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PARIS TERRORISME ATTACKS: INTERDISCIPLINARY STUDIES OF INSIDER TRADING AND MONEY LAUNDERING ON GLOBAL SCALE

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Abstract

In this paper, we investigate past research and the development of knowledge and practice in the area of countering money laundering and terrorist financing. Additionally, we draw attention to the gaps in the preventive mechanisms adopted by countries to fight against AML & ATF and to highlight areas for possible future research. There are various avenues to invest and one of those is Stock Market. But the decision of the investor depends on various factors. One of the factors which affects the behavior of investment is Terrorism. The paper focuses on short run and long run association and influence of terrorism on major global stock indices and Gold. We have taken Paris attacks of 2015 as base and ARDL model is used to study the short run and long run impact on the selected stock indices. We find that terrorism has got short run impact on the global indices but there is no long run impact.

Keywords: Terrorism, Global Indices, Paris Attacks, Investors

INTRODUCTION

Europe is facing an escalating threat from jihadi terrorism. There has never been higher numbers of attack plots per year than in 2014-16. An increasing proportion of plots goes undetected and result in deadly attacks. More people have been killed by jihadi violence in Western Europe in 2014-2016 (273 people) than in all previous years combined (267 people). This is due to a small number of highly deadly incidents: The Paris attack on 13 November 2015 (130 killed), the Brussels bombing in March 2016 (32 killed) and the Nice truck attack in July 2016 (84 killed). The period also saw the first example of two mass casualty attacks being launched successfully in a row, namely those in Paris and Brussels. Beginning in the winter 2013-14, the vast majority of plots involve links to the Islamic State (IS) (UN 2019).

Terrorism has a long history (Forman 2006). In recent years, extremely disastrous terrorist attacks are observed. Besides the loss of human life and property, terrorist acts have large number of indirect effects on society and economy (Gilmore 1995). It is expected to have an adverse impact on investor confidence, and thus leading to wide ranging impact on financial markets (Nikkinen & Vähämaa 2010).

Terrorism is a critical global issue, directly and indirectly affecting the world (Corbet, Gurdgiev & Meegan 2018). Countries are increasingly more conscious of risks faced by terrorism, seeking to limit and control terrorist agendas, limit damage to public properties, and loss of thousands of innocents, soldiers, politician's government official lives (Leong 2016). Impacting foreign investors confidence to invest in the countries subject to terrorist activities, and inducing local investors to move their investment to more stable and less disruptive financial environments, terrorism's effect on stock markets is great and has been shown to impact variables such as liquidity, returns and stock market volatility (Ouadghiri & Peillex 2018).

This topic is therefore of considerable interest among investors seeking to understand the effects of terror shocks to stock exchanges and to which country they should invest their money (Koo 2020). The objective of the study are to examine the effect of different terrorist attacks on terrorism financing framework, to undertake a comparative analysis of the intensity of each category of terrorist attack on Stock Exchange, and to suggest potential measures to regularities and policy makers of terrorist attack.

Stock markets reflect investors' expectations and worries about the future. Incidences like terrorists' attacks that effect the economy also have serious effects on capital markets. Decisions to purchase and sell can be easily reversed. When information is available about a terrorist attack, investors often flee the market in search of safer heaven which leads to panic selling with its consequences (Chen and Siems, 2004). This panic may lead to chaos that leads to a long-term or short term bearish trend. The markets in other countries where these investors go in the expectation of safer investment may tend to become a bull market. With increasing globalization countries of the world are integrated and any occurrences in one country will have impact in other countries of the world. That's the reason why it is generally quoted that when US sneezes, entire world catches cold (Tranfield, Denyer and Smart 2003).

The general findings of the reviewed papers show the deficiencies in the laws, acts and preventive measures meant to fight money laundering and terrorism financing and supports the need for more research in this area in terms of law, regulations and technological matters. So the paper examines the extent to which Islamic State (IS) has affected jihadi terrorism in Europe. We look at the scope of attack activity, perpetrators and their networks, modus operandi and funding. For all the talk of a new threat we argue that, apart from scope, less is new than most assume. IS wants largely the same as al-Qaida did by attacking Europe. Their tactics are similar and their networks overlap in time and space. The core dynamics of the threat endure. It is premature to talk of a new paradigm in recruitment, but more terrorists are instructed online than before. Patterns in funding remain relatively stable, but there is an increase in plots financed from abroad. Despite military setbacks, IS remains a formidable terrorist actor, with territorial control, economic muscle and thousands of Europeans in its ranks. These things, combined with the group's skilful social media usage, are exhausting European security services' capacities. So is the refugee situation, which is exploited by IS to transfer personnel. If IS's territorial control persists, we foresee attempts at large-scale operations, including attempts at using improvised chemical or radiological devices. If IS continues to lose ground, small-scale attacks by single actors will become even more frequent.

Upon searching google scholar, under the keywords of "review of the literature on AML & ATF or financial economic crimes", no paper was found to extensively review the

subject from the perspective of our study or even from a general perspective. However, a few papers were found that reviewed some predicate offenses, such as corruption, fraud, human trafficking, and child pornography. Google scholar was chosen as the basis for this search because it searches within most of the databases available. For that reason, our review is considered among the first initiatives to fully analyze the existing literature on AML & ATF.

