**
(0, 5)	-3.66%	513 : 921	-13.05**	-12.09**	-3.6%	504 : 930	-12.82**	-12.29**
(0, 2)	-7.29%	249 : 1185	-28.10**	-26.04**	-7.41%	244 : 1190	-28.16**	-26.02**
(0, 1)	-3.79%	316 : 1118	-23.54**	-22.50**	-3.84%	298 : 1136	-23.86**	-23.17**
GLOBAL								
(-5,15)	2.31%	4180 : 2141	14.40**	24.19**	1.45%	3840 : 2481	8.97**	16.10**
(-1,10)	1.39%	3636 : 2685	10.72**	10.50**	2.10%	4009 : 2312	16.51**	20.35**
(0, 15)	2.94%	4329 : 1992	20.83**	27.94**	2.99%	4353 : 1968	21.18**	29.00**
(0, 10)	0.88%	3535 : 2786	6.82**	7.96**	1.81%	3999 : 2322	14.20**	20.10**
(0, 5)	-0.58%	2952 : 3369	-5.18**	-6.70**	-0.07%	3328 : 2993	-2.59*	3.22**
(0, 2)	-0.81%	2585 : 3736	-9.39**	-15.93**	-0.72%	2771 : 3550	-8.70**	-14.36**
(0, 1)	-0.13%	1444 : 4877	-18.59**	-30.83**	-0.77%	1770 : 4551	-29.50**	-39.49**

*and** represent significance at 5% and 1% respectively

Contrary to what is seen on the other markets, the Chinese stock market reacted positively to the Brexit announcement. Significant positive abnormal returns exist immediately before and after the event, though the market slowed down with insignificant AAR (-0.06%) on the event day (see Table 1). Once again, the continuous significant rise in AARs after the event could be attributed to global media discussions on the negative repercussions on major economies and benefits to China. The post-announcement CAARs for all event windows, except window (0, 1), are positive and significant at 1% level for both the *t* and generalised sign tests. For instance, the CAAR (estimated using OLS) for event window (0, 2) has increased from 0.56% to 5.31% fifteen days after the event. The positive CAARs, days after Brexit, are in sync with the Chinese market expectation of the exodus of European capital due to the uncertainty created by Brexit.

To determine the Brexit effect on global stock markets, we combined the individual ARs for our sample firms to get a total of 6,321 cross country firms. Overall, our findings reveal that market activities were normal prior to the event. Trading on the event day recorded a significant negative abnormal return of -2.11% at the 1% level. Stocks, to a very large extent, exhibit normal returns prior to Brexit[2]. Collectively, significant negative effect of Brexit on the global stock market lasted for two days (ARs of -2.11% and -1.10% on day 0 and 1 respectively after the event. Consequently, the cumulative abnormal returns for windows (0, 1), (0, 2) and (0, 5) are significantly negative (see Table 2). The market bounced back from day 2 with positive CAARs spanning up to three weeks after the event.

The decision by the UK to exit the EU could have potential long-term and far-reaching consequences for both UK and the EU countries. First, common trade standards, in literature, have been found to boost flow of capital than country-specific standards (Li & Beghin, 2012). Brexit now allows UK to develop and implement a single standard trade policies that could hinder stock market trading and increase barriers between UK and the other European countries. More so, the European unification process has increased the extent of stock market integration among countries that use the Euro. Thus, shocks within any of the markets could easily spill over to the other countries irrespective of level of market efficiency. Although the prices of stocks on the global capital market recovered some few weeks after the Brexit, the general performance of these stocks especially in the UK and Europe has been slow and volatile. This poor performance, including bank stocks, has the potential to affect the financial conditions of banks. If central banks do not properly monitor major banks and their financial positions, the situation has the potential to spark another European financial crises.

As shown by our results, Brexit effect has been experienced across major stock exchanges. Investors in general are risk-averse and as such will sell off risky assets such as stocks and redirect their investments to safer havens. The Japanese equity market over the months has been experiencing decline in equity prices and the fight against deflation could be endangered by the strengthening of the Yen against the GBP due to Brexit. Apart from the immediate decline in equity prices around the Brexit announcement, the US equity market has been relatively stable. However, the sharp and continuous rise in the US dollar against the Euro, GBP and other currencies puts pressure on the already-struggling manufacturing sector which could affect general economic growth and create a more volatile stock market. The unstable economic environment in Europe, coupled with weakening growth in China does not bode well for global growth.

The South Africa market recorded negative abnormal returns (-0.82%) a day after Brexit; a reflection of what happened across most African stock markets. For instance, while the JSE all share index dropped by 3.5%, Nigeria Stock Exchange all share index

2. This was expected because the global community was optimistic Britain was going to stay in the EU based on out-comes of opinion polls and media commentaries coupled with the fear of UK being cut out of several opportunities in terms of trade, etc.

shed 1.4% a day after Brexit. This is a clear signal of how the event has affected various sectors of the African market.

The existing literature on market integration and transmission of shocks reveal that the global stock markets are becoming more integrated with time (Bekaert & Harvey, 1995; Fratzscher, 2002; Boako & Alagidede, 2016). Clearly, the global response of major exchanges to a single political event indicates the interconnectedness of the world. Thus, the slightest perturbation on any single market has the potential to spill over to the global financial system. Moreover, the short run effect of Brexit on the global markets has been severe and swift. The long run impact could depend on the terms of exit negotiations, adjustment strategies and market stimulations policies adopted by the EU and UK. Despite these consequences, Brexit could open opportunities for most countries (especially the British colonies) to open a better negotiations with the UK in terms of cross-border transactions agreements that has the potential to revamp stock market operations.

4. Conclusion

In this study, we examined the effect of Brexit on the reaction of six stock markets using event studies. Using daily stock prices of firms listed on the major exchanges in these countries, we found out that the US stock market responded negatively to the Brexit referendum on the day of the announcement. Stocks on all the markets responded negatively on the event day and a day after the event, except China and Japan. The Japanese market, was however, significantly affected only on the event day. The Chinese market rather reacted positively to the announcement with positive cumulative abnormal returns over all windows. Significant AARs for UK and South African stocks prior to the referendum suggests a positive market reaction to opinion polls published in the UK some few days before the event. All the markets recovered from the Brexit shock, after day 1, with positive ARs with the exception of Germany and UK that saw reducing CAARs even weeks after the event because of their direct role in the event. In general, our findings are consistent with notion that the arrival of new information such as Brexit should immediately be reflected in stock price. However, when we focus our analysis on the information content of opinion polls the results predicting *Bristay* in the EU had no effect on trading.

However, the global market responded with substantial decline in stock returns on the event day 0 and 1. The possible explanation to the decrease in return two consecutive days after the Brexit could be attributed to the heavy discussions of the matter on international media about the effect of the exit on various economies, most especially about UK and European investments. The short and long term repercussion of Brexit on the global equity market is endless and unpredictable based on the pull out conditions and terms.

Could Brexit be a sign of more troubles for the global equity market? This is a question that should occupy the attention of the analyst and policy makers. Our verdict is that, barring any potential interventions, the momentum generated by Brexit and the expected triggering of Article 50 may well lead things to become worse before they get better.

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