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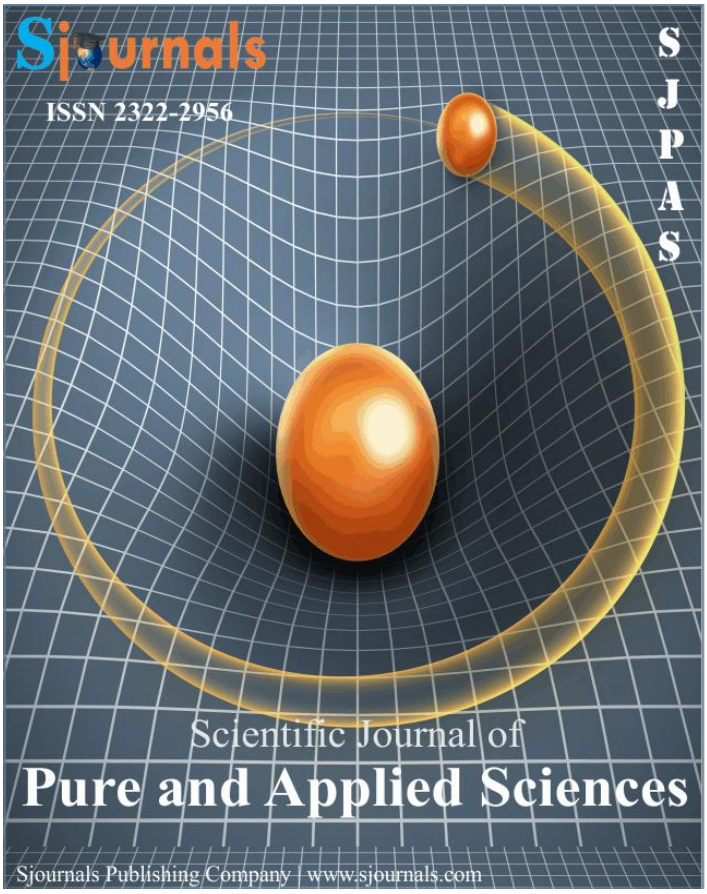

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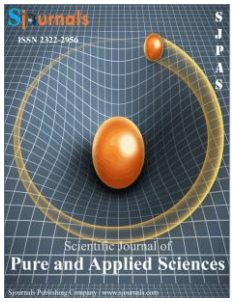
Scientific Journal of Pure and Applied Sciences (2016) 5(4) 413-421
ISSN 2322-2956
doi: 10.14196/sjpas.v5i4.2187



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Review article

International incidences, macroeconomic variables and their volatility effect on economic growth: empirical evidence from Pakistan

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ARTICLE INFO

Article history,
Received 19 March 2016
Accepted 18 April 2016
Available online 25 April 2016
iThenticate screening 22 March 2016
English editing 15 April 2016
Quality control 21 April 2016

Keywords,
ARCH
GARCH
Marcoeconomic variables
IMF
GDP
Volatility

ABSTRACT

The prime objective of this study is to incorporate the volatility among the different macroeconomic variables. In order, to analysis the volatility among different variables we have employed the ARCH/GARCH model. Our results suggested that there is not significant relationship between IMF, FDI and GDP. while, import, export and market capitalization have negative relationship. GRCH model reported that in the case of gold there is persistence of volatility exists. Morever, inflation and exchange rate are found insignificant volatility. Our study is also trying to show that Iraq war have significant volatility while other global crisis have negative volatility.

