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An empirical evident the Impact of global economic crisis on the Indian economy in components of gross domestic product during the pre and post crisis period for analysis

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Abstract: *In this paper, the impact of global financial crisis on Gross Domestic Product (GDP) is investigated upon in components of GDP (at constant price) using financial year data for the pre crisis period from 1997-1998 to 2006-2007 and post crisis period from 2007-2008 to 2016-2017. This research analyzes Exports, Gross Domestic Product (at constant price GDP), government final consumption expenditure (GFCE), Gross Fixed Capital Formation (GFCF), Imports and Private Final Consumption Expenditure (PFCE). The Augmented Dickey Fuller (ADF) Test, Multiple Regression and Granger Causality Test were used through Eviews software to unravel the connection between impact of economic indicators and GDP in pre and post crisis period of Indian economy. The stationary data was used to unearth the significant components of Gross Domestic Product (at constant price) through multiple regression model. Only two economic indicators, GFCF and PFCE have been found significant in post crisis period of Indian economy. It concluded that investors would not be able to gain nonstandard profits in information for increased in expenditure create capital formation*

Key Words: *Global financial crisis, Exports, Gross Domestic Product, government final consumption expenditure, Gross Fixed Capital Formation, Augmented Dickey Fuller test.*

1. INTRODUCTION:

Economies from all over the world maintain to endure the average effect of the global financial crisis 2008-2009 which considered as the year when the crisis came under control. The US economy was the first country experiencing significant problems in the period up to 2008-2009 while other developed European countries have reported similar problems both of economic and financial nature. However, not only the developed financial markets are affected by the economic crisis but also the spread to developing economies.

2. REVIEW OF THE LITERATURE:

Raj Rajesh and Sanjib Bordoloi (2012) in their analysed, the impact of global financial crisis on the Indian economy is carried out in an aggregate demand framework. Their investigated, search to gauge the relative importance of external factors domestic factors (consumption and investment) in driving growth of the Indian economy. For the empirical estimation, we have used quarterly data (from the second quarter of 1996 till the first quarter of 2010) in respect of the following variables in gross domestic product, final consumption expenditure, gross domestic capital formation, export, United States of America GDP, and a dummy model. In this model used to differentiate the recent crisis period from the non-crisis period. As a result, despite the fact that both investment activity and external trade contracted in the aftermath of global crisis, domestic consumption expenditure, which was found to have remained steady, on the back of sustained momentum of the private sector consumption expenditure Government welfare schemes and increased Government consumption expenditure on account of intended fiscal stimulus, shielded the Indian economy from the worst onslaught of the recent global financial crisis.

Srinivas.N, M.Muhammadilyas and Veenakumari.S (2013) in their recognized the impact of financial crisis on India's external sector and growth Rate the immediate impact of the financial crisis on major world economies especially Indian economy in terms of selected economic indicators. The study inspected the trends in export, import, foreign remittances, Earnings from business services, overall Balance of Payment position, GDP growth rates etc in the context of Indian economy against the background of global financial crisis and subsequent global recession. India is measured to be enormously susceptible to a crisis like this because of its greater integration with the rest of the world. The study showed that there are some reasons to believe that the financial crisis affected Indian economy adversely by slowing foreign remittances, foreign investment, adverse Balance of payments position etc. But, Indian economy has monetary authority showed the indications of rapid recovery from the sudden set back it had to experience during 2008-09.

4. OBJECTIVES OF THE STUDY:

This work was executed with the objective to check whether components of Gross Domestic Product (at constant price) the Global economic Crisis. Thus, the objectives are:

• To analyze the empirical evident the impact of components of Gross Domestic Product (at constant price) on the functioning of Indian economy in pre and post the Global economic Crisis period.

4.1 HYPOTHESES OF THE STUDY

Null Hypothesis (Ho1): components of Gross Domestic Product (at constant price) are not stationary during the pre crisis period

Null Hypothesis (Ho2): components of Gross Domestic Product (at constant price) are not stationary during the post crisis period

Null Hypothesis (Ho3): No causal relationship between GDP and components during the pre crisis period.

Null Hypothesis (Ho4): No causal relationship between GDP and components during the post crisis period.

