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Impact of Foreign Aid Inflows on Income Inequality in India: Regression Analysis

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Abstract

This paper investigates the impact of foreign aid on income inequality in India by using the Ordinary Least Square (OLS) test from 1960-61 to 2009-10. The study uses the major macroeconomic variables such as per-capita Gross National Income (PcGNI), Gross Domestic Product (GDP), Official Development Assistance (ODA), Wholesale Price Index (WPI), population, Gross National Expenditure (GNEx) and Gini Index (GI) for its empirical analysis. The whole study is based on the secondary annual time series data which is collected from the World Development Indicators published by the World Bank

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and the Standardized World Income Inequality Database (SWIID). First, this study uses the Unit Root test to verify the stationary property of the variables. The OLS test result shows that foreign aid, per-capita national income and public expenditure help in the reduction of income inequality whereas economic growth, high population growth and inflation rate are some of the factors responsible for raising the inequality gap in India during the study period. The study concludes that aid helps in reduction of income inequality in India but its impact is not satisfactory. Corruption, poor management, poor technology, unproductive utilization, institutional inefficiency might be some of the factors causes aid ineffectiveness in India.

1. INTRODUCTION

Since World War II, foreign aid is considered as an important instrument to finance the development programs of the developing countries. It acts as a major source of foreign exchange earnings for developing countries. It can be defined as the international transfer of the public funds from one country or any international financial institutions to another country at the time of need. It takes two forms first one is loan at concessional terms (i.e. contains grant element of at least 25%) and the second one is grant which is non-refundable in nature (OECD, 2009). Before the First World War, foreign capital is used as an important instrument of the foreign policy by the donor communities. Up to the commencement of the Second World War, it is used as a profitable investment by the donor community. In the post war period foreign aid began to flow in a planned way from rich country to poor countries. The rich western countries started helping the poor countries in terms of sanctioning more amount of foreign aid. The primary objective of this aid inflow was meant for emergency relief, poverty reduction, peace-keeping efforts, development of infrastructure, and socio-economic reconstruction programs of the war devastated economies. The main purpose of this aid inflow is to accelerate the process of development up to a point where a satisfactory growth rate can be achieved. It also aims to stimulating the process of growth by supplementing its scarce domestic resources i.e. savings which directly helps in raising the amount of both capital stock and investment in the economy.

Shortage of capital is a common feature of the developing economies. The solution is to have more and more free flow of foreign

capital with less debt burden. There are two ways to generate capital i.e. domestic capital and foreign capital. Developing Countries are characterized as capital poor or low saving and low investing economies along with technological backwardness. Foreign capital in terms of foreign aid supports in overcoming these problems as it brings both physical and financial capital, investment funds, technical Know-how, market information, skilled personnel, cheap advanced production techniques, new products and foreign exchange earnings (Morrissey, 2001).

In the era of globalization, economics are so dependent on each other that impacts of one economy quickly affect the other economy. That is why many developed economies provide financial assistance to other developing nations to overcome from their socio-economic problems which help them to find a market of their product. Many developed economies and the aid agencies provides huge amount of financial support i.e. foreign aid to other developing nations to overcome from socio-economic evils and to accelerate the process of development. The major contribution of foreign aid towards underdeveloped economies can be evaluated by its role in filling three major gaps (a) saving-investment gap (b) Foreign exchange (export-import) gap (c) Technological gap. It is one of the cheapest ways to earn foreign exchange reserves for a developing country. Foreign capital in terms of aid is one of the major determinants for the initiation of any welfare activities particularly in the initial stages of economic development.

In this recent time, there have been considerable debates going on over the effectiveness of foreign aid. There are different views have been given by various group of researchers regarding the impact of foreign aid on income inequality. Foreign aid is sanctioned to address the socio-economic evils like poverty, unemployment and income inequality by supplementing domestic scarce resources. Availability of more capital will lead to faster and sustained economic growth via higher investment. Economic growth should benefit the economy as a whole that does not mean that income inequality will lessen with rise in economic growth. In this recent time, there have been considerable debates going on regarding the impact of aid inflows on income inequality and its effectiveness. Foreign aid is accused of aggravating income inequality which it is purposed to reduce first (Shafiullah, 2011). Current unproductive utilization of huge amount of foreign aid creates a threat for large amount of external debt burden in the long run. Over

time this debt burden increases and acts as a major obstacle in attending the targeted rate of growth in future (Quazi, 2005). The extents to which foreign aid can be used as a decisive factor in the economic development of a recipient country remain controversial. At present many developing countries are accepting foreign aid and get many benefits along with some adverse results. By considering both the positive and negative impact of foreign aid, it is essential to identify the extent to which foreign aid can be used to accelerate the process of economic development via addressing poverty, inequality and unemployment.

