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Brexit and the Effects on European ADRs vs British ADRs

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By

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Abstract:
Using a collection of American Depositary Receipts (ADRs), this study examines the stock-price reaction of European, European Union, and British firms to the Brexit Referendum on June 23, 2016. Results show that non-European firms experienced greater returns than the market after the Brexit referendum. European, European Union, and British firms all experienced negative returns compared to the average market return. While at first glance British firms appeared to experience even greater negative returns as compared to firms in the European Union, overall there was no statistically significant difference between returns for firms in the European Union and firms in the United Kingdom. These results show that in the initial aftermath of the Brexit Referendum, investors believed that the non-European world would benefit from a weaker European Union, and that both the European Union and the United Kingdom were likely to adversely effected by the referendum.

Keywords: Brexit; Financial Markets; American Depositary Receipts

1. Introduction

On June 23, 2016 the future of and very existence of the European Union came into question when the United Kingdom in the "Brexit" Referendum decided, by a narrow margin, to leave the European Union. In the aftermath it was quite unclear what the referendum would mean, but turmoil was definitely a part of the complicated equation. David Cameron, the prime minister stepped down, while financial markets were in a turmoil (Erlanger). One big question was who would fare better (or at least be the least worse off) in the aftermath, the United Kingdom (UK) or the European Union (EU)? In this paper I seek to answer that question by conducting an event study using Cumulative Abnormal Returns (CARs), returns on financial instruments, or groups of financial instruments, that are statistically different than the average market return for the day, on international firms around the referendum date (June 23, 2016). In this paper I analyze the CARs on different American Depositary Receipts (ADRs), which are equities listed on American stock exchanges but represent foreign-based firms. The use of ADRs allows the researcher to control for the market structure while exploiting the variation in home-country characteristics. In the framework of our analysis, all securities that are analyzed are listed on U.S. stock exchanges, but the actual firm is located in a foreign country. This unique research design allows us to better isolate the announcement effect of the Brexit Referendum on ADR stock returns.

Brexit created a lot of anxiety about the future of the global economy. It raised questions about the fracture of potential trade partners and the ramifications of the fracture. Most importantly, it raised questions about the future of the EU and the UK, what would happen economically to the two political entities. Proponents of The UK exiting claimed it would be a positive, while opponents feared the economic fallout for both The UK and the EU. This paper

provides perspective on what perceptions were prevailing among investors after the referendum took place. It also provides perspective on how the perceptions of investors were different on how different political regions were going to be impacted. By providing this perspective it helps guide future policy makers when considering the economic implications of renegotiating trade deals and associations, especially if the renegotiation creates less robust trade partners.

The results of the analysis were interesting and enlightening. The research revealed that non-European ADRs were slightly better off when the UK separated from the EU. European countries, the EU, and the UK ADRs all were negatively impacted by the results of the referendum. All three types of ADRs were negatively impacted for various time windows following the referendum, indicating that investors believed they had misjudged, or more appropriately underappreciated the negative impact that Brexit would have on the various European political entities. By the fifth day, while returns had improved for all three entities, they were still negative, indicating investors had corrected a perceived over-reaction. At first glance by examining each entity separately, it would seem that Europe was worse off than the EU, and the UK was more negatively impacted than either the EU or Europe. However, examining a set of regressions that incorporated both the EU and the UK as independent variables, and conducting a test to see if EU and UK had statistically different estimates for the impact on the returns, it showed that only on returns from day zero (referendum date) to three days after was there truly a statistical difference in their returns. This seems to indicate that both the UK and the EU were both negatively impacted by referendum in a statistically similar way.