REVIEW OF LITERATURE

The indirect economic consequences of terrorism on global financial markets have received considerable attention in the academic literature over the past few years. Several studies have examined the effects of terrorism on stock markets. Chen and Siems (2004), Maillet and Michel (2005), Charles and Darné (2006), Johnston and Nedelescu (2006), and Nikkinen, Omran, Sahlström, and Äijö (2008) demonstrate that the major stock markets throughout the world were negatively affected by the September 11 terrorist attacks.

Due to globalization, terrorist attack in one country has a significant impact on stock market indices of other countries (Chen and Siems, 2004; Kumar and Liu, 2013). The impact on other countries stock market depends on the level of integration between the two countries (Kumar and Liu, 2013). Chaudhry *et al.* (2018) studied the impact of terror attack in SAARC countries for the period 2000-2015 using event study methodology and fixed effect regression analysis. They observed that the stock returns of highly affected countries differ from countries that are least effected by terrorism. Narayan *et al.* (2018), studied terrorist activities and fear for eight OECD countries from 2001 to 2014 using dynamic conditional correlations (DCC) methodology. They concluded that DCCs of France and seven OECD countries are not much affected due to terrorism over time. The flight for safety was found for other seven countries.

Kosco (2017) used multifactor model, a difference equation and logit model to understand the impact of terrorism on stock market. He mainly worked on the world's 20 largest markets from 2010 to 2015. Schepers (2015) worked to know the effect of attacks by terrorist on the stock and bond market of United Kingdom, Germany, Spain, France and Belgium. The time span of the research was from 1994 to 2014. There was a significant impact on bond market but not for stock market. Another result that is found is that

different targets of the terror attack have different impacts on the stock and bond market. Chesney, M., Reshetar, G., & Karaman, M. (2011), did an empirical study on the impact of terrorism on the behaviour of stock market, bond market and commodity markets. They took 25 countries terror attack for the time period of more than 11 years. Event study approach, a non-parametric methodology, and a filtered GARCH-EVT approach is used here. They found that a non-parametric approach is the most appropriate method among the three for analyzing the impact of terrorism on financial markets.

Risk diversification by investors in their investments are also found by them in doing this research. Kumar, Sanjay and Liu, Jiangxia (2013) worked on impact of terrorism on global capital markets. When a larger economy is measured by GDP, the spill over is specifically prominent for economically smaller trading partners. It will see a reduction in -2.5% of national stock indices. Jackson, O. A. (2008) deals with aftermath of 9/11 attacks at U.S. He tells the overall impact that America met after the great terror incident. Impact on stock market is also shown covering U.S economy and tourism too. Chen, Andrew and Siems, Thomas (2004) examined 14 terror attacks to U.S capital market. Even they included Kuwait attack of 1990 and 9/11 American tragedy. They founded that U.S market will recover soon than any other capital markets due to stability in banking sector and sufficient liquidity in order to make market stable and avoid panic. Johnston, Barry and. Nedelescu, Oana (2005) quotes about the international awareness of the danger of terrorism and its effects on markets. They told the reaction of the market to various attacks. Matured stock exchanges did observe the attack and they were efficient in doing that. Eldor and Melnik (2004) examined the impact of 639 attacks between 1990 to 2003 on stock market and foreign exchange market. Even suicide attacks had impact on stock markets ,as did the victims. Some researchers like Hammoudeh and Li (2008) and (Inclan and Tiao, 1994) studied its volatility impacts using Cumulative Sum of Squares (ICSS), ARCH and GARCH models.

A literature review of past studies aimed to collect and examine the laws using technical or argument methods; most of the papers lack a real evaluation of the state of money laundering or terrorist financing events, most likely due to the lack of statistical data (Kiser 2005). In this review, we aim to contribute to answering the following questions: a)

What are the best ways to enhance the safeguarding mechanisms injected into financial institutions? b) How can we possibly identify a case of AML and/or ATF?

We answer these questions by means of a systematic review of the literature on AML & ATF. This paper aims to present an integrated summary of the existing body of knowledge of AML & ATF published in high-ranked databases. We identify where the conclusions of previous research meet and diverge to set the agenda for future possible research. This review is motivated by two key factors: the recent events of money laundering meant to finance terrorism around the world and the current state of the AML & ATF literature is exacerbated by the fact that, in addition to the lack of a concrete understanding of the concept, there has also been an alarming lack of theoretical development in the area. The literature used in this review was classified by year of publication, number of citations, type of paper, publisher, and journal rank in five databases (Scopus, ABDC, ABS, Scimago and the Web of Science). Moreover, the papers were categorized based on the coverage of each study (Boister 2012): a) AML regulations, criminology and trends; ATF regulations, trends, economics, financial economics, behavioural and social sciences (criminology) and socioeconomics; b) AML & ATF regulations and trends. This categorization was followed by detailed content analysis.

Through the content analysis, the results, findings, and recommendations of each sample study were illustrated and highlighted (Cassella 2003). The findings of this review have several implications. First, the review provides a synthesis of the research on AML & ATF and shows how the direction of the recent studies in this area of research was growing and taking different directions prior to the events of September 11 (FAT 1990). Second, for governments and officials, this review highlights the common challenges associated with the international measures of AML & ATF and provides ways to enhance risk mitigation associated with the FATF (2001) recommendations to provide a higher level of compliance among the entities involved. Third, the review provides researchers with a better understanding of the subject and opens doors to address the gaps illustrated in the previous literature.

