Determinants of Currency Depreciation in Pakistan

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Abstract

The loss of value of currency of any country with respect to foreign currencies like US $ is called Currency depreciation. Since 2008, Pakistani Rupee depreciates extensively which created many problems and hinders economic growth of country. The main reason behind this sharp decline is bad economic condition, terrorism, law and order situation, decrease in foreign portfolio investment and bad performance of stock market in Pakistan. The purpose of this research study is to analyze impact of terrorism, portfolio investment and stock market return on currency depreciation. This study uses monthly secondary data from 2003 to 2012. Both descriptive and inferential statistics are used to analyze data. The result of ADF test show that all series are stationary at level and first difference with and without trend. Correlation is used to check relationship among variables and Ordinary Least Squares (OLS) Methods is used to test impact of independent variables (terrorism, portfolio investment and stock market return) on dependent variable i.e. currency depreciation. Correlations of currency depreciation are 30%, -13% and -29% with terrorism, portfolio investment and stock market return respectively. The results suggest that terrorism has positive contributions in currency depreciation while portfolio investment and stock market return has negative impact of currency depreciation during 2003-2012.

1. Introduction

The loss of value of currency of any country with respect to foreign currencies like US $ is called Currency depreciation. In simple words, it is unofficial increase of exchange rate due to demand and supply of currency. This happens when country is following floating exchange rate system. Now days, the currency depreciation is one of main and important issue in Pakistan. This issue has created many severe problems for economy of Pakistan. For

example, if the Pakistani Rupee depreciates as comparative to the US $, the exchange rate (the Pakistani Rupee price of US $) rises: it means that it will take more Pakistani Rupee to buy 1 US $. However, when real effect of currency depreciation on country is studied, a eye opening facts revealed that Pakistan's foreign debt in 1994-95 was Rs 1,035 billion equivalent to $30.22 billion at a rate of Rs. 34.25/US $ but in 2013 it increased to six times Rs 6,499 billion ($60.43 billion) due to current dollar rate of Rs 108.04. Contrary to that, if Rupees remains stable at Rs. 34.25/US $, it would have been Rs. 2, 069 only. Since 2008, Rupee depreciates extensively which created many problems and hinders economic growth of country.

The main reason behind this sharp decline is bad economic condition, terrorism, political instability, law and order situation and decrease in foreign portfolio investment and in the country. The currency depreciation increase cost of doing business which lowers business competitiveness in international market. Another important aspect is that currency depreciation increase exports. However, as Pakistan is importer of fertilizers, oil, food items, machinery and raw material in this situation due to bad competitiveness in international market, this will definitely increase inflation and import bill. In short time period it may be favorable but in long run it may be loss of whole economy (Zia & Mahmood, 2012). After 9/11, Pakistan is considered as font line ally in war on terror. Since 2002, approximately 10,000 persons died and further 30,000 injured in this so called war on terror. The events that make people more concern about future have negative impact on forex markets.

The issue of exchange rate modeling is one of important which need attention. Exchange rate behavior has huge significance in economy of any country. There is need to understand the issue and behavioral trends. Exchange rate fluctuations have severe consequences like impact on interest rates, production levels, prices and employment opportunities. Since the collapse of Bretton Woods System in 1970, these short term fluctuations have dramatically increased. There are many short as well long term factors affecting exchange rate like political, economic, and psychological. Exchange rate behavior has high impact on economy and still there is a need to study determinants of these fluctuations with empirical evidences (Saeed, Awan, Sial & Sher, 2012).

Pakistani Rupee was de-linked from Pound in 1971 and pegged it with US Dollar. Then in 1982, Pakistan adopted mechanism of managed floating exchange rate. Somehow, this

mechanism tried to reduce gap in market rate and official rate. However, in 1991, Pakistan introduced my financial reforms in financial sector. Due to sanctions as a result of atomic explosions, Pakistan adopted three multiple exchange rate system. First rate were Official rate (Rupee was pegged with US Dollar at a fixed rate), Floating Inter Bank Rate (FIBR) (commercial banks quoted rate) and, Composite rate that was calculated by combining FIBR rate and official rate. However, in 1999, different band was introduced and multiple exchange rate system was unified and Rupee was pegged with US Dollar. In 2000, these bands were removed by Government of Pakistan. Since then, there is floating exchange rate system in Pakistan (Saeed, Awan, Sial and Sher, 2012). Exchange rate in Pakistan exhibited a tendency to rise from 1982 to 2001 and then started declining in late 2001till 2005. After 2005, it is on rise till now.