2. Prior Literature

The Brexit referendum and its impacts have been the subject of lots of research. Outside of purely Brexit oriented research, there are plenty of studies examining the effects of elections

on markets. Roberts (1990) and Herron, et al (1999) conducted studies on the US elections in 1980 and 1992 (respectively) and their effects on stocks. Brexit oriented research also abounds. Before the vote even took place researchers were estimating what the impact would be on member nations and the UK alike, such as Boulanger and Philippidis (2015), their paper argued that after doing a cost-benefit analysis for the UK specifically, the country would have experience a net loss from leaving, and proposed alternatives. After the referendum research by Chen, et al. (2017) on impacts on different regions across the UK and EU member nations. This research concluded that British regions was significantly more negatively impacted by the separation than most EU regions, with only a few regions in Ireland being anywhere near as negatively impacted as the UK (Chen, et al.). In addition to broad impact studies there is plenty of more focused research on Brexit impacts. Portes and Forte (2017) found that because of reduced immigration caused by Brexit, Britain's GDP per capita would be negatively impacted. Seferidi, et al. (2019) found that because of higher prices on fruits and vegetables thanks to Britain no longer being a part of the EU, citizens of the UK would have higher rates of cardiovascular disease.

3. Data Description

To analyze the perceived effects of the Brexit Referendum on the EU and the UK, I gathered data on American Depositary Receipts (ADRs) for 320 firms located worldwide with firms from every major continent and region (including the Middle East and Oceania). Table 1 Panel A gives summary statistics for key variables for all observations in this data including Market Capitalization (Mkt Cap), Price, Volume, and Volatility. Market Capitalization is a measure of how large the firm is (being derived from multiplying price by shares outstanding) was fairly compacted, but also with some large outliers, with the median of the data falling well

below the mean of $3,315,816. Volume, a measure of how much a security trades daily, was also compacted with some large outliers. Here again, the median of the data is below the mean of 1,104,579. Following Alizadeh, Brandt, and Diebold (2002), Volatility is calculated as the natural log of the daily high price minus the natural log of the daily low price. This measure of volatility accounts for how much a stock moves in price in a day. Panel A shows that Volatility was less compacted below the mean, although the median was still below the mean of the data.

Panel B gives identical summary statistics for only those ADRs located within the bounds of the European Continent (including some firms from countries that are not a part of the EU such as Russia and Norway). Similar distributions of data for Market Capitalization and Volume that were seen for Panel A are seen in Panel B.

4. Results

i. Mean Significance

The bulk of the analysis examines cumulative abnormal returns (CARs), which are calculated in the following way. I estimate a daily market model during a pre-estimation window that extends from approximately 14 months to two months prior to the referendum date, which occurred on June 23rd, 2016. From this model, which is simply a regression of daily stock returns on the CRSP value-weighted index, I obtain intercept and slope coefficients. Then, during the event window, I use the estimated (intercept and slope) parameters to calculate the residuals of the market model. These residuals are denoted as abnormal returns. I then estimate six different CAR windows where I sum the estimated residuals for different event windows surrounding the referendum. The first statistical test on the data was a test of whether the means of the six CAR

windows I analyzed were significant for three different groups of ADRs. Table 2 summarizes the results of this test of significance[1].

Panel A summarizes the significance of the means of the six CAR windows for all ADRs, this includes ADRs from countries outside of Europe and the EU like China, Israel, and South Africa, among others. Of the six CAR windows only one, the (-3, 3) CAR (which is the return on all ADRs if one had purchase three days prior to the event, Brexit, and sold three days after the event), was statistically significant. This CAR is positive, albeit only slightly. Investors would have realized a return 0.01 percentage points larger than someone who had invested in the market in aggregate, which points to investors believing that on average for the global economy, Brexit was a positive event.

Panel B does the same thing as Panel A but only for European ADRs. It should be noted that European ADRs includes those with home-country firms from anywhere inside the European continent and not just the EU, such as was mentioned before, Russia and Norway. For this data, four of the six CARs were significant, all at the 0.01 level. The first significant CAR (-1,1) or from one day prior to the event date, to one day after), shows that purchasing all the European ADRs would have given a return 0.0265 percentage points lower than a portfolio composed of the market. The next three CAR windows are (0,1), (0,3), and (0,5) (returns from the event day to one, three, and five days after the event respectively). These three help show the developing effects of the Brexit referendum in the days following the vote. One day after the