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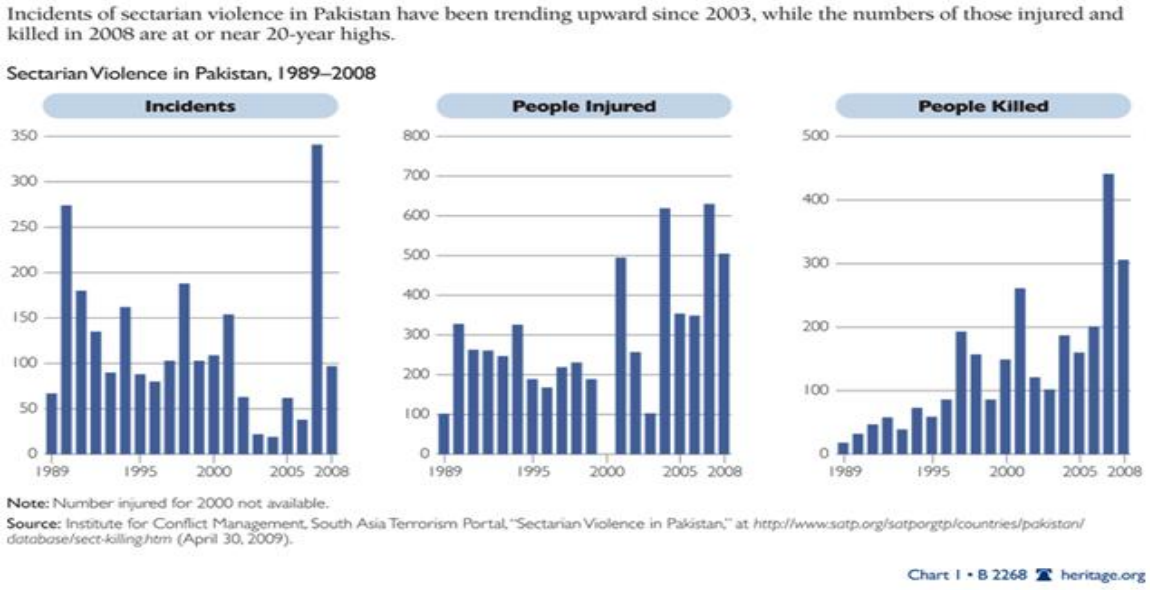
1. Introduction

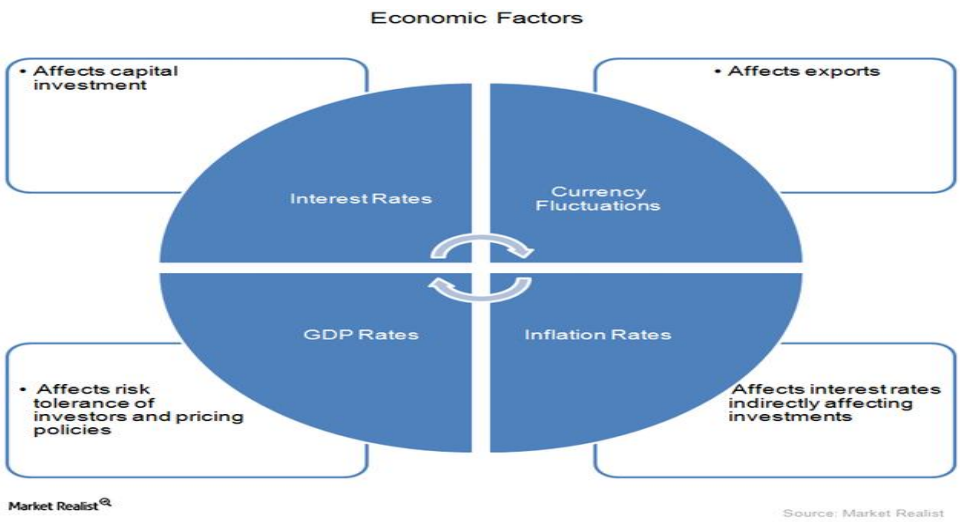
All the international and national dynamics have impacted on the economic growth of Pakistan. The international factors which have impacted on the poverty of Pakistan could be regional disability and war crises. conseqently, these factors have indirectly link with the economic growth of different countries. These factors are also link with the previous gold prices, loans, exchange rate, foreign aids and foreign direct investment. Different researchers have shown that when all the macroeconomic variable and international variables are combined then it affect badly on the economics of the country. All the developing country like Pakistan get directly affected by the changes of the prices of volatility. Different sacholares have been proved that increase and decrase oil prices have

crucial role in the performance of the business cycles. Ghosh etal. (2002) examined the relationship between gold prices and inflation rate and proved that there is not significant relationship between these variables (Mahmood et al., 2011) have shown that exchange rate also effects the economic growth.