In this context, it is essential to find out whether foreign aid inflows contribute to the development process of India or not from the period 1960-61 to 2009-10. The present study tries to find out the impact of foreign aid on income inequality in India during the study period. By using the Ordinary Least Square (OLS) technique, the present study aims to examine the impact of foreign aid and some major macroeconomics variables on income inequality of India during last 50 years. The remaining part of this paper is organized into five sections including introduction. Section 2 presents recent trend on foreign aid inflows into India. Section 3 presents the nature, data sources and methodology of the study. Section 4 deals with the analysis of the empirical results and its discussion. Section 5 presents the summary, conclusion and limitation of the study with some policy implication.

2. RECENT TREND ON FOREIGN AID INFLOWS INTO INDIA

The strategic role of capital in accelerating the process of development has conventionally been accepted by economics. After post World War, the importance of capital in economic development has been progressively acknowledged. Harrod-Domar model of growth is considered capital as the crucial factor in economic development. Studies carried out by Papanek (1972), Dowling and Hiemenez (1982), Gupta and Islam (1983), Hansen and Tarp (2000), Burnside and Dollar (1997) and Dalgaard *et al.* (2004) find evidences for positive impact of aid on growth. It is new universally accepted that a developing country has to save a high proportion of its income to finance the process of both economic growth and development. India is a developing country and to finance its developmental programs it needs huge amount of investment. The financial need of India is so large that domestic resources and private foreign investment can only partially solve the problem of

financing. Private capital flows are guided by the profit motives, so it has nothing to do with the developmental programs which need huge investment, high risks, long gestation period and low yielding. The implementations of these schemes are essential for India particularly when it starts to accelerate its development process. Investment in these low yielding and high gestation programs can be financed only by foreign aid which is guided by the welfare motive. These schemes yield no direct returns but it indirectly contributing to economic efficiency and productivity of the economy. India's economic development is based on a sort of ideological and psychological barrier about the use of foreign aid in the pre-war period. In the post war period, there was a transformation noticed relating to the use of foreign capital in Indian economy.

During its initial periods of development, India faced two major economic problems i.e. adverse Balance of Payments (BoP) difficulties and the shortage of foreign exchange reserves. After independence, the first Industrial Policy Resolution passed by government of India in 1948 which opened the door for the international capital flows. The inflow of international financial assistance into India began with the drawings from the International Monetary Fund (IMF) in early 1948 to support its hard currency needs. In 1949, India got its first loan from World Bank for the expansion and modernization of Indian railways.

Since last 60 years, developed economies have been providing hundreds billions of dollars in terms of foreign aid to the developing world for welfare motive. Still the problems are not cured completely and even in some cases the existing problems are aggravated than the past. Here the question arises where is the problem lies? Whether with the donor community or the recipient government or the aid providing system or the implementation strategy or in some other factor?

With the passage of time the issue has become a worldwide phenomenon. There is no remarkable socio-economic progress has been noticed in case of India. At present 32.7% of India population is still living below poverty line and 9.4% people are still unemployed (Economic Survey, 2011). In HDI, it has occupied 134th position among 189 countries (The Economic Times, 2nd November, 2011). Many empirical studies carried out by Herzer and Vollmer (2011); Panizza (2002) have found that higher economic growth does not helps in reduction in income inequality. Foreign aid has become

ineffective in Bangladesh due to its utilization in unproductive expenditures (Quazi, 2005). Donors' conditionality may be partly responsible for the ineffectiveness of foreign aid (Dalgaard 2008). Foreign aid has shown significant negative impact on economic growth which may be the reasons like fungibility of aid, poor economic policies, aid dependency, bad economic management, corruption and poor coordination and corporation among aid agencies.