[1] Tests of mean significance were also run using bootstrap methods to obtain more accurate and precise standard errors (in addition to bootstrapped Jackknife Correction, Patell Z Correction, and Portfolio Time Series Correction methods). Furthermore, all these correction methods were used on tests of mean significance on a regression of daily stock returns on the CRSP equal-weighted index (as opposed to the value-weighted index mentioned above). Similar patterns of significance were found, since a more useful interpretation could not be gleaned from these more precise error correction methods, they were not employed in the main analysis of the paper.

event, European ADRs were giving a return 0.03 percentage points below the market return, by day three this lower return was down to 0.033 percentage points below market return. By the fifth day this return had improved somewhat to be only 0.029 percentage points below market return.

The final panel, Panel C, shows the effects of the Brexit referendum on only Non-European ADRs, four of these CARs were significant. The first window (-3,3) showed a positive return above market returns of 0.021 percentage points higher, indicating that investors perceived non-European countries and firms doing better because of the Brexit decision, than they had before. CAR (-1,1) shows similar, albeit smaller results compared to CAR (-3,3) with the CAR being only 0.0095 percentage points higher than the market return. CAR (0,1) showed a higher than market return of 0.006 percentage points and this only improved by day three where the (0,3) CAR was 0.01 percentage points higher than market returns.

Taken together these results paint a picture of how investors perceived the effects of the Brexit referendum. Investors seemed to perceive that the world economy, on the whole, would be better off with the UK having left the EU. However, the market expected that Europe would not fare so well. Investors perceived that Europe would be worse off without the UK being a part of the largest trade organization in the region. At first glance this can seem a little confusing, how could the world as a whole be better, while one of its most developed and wealthy regions would do worse? This can be explained a few different ways. Perhaps investors saw non-European firms doing better with increased world competition due to a weakening in one of the largest trade agreements in the world. Investors may also have overreacted to the news, perceiving Europe as a riskier investment and flocking (understandably) to perceived “safer” investments in non-European ADRs. This view would mean that non-European positive CARs

were not the result of perceptions that the non-European world would be better off, just less worse off. This makes sense as we saw the CARs for European ADRs getting more negative from (0,1) to (0,3) and non-European ADRs improving more.

One important thing to note is that while the data discussed in Table 2 are statistically significant, the results are not very economically significant. Or in other words, the results do not have large effects in economic terms. Still, these slight differences point toward overall investor sentiment viewing Europe being worse off because of the results of Brexit.

ii. Europe

After analyzing the significance of the means, I ran four groups of regressions that were essentially identical with the various CARs being the dependent variables and a political designation variable, the natural log of market capitalization, natural log of price, natural log of volume, and volatility as independent variables only changing the political designation variable. The first set of regressions has Europe as the political designation variable. Europe is set to one for all ADRs that are in the bounds of the continent of Europe, and set to zero for all other ADRs. The results of the regressions are summarized in Table 3. For all six regressions Europe had a statistically significant impact, with European ADRs having on average anywhere from 0.03469 to 0.04665 percentage points lower return as compared to non-European firms. Again, we see that from CAR (0,1) to CAR (0,3) returns only got worse for European ADRs, but on the fifth day they had improved slightly, suggesting again that investors adjusted perceptions after the initial fear and shock from the referendum results.

The natural log of market capitalization had a statistically significant impact on returns, for every 1% increase in market capitalization the CARs were anywhere from 0.01226 to

0.03535 percentage points greater. At first glance this seems contradictory, larger firms are more likely exposed to risks associated with how interconnected their domestic country is with the rest of the world, for example, a large firm that imports large quantities of goods and for its production process and exports finished goods is going to be worse off with a separated the UK, they have to pay more to either ship things in or out. But remembering the type of firms involved in this study resolves this contradictory data. The firms in the dataset are *all* exposed, at least a small degree, to risks involved with the global economy and its interconnectedness, they are global enough to feel they should be listed on a US Stock exchange in addition to or instead of their home country's equity market. Larger firms then, are better risks because, larger firms have greater access to resources and are likely more able to respond to shifts in trade power and balances. CARs that were more closely centered around the event date ((0,1) and (-1,1) for example), had the smallest positive returns, with the CARs further from the event ((-5,5) and (0,5), for example) had larger returns, indicating that investor fears mellowed as the event became better understood and perceptions were able to be fully shaped.