Capital formation is the considered as the resource generation which has curial role for the better performance of the economy. According to (Romer, 1986; Romer, 1990) with the increases the resources will enable the increase the ratio of capital formation. Lack of exports have influenced on the development of the country. Mostly, Asian region are facing the disabilities due to terrorism activities like 9/11 and Iraq war. Due to war activities Pakistan faced the loss of ratio of foreign exchange. Due to these factors, which caused the effect on the poverty of Pakistan. Wave of terrorism is the major cause of the decline the KSE. When decline the KSE then it wills effect of the development on our economy. For instance; due to financial crisis the Asian countries have low growth of income. East countries were income growing fastly before financial crisis. It is proved that UK and US countries affected badly due to financial crisis. Several theories have proved that financial crisis is the factor which have badly influenced on the growth of all developing and under developing country.



Pakistan faces increases in sectarian violence.



2. Objective

The purpose of this study is to examine the mar economic variables and terrorism on the poverty of paksiatn. For checking the economic growth GDP is considered as the crucial indicator. This paper is also trying to expose that how terrorism affected the economic growth of paksiatn. For insatane, American attack and its consequences on the growth of paksiatn. We are also at the time of American intervention in Iraq oil prices was high in all over the world. Moreever, we have also explored that IMF aids and its effect included in this paper. We have showing effect of all these events on the poverty of Pakistan.

3. Literature review

Abdulahi, S.A. Assessed the relationship among the different variables of India and determined the there is negative relationship between gold demand and market index. For this purpose they have utilized the OLS model. They had taken data from 1988 to 1998 (Abdulahi, 2005). Adamu, J.A and Sanni, I have explored that how terrorist attack influenced on the expected rate of return. For this purpose they had taken the data from 1998 to 2009 and applied the unit root and granger causality and shown there is negative relationship between terrorist attack and expected rate of return. They had suggested that government should control such types of attack for the development of the country (Adamu and Sanni, 2005).

Agarwal S. he had analyzed the impact of changes oil prices on the development of paksitan. For this purpose they had taken the data from 1988 to 1998 and applied the univariate and vicariate Garch model. They had taken the results that these increase and decrease the oil prices has linkage with the poverty of any country. They had suggested that investors should be taken the rational decision such type of situation (Agarwal, 2001). Andersen, T.G., analyzed the volatility between different variables by utilization the Aarch model. They had utilized the data 1976 to 2006.results had shown that exchange rate has influenced on the volatility of these variables (Andersen et al., 2000).

Arshad Hasan and Dr. Zafar Mueen Nasir have examined the importance and demand of gold. They had collected the data from 1998 to 2009. For the purpose they have collected the Multiregression model. Their results have shown that these metals prices have also effect on the growth of developing and under developing country (Hasan and MueenNasir, 2008). Balasubramanyam V.N., Salisu M. and Sapsford D. In this paper they have analyzed the relationship between stock market performance and economic growth of china. For this purpose they had applied the Johansenco-integration model and collected the data from 1986 to 1996. Their results have proved that there is positive relationship between stock market and economic growth. They suggested that stock market is the important tool for the development of the economic growth (Balasubramanyam et al., 2015).

Ben Porath, Y. In this paper they have analyzed the impact of capital market on the economic growth of Nigera. For this purpose they have used the data from 1981 to 2014. They have applied the ADF test and ECM model and analyzed the results that there is significant relationship between equity market and nigera developmen According to this research capital market has a curcial role for the development of the country (Ben Porath, 2014). Blomström, M., Robert E. Lipsey, and Zejan, M In this paper they have analyzed the impact of causality relationship between macroeconomic variables and economic growth. For this purpose they had utilized the data from 1980 to 1990. They have applied the ECM model and their results have shown that there is positive relationship between macroeconomic variables and economic performance of JAPAN. And it is /being found at significant level 5 % (Blomström et al., 2013).

