

Economic Globalization and Income Inequality in Bangladesh

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Abstract *The impact of economic globalization on macroeconomic variables has become an issue of significant academic interest. From one point of view, economic globalization is considered to promote economic growth and social stability, while from an alternate viewpoint, it is blamed for growing income inequality which in turn increases economic and social instability and hinders economic growth. Income inequality has become an important issue for Bangladesh's economic development in recent years. This study investigates economic globalization as characterized by international trade and foreign direct investment (FDI) flows, foreign aid and remittance inflows to show their impact on income inequality in Bangladesh. The study employs Phillips-Ouliaris Cointegration Test to identify the existence of a long run relationship between the variables. After the application of FMOLS regression analysis, the empirical results show that not all the globalizing factors show unidirectional effect on income inequality in Bangladesh. Increase in foreign trade increases inequality, but increase in FDI and remittance inflow reduces it. Some possible policy choices are also proposed to deal with this issue of income inequality.*

Key Words: *Economic globalization, FMOLS, Income inequality, Gini coefficient, Foreign trade, FDI, Foreign aid, Phillips-Ouliaris cointegration Test, Remittance.*

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1. Introduction

Economic globalization and income inequality have been two of the most hotly debated issues in Economics for the last three decades. Economic globalization is expected to enhance economic performance through increasing flows of productive resources and knowledge across the world. Income inequality is expected to hamper economic growth by creating deficiencies in investment, productive capacities and utilization of resources, as well as in the smooth level of consumption. The most important driving forces of economic globalization are trade liberalization, FDI, remittance inflow, foreign aid etc. Trade liberalization leads to higher flows of goods, services, and capital among nations, increasing competitiveness both in the goods and capital markets. Likewise, FDI allows the transfer of production technology particularly in the form of new business establishment. However, in the developing countries, a significant portion of remittance earning is spent for consumption purposes, asset acquisition, investment in trade and business and to finance export payments. Moreover, advanced countries (donor) often aid weaker nations in the form of financial resources, commodities (such as food, military equipment), technical advice and training. The purpose of this aid is to promote economic development in the recipient countries. On the other side, income inequality is the disproportional distribution of income among the people in a country, which is not at all desirable. The addressing issues of income inequality are significant. The existence of the traditions of income redistribution and welfare schemes among countries and societies across the globe indicates that societies do not like income inequality. Many studies have been carried out to address the impact of inequality on economic performance, where most of the studies conclude that income inequality is detrimental to development (Alesina and Rodrik, 1994). Therefore, it is important to study income inequality from the view point of economic globalization not only for its economic and socio-political consequences, but also for its intrinsic value to equity. The economic globalization and income inequality relationship has been discussed by several authors. Findings differ from author to author. Bergh and Nilsson (2010), Thomas Piketty (2014), Feenstra and Hanson (1997), Sala-i-Martin (2002), Slaughter & Swagel, (1997), Ocampo & Martin, (2003), etc., argue that there is a positive relationship between income inequality and economic globalization. However, Adams (2008), Ostry and Berg (2011), Das (2005), Tisdell & Svizzero (2004) argue that economic globalization negatively impacts income inequality.

This paper is organized into ten parts. Following the introduction, second part discusses on the objectives of this paper, third part background. Methodology,

results and interpretations of the findings of the study, recommendations, and conclusions are respectively organized by the subsequent parts.

2. Objectives of the Study

The general objective of this study is to investigate empirically the impact of economic globalization on income distribution in Bangladesh. And our specific objectives are to:

- investigate whether globalization has any significant relationship with income inequality in Bangladesh;
- examine which globalizing factors are responsible for increasing income inequality in Bangladesh;
- examine which globalizing factors are affecting income inequality negatively in the country;
- state some key policy solutions to address the problem of income inequality in Bangladesh.