Since after independence, planners and policy makers of India had to depend on foreign aid to support its scarce domestic resources needed for its developmental programs. During the First Five year plan (1951-56), India needed foreign aid to supplement its scarce domestic resources. In the Second plan (1956-61). India accepted foreign aid to finance its industrial projects which adversely affected the productivity of the agricultural sector and caused food shortage. The Third five year plan (1961-66), utilized foreign aid to become self-reliant. The major objective of the Fourth Plan (1969-74), was to reduce the debt burden on foreign aid. During the Fifth Plan (1974-1979), foreign aid was accepted to supplement the shortage of foreign exchange reserves. The Sixth Plan (1980-85), foreign aid was used in various productive project plans. During the Seventh Plan (1985-90), India used a major share of foreign aid in debt repayments of past loans. During the Eighth Plan (1992-97), the total inflows of foreign aid had shown a rising trend due to the adoption of new economic policy. During the ninth five year plan the inflows of foreign aid to India had shown a declined trend for two major reasons i.e. India's nuclear test in May 1998 and the imposition of economic restriction on trade. The inflows of foreign aid remained stable during the Tenth Plan period (2002-2007). Total amount of aid received by India is constituted by 90% of loan amount, while the remaining 10% was in forms of grants. The following Table 1 shows the inflows of foreign aid during different plan period.

Table 1 shows that there is a gap found between the sanctioned amount and the actual amount of foreign aid inflows into India. If we observe the trend of foreign aid inflows into India, then it has shown a rising trend up to 9th five year plan after that it has shown some variations. If we consider the percentage of utilization of foreign aid, then it is true that the whole of foreign aid is not utilized in India. The difference between sanctioned amount and the utilization amount of foreign aid, is one of the major obstacles in achieving the real goals of foreign aid.

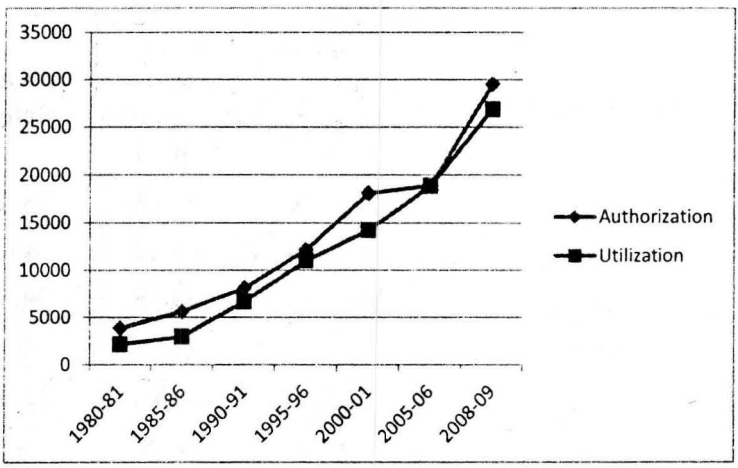
Table 1
Inflows of Foreign Aid into India during Different Plans
(1951-52 to 2007-12) (Rs. in Crores)

Different Five Year Plans	Sanctioned of Amount of Foreign Aid	Actual Amount Foreign Aid Inflows	Interest Rate
First five year plan 1951-56	381.75	191.75	13.3
Second five year plan 1956-61	2531.14	1430.2	64
Third five year plan 1961-66	2798.71	289.75	294.54
Yearly plan 1966-67	1506.5	1131.4	0
Yearly plan 1967-68	718.8	1195.6	153.47
Yearly plan 1968-69	946.8	902.6	0
Fourth five year plan 1969-74	4172.2	4183.7	880.48
Fifth five year plan 1974-78	7508.1	5725.03	866.82
Yearly plan 1978-79	2335.7	1177.47	271.32
Yearly plan 1979-80	1859.5	1353.19	0
Sixth five year plan 1980-85	16761.3	10902.69	1686.97
Seventh five year plan 1985-90	44064.7	22695.11	327.85
Yearly plan 190-91	8123.38	6704.29	1953.6
Yearly plan 1991-92	13561.34	11614.79	3005.88
Eighth five year plan 1992-97	70996.12	56703.45	22748.4
Ninth five year plan 1997-2002	89719.63	71680.55	26151.86
Tenth five year plan 2002-07	109509.62	88671.72	20614.67
Eleventh five year plan 2007-12	62124.58	46728.21	9464.59
Grand total grants	44528.95	35650.84	0
Grand total loans	395090.92	300220.67	94406.16
Grand total	439619.87	335871.51	94406.16

Source: Ministry of Finance, Government of India.