5. METHODOLOGY:

5.1 COLLECTION OF DATA AND CALCULATION OF THE STUDY:

The secondary data was used for the complete study. For analyzing the data, it uses time series data of 20 years from 1997-1998 to 2006-2007 to 2007-2008 to 2016-2017 in pre for 10 years and post crisis period for 10 years of Indian economy. Here, the research analyzes Exports, Gross Domestic Product (at constant price GDP), government final consumption expenditure (GFCE), Gross Fixed Capital Formation (GFCF), Imports and Private Final Consumption Expenditure (PFCE). In this study, GDP represents the economic growth. Here, the exports, GFCE, GFCF, imports and PFCE time series data, and the economic survey 2016-2017 statistical appendix is for the GDP.

5.2 TECHNIQUES USED:

The Augmented Dickey Fuller (ADF) Test, Multiple Regression and Granger Causality Test were used through Eviews software to unravel the connection between impact of components of Gross Domestic Product (at constant price) in pre and post crisis period of Indian economy. The ADF Test was in use to check the stationarity of data. When the data became stationary, then Multiple Regression has been applied to find out the significant indicators variables. Granger causality test was used in pre and post crisis period multiple regression impact to check the casual relationship between the dependent and independent variables on Indian economy. The causal relationship was confirmed for those which found significant after the results of multiple regression.

6. EMPIRICAL EVALUATION IN COMPONENTS OF GDP (AT CONSTANT PRICE) THE IMPACT OF GLOBAL ECONOMIC CRISIS ON THE INDIAN ECONOMY DURING THE PRE AND POST CRISIS PERIOD:

6.1 EMPIRICAL ESTIMATION

Through empirical estimation, I seek to investigate the impact of global financial crisis on India's GDP in components. Through this estimation exercise, we seek to validate the hypothesis that domestic consumption expenditure provided the necessary buffer in saving the Indian economy the impact of global economic crisis pre and post crisis period.

Unit root in ADF test was conducted to test the stationarity among the components of Gross Domestic Product (at constant price)during the pre and post crisis period. The results are following the table

Table No.1.1: Results of unit root in ADF test during the pre crisis period

	II difference Intercept	II difference Trend and Intercept	II difference and none
Pre crisis period	EXPORTS -4.1324 (0.021)	GDP -5.7106 (0.016)	GFCF -3.7888 (0.002)
		GFCE -4.4474 (0.050)	
		PFCE	

		-13.8693 (0.000)	
		IMPORTS -5.2518 (0.035)	

Source: Eviews (authors' own calculate)
Note : *Stationarity at 5% level of significance

Table No.1.2: Results of unit root in ADF test during the post crisis period

	II difference Intercept	I difference Intercept/None
Post crisis period	EXPORTS -3.4894 (0.045)	GFCE -3.3205 (0.050)
	GDP -3.8606 (0.029)	GFCF -1.9574 (0.053)
	PFCE -3.918 (0.025)	IMPORTS -2.1361 (0.038)

Source: Eviews (authors' own calculate)
Note : *Stationarity at 5% level of significance

Above the tables No.1.1 and 1.2 shows that outcome of unit root test (ADF) of the economic indicators, ADF test statistics, critical values at different percentage and the level of stationary are summarized in pre crisis period and post crisis period. The null hypothesis of this test is nonstationary; for that cause, the concept of this test is to reject the null hypothesis. The p-values indicates that the indicators exports, GFCE, GFCF, imports and PFCE and GDP are stationary at 5 per cent level of significance. Actually, the null hypothesis is rejected when the p-value is 0.05 (5% level of significance). Another way of rejecting the null hypothesis is the t-value. In this case, the null hypotheses (H_O1, H_O2) are rejected when the t-value is greater than critical values in pre and post crisis period. It is considerable to declare that the test considers only absolute value. So, considering the values of the unit root test, the findings of stationarity declare that there is no variable used in this analysis which has unit root in its time series data, in other words, all the variables are stationary some are at 1% level and others are at 5% level in pre and post crisis period.

Next following discusses shows the Granger causality of paired variables of components of Gross Domestic Product (at constant price) and its impact on Indian economy during the pre and post crisis period.

6.2 GRANGER CAUSALITY ANALYSIS:

In this result finding and study investigation analysis element, the study impact exemplifies and discusses Granger causality of paired variables of GDP and components on Indian economy during the pre and post crisis period. Below the table interpret findings and analysis is discussed in the following section.