Borensztein E. J., Gregorio J. D. and Lee J. W. In this paper they have analyzed the impact of terrorism on the proverty of UK .for this purpose they have taken the data from 1982 to 2012. Thety have applied the cointegration test and analysed the results that there is negative relationship between terrorism and terrorism and Uk economy. They suggested that government should make proper policies to stay away such types of events (Borensztein et al., 2012). Braun, P.A., Nelson, D.B., and Sunier, A.M. In this paper they have analyzed the inflation and exchange rate on the economic development of Jordan for this paper they had taken the data from 1999 to 2009 and applied the co-integration test and error correction model and have shown the results that these variables have influenced on the economic growth of Jordan (Brecher and Diaz-Alejandro, 2014).

Brecher, R.A. and Diaz-Alejandro, C.F. They assessed the relationship among the different variables of Malaysia and determined the there is not significant relationship between gold prices and market index. For this purpose they had taken data from 1988 to 1998 and applied the OLS model (Cai et al., 2001). Cai, J., Y-L. Cheung

and M. C. S. Wong. They had explored that how terrorist attack influenced on the expected rate of return of Brazil. For this purpose they had taken the data from 1998 to 2009 and applied the unit root and granger causality and shown there is negative relationship between terrorist attack and expected rate of return. They had suggested that government should control such types of attack for the development of the country (Cai et al., 2001).

Chen, A.H and T.F. Siems. They had analyzed the impact of changes oil prices on the growth of South asia. For this purpose they had taken the data from 1988 to 1998 and applied the univariate and vicariate Garch model. They had taken the results that these increase and decrease the oil prices has linkage with the poverty of any country. They had suggested that investors should be taken the rational decision such type of situation (Chen and Siems, 2004). Chen, N. F., Roll, R. and Ross, S. They analyzed the volatility among different macroeconomic variables and growth of Newyork by utilization the Garch model. They had utilized the data 1976 to 2006.Results have shown that exchange rate has influenced on the volatility of these variables (Chen et al., 1986).

Devarajan, S., V. Swaroop, and Heng-fu Zou They have examined the importance and demand of gold in the Arabian countries. They had collected the data from 1998 to 2009. For the purpose they have collected the Multiregression model. Their results have shown that these metals prices have also effect on the growth of developing and under developing country (Devarajan et al., 1996). Doucouliagos, H. and Paladam, M., In this paper they have analyzed the impact of capital market on the economic growth of Taiwan. For this purpose they have used the data from 1982 to 2012. They have applied the ADF test and ECM model and analyzed the results that there is positive relationship between equity market and Taiwan development. According to this research capital market has a crucial role for the development of the country (Doucouliagos and Paladam, 2009).

Dr. Kanchan Datta and Dr. Chandan Kumar Mukhopadhyay In this paper they have analyzed the impact of causality relationship between macroeconomic variables and economic growth of Uganda. For this objective they had utilized the data from 1981 to 1991. They have applied the ECM model and their results have shown that there is positive relationship between macroeconomic variables and economic growth of Uganda and it is being found at significant level 5 % (Datta and Kumar Mukhopadhyay, 2011).

4. Materials and methods

Table 1
Dependent Variable: GDP.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000624	0.000267	2.340977	0.0204
GDP(-1)	0.920212	0.028503	32.28544	0.000

Table 2
ARCH Test.