The following Diagram 1 shows both the authorization amount of foreign aid inflows to India:

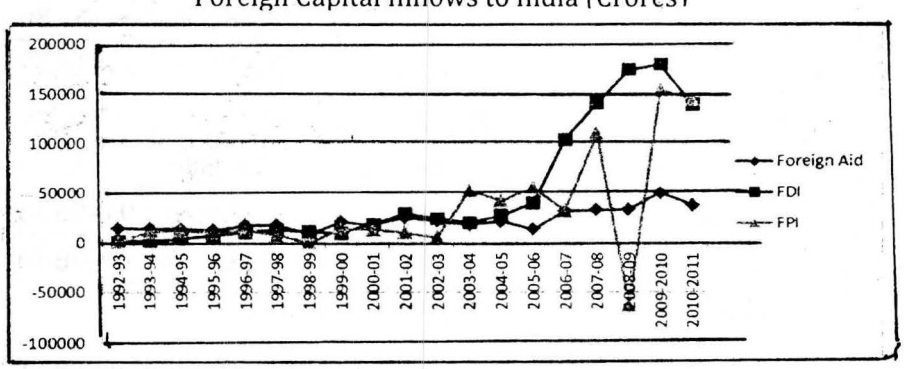
Figure 1
Authorization and Utilization of Foreign Assistance



Source: Aid Accounts and, Audit Division, Dept. of Economic Affairs, Ministry of Finance, Government of India.

After 1990s, Indian government have been introduced various economic reforms to encourage foreign capital investment in Indian market. The following Diagram 2 shows inflows of both officials (Foreign aid and private capital (FDI and FPI) flows to India after introduction of the new economic reforms in 1990s:

Figure 2
Foreign Capital Inflows to India (Crores)



Sources: Handbook of Statistics on Indian Economy, RBI, 2011

From the above Diagram 2, it is clear that among the three types of foreign capital (foreign Aid, FDI and FPI), the inflows of foreign aid is more persistent over time in comparison to other two types of private capital flows. The inflows of FPI has shown high fluctuation where as the inflows of FDI has shown a declined trend after 2008-09 which may be due to the global financial crisis of 2007-08.

3. METHODOLOGY AND MODEL SPECIFICATION

The present study attempts to examine the impact of foreign aid on income inequality in India by considering the variables like Gross Domestic Product (GDP as the indicator of economic growth), Per-capita Gross National Income (PcGNI as the indicator of economic development), Official Development Assistance (ODA as the indicator of foreign aid), Wholesale Price Index (WPI as the proxy of inflation rate), population, Gross National Expenditure (GNEx) and Gini Index (as the indicator of income inequality).

The whole study is based on the secondary data from 1960-61 to 2009-10 which is collected from the Handbook of Statistics on Indian Economy published by RBI, Economic Survey of India, World Development Indicators published by the World Bank and the online database of Standardized World income Inequality Database (SWIID), Version 3.1 (Solt, 2011). The missing data on income inequality is again collected from the World Income Inequality Database (WIID) and the CIA world fact book. This study uses the statistical package E-views 5.0 for its empirical analysis. The study uses Gini Index as the proxy of income inequality (Saidon, 2012). Due to high variation in their absolute values, all the variables are expressed in terms of their log value to minimize the error present in their absolute values. This study uses the following methodology for its empirical analysis.

In order to examine the impact of foreign aid on income inequality in India, Ordinary Least Squares (OLS) techniques is used. In case of time series data, before going to use OLS technique first we have to test the stationary properties of the variable. As this study is used time series data, so it needs to check the stationary property of the variables by applying unit root tests, namely Augmented-Dicky Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test. Among three units root tests only the KPSS test without trend shows that all the variables are satisfied the stationary property.

In the light of the above discussion, the following equation is used as the basic model to find out the impact of foreign aid on income inequality in India. Here Gini Index (GI) is considered as the proxy of income inequality.