Upon searching google scholar, under the keywords of “review of the literature on AML & ATF or financial economic crimes”, no paper was found to extensively review the subject from the perspective of our study or even from a general perspective (Tofangsaz

2012). However, a few papers were found that reviewed some predicate offenses, such as corruption, fraud, human trafficking, and child pornography. Google scholar was chosen as the basis for this search because it searches within most of the databases available. For that reason, our review is considered among the first initiatives to fully analyse the existing literature on AML & ATF.

RESEARCH METHOD

Most of the researchers focused on the volatility of the benchmark with respect to terrorism, economic impact after the terrorism, reaction of international indices after the major terror attacks, impact of terrorist attack on US stock markets (DeNichilo 2021). Some researchers discussed the duration and magnitude of the effect of few worst terrorist attacks on Global Stock indices like S&P, DAX, IBEX, NIKKEI, FTSE, CAC and BEL during the period 2001-2016 (Bonekamp & Van Veen, 2017). Chesney (2011) observed risk diversification by investors. Some discussed that a non-parametric approach is the most appropriate method for analysing the impact of terrorism on financial markets. This section mainly focuses on the short run and long run association between the indices of terror affected country and selected global indices and Gold (He 2010). It also compares the pre and post terror attack stocks performance of terror affected country's index as compared to selected global indices and Gold.

H_0**:** There is no short run or long run association between the terrorism affected country's benchmark to the other selected global indices and Gold.

H_1: There are no linkages between terrorism and the returns in the selected stock markets.

To understand the short run and long run association between the top nine terror affected country's index and selected Global indices and Gold, Autoregressive Distributed Lag (ARDL) Models are used. This study investigates the short-run and the long-run relationship between Paris attack and its impact on world's major stock indices. The ARDL model is a least squares regression which includes the lags of dependent and the independent variables (Pesaran and Shin 1999). The ARDL model became popular with the works of Pesaran and Shin (1999) and Pesaran *et al.*. (2001). The dependent and the independent variables are related also related through their lagged values. The ARDL model following Pesaran *et al.*. (2001) can be written in the following form:

$y_t = \mu + X_p\ i=1\ \gamma_i y_{t-i} + X_r\ j=0\ \beta_j x_{t-j} + \varepsilon_t,\ \varepsilon \sim i.i.d\ \forall\ t\ C(L)$

$y_t = \mu + B(L)X_t + \varepsilon_t,$

where $C(L) = 1 - \gamma_1 L - \gamma_2 L_2 - \cdot\cdot\cdot - \gamma_p L_p$

and $B(L) = \beta_0 + \beta_1 L + \beta_2 L_2 + \cdot\cdot\cdot + \beta_r L_r$

ARDL model shows the whether there is any association between attacks and the index of the particular countries. We have taken Paris attacks and its effects on stock indices of five countries. The five indexes considered are DJI, FTSE, N225, DAX and BSE. The stock market index of Paris CAC is taken as independent variable and the dependent variable being the index of that particular country. After this, Serial Correlation LM test is considered to know the probability significance. In case the Serial correlation LM test does not satisfy the level, then we go to CUSUM test, which is a graphical representation of long run and short run association between the variables. Finally, Wald test is used to determine long or short run impact and association due to terrorism (Zubair, Oseni and Yasin 2015).

To calculate the returns performance of the indices, Miller Modigliani Performance measure is used to calculate and analyse the Pre and Post returns on stock indices of top five global indices and gold is done. Historical data of share price is drawn from the respective countries benchmark websites. Research papers, journals, newspapers, expert views, websites and other various sources are taken into consideration for the further analysis of this research.

For the present study we have taken only the Paris Attack and the corresponding index is CAC 40. The data period is one-year daily data from the date of attack i.e. from November 14, 2016 to November 24, 2017. Historical data of share price is drawn from the respective countries benchmark websites (Keesoony 2016).

RESULTS AND DISCUSSION

The ARDL (AutoRegressive Distributed Lag) model results of Paris attacks on the DJI (Down Jones Index NY) are summarized in Table 1. The table 1 illustrates the short or long run association between CAC index (Cotation Assistèe en Continu Paris) and DJI by using ARDL model and bound test. The F-statistic for the models is observed to be significant at 5% level i.e., p-value is seemed to be less than 0.05.