Figure 1 describes the pattern of monthly exchange rate of Pakistani Rupee against US Dollar from 2003 to 2012. The pattern is evident from Rs. 58/US $ to Rs. 106/US $
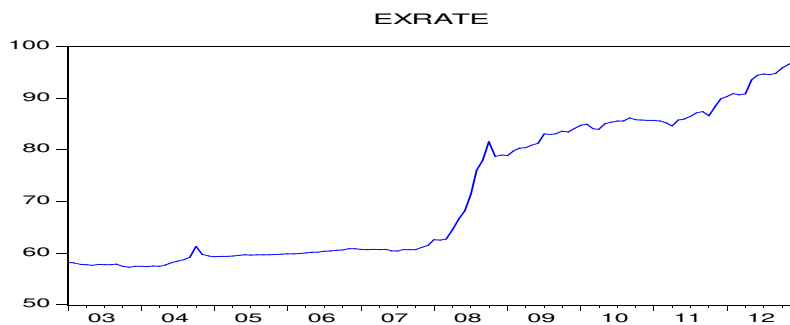

Figure – 1 (Currency Depreciation/Exchange Rate trend)

The main research questions of this research study are;

- Is there any impact of terrorism on currency depreciation?
- Is there any impact of foreign portfolio investment on currency depreciation?
- Is there any impact of stock market return on currency depreciation?

The main research objectives of this research study are;

- To study impact of terrorism on currency depreciation
- To study impact of foreign portfolio investment on currency depreciation
- To study impact of stock market return on currency depreciation

Above section of this research study includes introduction, research questions and research objectives of the study. The remaining of the study is arranged as follow. Literature review is provided in section two while research and econometric model is presented in section three of this research study. Results, discussion and conclusion are explained in section four and five.

2.   Literature Review

In simple words, terrorism can be defined as a violent act of non-state actors' against security personnel, government officials and common citizens. Bandyopadhya, Sandler and Younas, (2013) defined "Terrorism is the premeditated use or threat to use violence by individuals or sub national groups against noncombatants to obtain a political or social objective through the intimidation of a large audience beyond that of the immediate victims." Llussa and Tavares, (2006) claimed that the in the past the word "terror", was linked with indiscriminate violence by governments against their citizen but now "terrorism" (no longer "terror") is linked with the actions of sub-national groups or non-state actors. Terrorism is one of poisons in Pakistan. The greatest damage, of course, results from the lives that are lost and the people who are injured. Nonetheless, it's natural to wonder whether a terrorism event is likely to have a longer-term impact on the economy and the forex market. Now a day, terrorism is a hot topic in every household and this issue gained huge importance by social scientist and researchers. This issue gained importance after 9/11 attacks and subsequently so called war on terror led by America. However, countries like Pakistan is one of most affected by terrorism and are frontline alley of war on terror.

Terrorism incidents destroy or damage infrastructure, increase cost of business operation, thereby reducing output from a given set of inputs. Terrorist may destroy foreign company offices; kidnap foreign officials of multinationals, threat for ransom. This will increase country risk and will result in outflow of FDI and also effect inflow of FDI or foreign investment (Bandyopadhya, Sandler & Younas, 2013). Karolyi, (2006) further revealed that terrorism is one of an important geo political risk that affects the financial markets and global

economy. In short term, the terrorism activity enhances investor risk in commodity markets and financial markets. Karolyi, (2007) explained that the terrorism threat violence motivated politically is increasing direct and indirect cost of doing business in US and all over the world. The direct cost of terrorism includes insurance premiums, security-related expenditures and business interruptions while indirect cost of terrorism includes lost productivity, lower consumer spending, reduced executive air travel and higher costs of oil due to terrorism activities.

Majority of research about terrorism is carried out in the field of political science, sociology and history while in finance and economics; it did not get enough attention. Terrorism activities like 9/11, Madrid and London attack in 2004 and 2005 created awareness about catastrophic risk in financial markets and investors. There is a negative impact of these natural catastrophes on financial markets in short run. However, in the long run, the financial market needs more time for reaction (Karaman, 2010). Blomberg, Hess and Weerapana, (2002) claimed that both economic as well as human loss of 9/11terrorism incident are very high. Frey and Luechinger, (2003) claimed that terrorism and economy are related. Sharif (2002) claimed that developed economies have reduced vulnerability against shocks due to secure and modern financial system. But, it is not clear that whether developing economies should follow developed market financial market model or not. Forex market in Pakistan has many imperfections and is quite vulnerable to shocks. Forex market in Pakistan neither improve investments nor able to grasp saving despite many efforts and policy changes.