The natural log of price was never a significant variable and the one CAR where the log of volume was (0,3) it had a fairly small impact. Volatility was a significant factor on CARs (-1, 1), (0,1), and (0,3), having a positive impact of anywhere from 1.624 to 2.053 increase in CAR for every increase of one in volatility. This means that were an investor to build a portfolio with ADRs that were comparatively more volatile than other ADRs in the data, they would experience higher returns. The effect of volatility became greater from day one to day three, meaning that investors who stayed with volatile stocks after day one would receive even greater returns if they waited till day three.

The adjusted R-squared was highest in CARs around the event (0.2548 and 0.2506 for CARs (-1,1) and (0,1) respectively). Meaning that 25% of the variation in the CARs were explained by the data.

iii. EU

The second set of regressions used the same independent variables as the last set, but replaced Europe with EU, a dummy variable that recorded a 1 if the country was a part of the EU (EU) and a 0 if they were not. While technically at the time the UK *was* a member of the EU, they were not recorded as being a part of the EU so as to create the ability to compare the effects of the Brexit referendum on the two governments. The results of the regressions are summarized in Table 4.

The effect of being a member nation of the EU on the CAR was very similar to the effects of being a European nation on the CAR. CARs for firms in the EU around the event (-1,1) and (0,1) had returns -0.022 and -0.022 each, by day three, returns are worse for both European and EU countries. For EU countries returns had declined to -0.0299 and -0.293 for CAR (-3, 3) and (0,3) respectively. This indicates that just like their concerns with Europe, investors became more concerned about the repercussions of Brexit on the EU as more days passed after the event. Like Europe, by the fifth day returns had improved slightly up to -0.022 for CAR (0,5), indicating that investors had readjusted expectations upward for the EUs outlook.

Similar to Europe again, firms with larger market capitalizations faired better than smaller firms, with returns for larger market capitalizations increasing as the CARs were less close to the event date, again suggesting that while ultimately expectations for Europe and the EU were negative, and at a fairly consistent level over time, larger firms were likely to fair

better, and as days passed, these larger firms were generally considered more and more better off.

Price and volume again did not generally have any significant impacts on the CARs. Volatility had a similar effect as it did in the Europe regressions. Volatility was significant for CARs (-1,1), (0,1), and (0,3), with a bigger return on day three as opposed to day one. The adjusted R-squared was smaller for these regressions generally, showing that less of the variation in the CARs was explained by these regressions, which makes sense. There were more European firms as opposed to just EU firms, so naturally having more degrees of freedom for the political designation variable would mean more of the variance in the CARs would be explained.

iv. UK

Similar to the EU and Europe regressions, the UK political designation variable had negative effects on returns. The regressions with UK as an independent variable are summarized in table 5. This negative effect worsened into day three, as seen by the increase from -0.039 and -0.044 estimate on CARs (-1,1) and (0,1) respectively, to -0.061 for CAR (0,3), investors were negative to begin with on the effects of Brexit on the UK, and their fears only became worse by day three. By day five, returns had improved upward like EU and Europe, but were further from the CAR (0,1) and (-1,1) estimates than either EU or Europe had been, indicating that while investors were less concerned about the UK, they carried more doubts on it than they did with the European continent or the EU.

Market capitalization had the same effects as it did in the case of Europe and the EU. Price and Volume were again insignificant variables, generally, and Volatility had a positive significant effect on CARs (-1,1), (0,1), and (0,3). The R-squared for this data is interesting.