Table No.1.3: Pairwise Granger Causality Tests of components of Gross Domestic Product (at constant price)

Pre crisis period					
Null hypothesis	**Observation**	**F-statistics**	**P-value**	**Result**	**Relationship**
GDP does not Granger Cause EXPORTS EXPORTS does not Granger Cause GDP	8	2.48729 0.57319	0.2307 0.6154	Accepted null hypothesis Accepted null hypothesis	No relationship
GFCE does not Granger Cause GDP GDP does not Granger Cause GFCE	8	13.7206 9.39401	0.0309 0.0511	Accepted null hypothesis rejected null hypothesis	No relationship Has relationship

GFCF does not Granger Cause GDP GDP does not Granger Cause GFCF	8	0.14698 0.72542	0.8692 0.5534	Accepted null hypothesis Accepted null hypothesis	No relationship
IMPORTS does not Granger Cause GDP GDP does not Granger Cause IMPORTS	8	33.8358 4.70721	0.0087 0.1188	Accepted null hypothesis Accepted null hypothesis	No relationship
PFCE does not Granger Cause GDP GDP does not Granger Cause PFCE	8	0.01233 1.44271	0.9878 0.3639	Accepted null hypothesis Accepted null hypothesis	No relationship

Source: Author's own calculation work.

Table No.1.4: Pairwise Granger Causality Tests of components of Gross Domestic Product (at constant price)

Post crisis period					
Null hypothesis	**Observation**	**F-statistics**	**P-value**	**Result**	**Relationship**
GDP does not Granger Cause EXPORTS EXPORTS does not Granger Cause GDP	8	0.6456 0.75946	0.5841 0.5409	Accepted null hypothesis Accepted null hypothesis Accepted null hypothesis	No relationship
GFCE does not Granger Cause GDP GDP does not Granger Cause GFCE	8	0.36471 1.06900	0.7215 0.4462	Accepted null hypothesis Accepted null hypothesis	No relationship
GFCF does not Granger Cause GDP GDP does not Granger Cause GFCF	8	0.05084 0.02842	0.9512 0.9722	Accepted null hypothesis Accepted null hypothesis	No relationship
IMPORTS does not Granger Cause GDP GDP does not Granger Cause IMPORTS	8	0.04018 0.07320	0.9611 0.9310	Accepted null hypothesis Accepted null hypothesis	No relationship
PFCE does not Granger Cause GDP GDP does not Granger Cause PFCE	8	0.42554 0.38891	0.6876 0.7077	Accepted null hypothesis Accepted null hypothesis	No relationship

Source: Author's own calculation work.

Table No. 1.3 and 1.4 presents the results of granger causality test for components of Gross Domestic Product (at constant price)are exports, GFCE, GFCF, IMPORTS and PFCE and GDP have been found significant after applying multiple regression model in pre crisis period. It has been found that exports, GFCF, imports and PFCE do not granger cause GDP. The calculated p-value for FIIs is 0.2307, 0.8692, 0.0087, 0.9878 in pre crisis period and 0.5841, 0.7215, 0.9512, 0.9611 and 6876 in post crisis period was found greater than the critical p-value i.e. 0.05, but GFCE does not Granger cause GDP, but GDP does Granger cause GFCE because the p-value is <5% which proves its statistical significance. This only causality test shows a unidirectional causal relationship between GDP and GFCE in pre crisis period. It's exhibited no causality relationship between the economic indicators and GDP. In this case, the null hypotheses (H_O3, H_O4) are accepted when the t-value is greater than critical values in pre and post crisis period. The

same result has been found when the no causality relationship between the exports, GFCF, IMPORTS and PFCE and GDP was checked. The calculated p-values found greater than critical p-value in pre and post crisis period.

Following that mentions the impact of global economic crisis on Indian economy components of Gross Domestic Product (at constant price) during the pre and post crisis period.