F-statistic	129.6289	**Prob. F(1,178)**	0.0000
Obs*R-squared	75.67312	**Prob. Chi-Square(1)**	0.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.92E-07	4.83E-08	3.974104	0.0002
RESID^2(-1)	0.651103	0.057188	11.38547	0.0000
F-statistic	129.6289	Durbin-Watson stat	2.119719	
Prob(F-statistic)	0.000000			

Table 3
Dependent Variable: GDP
Method: ML - ARCH (Marquardt) - Normal distribution
GARCH = C(15) + C(16)*RESID(-1)^2

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.001566	6.71E-06	23.33858	0.0000
CF	0.180169	0.007847	22.96158	0.0000
CS	0.084116	0.002097	40.13845	0.0000
ER	-0.000127	0.001016	-0.124027	0.9013
EX	0.232448	0.004654	49.95732	0.0000
FDI	-0.003946	0.000637	-6.201734	0.0000
GFC	0.001312	8.40E-06	15.61253	0.0000
GP	-0.000178	0.000324	-0.547964	0.5838
IMF	-0.008847	0.001051	-8.425656	0.0000
IW	0.002551	7.36E-06	34.63623	0.0000
MC	0.005232	0.000686	7.641298	0.0000
OP	0.001008	0.000104	9.817976	0.0000
R	0.021087	0.001121	18.83375	0.0000
SEP	0.000219	5.19E-06	4.197237	0.0000
Variance Equation				
C	3.54E-08	2.48E-08	1.429484	0.1528
RESID(-1)^2	1.245247	0.141045	8.828775	0.0000

Table 4
Dependent Variable: GDP
GARCH = C(3) + C(4)*RESID(-1)^2 + C(5)*CF + C(6)*CS+C(7)*ER+ C(8) *EX+ C(9)*FDI+ C(10)*GP+ C(11)*IMF+ C(12)*MC+

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000728	0.000407	1.784065	0.0745
GDP(-1)	0.920258	0.040574	22.68141	0.0000
Variance Equation				
C	4.36E-07	4.33E-08	10.07838	0.0000
RESID(-1)^2	0.171388	0.142648	1.201491	0.2297
CF	-1.08E-06	2.54E-06	-0.425987	0.6702
CS	-1.57E-06	9.62E-07	-1.633248	0.1025
ER	7.86E-07	2.34E-06	0.336622	0.7365
EX	-5.33E-07	4.45E-06	-0.119682	0.9048
FDI	-1.43E-06	5.91E-07	-2.423128	0.0155
GP	-2.60E-06	3.76E-07	-6.909758	0.0000
IMF	-5.33E-07	9.54E-07	-0.558408	0.5767
MC	-2.10E-07	8.40E-07	-0.250538	0.8023
OP	-6.23E-08	3.71E-07	-0.167968	0.8667
R	2.33E-07	7.47E-07	0.311803	0.7553

Table 5
Dependent Variable: GDP.

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000759	0.000244	3.125365	0.0018
GDP(-1)	0.920398	0.025048	36.74505	0.0000
Variance Equation				
C	5.15E-07	2.49E-08	20.70087	0.0000
RESID (-1)^2	0.171305	0.136231	1.257465	0.2087
IW	-4.26E-07	2.91E-08	-14.62066	0.0000
GFC	4.29E-07	3.87E-08	11.08861	0.0000
SEP	-2.33E-08	2.63E-08	-0.887185	0.3751

Table 6
Dependent Variable: GDP.

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000749	0.000923	0.811142	0.4174
GDP(-1)	0.920217	0.081212	11.33125	0.0000
Variance Equation				
C	4.47E-07	2.09E-07	2.135555	0.0328
RESID(-1)^2	0.149928	0.127786	1.173281	0.2408
GARCH(-1)	0.599856	0.181158	3.311207	0.0008
CF	-3.48E-06	6.09E-06	-0.571143	0.5678
CS	-2.03E-06	1.79E-06	-1.134128	0.2568
ER	-1.51E-06	2.89E-06	-0.520868	0.6026
EX	-4.24E-06	7.63E-06	-0.555484	0.5787
FDI	-8.35E-07	1.77E-06	-0.472341	0.6368
GP	-3.53E-06	1.18E-06	-3.005253	0.0028
IMF	-1.33E-05	2.05E-05	-0.646774	0.5178
MC	-1.48E-05	1.71E-05	-0.870145	0.3842
OP	2.69E-06	7.84E-06	0.343219	0.7314
R	-4.69E-06	1.66E-05	-0.281951	0.7780