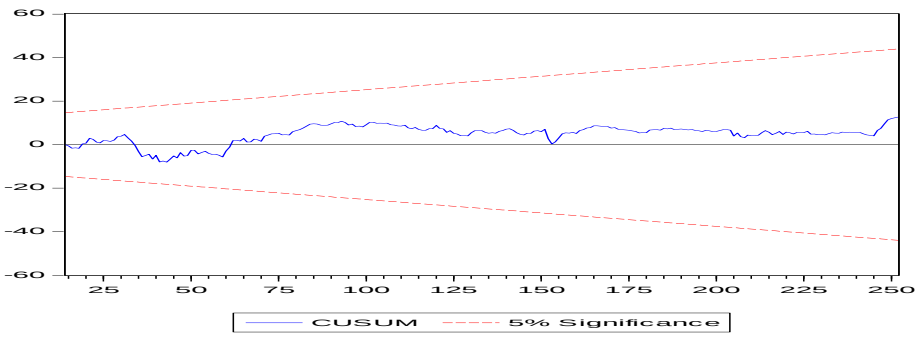
Table 1
ARDL Model for CAC and DJI

Dependent Variable: D(DJI)
Method: Least Squares
Sample (adjusted): 5 252
Included observations: 248 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	648.82	298.95	2.17	0.03
D(DJI(-1))	-0.10	0.07	-1.58	0.12
D(DJI(-2))	-0.07	0.07	-0.98	0.33
D(DJI(-3))	-0.01	0.07	-0.09	0.93
D(CAC(-1))	0.11	0.17	0.65	0.52
D(CAC(-2))	-0.01	0.16	-0.07	0.95
D(CAC(-3))	0.18	0.16	1.13	0.26
DJI(-1)	0.00	0.01	-0.20	0.84
CAC(-1)	-0.13	0.06	-2.20	0.03
R-squared	0.04	Mean dependent var		4.43
Adjusted R-squared	0.00	S.D. dependent var		147.76
S.E. of regression	147.50	Akaike info criterion		12.86
Sum squared resid	5199827.00	Schwarz criterion		12.99
Log likelihood	-1585.78	Hannan-Quinn criter.		12.91
F-statistic	1.11	Durbin-Watson stat		2.00
Prob(F-statistic)	0.36			

Source: Compiled through Eviews

The above table illustrates the short or long run association between the DJI with CAC by using ARDL model and bound test. The F-statistic for the model is observes to be significant at 5% level and i.e., p-value is seemed to be less than 0.05. Further analysis signifies that third lag is considered to be optimum lag selection which deriving the values of AIC (Akaike info criterion) (12.86) and SIC (Schwarz criterion 12.98). Hence concluded this model is fit for the lag 3.



In least square the probability value is greater than 0.05 which means this model has no serial correlation. In these results, the plotted points fluctuate between the upper and lower limit i.e., between the red line which signifies that the model is in control limit to the check long and short run association between the variable.

Wald Test:			
Test Statistic	Value	Df	Probability
F-statistic	2.941789	(2, 239)	0.0547

Source: Compiled through Eviews

The above table F-statistic values (2.94) as compared with critical value at % per cent level observes that F-statistic is more than upper bound value (4.85). Hence concluded that Null hypothesis has been rejected and alternative hypothesis has been accepted i.e. DJI with CAC having short run association.

The ARDL model results of Paris attacks on the FTSE (Milano) are summarized in Table 2. The table 2 illustrates the short or long run association between CAC and FTSE by using ARDL model and bound test. The F-statistic for the models is observed to be significant at 5% level i.e., p-value is seemed to be less than 0.05.

Table 2
ARDL Model for CAC and FTSE

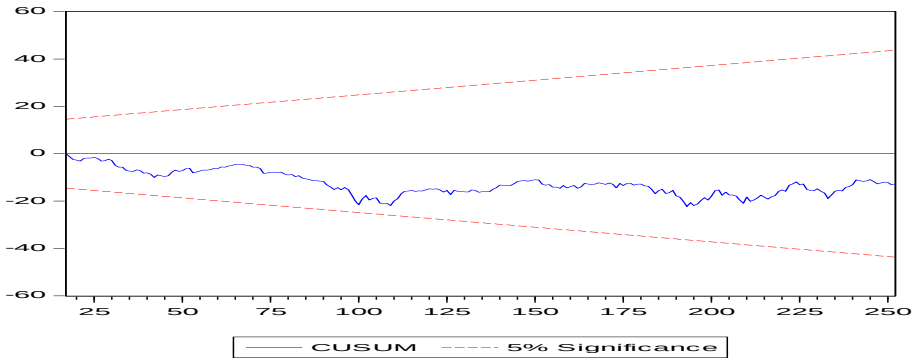
Dependent Variable: D(FTSE)
Method: Least Squares
Sample (adjusted): 6 252
Included observations: 247 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.66	130.22	-0.07	0.95
D(FTSE(-1))	0.12	0.06	1.85	0.07

D(FTSE(-2))	-0.12	0.06	-1.83	0.07
D(FTSE(-3))	0.06	0.06	1.02	0.31
D(FTSE(-4))	-0.15	0.06	-2.31	0.02
D(CAC(-1))	-0.05	0.07	-0.67	0.50
D(CAC(-2))	0.05	0.07	0.68	0.50
D(CAC(-3))	-0.11	0.07	-1.45	0.15
D(CAC(-4))	-0.05	0.07	-0.67	0.51
FTSE(-1)	-0.02	0.01	-1.75	0.08
CAC(-1)	0.03	0.03	1.15	0.25
R-squared	0.07	Mean dependent var		-2.33
Adjusted R-squared	0.03	S.D. dependent var		68.48
S.E. of regression	67.34	Akaike info criterion		11.30
Sum squared resid	1070261.00	Schwarz criterion		11.46
Log likelihood	-1384.67	Hannan-Quinn criter.		11.36

Source: Compiled through Eviews

The table 2 illustrates the short or long run association between the FTSE with CAC by using ARDL model and bound test. The F-statistic for the model is observes to be significant at 5% level and i.e., p-value is seemed to be less than 0.05. Further analysis signifies that fourth lag is considered to be optimum lag selection which deriving the values of AIC (11.30) and SIC (11.45). Hence concluded this model is fit for the lag 4.