Despite their being 51 firms in the data for the EU, 90 for Europe, and only 30 for the UK, the set of regressions with UK as an independent had a few regressions that had a larger R-squared than the regressions with EU as an independent variable. Which indicates that the UK is a significant factor in explaining the variation in the CARs

v. EU and UK

The final set of regressions, summarized in table 6, used both EU and UK as independent variables. The trends in results from the last two sets of regressions carried through to this one. Investors were concerned about the effects of Brexit on both the EU and the UK, and those fears only became heightened on day three, and by day five they had been quelled at least to a degree. Firms with larger market capitalization were viewed favorably, and volatility had a positive effect on a few CARs. Where this set of regressions provides new information is in a test of whether the estimates for UK and EU were statistically different, or whether they were really different enough to be considered truly different effects. Only on CAR (0,1) was there a significant difference between the two effects, and then only at the 0.10 level. This shows that the ADRs for both EU and UK firms declined one day after the referendum, and that investors generally viewed UK ADRs as less valuable and more negatively impacted than their EU counterparts. After that, when by day three returns had worsened for both UK and EU ADRs, there was no significant difference between returns, meaning that investors believed that the effects of Brexit on the EU and UK were approximately equal. By day five, they were still not statistically different effects and so while investors had decided that both the EU and UK were better off, neither was better off than the other.

5. Conclusion

The Brexit Referendum results were a surprise globally, and financial markets reflect how investors processed the surprise. This paper found that investors viewed the results of the referendum in a negative light for European, the EU, and the UK based firms, and in a positive light for firms from the rest of the world. Furthermore, regressions on CAR(0,3) with EU and UK as independent variables showed a slight statistical difference between the effects of EU and UK, with UK having a greater negative effect. However, by day 5, regressions on CAR(0,5) with the same independent variables, showed no statistical difference between the two variables. This suggests that ultimately investors believed there would be no real difference between the negative effects on the UK and the EU.

Table 1

Panel A. All ADRs

	Mean	Std. Dev.	Minimum	25th Perc.	Median	75th Perc.	Maximum
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Mkt Cap	$3,315,816.74	$13,655,331.16	-$24,293.00	$99,065.44	$426,395.59	$1,860,517.13	$207,752,504
Price	$23.971	$29.351	-$8.500	$5.495	$13.245	$30.470	$180.290
Volume	1104579.61	2477317.30	0	43581.00	220672.50	868610.50	23871049.00
Volatility	0.01306	0.0133963	0	0.0064757	0.0095731	0.0144836	0.1511200

Panel B. European ADRs

Mkt Cap	$5,361,747.79	$22,181,337.07	$5,685.38	$271,686.12	$1,100,957.25	$3,315,593.94	$207,752,504
Price	$32.049	$33.886	$0.822	$8.150	$18.630	$43.260	$180.290
Volume	1644097.32	2419699.52	1391.00	81196.00	483334.00	2086558.00	10651173.00
Volatility	0.0113275	0.0075066	0.0026878	0.0068799	0.0091483	0.0127443	0.0398128

Table 2 – Cumulative Abnormal Returns

*, **, *** denote significance at the 0.10, 0.05, and 0.01 level, respectively.

Panel A. All ADRs

	CAR(-5,5)	CAR(-3,3)	CAR(-1,1)	CAR(0,1)	CAR(0,3)	CAR(0,5)
	[1]	[2]	[3]	[4]	[5]	[6]
Mean	0.0063342	0.0114855***	-0.000587361	-0.0040832	-0.0015664	-0.0086423
Median	0.0140716	0.0157584	-0.0033348	-0.0041629	0.0038451	0.0043623
t-statistics	(1.15)	(2.77)	(-0.19)	(-1.47)	(-0.40)	(-1.85)

Panel B. European ADRs

Mean	0.0016142	-0.0117134	-0.0264957***	-0.0300514***	-0.0335706***	-0.0299356***
Median	0.0135952	-0.000955086	-0.0161384	-0.0213285	-0.0115829	0.000268991
t-statistics	(0.17)	(-1.54)	(-5.57)	(-6.16)	(-3.80)	(-2.83)

Panel C. Non-European ADRs

Mean	0.0081812	0.0205634***	0.0095507**	0.0060783*	0.0109570***	-0.000310120
Median	0.0145512	0.0204915	0.0033007	0.0027913	0.0084625	0.0054879
t-statistics	(1.23)	(4.27)	(2.61)	(1.96)	(2.78)	(-0.06)

Table 3 – Multivariate Tests - Cumulative Abnormal Returns – Europe as Independent Variable

Robust standard errors are in parenthesis. *, **, *** denote significance at the 0.10, 0.05, and 0.01 level, respectively.