Table 7
Dependent Variable: GDP

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000532	0.000298	1.785966	0.0742
GDP(-1)	0.947373	0.031837	29.75788	0.0000
Variance Equation				
C	3.43E-07	7.17E-08	4.783596	0.0000
RESID(-1)^2	-0.038533	0.002718	-14.18423	0.0000
GARCH(-1)	0.583055	0.080734	7.222048	0.0000
GFC	1.95E-07	4.09E-08	4.773621	0.0000
IW	-3.16E-07	8.40E-08	-3.764804	0.0003
SEP	7.02E-09	4.79E-08	0.146621	0.8835

5. Empirical results

The purpose of this study is to find out the impact of different macroeconomic variables on the Growth of Pakistan with the help of different methods. In this study used ARCH and GARCH model. Different reasraehers have worked out on the volatility of stock market returns. In 1989 Schwert and Katolyi have analysis the impact of these variables by using the GARCH model. ARCH is the most commonly method for the time series analysis. The most common problem in the time series ia the error terms or presence heteroskedasticity. However, heteroskedasticity is existence in the time series. We have been observed the heteroskedasticity is the way of to analysis the systematic variability. Due to this reason we cannot be viewed the time varying variance. The error term is known as the uncertainty at any specific points. The Autoregressive conditional Heteroseedatic is the combination of two various processes. For instance, AR(P) 1) the all the return series is regressed on it past values. Moreover, conditional variance is regressed on the lagged value of square error terms. GARCH model explains the future variance. Heterskedasticity shows that expected value of error term is not constant in time series data. The purpose of these lags to show the conditional variance and influence on the returns. In this study we have used the GDP for analyses the growth measure and some other variables as the potential influences. These macroeconomic variables are telling impact of these variables on the economic growth. Additionally; we have used the dummy variables to capture the different crisis and their impact on the growth.

6. Hypothetical model

$$GDP = f [CF, CS, EX,FDI,IMF,MC,R,ER,GP,OP,D1,D2,D3,D4]$$

In order to measure the volatility of macroeconomic variables on the economic growth the following model is measured:

$$GDP = \alpha + \beta 1cf + \beta 2cs + \beta 3ex + \beta 4FDI + \beta 5imf + \beta 6MC + \beta 7R + \beta 8ER + \beta 9GP + \beta 10OP + D + \epsilon$$

In this model α is as the constant and β is known as the coefficient. Where ϵ is known as the error term. β1, β2, β3 β4 β6 β9 β10 are showing the positive values. While, β5 β7 and β8 are representing the negative values. The purpose of growth of the variables are to analysis the rate of change .we have utilized the real GDP for analysis the economic growth of Pakistan. We are also exploring that different macroeconomic variables have impacted on the economic growth of country. We have utilized the different dummies to capture the potential influence. In this study we have utilized the real GDP to reduce the multicollineraity. For the generation of monthly time series we have utilized mostly E –views software.

The following results are showing the impact of volality on the GDP of Pakistan. There are different macroeconomic variables but we cannot be investigated their impact on the GDP without proper knowing the proper facts. Each economy faces the different types of risk and pattern like political policies, environmental factore, investors attitude. In our paper at the first stage we have analyzed that GDP is regressed on its lagged value. The GDP positive depend upon its previous value.

$$GDP = \alpha + \beta 1GDP(-1)$$

In the table no 2 probability of f static has shown that rejected the null hypothesis. Observes are showing the highly stsistically significant value. Our result is showing that ARCH model is giving us better result. These results have reported in the table no 3. The upper portion of the model is showing the mean equation while lower part is showing the ARCH specification. Results are showing that there is inverse relationship between FDI and GDP. Result is -0.003946. while, Zhang (2001) has found the mixed results related to FDI impact on the growth of the country. He found that FDI has no positive impact with the growth of Brazil, Korea, and Singapore. Some macroeconomic variables are the not proper results. It has shown that there is significant relationship between GDP and capital formation. Value 0.180168 is showing that it is highly significant. It is also showing that private sector do more contributing then public.