Table No.1.5: Regression analysis of components of Gross Domestic Product (at constant price) during the pre crisis period

	Dependent variable: GDP **Method : Least squares** **Observations : 10 years**			
Pre crisis period	**Variable**	**Coefficient**	**Stand.error**	**t-statis**	**Prob.**
	C	56509.53	319950.1	0.1766	0.8684
	EXPORTS	0.9166	0.7299	1.2557	0.2776
	GFCE	0.6465	0.9549	0.6770	0.5355
	GFCF	0.3520	0.3725	0.9448	0.3982
	IMPORTS	-0.4627	0.4632	-0.9988	0.3744
	PFCE	1.2409	0.3904	3.1779	0.0336
	R^2 =0.99 Adjusted R^2 =0.99 F-statistics =727.1115 Prob(f-statistics =0.000005				

Source: Eviews (authors' own work computation)

Table No.1.5 shows summarizes different measurements for interpreting multiple regression least square model of GDP and selected indicators in pre crisis period. The regression indicates that one unit increase in India's exports, GFCE, GFCF and PFCE have positive impact and imports has negative impact of GDP, its leads to an increase in GDP by Rs.56509.53 Crore, but this interpretation is statistically insignificant because of p-value which is >5%. Imports only the results are found to be statistically significant in pre crisis period. Current account and capital account are not significant. at present, allowing for probability value of F-statistics, it rejects the null hypothesis which ways that independent variables in cooperation impact the dependent variable, GDP, because the p-value of the same F-statistic is <5%. In conclusion from above the table, to measure how strong the data are to the fitted regression line, the R square value of 99% means that 99% variation in GDP can be explained by the independent variables exports, GFCE, GFCF, PFCE and imports in pre crisis period.

Table No.1.6: Regression analysis of components of Gross Domestic Product (at constant price) during the post crisis period

	Dependent variable: GDP **Method : Least squares** **Observations : 10 years**			
post crisis period	Variable	Coefficient	Stand.error	t-statis	Prob.
	C	-448634.1	122900.3	-3.6503	0.0218
	EXPORTS	-0.2078	0.3744	-0.5550	0.6085
	GFCE	-0.0384	0.8051	-0.0479	0.9690
	GFCF	1.3342	0.4903	2.7207	0.0529
	IMPORTS	-0.4692	0.3402	-1.3791	0.2399
	PFCE	1.4122	0.3780	3.7355	0.0202
	R^2 =0.99 Adjusted R^2 =0.99 F-statistics =5439.292 Prob(f-statistics =0.0000				

Source: Eviews (authors' own work computation)

Table No. 1.6 indicate that multiple regression least square model of components of Gross Domestic Product (at constant price)in post crisis period. The regression indicates that one unit increase in India's exports, GFCE and imports have negative impact and GFCF and PFCE has positive impact of GDP, its leads to an increase in GDP by Rs.-

448634.1Crore, but this interpretation is statistically insignificant because of p-value which is >5%. GFCF and PFCE only the results are found to be statistically significant in post crisis period. At present, allowing for probability value of F-statistics, it rejects the null hypothesis which ways that independent variables in cooperation impact the dependent variable, GDP, because the p-value of the same F-statistic is <5%. Finally from above the table, to measure how strong the data are to the fitted regression line, the R square value of 99% means that 99% variation in GDP can be explained by the independent variables exports, GFCE, GFCF, PFCE and imports in post crisis period.

7. LIMITATION OF THE STUDY:

The study has been done for the limited time period from 1997-1998 to 2006-2007 for pre crisis period and 2007-2008 to 201-2017 for post crisis period. The research period might be extended for added studies. The results were strained on the root of ADF test with stop, Multiple Regression and Granger Causality. The different statistical techniques can be used to do the current year of the study.

8. CONCLUSION:

This paper has inspected the impact of components of Gross Domestic Product (at constant price) like exports, GFCE, GFCF, imports and PFCE and GDP during the pre and post the Global Economic Crisis period of Indian economy. The purpose of this study was to find out whether Indian GDP is being affected by any changes in economic indicators. To test this effect ADF test along with multiple regression and granger causality has been used. The stationary data was used to unearth the significant economic indicators through multiple regression models. Only two components variables, GFCF and PFCE have been found significant in post crisis period of Indian economy. The causality relationship between this one significant GFCE and of GDP was tested with Granger Causality model. The study revealed that Indian GDP was weak capital formation efficient during post crisis period of study. It can be concluded that investors would not be able to gain nonstandard profits in information for increased in expenditure create capital formation. With the opening of structural reforms such as the GST, the macroeconomic context needs to be dynamic and healthy, to lubricate and reduce the inescapable troubles resulting from these reforms. Thus, it is all the more important to conquer these demand shortfalls.

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