	CAR(-5,5)	CAR(-3,3)	CAR(-1,1)	CAR(0,1)	CAR(0,3)	CAR(0,5)
	[1]	[2]	[3]	[4]	[5]	[6]
Europe	-0.01561	-0.03661***	-0.03469***	-0.03542***	-0.04665***	-0.03618***
	(0.01141)	(0.00913)	(0.00560)	(0.00540)	(0.00983)	(0.01167)
Ln(MktCap)	0.03459***	0.02209***	0.01226*	0.01576***	0.02540***	0.03535***
	(0.01094)	(0.00813)	(0.00645)	(0.00591)	(0.00750)	(0.00928)
Ln(Price)	-0.00646	0.00632	-0.00288	-0.00805	-0.00290	-0.00754
	(0.01696)	(0.01280)	(0.00945)	(0. 00845)	(0. 01213)	(0.01535)
Ln(Volume)	-0.00062	-0.00679	-0.00379	-0.00528	-0.01000*	-0.00939
	(0.00859)	(0.00628))	(0.00539)	(0.00494)	(0.00603)	(0.00760)
Volatility	1.45834	1.67018	1.98940**	1.62421**	2.05329*	1.63848
	(1.20866)	(1.15679)	(0.85693)	(0.76261)	(1.04612)	(1.35570)
Constant	-0.19287***	-0.09530***	-0.06233**	-0.06695***	-0.10149***	-0.16025***
	(0.04053)	(0.03557)	(0.02471)	(0.02257)	(0.03215)	(0.04139)
Adj. R2	0.0762	0.1118	0.2548	0.2506	0.1949	0.1086
N	317	317	317	317	317	317

Table 4 – Multivariate Tests - Cumulative Abnormal Returns – EU as Independent Variable

Robust standard errors are in parenthesis. *, **, *** denote significance at the 0.10, 0.05, and 0.01 level, respectively.

	CAR(-5,5)	CAR(-3,3)	CAR(-1,1)	CAR(0,1)	CAR(0,3)	CAR(0,5)
	[1]	[2]	[3]	[4]	[5]	[6]
EU	-0.02004	-0.02992***	-0.02198***	-0.02238***	-0.02932**	-0.02189
	(0.01389)	(0.01152)	(0.00605)	(0.00581)	(0.01214)	(0.01437)
Ln(MktCap)	0.03500***	0.02263***	0.01261*	0.01612**	0.02586***	0.03569***
	(0.01107)	(0.00852)	(0.00680)	(0.00631)	(0.00826)	(0.00978)
Ln(Price)	-0.00834	0.00195	-0.00701	-0.01227	-0.00845	-0.01184
	(0.01725)	(0.01306)	(0.00951)	(0.00855)	(0.01276)	(0.01601)
Ln(Volume)	-0.00156	-0.00911	-0.00604	-0.00758	-0.01302*	-0.01174
	(0.00848)	(0.00656)	(0.00576)	(0.00538)	(0.00674)	(0.00806)
Volatility	1.46205	1.67818	1.99672**	1.63168**	2.06312*	1.64607
	(1.21179)	(1.17340)	(0.87410)	(0.77982)	(1.07165)	(1.37529)
Constant	-0.18939***	-0.08695**	-0.05434**	-0.05880***	-0.09075***	-0.15191***
	(0.03985)	(0.03526)	(0.02469)	(0.02257)	(0.03200)	(0.04084)
Adj. R2	0.0770	0.0867	0.1981	0.1782	0.1332	0.0816
N	317	317	317	317	317	317

Table 5 – Multivariate Tests - Cumulative Abnormal Returns – UK as Independent Variable

Robust standard errors are in parenthesis. *, **, *** denote significance at the 0.10, 0.05, and 0.01 level, respectively.