 Pakistan badly suffered from terrorism since 9/11 incident. Many major terrorism activities like assassination of Banazir Bhutto, Laal Masjid operation, operation in South Waziristan many suicide attacks. Terrorism activities are taking place daily or weekly and this violence in country is affecting investor confidence badly. They reported significant negative impact of terrorism on economy and Forex market of Pakistan. They further claimed that increase in terrorism activities in country will increase exchange rate and result in depreciation of currency. This is due to fact that more demands of dollar than supply. Therefore, they concluded that exchange rate has positive relationship with terrorism. This is due to loss of investor confidence about future of country (Qaiser, Sohail, Liaqat & Mumtaz, 2012).

Foreign investment inflow is one of main source of exchange earnings and help in saving and economic growth. Inflow of foreign portfolio investment will increase supply of foreign currency and ultimately help in reducing exchange rate (Anthony & Peter.N, 2011). As depreciation in currency is due to more demand of US $ than supply, so supply will impact positively. However, if outflow of foreign portfolio investment is more that inflow or net foreign portfolio investment is lower and exchange is rising, it will have negative relationship. Obadan (1994) also emphasized importance of exchange rate on foreign private investment inflow and Reported that high exchange rate will discourage exports and have negative impact on foreign private investment.

If investors fail to understand the terms and conditions of the market then it would be in a difficult position to get any good amount of money from the market. Durnev, Enikolopov, Petrova, and Santarosa, (2012) claimed that instability decreases the importance for minority-owned investment (FPI), as compared with majority-owned investment (FDI). They predicted that instability makes minority-owned investment a relatively less attractive option as compared with majority-owned investment. Therefore, decrease in foreign portfolio investment will increase exchange rate due to less supply.

The relationship between equity return (stock market return) and exchange rate is an important phenomenon to understand for policy makers and academicians. This is due to the fact that in last decade, many counties adopted flexible exchange rate and more open financial markets. These not only increase opportunities and avenues for investment but also increase volatility and it consequences. They reported equity return and exchange rate has negative relationship in short run (Hasan & Javed, 2009). Bahmani and Sohrabian (1992) reported bidirectional causality relationship between stock market returns and exchange rate by using Granger causality analysis and co integration analysis.
However, Yu (1997) reported only a bidirectional relationship between the equity market and exchange rates in Japan and unidirectional causality flowing from changes in exchange rates to changes in stock prices in Hong Kong. However, they reported no causality in the Singapore market during 1983-1994. Abdalla and Murinde (1997) found unidirectional

causality from equity market to the exchange rate in the Philippines. Muhammad and Rasheed (2003) reported that in Pakistan, India no relationship exists between equity markets and foreign exchange rates in the long or short run. However, they found relationship in between exchange rate and equity market in Bangladesh and Sri Lanka.

3. Research Methodology

3.1 Data and Sample

This study uses monthly secondary data from 2003 to 2012. Therefore, it will make 120 observations for each variable. STATA 11 version is used to analyze data. Currency depreciation is calculated taking first difference of exchange rate series. Monthly closing exchange rate of US $ against Pakistani Rupee is taken from official website of State Bank of Pakistan. The data of closing monthly stock market index is collected from website of KSE. The market returns (R_m) is calculated using formula as $R_{m,t} = (R_{i, t}/Rm_{t-1}) -1$. The monthly data of foreign portfolio investment is retrieved from website of State Bank of Pakistan (SBP). Terrorism data is retrieved from south Asia terrorism portal. As terrorism data is available only from 2003 onward therefore, data of all other variables is also taken from 2003 to 2012.

3.2 Method

In this paper dependent variable is currency depreciation and independent variables are terrorism, Stock market return and foreign portfolio investment. Both descriptive and inferential statistics are used to analyze data. This study first check stationarity of data by using ADF Unit Root Test. The result of ADF test show that all series are stationary at level and first difference with and without trend. Therefore, ordinary least square method can be used to test impact of independent variables on dependent variable. Correlation is used to check relationship among variables. Ordinary Least Squares (OLS) Methods is used to test

impact of independent variables (terrorism, portfolio investment and stock market return) on dependent variable i.e. currency depreciation.