Inequality in terms of GI = f {ODA, WPI, GNEx, Popu, GDP, PcGNI}

Here, GI is taken as the dependent variable and other variables are considered as independent variables. The following model is specialized to find out the impact of foreign aid on income inequality. The study investigates the effects of all the independent variables on income inequality (dependent variable) by using the Ordinary Least Squares (OLS) techniques which can be written as:

$$(GI)_t = \alpha_0 + \alpha_1 ODA_t + \alpha_2 WPI_t + \alpha_3 GNEx_t + \alpha_4 Popu_t + \alpha_5 GDP_t + \alpha_6 PcGMI_t + u_t \quad (1)$$

Here,

$(GL)_t$ = Income Inequality in terms of Gini Index during the time period

ODA_t = Official Development Assistance during the time period t

WPI_t = Weighted Price Index during the time period t

$GNEx_t$ = Gross National Expenditure during the time period t

$Popu_t$ = Total population during the time period t

GDP_t = Gross Domestic Product during the time period t

$PcGNI_t$ = Per-Capita GNI during the time period t

u_t = Disturbance term

4. REGRESSION RESULTS

This section presents the analysis of the empirical results and its discussion. The empirical result is calculated by using the OLS technique. Before going to use OLS test, the present study has examined the stationary property of the variables. This study has used the annual time series data of 50 years which contains some trend. Before using OLS test, the first step is to test the stationary-property of the variables. If the variables of the time series data do not satisfy the unit root test, then the result of the regression analysis becomes spurious, which have no practical value. Unit root test is a pre-requisite of testing stationary

property of the time series data (Granger, 1981). Augmented Dickey-Fuller (ADF), Phillips-Perron and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) Tests are widely used in empirical research. Here, we conducted all the three tests. The result of unit root test has shown in the following Table 2. The result suggests that all the variables are stationary in KPSS without trend.

Table 2
Unit Root Test Results

Variables	ADF		PP		KPSS	
	Without Trend	With Trend	Without Trend	With Trend	Without Trend	With Trend
PcGNI	0.63	-0.93	0.63	-1.04	0.93*	0.16*
GDP	1.5	-0.29	1.5	-0.17	0.95*	0.19*
GI	-2.13	-2.29	-2.01	-2.19	0.16***	0.1
ODA	-1.2	-4.2*	-2.1	-4.1**	0.81*	0.08
Trade	1.1	-0.79	1.19	-0.84	0.96*	0.18*
WPI	-0.84	-2.18	-0.95	-1.69	0.95*	0.18*
GNEx	1.48	-0.42	1.59	-0.45	0.95*	0.19*
Popu	2.8	-2.3	-3.67*	2.94	0.95*	0.23*

Source: Author's calculation (by using the statistical package E-views),
Notes: *, ** and ** indicate significance at 1%, 5% and 10% respectively.

Next, to find out the impact of foreign aid on income inequality the study has used the Ordinary Least Square (OLS) method. The following Table 3 shows the result of the OLS test. Here GI is considered as the dependent variable and rest are considered as independent variables. But the regression result of OLS test is not appropriate for analysis due to the low value of the Durbin-Watson d-statistics (Enders, 1995).

To minimize the error, the AR (1) model of the OLS technique has been taken. Both the values of OLS test and OLS test with AR (1) model has been given in the following Table 3.

The following three major criterions are used to identify whether a model is good fit or not. The empirical result of both OLS technique and OLS test with AR (1) model is presented in the following Table 3.

From the Table 3 it is clearly visible that the regression result which is drawn from the OLS test with AR (1) model is more appropriate for our empirical analysis. In the simple OLS test, both the values of R^2 and adjusted R^2 are far away from 1 than the AR (1) Model. If we compare the Durbin-Watson (DW) Statistics with simple OLS test, then also it has scored very low value 1.43 which indicates the presence of auto-correlation problem. But in case of AR (1) model the value of D-W statistics is 1.97 (nearer to its ideal value 2). It is found that the result of the OLS test with AR (1) model is used for the analysis of equation 1. The result of the OLS technique with AR (1) is presented in the following Table 4.

Table 3

Selection Criterion of a Good Model (for Euqation-1)

Major Criterion	Simple OLS test	OLS with AR(1)	Ideal Value
R-squared Value	0.78	0.97	1
Adjusted R-squared Value	0.85	0.99	1
Durbin Watson stat	1.43	1.97	2

Source: Author's calculation (by using the statistical package F-views)

Table 4

OLS test results with AR (1) model Impact of Foreign Aid on Income Inequality in India

Variable	Coefficient	t-Statistics
C	194.4	1.02
GDP	0.65	3.45*
GNEx	-2.98	-3.75*
ODA	-0.27	-l.89**
PcGNI	-0.49	-4.78*
Popu	0.41	3.73*
WPI	0.29	2.61*
R-squared: 0.97, Adjusted R-squared: 0.99, Durbin Watson stat: 1.97. Akaike Info Criterion (AIC): -3.8, Schwarz Info Criterion -3.36.		