Source: Compiled through Eviews

In least square the probability value is greater than 0.05 which means this model has no serial correlation. In these results, the plotted points fluctuate between the upper and lower limit i.e., between the red line which signifies that the model is in control limit to the check long and short run association between the variable.

Wald Test:			
Test Statistic	Value	Df	Probability
F-statistic	1.929613	(2, 236)	0.1475
Chi-square	3.859226	2	0.1452

Source: Compiled through Eviews

The above table F-statistic values (1.92) as compared with critical value at % per cent level observes that F-statistic is more than upper bound value (4.85). Hence concluded that Null hypothesis has been rejected and alternative hypothesis has been accepted i.e. FTSE with CAC having short run association.

The ARDL model results of Paris attacks on the NIKKEI are summarized in Table 3. The table 3 illustrates the short or long run association between CAC and NIKKEI by using ARDL model and bound test. The F-statistic for the models is observed to be significant at 5% level i.e., p-value is seemed to be less than 0.05.

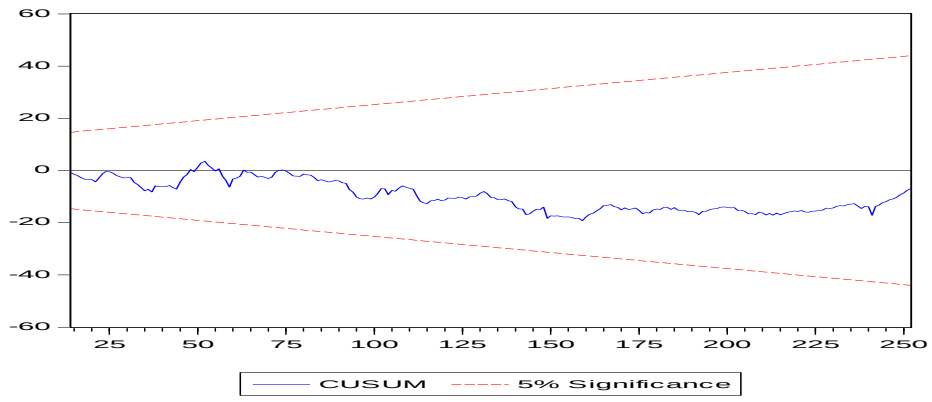
Table 3
ARDL Model for CAC and NIKKEI

Dependent Variable: D(N225)
Method: Least Squares
Sample (adjusted): 5 252
Included observations: 248 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	234.70	504.80	0.46	0.64
D(N225(-1))	-0.07	0.07	-1.08	0.28
D(N225(-2))	0.02	0.07	0.37	0.71
D(N225(-3))	-0.02	0.06	-0.30	0.76
D(CAC(-1))	0.09	0.32	0.27	0.79
D(CAC(-2))	0.33	0.31	1.05	0.29
D(CAC(-3))	0.22	0.31	0.69	0.49
N225(-1)	-0.08	0.03	-2.47	0.01
CAC(-1)	0.24	0.19	1.26	0.21
R-squared	0.06	Mean dependent var		-5.96
Adjusted R-squared	0.03	S.D. dependent var		286.63
S.E. of regression	282.34	Akaike info criterion		14.16
Sum squared resid	19051744	Schwarz criterion		14.29
Log likelihood	-1746.80	Hannan-Quinn criter.		14.21
F-statistic	1.95	Durbin-Watson stat		2.01
Prob(F-statistic)	0.05			

Source: Compiled through Eviews

The table 3 illustrates the short or long run association between the NIKKEI (Tokyo) with CAC by using ARDL model and bound test. The F-statistic for the model is observes to be significant at 5% level and i.e., p-value is seemed to be less than 0.05. Further analysis signifies that fourth lag is considered to be optimum lag selection which deriving the values of AIC (14.15) and SIC (14.28). Hence concluded this model is fit for the lag 3.



Source: Compiled through Eviews

In least square the probability value is greater than 0.05 which means this model has no serial correlation. In this results, the plotted points fluctuate between the upper and lower limit i.e., between the red line which signifies that the model is in control limit to the check long and short run association between the variable.

Wald Test:			
Test Statistic	Value	df	Probability
F-statistic	3.03503	(2, 239)	0.0189
Chi-square	8.07006	2	0.0177

Source: Compiled through Eviews

The above table F-statistic values (3.03) as compared with critical value at % per cent level observes that F-statistic is more than upper bound value (4.85). Hence concluded that Null hypothesis has been rejected and alternative hypothesis has been accepted i.e. NIKKEI with CAC having short run association.

The ARDL model results of Paris attacks on the DAX (Frankfurt) are summarized in Table 4. The table 4 illustrates the short or long run association between CAC and DAX by using ARDL model and bound test. The F-statistic for the models is observed to be significant at 5% level i.e., p-value is seemed to be less than 0.05.