3.3 Explanation of variables and Econometric Model

First of all, variables under study and research hypothesis are explained and then on the basis of that econometrics model is developed.

3.4 Dependent Variable: Currency Depreciation

Now days, the currency depreciation is one of main and important issue in Pakistan. The loss of value of currency of any country with respect to foreign currencies like US $ is called Currency depreciation. In simple words, it is unofficial increase of exchange rate due to demand and supply of currency. The change in rate of US $ against Pakistani Rupee is taken as proxy for currency depreciation. Therefore, currency depreciation is calculated by taking first difference of US $ exchange rate. This is also pertinent here to mention that US $ exchange rate is widely used and officially used to calculate currency depreciation.

3.5 Independent Variables

3.5.1 Terrorism/ Violence

In simple words, terrorism can be defined as a violent act of non-state actors' against security personnel, government officials and common citizens. Terrorism data is retrieved from south Asia terrorism portal. As terrorism data is available only from 2003 onward therefore, data of all other variables is also taken from 2003 to 2012. Terrorism incidents destroy or damage infrastructure, increase cost of business operation, thereby reducing output from a given set of inputs. Terrorist may destroy foreign company offices; kidnap foreign officials of multinationals, threat for ransom. This will increase country risk and will result in outflow of FDI and also effect inflow of FDI or foreign investment. It is cleared from literature review that there will be significant negative impact of terrorism on economy and forex market of Pakistan. The increase in terrorism activities in country will increase exchange rate and result

in depreciation of currency. This is due to fact that more demands of dollar than supply. Therefore, currency has significant positive relationship with terrorism.

H₁: There is significant positive impact of terrorism on currency depreciation

3.5.2 Foreign Portfolio Investment (FPI)

Foreign investment inflow is one of main source of exchange earnings and help in saving and economic growth. Inflow of foreign portfolio investment will increase supply of foreign currency and ultimately help in reducing exchange rate. As depreciation in currency is due to more demand of US $ than supply, so supply will impact positively. However, if outflow of foreign portfolio investment is more that inflow or net foreign portfolio investment is lower and exchange is rising, it will have negative relationship. Increase in foreign portfolio investment will decrease currency depreciation resulting in negative relationship.

H₂: There is significant negative impact of portfolio investment on Currency depreciation.

3.5.3 Stock Market Return

The relationship between equity return and exchange rate is an important phenomenon to understand for policy makers and academicians. This is due to the fact that in last decade, many counties adopted flexible exchange rate and more open financial markets. There is no consensus on relationship between stock market return and currency depreciation as many authors reported different results. However, this study expect that there will negative relationship in short run between stock market rerun and currency depreciation. This argument is more reasonable as stock market attracts foreign investment. If stock market yield more market return, this will attract more foreign investments and this will increase supply of foreign currency. When supply increase exchange will decrease and vice versa. Therefore, On the basis of above literature review, following hypothesis may be made.

H₃: There is significant negative impact of stock market return on currency depreciation.

3.5.4 Econometric Model of the study

On the basis of above variable explanation and literature review, following econometric model is developed. The econometric model to test impact of terrorism, portfolio investment and stock market return on exchange rate is developed on the basis of literature.

$$?? = ?_? + ?_?(????) + ?_?(???) + ?_?(???) + ?$$

Where,

CD = Currency Depreciation

β0 = Constant

Terr = Terrorism

FPI = Foreign Portfolio Investment

SMR = Stock Market Returns

e = error term

4. Results and Discussion

4.1 Descriptive Statistics

The descriptive analysis is carried to study the characteristics of data. The results of Kurtosis are above threshold level i.e. 3 for all the four variables. The data is also skewed and Jarque-Bera is used for testing whether the series are normally distributed or not. It produces the differences of the skewness and kurtosis of the series with those from the normal distribution. According to the results of Jarque-Bera, all the series has p value less than 5% which suggested to reject null hypothesis i.e. data has normal distribution. The detailed results are reported in table 1.