Source: Author's calculation (by using the statistical package E-views)

Notes: *, ** and *** indicate significance at 1%, 5% and 10% level respectively.

The above Table 4 shows that the OLS test results with AR (1) model is used for the analysis of equation 1 as it satisfies all the criteria of a good model. The value of both R^2 and adjusted R^2 are nearer to 1 which shows the goodness of fit of the model. The value of DW statistics (1.97) is nearer to 2 which indicate lower chances of the presence of auto-correlation in the error term (Gujarati, 2004). This model shows that the income inequality of India is completely explained by the independent variables included in the model. Therefore, the regression results of Table 4 has used for the analysis of equation 1. After putting the regression result of Table 4, equation 1 can be written as:

$$(g_t) = \alpha_0 + \alpha_1 ODA_t + \alpha_2 WPI_t + \alpha_3 GNEx_t + \alpha_4 Popu_t + \alpha_5 GDP_t + \alpha_6 P_cGNI_t + u_t \quad (1)$$

$$(g_t) = 194.4 - 0.027\ ODA_t + 0.29\ WPI_t - 2.98\ GNEx_t + 0.41\ Popu_t + 0.65\ GDP_t - 0.49\ PcGNI_t + u_t \quad (1)$$

t-statistics (1.02) (1.89***) (2.61*) (-375*) (-3.73*) (345*) (-4.78*)

From the above OLS test result it is found that, the coefficients of GNEx, GDP, ODA, WPI, Popu, and PcGNI has significant impact on income inequality of India during the study period. The coefficient of all the above variables is statistically significant. It is clear that these six variables have significant impact on income inequality in India during the study period. Among these variables GDP, Popu and WPI have shown significant positive impact on income inequality which indicates that these three variables help in widening the income inequality gap in India. It is quite obvious that inflation, heavy population pressure and high economic growth are some of the major factors cause mass poverty, unemployment and unequal distribution of wealth and income in the economy. These problems are responsible for raising the gap among the different sections of the people in the society. The rest three variables ODA, PcGNI and GNEx have shown significant negative impact on income inequality which indicates that these variables help in reduction of income inequality situation in India. Among the three, the impact of ODA is less on income inequality which may be caused due to a major proportion of foreign aid is utilized in some unproductive economic activities i.e. repayment of debt burden or any past loan. Public expenditure has played a major role in the reduction of income inequality in India which may cause due to its productive utilization in many developmental activities i.e., infrastructural development. There is

a direct link exist between developmental economic activities and higher standard of living of the people which ultimately helps in the reduction of income inequality.

5. CONCLUSIONS

This paper contributes to the recent empirical literature of aid effectiveness. The empirical result shows that per-capita income, public expenditure and foreign aid has shown significant negative impact on income inequality in India. It clearly indicates that aid helps in the reduction of income inequality in India during the study period but its impact is not satisfactory in comparison to other two variables due to the fact that it may not properly utilized in the welfare activities. Underutilization, corruption, poor management, unproductive expenditure, institutional inefficiency, poverty, might be some of the factors responsible for aid ineffectiveness in India. It has found that economic growth helps in increasing the income inequality situation in India which shows that the benefit of growth is not equally distributed among the people of India. The growth can he translated into meaningful development only when there will be equitable distribution of wealth and income. As reduction of income inequality and higher economic growth are the two primary objectives of foreign aid, so both should be given equal importance in India. One should not be compromised with other and income inequality can't be ignored with the name of higher economic growth.

The findings of this study suggest some policy implication in order to improve the effectiveness of foreign aid. At first, a developing country like India should try to fully utilize its own domestic resources. If it will feel the shortage of capital then only it try for the foreign capital as a supplement to its scarce domestic resources. If a country feels the need of foreign aid, then first it should make proper plans for its productive utilization. Aid should be utilized in welfare activities i.e., employment generation, infrastructural development, human capital development where the rate of return should be more in the long run. The result of this study may through more light on current debates relating to aid effectiveness. It has tried to use appropriate data, variables and methodology. However, the study is not without its limitations. The analysis and conclusions presented in this study are subject to certain limitation. The study is constrained due to the unavailability of data on some other macro-economic variables like FDI,

FPI. Certain variables like institutional efficiency, economic policy and good governance have to be dropped due to the non-availability of reliable data. The present study can hopefully provoke further research in find out the appropriate way by which the whole amount of aid can be utilized properly to raise the standard of living of the common people.

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