3. Background

In the early years of the 1970s, Bangladesh pursued an inward-oriented development policy, imposing high tariffs and quota on imports. As a result, export declined drastically. But, in the 1980s Bangladesh shifted its industrialization policy towards export-promotion. The country started providing financial incentives on exportable commodities (in the form of tax exemption). To attract foreign direct investment and promote export, Export Processing Zones (EPZ) were established. Privatization of state owned enterprises started in the early 1970s (Ahmed, 2001). Export composition changed from primary commodities to manufacturing goods (Love and Chandra, 2005). In the following years, imports of capital machinery, intermediate goods and industrial raw materials started rising. With increasing exports and imports the economy of Bangladesh has maintained the GDP growth rate at 5 per cent and above in the past decade or so. Foreign trade was 17.6 percent of GDP in 1990, while in 2002 it rose to around 29.4 percent (World Bank, 2004). In FY 2012-13, total imports and total exports were \$34.08 billion and \$23.76 billion respectively. The World Bank (Ali, 1981) states that overseas remittances are credited to have brought a favourable balance of payments as well as created a new resource base for the country. If the cost of importing raw material is taken into account, then the net remittances' earnings will be higher than the earnings of the garments sector. In

FY 2001-02, the net earnings from remittances was net US\$2.501 billion, whereas the net export earnings from RMG was between US\$2.29-2.52 billion in 2003 (Bangladesh Bank, 2014). The contribution of remittance to GDP has grown dramatically, taking off at a meagre 1 percent in 1977-1978 to 5.2 percent in 1982-83. Murshed (2000) finds that an increase in remittance by 1% results in an increase in national income by 3.33%. In Bangladesh, FDI inflow plays an important role in determining the surplus/deficit in the capital and financial account of the BOP statement. The aggregate FDI inflow to Bangladesh was USD 5,510 million over the time period 1998-2007. Of this, equity was 54% (\$2,986 million), reinvested earnings 30% (\$1,634 million), and intra-company loans constituted 16% (\$890 million) (Bangladesh Bank, 2014). Bangladesh has historically run a large trade deficit, financed largely through aid receipts and remittances from workers overseas (“Background Note: Bangladesh”, 2008). In 1973, Bangladesh received \$1035.2 million as food aid. Within the following two years, food aid doubled, remaining that level up to 1980. The average food aid inflow during the period 1972-1999 accounted for \$216 billion. Aid inflows gradually became diversified with increased growth in developmental needs. Bangladesh was committed \$42.55 billion up to 30 June 1999 by donor countries and international agencies, which constituted food aid 14.08%, commodity aid 24.42% and project aid 61.50%. Over the years, project aid including technical assistance increased substantially, while the share of food aid and commodity aid declined (Rahman Mahfuzur, 2006).

4. Literature Review

In this section we will review various studies carried out in the relevant field.

The standard Stolper-Samuelson theorem (1941) states that free trade increases income for the abundant factors and reduces income for the scarce factors. Therefore, countries abundant in both physical and human capital (the developed nations) can see a significant improvement in the real and nominal income for the owners of these two factors of production with increasing trade liberalization. In other words, income inequality will be increased in the developed countries and the opposite will happen in the developing countries. Some authors find that economic globalization eventually results in a reduction in income inequality in less developed countries and an increase in the advanced developed countries, supporting the Stolper-Samuelson hypothesis. Using the KOF index of globalization and the Fraser index of economic liberalization, Bergh and Nilsson (2010) summarize that the reforms to encourage economic liberalization increase

income inequality in the advanced countries. But for developing and under-developing countries, they find that social globalization is the most crucial factor in increasing income inequality. Social globalization is one of the KOF index components.¹

Unlike Bergh and Nilsson, Mundell (1957) finds that FDI inflow into developing nations has a remarkable impact on the reduction of inequality levels. FDI leads to a general rise in the amount of capital as it flows mainly from the developed countries to developing countries, increasing the marginal physical product of labour. As a result both the real wages and nominal wages increase, thus income inequality decreases in the developing countries.

On the other hand, Barba Navaretti et al. (1998)² argue that it may be more efficient for firms in developing countries to acquire used rather than new machinery in certain instances. In fact, benefits of skill based technology transfer (SBTC) from developed to developing countries are much higher for middle income developing countries than for their low income counterparts. Accordingly, Mescher and Vivarelli (2007) provide similar conclusions. Comparing the middle income and the low income countries they find that the low income countries are not affected by globalization. However, several authors find the existence of empirical evidence that contradicts the Stolper-Samuelson theorem. This kind of evidence we see in the study of Figini and Gorg (1999). These authors affirm that increased penetration of foreign direct investment widens the gap of inequality in the developing countries. The multinational companies outsource their activities relying heavily on low skilled and cheap labour. They introduce new technologies that didn't exist previously in the developing economies. A high demand for highly skilled workers to cope with the new technologies arises initially, leading to an increase in their wage levels, and thus creating income disparity between high skilled and low skilled workers. But in the later phases, previously unskilled or low-skilled workers become skilled themselves due to the experience gained with the use of the new technologies (learning by doing), resulting in a decrease of wage inequalities. Conducting a study on Ireland they find evidence on this, noting that there is a Kuznet's inverted-U shaped relationship between wage inequality and FDI inflows.