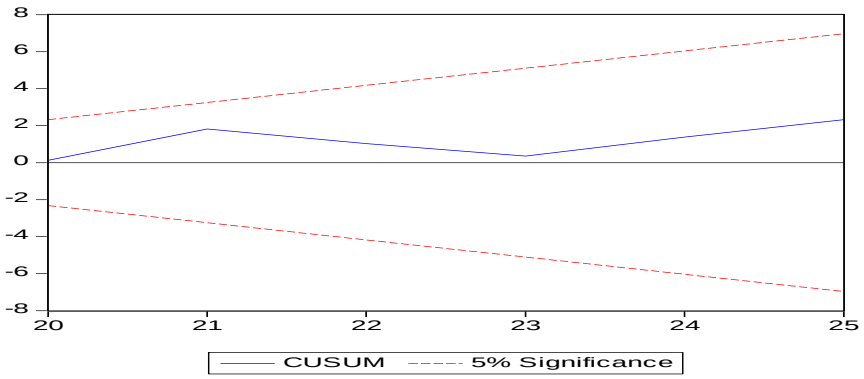
Table 4
ARDL Model for CAC and DAX

Dependent Variable: D(DAX)
Method: Least Squares
Sample (adjusted): 7 25
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.40	0.49	0.81	0.45
D(DAX(-1))	0.26	1.32	0.20	0.85
D(DAX(-2))	0.01	0.97	0.01	0.99
D(DAX(-3))	-0.78	1.16	-0.68	0.52
D(DAX(-4))	-1.05	1.51	-0.70	0.51
D(DAX(-5))	3.76	1.59	2.37	0.06
D(CAC(-1))	0.08	0.69	0.12	0.91
D(CAC(-2))	0.38	0.66	0.57	0.59
D(CAC(-3))	0.70	0.90	0.77	0.47
D(CAC(-4))	0.55	1.03	0.53	0.61
D(CAC(-5))	-2.01	0.85	-2.36	0.06
DAX(-1)	-3.89	1.62	-2.40	0.05
CAC(-1)	1.74	0.72	2.41	0.05
		Mean dependent var		-0.01
R-squared	0.97			
Adjusted R-squared	0.92	S.D. dependent var		0.98
		Akaike info criterion		
S.E. of regression	0.28			0.49
Sum squared resid	0.463738	Schwarz criterion		1.139618
		Hannan-Quinn criter.		
Log likelihood	8.312483			0.602785
F-statistic	18.03817	Durbin-Watson stat		1.821683
Prob (F-statistic)	0.000992			

Source: Compiled through Eviews

The table 4 illustrates the short or long run association between the DAX with CAC by using ARDL model and bound test. The F-statistic for the model is observes to be significant at 5% level and i.e., p-value is seemed to be less than 0.05. Further analysis signifies that sixth lag is considered to be optimum lag selection which deriving the values of AIC (.49) and SIC (1.13). Hence concluded this model is fit for the lag 6.



Source: Compiled through Eviews

In least square the probability value is greater than 0.05 which means this model has no serial correlation. In these results, the plotted points fluctuate between the upper and lower limit i.e., between the red line which signifies that the model is in control limit to the check long and short run association between the variable.

Wald Test:		Equation: Untitled	
Test Statistic	Value	df	Probability
F-statistic	2.917327	(2, 6)	0.1303
Chi-square	5.834655	2	0.0541

Source: Compiled through Eviews

The above table F-statistic values (2.91) as compared with peasant critical value at % per cent level observes that F-statistic is more than upper bound value (4.85). Hence concluded that Null hypothesis has been rejected and alternative hypothesis has been accepted i.e. DAX with CAC having short run association.

The ARDL model results of Paris attacks on the BSE (Bombay) are summarized in Table 5. The table 5 illustrates the short or long run association between CAC and BSE by using ARDL model and bound test. The F-statistic for the models is observed to be significant at 5% level i.e., p-value is seemed to be less than 0.05.

Table 5
ARDL Model for CAC and BSE

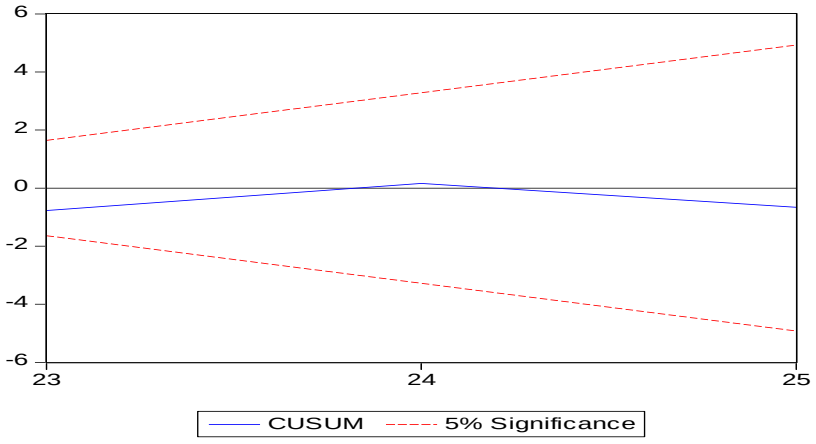
Dependent Variable: D(BSE)
Method: Least Squares
Sample (adjusted): 8 25
Included observations: 18 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.59	1.29	-1.23	0.31