	CAR(-5,5)	CAR(-3,3)	CAR(-1,1)	CAR(0,1)	CAR(0,3)	CAR(0,5)
	[1]	[2]	[3]	[4]	[5]	[6]
UK	0.00343	-0.03045**	-0.03979***	-0.04356***	-0.06091***	-0.04771**
	(0.01791)	(0.01394)	(0.01014)	(0.01015)	(0.01632)	(0.01977)
Ln(MktCap)	0.03463***	0.02086**	0.01072	0.01408**	0.02307***	0.03353***
	(0.01121)	(0.00839)	(0.00654)	(0.00594)	(0.00733)	(0.00909)
Ln(Price)	-0.00872	0.00575	-0.00208	-0.00687	-0.00091173	-0.00594
	(0.01820)	(0.01392)	(0.00984)	(0.00885)	(0.01344)	(0.01681)
Ln(Volume)	-0.00188	-0.00775	-0.00414	-0.00549	-0.01009*	-0.00943
	(0.00862)	(0.00635)	(0.00556)	(0.00504)	(0.00567)	(0.00719)
Volatility	1.46096	1.67936	1.99896**	1.63420**	2.06673*	1.64894
	(1.22361)	(1.17534)	(0.86562)	(0.77024)	(1.06166)	(1.36712)
Constant	-0.18875***	-0.09029**	-0.05890**	-0.06381***	-0.09777***	-0.15743***
	(0.04019)	(0.03590)	(0.02495)	(0.02282)	(0.03251)	(0.04126)
Adj. R2	0.0713	0.0784	0.2198	0.21244	0.1711	0.0990
N	317	317	317	317	317	317

Table 6 – Multivariate Tests - Cumulative Abnormal Returns – UK and EU as Independent Variables

Robust standard errors are in parenthesis. *, **, *** denote significance at the 0.10, 0.05, and 0.01 level, respectively.

	CAR(-5,5)	CAR(-3,3)	CAR(-1,1)	CAR(0,1)	CAR(0,3)	CAR(0,5)
	[1]	[2]	[3]	[4]	[5]	[6]
UK	-0.00066	-0.03748***	-0.04540***	-0.04935***	-0.06860***	-0.05351***
	(0.01800)	(0.01391)	(0.01017)	(0.01014)	(0.01617)	(0.01969)
EU	-0.02012	-0.03452***	-0.02756***	-0.02844***	-0.03775***	-0.02846**
	(0.01401)	(0.01162)	(0.00613)	(0.00584)	(0.01211)	(0.01436)
Ln(MktCap)	0.03498***	0.02146***	0.01119*	0.01457**	0.02372***	0.03402***
	(0.01117)	(0.00820)	(0.00643)	(0.00581)	(0.00716)	(0.00909)
Ln(Price)	-0.00826	0.00654	-0.00144	-0.00622	-0.00004	-0.00528
	(0.01776)	(0.01337)	(0.00965)	(0.00858)	(0.01270)	(0.01622)
Ln(Volume)	-0.00153	-0.00714	-0.00365	-0.00498	-0.00942*	-0.00893
	(0.00867)	(0.00626)	(0.00542)	(0.00491)	(0.00560)	(0.00720)
Volatility	1.46210	1.68132	2.00053**	1.63581**	2.06887**	1.65056
	(1.21157)	(1.15523)	(0.85320)	(0.75782)	(1.03864)	(1.35020)
Constant	-0.18947***	-0.09152***	-0.05989**	-0.06482***	-0.09912***	-0.15844***
	(0.03999)	(0.03517)	(0.02467)	(0.02250)	(0.03170)	(0.04091)
Chi-Square value for Test UK = EU (Pr > ChiSq)	0.83 (0.3619)	0.03 (0.8615)	2.61 (0.1064)	3.55* (0.0594)	2.49 (0.1145)	1.13 (0.2869)
Adj. R2	0.0740	0.1042	0.2515	0.2564	0.2067	0.1115
N	317	317	317	317	317	317

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