¹ KOF measures globalization on three dimensions: Economic, Social & Political. Web address: <http://globalization.kof.ethz.ch/>

² These findings are consistent with Berman (2000) who found most high and middle-income countries showed symptoms of skill-biased technological change in the 1980s; while no results emerged for the low income group of countries.

In contrast to the view of the neoclassical theory, the dependency theory argues that dependency of the developing countries on the advanced countries harms the former economically and socially, especially in the long run (Firebaugh and Beck, 1994; Stringer, 2006). This theory further argues that dependency on international trade and FDI inflows creates and maintains this dependency. Major proponents of this school of thought argue that FDI inflow into the developing countries creates disparities and dualism in economies and productive structures, and thereby hampers economic growth and increases income inequality. For instance, the multinational companies create highly capital intensive export sectors in the developing countries. They operate their business worldwide staying away and utilizing most of the resources, the existing capital and credit of these economies. But they repatriate most of the profits and wealth earned in these economies. Besides this, the penetration of FDI in the local communities tends to produce and maintain local elites whose main function is to ensure the best interests of multinational companies (Firebaugh and Beck, 1994; Stringer, 2006).

Contradicting the view of Stolper-Samuelson theorem, Barro (2000) argues that: “the standard theory seems to conflict with the concerns expressed in the ongoing popular debate about globalisation. The general notion is that an expansion of international openness (...) will benefit most the domestic residents who are already relatively well off“ (p. 27). Further, Feenstra and Hanson (1997) present a similar conclusion, but in a slightly different manner. Examining the impact of foreign direct investment (FDI) on the share of skilled labour in total wages in Mexico using state-level data on two-digit industries from the Industrial Census for the period 1975 to 1988, they argue that rising wage inequality in Mexico has a link to capital inflows from abroad. The effect of these capital inflows shifts production in Mexico towards relatively skilled labour-intensive goods, thereby increasing the relative demand for skilled labour. As a result, it is inevitable that this increased demand for skilled labour will lead to inequality between highly skilled workers and the least qualified, as the former attracts huge wages compared to what the latter earns as salary. This is clearly evident in the Mexico case. The relative wages earned by the unskilled workforce is deteriorated in the country which therefore means that inequality is increased.

Some studies show that there is no correlation (or very little correlation i.e., insignificant correlation) between economic globalization and income distribution disparity. As Edwards (1997) concludes-“for the developing countries, there is no evidence linking openness or trade liberalization to increases in inequality” (p. 209). But David Dollar (2001) presents a somewhat different argument. He argues that, though economic globalization lowers between-nation income inequality, it

has hardly any real effect on within-nation income inequality. He states that poverty and income inequality are interconnected. As poverty level is decreasing in the globalizing developing countries, correspondingly income inequality level is also decreasing. In another study, Dollar and Kraay (2001) propose that, on average poorer households should benefit proportionally as much from trade and openness as other households. If this is the case, then every household of a country will benefit equally from globalization and it cannot increase income inequality within that country. In the same manner, Li, Squire, and Zou (1998) find that income inequality across countries varies greatly, but income inequality within countries remains relatively stable. They assert that a country's economic policy is controlled by the rich to an extent that allows them to preserve their privileged position, while the poor, faced with the brunt of capital market imperfections, cannot acquire enough capital to change their position in the distribution of income.

There is some evidence in the literature that to some extent economic globalization increases the severity of income inequality: According to Cornia (1999), globalization has a positive link with income inequality and the production outsourcing processes. He mentions that globalization increases disparity in income levels between individuals in various regions. A similar conclusion can be derived from the empirical findings by Sala-i-Martin (2002). He finds that the within-country income inequality is rising. He further finds that within-nation income inequality accounts for a small portion of total income inequality, so a little increase in the within-nation inequality cannot significantly reduce between-nation inequality. Sala-i-Martin uses the Gini Coefficient, the variance of log-income, two Atkinson's Indices and three Generalized Entropy Indices to prove his argument. He does not think that a rise in income inequality is always a bad side of globalization. And finally, some authors state that globalization does not affect income distribution at all. For example, Mahler et al. (1999) and Mah (2003) do not find any statistically significant relationship between FDI inflow and income inequality in the developing economies.