D(BSE(-1))	-0.20	1.53	-0.13	0.90
D(BSE(-2))	-0.41	1.64	-0.25	0.82
D(BSE(-3))	-1.02	1.62	-0.63	0.57
D(BSE(-4))	-0.84	2.68	-0.31	0.78
D(BSE(-5))	-0.56	1.81	-0.31	0.78
D(BSE(-6))	-2.21	2.41	-0.92	0.43
D(CAC(-1))	-1.84	0.87	-2.12	0.12
D(CAC(-2))	-0.94	0.94	-1.00	0.39
D(CAC(-3))	-0.39	1.01	-0.38	0.73
D(CAC(-4))	-0.68	0.72	-0.94	0.42
D(CAC(-5))	-0.10	1.30	-0.07	0.95
D(CAC(-6))	-1.00	0.62	-1.62	0.20
BSE(-1)	-0.47	1.13	-0.42	0.71
CAC(-1)	0.93	0.61	1.54	0.22
R-squared	0.94	Mean dependent var		0.06
Adjusted R-squared	0.65	S.D. dependent var		0.98
S.E. of regression	0.58	Akaike info criterion		1.62
Sum squared resid	1.01	Schwarz criterion		2.36
Log likelihood	0.40	Hannan-Quinn criter.		1.72

Source: Compiled through Eviews

The above table illustrates the short or long run association between the BSE with CAC by using ARDL model and bound test. The F-statistic for the model is observes to be significant at 5% level and i.e., p-value is seemed to be less than 0.05. Further analysis signifies that sixth lag is considered to be optimum lag selection which deriving the values of AIC (1.62) and SIC (2.34). Hence concluded this model is fit for the lag 6.



Source: Compiled through Eviews

In least square the probability value is greater than 0.05 which means this model has no serial correlation. In these results, the plotted points fluctuate between the upper and lower limit i.e., between the red line which signifies that the model is in control limit to the check long and short run association between the variable.

Wald Test:		Equation: Untitled	
Test Statistic	Value	df	Probability
F-statistic	3.472498	(2, 3)	0.1657
Chi-square	6.944995	2	0.031

Source: Compiled through Eviews

The above table F-statistic values (3.47) as compared with critical value at % per cent level observes that F-statistic is more than upper bound value (4.85). Hence concluded that Null hypothesis has been rejected and alternative hypothesis has been accepted i.e. BSE with CAC having short run association.

The ARDL model results of Paris attacks on the Gold are summarized in Table 6. The table 6 illustrates the short or long run association between CAC and gold by using ARDL model and bound test. The F-statistic for the models is observed to be significant at 5% level i.e., p-value is seemed to be less than 0.05.

Table 6
ARDL Model for CAC and Gold

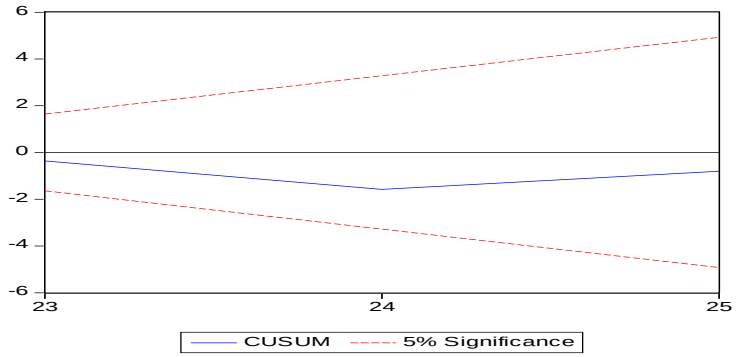
Dependent Variable: D(GOLD)
Method: Least Squares
Sample (adjusted): 8 25
Included observations: 18 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.42	3.40	-0.12	0.91
D(GOLD(-1))	0.17	4.62	0.04	0.97
D(GOLD(-2))	0.08	4.16	0.02	0.99
D(GOLD(-3))	-0.02	3.85	0.00	1.00
D(GOLD(-4))	-2.45	3.07	-0.80	0.48
D(GOLD(-5))	-1.40	1.80	-0.78	0.49
D(GOLD(-6))	1.20	1.37	0.88	0.45
D(CAC(-1))	-0.70	1.04	-0.67	0.55
D(CAC(-2))	-0.36	1.00	-0.36	0.74
D(CAC(-3))	-0.93	0.74	-1.25	0.30
D(CAC(-4))	-0.72	0.66	-1.09	0.36
D(CAC(-5))	-0.30	0.65	-0.46	0.68
D(CAC(-6))	-0.49	0.80	-0.61	0.59

GOLD(-1)	-1.30	4.86	-0.27	0.81
CAC(-1)	0.28	0.87	0.32	0.77
		Mean dependent var		0.04
R-squared	0.96			
Adjusted R-squared	0.79	S.D. dependent var		0.97
		Akaike info criterion		
S.E. of regression	0.44			1.08
Sum squared resid	0.58	Schwarz criterion		1.82
		Hannan-Quinn criter.		
Log likelihood	5.24			1.18

Source: Compiled through Eviews

The above table illustrates the short or long run association between the Gold with CAC by using ARDL model and bound test. The F-statistic for the model is observes to be significant at 5% level and i.e., p-value is seemed to be less than 0.05.



Source: Compiled through Eviews

In least square the probability value is greater than 0.05 which means this model has no serial correlation. In these results, the plotted points fluctuate between the upper and lower limit i.e., between the red line which signifies that the model is in control limit to the check long and short run association between the variable.