The positive values of 0.084116 are showing that coefficient of cash surplus is highly significant. Mostly; exports represent the value of goods and services in cash. Our results are showing that there is positive relationship between export and GDP. the coefficient value is 0.232448 which is highly significant. According to Dollar (1996) which countries do some exports then imports grow faster. The different results have shown that

there is positive relationship between inflation and GDP. The calculated coefficient value is 0.021087 which is highly significant. There is no long run relationship between real GDP and inflation. In short run there is no direct relationship. Moreover, the study has shown that there is indirect relationship between exchange rate and GDP. The value is positive which is shown 0.000127 that there is statistically insignificant. Foreign loans are utilized to improve the productivity. The coefficients are showing that there is negative relationship between IMF and economic growth. The values of coefficient are showing it is highly statistically significant. Market capitalization shows the positive value 0.005231 which represents the statistically significant. Marekt capitalization shows the investors' confidence. There is inverse relationship between investors confidence and organizational equities. Therefore there is direct linkage between market capitalization and GDP.

The purpose of this study to capture the dummy variables to find out the impact of different events on the GDP of Pakistan. These three dummies are being used to capture the impact of different financial crisis on the growth of Pakistan. For taking the proper economic decision volatility is returns has main role. Mostly, volatility depends upon the previous periods. The purpose of ARCH model to find out the volality in real GDP. There are two main parts. In the first part macroeconomic variables are being used while in the second stage dummy variables are utilized. The results of table no 4 are showing the variance analysis. There is two main variables in macroeconomic variables one is exchange rate and other is inflation. Which values are showing not statistically significant. On the other side the FDI and old prices have positive relationship. The purpose of three dummies variables are incorporated the variance equation. In the table no 5 the results of dummies are showing that impact of financial crisis on the GDP. In table is also try to show that variance may dependent on the squared error term. By applying the GARCH model can be determined the persistency of variance. Table no 6 has shown that gold prices can be generated from the gold prices. Table no 7 is showing that there is different behavior in both global financial crisis and Iraq.

7. Conclusion

The purpose of this study is to analysis the impact of different variables on the poverty of Pakistan. We have also investigated the different changes in the growth of Pakistan due to macroeconomics variables. We have used the macroeconomic variables like oil prices, market capitalization, inflation rate, exports, IMF. The results of ARCH (1) model shows that there is inverse relationship between FDI and GDP. As Borenztein, Degregorio, and Lee(1995) utilized this model in his study. They had been proved that poor management of the country is the reason of inverse relationship between FDI and GDP. Futhermore, the different variables are showing positive relationship between capital formation, here is outcome is highly significant. This paper is trying to show that if there will capital formation then GDP of that country will be also increase. Cash surplus also showing the significant statistics. Improvement in export will increase the GDP of the country. There is positive relationship between inflation and GDP. Inflation and GDP have a short run relationship. Additionally, there is direct relationship between exchange rate and GDP and IMF and GDP have inverse relationship. however, it has proved that foreign loans is the source of to increase capital formation. There is negative relationship between repayments and economic growth. Morever, different studies have proved that there is positive relationship between market capitalization and GDP. changes in volatility have positive impact on the economic decision making.

Finally, we have checked volatility through Garch model which showed that gold prices has effected on the future period. futhermore, results are indication the behavior of global and financial crisis.

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How to cite this article: Najaf, K., Najaf, R., 2016. International incidences, macroeconomic variables and their volatility effect on economic growth: empirical evidence from Pakistan. Scientific Journal of Pure and Applied Sciences, 5(4), 413-421.

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