Table1: Descriptive Statistics

Statistic	Currency Depreciation	VIOLENCE	RETURN	PI
Mean	0.324250	376.1417	0.019004	23.73675
Median	0.105000	316.0000	0.020220	13.83778
Maximum	4.680000	2024.000	0.224144	713.2865
Minimum	-2.850000	1.000000	-0.361604	-295.2777
Std. Dev.	0.880078	377.1917	0.076719	100.1372
Skewness	1.694010	1.514360	-1.130791	2.988325
Kurtosis	10.38940	6.163981	7.520056	22.41557
Jarque-Bera	330.4095	95.91960	127.7283	2063.424
Probability	0.000000	0.000000	0.000000	0.000000
Sum	38.91000	45137.00	2.280512	2848.410
Sum Sq. Dev.	92.16993	16930555	0.700416	1193269.
Observations	120	120	120	120

4.2 Unit root test

The time series data has an inherent problem of non-stationarity in levels which often produce spurious results. Thus, time series data is tested for unit roots to remove the problem of wrong results. Augmented Dickey-Fuller (ADF) test is applied for unit roots to find out

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that the variables included are integrated of the same order. An ADF test indicated that data for all four series is stationary at both level and at first differences with out and with trend. A complete summary of results of unit root test is reported in table 2.

Table 2: Unit Root Test results (ADF Test)

Variables	t-Statistic	Prob.*	1% level	5% level	10% level
At Level - Without Trend					
Currency Depreciation	-7.948079	0.0000	-3.486064	-2.885863	-2.579818
Terrorism	-3.685489	0.0055	-3.486064	-2.885863	-2.579818
FPI	-3.385149	0.0135	-3.488063	-2.886732	-2.580281
Return	-8.856916	0.0000	-3.486064	-2.885863	-2.579818
At First Difference - Without Trend					
Currency Depreciation	-18.36579	0.0000	-3.486551	-2.886074	-2.579931
Terrorism	-9.593859	0.0000	-3.487550	-2.886509	-2.580163
FPI	-16.36362	0.0000	-3.487550	-2.886509	-2.580163
Return	-9.705111	0.0000	-3.488063	-2.886732	-2.580281
At Level - Trend					
Currency Depreciation	-18.28645	0.0000	-4.037668	-3.448348	-3.149326
Terrorism	-4.681926	0.0012	-4.036983	-3.448021	-3.149135
FPI	-16.29236	0.0000	-4.039075	-3.449020	-3.149720
Return	-8.929371	0.0000	-4.036983	-3.448021	-3.149135
At First Difference - Trend					
Currency Depreciation	-8.182975	0.0000	-4.036983	-3.448021	-3.149135
Terrorism	-9.567022	0.0000	-4.039075	-3.449020	-3.149720
FPI	-8.856916	0.0000	-3.486064	-2.885863	-2.579818
Return	-9.667097	0.0000	-4.039797	-3.449365	-3.149922

4.3 Correlation analysis

A correlation suggests relationship between two variables either it is week or strong. Correlation among currency depreciation, terrorism, portfolio investment and stock market return is studied. Correlation between terrorism and currency depreciation is 0.30 which suggests that terrorism is 30% correlated with currency depreciation. There is a negative 13% correlation between portfolio investment and currency depreciation. This suggests that whenever, portfolio investment increases currency depreciation decrease or vice versa. Currency depreciation and stock market return has 29% negative correlation. This also

suggests that whenever, stock market yields high return, currency depreciation will be low and vice versa. The detailed results are reported in table 3.

Table 3: Correlation Analysis

Currency Depreciation	1			
VIOLENCE	0.30	1		
FPI	-0.13	-0.03	1	
RETURN	-0.29	-0.14	-0.07	1

4.4 Regression analysis

The results of model summary are given in the table 4. The dependent variable is the currency depreciation and independent variables terrorism, portfolio investment and stock market return and the time period of the analysis is 2003-2012. R squared is 0.17 which is the magnitude of determinants and show goodness of fit of model. In our study it has been found that we have R square value of 0.17 which means that 17% model has explained parts. Adjusted R squared is 0.15 which is close to R square value. This shows that model and data is fit to use. In our analysis, F value is 8.08 at significant level of less than 1% which shows that independent variables explained variation in the dependent variable very well. The Durbin Watson state is 1.6 which is less than 2 and show that there is autocorrelation in data however; data is not seriously affected by autocorrelation.