Wald Test:		Equation: Untitled	
Test Statistic	Value	df	Probability
F-statistic	1.366964	(2, 3)	0.3784
Chi-square	2.733928	2	0.2549

Source: Compiled through Eviews

The above table F-statistic values (1.36) as compared with critical value at % per cent level observes that F-statistic is more than upper bound value (4.85). Hence concluded that Null hypothesis has been rejected and alternative hypothesis has been accepted i.e. GOLD with CAC having short run association.

In the next stage a comparison of pre and post attack returns is done using Miller Modigliani Approach. Table 7 gives the comparison of pre and post Paris attack returns.

Table 7
Returns Performance Pre and Post Paris Attack

Returns Performance based on Miller Modigliani Approach														
Impact of Paris Attacks on Selected Global Indices and Gold														
	DJI		FTSE		NIKKEI		DAX		BSE		CAC		GOLD	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	post	Pre	post	Pre	post
November	0.2	0.3	0.02	0.31	0.08	0.35	0.15	0.37	0.03	0.2	0.11	0.31	0.1	0.3
December	0.1	0.26	0.16	0.32	0.22	0.07	0.44	0.09	0.28	0.48	0.42	0.03	0.19	0.31
January	0.3	-0.05	0.32	0.19	0.38	0.06	0.42	0.23	0.24	0.54	0.39	0.19	0.17	0.38
February	0.1	0.51	0.2	0.57	0.34	0.39	0.26	0.2	0.24	0.09	0.3	0.32	0.21	0.41
March	0.3	0.81	0.17	0.3	0.3	0.66	0.17	0.62	0.08	0.54	0.24	0.65	0.24	0.43
April	0.2	0.67	0.33	0.32	0.16	0.4	0.18	0.45	0.28	0.09	0.16	0.4	0.24	0.37
May	0.1	0.37	0.24	0.4	0.28	0.42	0.14	0.48	0.26	0.46	0.16	0.43	0.18	0.43
June	0.1	0.53	0.02	0.48	0.21	0.35	0.2	0.51	0.32	0.32	0.21	0.55	0.15	0.45
July	0.1	0.64	0.23	0.35	0.23	0.58	0.07	0.28	0.15	0.32	0.01	0.22	0.21	0.36
August	0.4	0.53	0.23	0.45	0.17	0.48	0.34	0.65	0.08	0.42	0.4	0.6	0.62	0.44
September	0.6	0.4	0.04	0.45	0.31	0.52	0.25	0.51	0.19	0.54	0.26	0.62	0.19	0.33
Yearly	0.9	1.55	0.95	1.55	0.97	1.55	0.96	1.55	0.95	1.55	0.96	1.55	0.96	1.54

We find in case of DJI that there is slight decline in returns in Dec 2015 and in January 2016 the returns were negative but it picked up after that and for almost all the months except January the returns were higher. The yearly average returns were also higher than the pre attack period. For FTSE also we have similar results. There was decline in January but overall, there was increase. NIKKI declined in December and January but later on reversed and finally overall average for the year it also increased. DAX and CAC also showed similar result but BSE increased during December Gold increased marginally.

CONCLUSION

It has been observed from the research that terrorist attacks have got short term impact on the stock indices of other countries as well as of the same country (Prasad, Narayanasamy, Paul, Chattopadhyay, and Saravanan 2018). It has also got short run negative impact on the returns but finally in the long run there is no impact either on stock indices as well as its returns. This result has got an important implication on the investors decisions i.e. it suggests that in case of any such eventuality when returns are negative and

indices are falling rather than losing all hopes and squaring their positions in losses the result suggests them to wait for some time when the impact eventually tapers out and indices are back on growth path (Rider, Alexander, Bazley, and Bryant 2016).

Therefore, this paper tries to further explore the scope of possible future research on AML & ATF. For example: a) More focused studies on detecting schemes using machine learning are needed; b) Using an artificial intelligence system to identify potential ML/TF accounts; c) Examining alternative remittance systems, their risks and how to properly control them; d) Study of predicate offense typologies; e) Examining pyramid marketing and its role in AML & ATF and the lack of laws in some countries to criminalize it (comparison between Sharia and law).

The paper contributes significantly to scholars and professional practitioners by providing insights through a detailed systematic review of the existing research studies on AML & ATF. First, the paper provides a comprehensive and detailed description of the available literature on the subject. Then, the paper describes the nature of the available studies and clearly discusses the gaps in the literature. Finally, the paper points out the directions for future research that may enable impactful studies on AML & ATF to be published in top-tier journals. To the best of our knowledge, this study is the first to make a detailed review of what has been studied so far in AML & ATF and to identify scope for further research work. This review has several implications. First, the paper reveals that there are gaps in both regulations and legislative laws and the technology used by countries to fight money laundering and terrorist financing. Second, the paper clearly shows the need for cooperation among different parties and entities in the war against ML/TF. Third, one purpose of this study was to more deeply examine the phenomenon of ML/TF, which remains relatively underexplored in different dimensional contexts. Finally, we provide the elements to initiate more quality research on AML & ATF. The issues discussed in the suggested research agenda could help to provide more sophisticated elements to fight money laundering and terrorist financing, which would be useful to authorities, policymakers and regulators who define requirements, technologies, and laws. The limitations of this paper are that it has not considered studies with fewer than 50 citations, and the findings may change if one includes all the studies irrespective of the number of citations. Moreover, the paper may ignore a few recent and important studies.

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