The regression results of first hypothesis i.e. impact of terrorism on currency depreciation show that t- value is 2.99 at p value of .0033 which show that null hypothesis can be rejected at 1% in favor of research hypothesis i.e. there is significant positive impact of terrorism on currency depreciation. Hence, our first hypothesis (H_1) is accepted. The results of second hypothesis show that t- value is -1.65 at significant level of .10 which show that null hypothesis cannot be rejected at 1% and 5% significance level but can be rejected at 10% significance level in favor of research hypothesis i.e. there is significant negative impact of portfolio investment on currency depreciation. Hence, second hypothesis (H_2) is accepted. The regression results of third hypothesis i.e. impact of stock market return on currency depreciation show that t- value is -3.14 at p value of .0029 which show that null hypothesis can be rejected at 1% in favor of research hypothesis i.e. there is significant negative impact

of stock market return on currency depreciation. Hence, third hypothesis (H₃) is accepted. The detailed results are reported in table 4.

Table 4: Regression [Ordinary Least Squares]:

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Hypothesis Decision
Constant	0.187564	0.110809	1.692675	0.0932	
Terrorism	0.000596	0.000199	2.996682	0.0033	H_1: Accepted at 1%
Portfolio Investment	-0.001227	0.000744	-1.648800	0.1019	H_2: Accepted at 10%
Stock market Return	-3.080332	0.980267	-3.142339	0.0021	H_3: Accepted at 1%
R-squared	0.172956				
Adjusted R-squared	0.151567				
Durbin-Watson stat	1.601872				
F-statistic	8.086192				
Prob (F-statistic)	0.000062				

Dependent Variable: Currency depreciation

4.5 Conclusion and Discussion of results

The results show that all three hypotheses can be accepted. First hypothesis suggested that terrorism has significantly and positively contributed in currency depreciation. When terrorism and law and order situation increases in Pakistan, exchange rate tends to increase and currency depreciate. The finding of this research study is very important and has significant implications for policy makers and government. The impact of terrorism on currency depreciation is rarely studied in Pakistan, and therefore, this research tried to investigate new but important phenomenon. There were many conventional determinants of currency depreciation like money supply, monetary policy, foreign exchange reserves and many more. These variables are very important and cannot be ignored but, this research study tried to investigate some new variables but important determinants of currency depreciation. The results of this study are consistent with results of Karaman, (2010) and Qaiser et al. (2012) studies.

Second hypothesis is impact of foreign portfolio investment on currency depreciation which suggests that there is significant negative impact of portfolio investment on currency depreciation. This suggests that as portfolio investment decrease currency depreciation

increases. The decrease in portfolio investment in Pakistan may be one of cause of currency depreciation. Therefore, Pakistani government should facilitate foreign investors and every effort should be made to increase portfolio investment so that supply of foreign currency should be increase which ultimately will decrease currency depreciation. Therefore, this study suggested a very important determinant of currency depreciation. The results of this research study are consistent with Anthony and Peter.N, (2011) and Obadan (1994). These both reported negative impact of portfolio investment on currency depreciation.

Third hypothesis is accepted on the basis of results which suggested that stock market return will negatively impact currency depreciation. Therefore, current currency depreciation can be related with the fact that from 2008 to 2012 stock market was performing very poorly and from 2003 to 2008 stock market was performing very well and consequently currency was also not depreciated. However, this is just an explanation of fact and it does not mean that whole currency depreciation is due to poor performance of stock. However, keeping other things constant stock market return is one of strong determinants of currency depreciation. The reasonable explanation may be that stock market attract foreign investment and encourage domestic investors to invest in Pakistan and consequently increases supply of foreign currency. Therefore, currency depreciation will be low and vice versa if stock market is not yielding high return. These results are in conformity with Hasan and Javed, (2009); Bahmani and Sohrabian (1992); Yu (1997) and Abdalla and Murinde (1997) studies. However, Muhammad and Rasheed (2003) reported different results from this study. This may be due to sample of their study which is before 2003. This study has sample from 2003 onward.

The results of this research study have important implication for policy makers and academicians. However, this study has some limitation like many important determinants are not included in this study. This is due to fact that this study uses monthly data. For many variables like GDP, monthly data is not available. The main purpose of this study is to examine short term relationship of these variables with currency depreciation. Currency depreciation, terrorism, portfolio investment and stock markets show quick reactions of events occurred in country; therefore, monthly data serve better purpose and show better results. The results of this study should be carefully interpreted as many important variables are missing in analysis. However, many studies carried out in past included those variables but missed out these variables. Therefore, there is need of comprehensive research study containing all important determinants of currency depreciation.

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