A number of empirical research studies have been conducted to investigate the nexus between economic globalization and income inequality in the developing countries. Of these, some are really unique and noteworthy. For instance, using KOF index Bergh and Nilsson (2010) add social and political aspects to economic globalization to explore the economic globalization and income inequality relationship. Figini and Gorg (1999) utilize Kuznet's U-shaped Hypothesis to show the relationship between wage inequality and FDI inflows. Barba Navaretti et al. (1998) use skilled based technological change in this regard. However, none

has taken the impact of other factors of economic globalization on income disparity into account. In the above studies we see that in most of the cases, trade liberalization and FDI inflow proxy for economic globalization. These studies ignore other important factors like foreign aid, remittance inflow etc. Additionally, in most of the cases, the studies are devoted to comparing either the between-country and within-country income inequalities or the developing country and developed country income inequalities. But the findings of these studies comparing presentations of inequalities cannot be used properly by a country in national policy making. For, a country needs more specific information about itself for this purpose; which cannot be obtained from a single study putting together multiple countries at a time. In addition, these comparisons may yield nonsense results as there is a huge problem in Gini Coefficient data on almost every database. Sometimes it needs adjustments to control for differences arising from the concepts measured (income versus consumption), the measure of income (gross versus net), the unit of observation (individual versus households), and the coverage of the survey (national versus sub-national). Besides this, we find no such study which extensively examines the economic globalization and income inequality relationship for a single country. Furthermore, very few studies are conducted on developing countries like Bangladesh in the field of globalization and income inequality. In this field, the more advanced developed and developing countries (for example- USA, India, China, UK, Germany etc.) are given priorities. In this sense these studies fail to fill the gap in the relevant literature.

In our study we examine if Gini Coefficient is affected by foreign trade, foreign aid, FDI, and Remittance inflow in Bangladesh. For this purpose, we collected data on Gini Coefficient from SWIID (Standardized World Income Inequality Database), on trade, aid and remittance inflow from World Bank Development Indicators database, and on FDI from TheGlobalEconomy.com website. These data sources are very reliable. We hope this study will fill the gap we have herein identified in the literature.

5. Methodology

To investigate the impact of economic globalization on income inequality, we specify the following regression model:

$$G_t = \alpha + \beta_1 A_t + \beta_2 F_t + \beta_3 R_t + \beta_4 T_t + u_t \quad (1)$$

Where,

G = Gini Coefficient;

- α = Intercept;
 β 's = Coefficient of the explanatory variables;
A = Foreign aid;
F = Foreign direct investment;
R = Personal remittance inflow from abroad;
T = Foreign trade;
u = Error term/stochastic term.
t = Time

Here, Gini Coefficient proxies for income inequality and total volume of trade, foreign aid, foreign direct investment and remittance inflow from abroad act as proxy variables for globalization. When the sign of any of the β_4 is positive (negative), increases in the corresponding globalizing factor increases (reduces) income inequality levels. According to the Stolper-Samuelson argument (1941), the sign of is expected to be negative (positive) if the country under investigation is a labour (capital) abundant country. If Mundell's hypothesis (1957) that increase in FDI flows may reduce income inequality holds true, then the sign of β_2 should be negative. But according to the argument made by Feenstra and Hanson (1997), that increased FDI inflows may benefit the skilled labourers more than unskilled labourers, the sign of β_2 should be positive. The sign of β_1 should be negative if increase in foreign aid in the country is effective in helping to reduce income inequality. And finally, if remittance inflow tends to decrease the disparity in the income distribution in Bangladesh then β_3 should be negative and vice versa.

Firstly, we run OLS regression analysis, and then conducted residual diagnostics tests to see whether the error terms -

- serially correlated;
- normally Distributed;
- homoscedastic.

Under OLS regression we then run the CUSUM test to check for any structural break in the variables in the model. As we are dealing with time series data, we need to examine the unit root properties of the variables and we also need to conduct a cointegration test to investigate whether there is any long run relationship between the explained variable and any of the explanatory variables (which may yield spurious/nonsense results).

To test whether the time series are stationary or non-stationary, we used ADF unit root test. As our unit root test suggests that the variables are integrated at different

orders, to test for any long run relationship among the response variable and the predictor variables we resorted our cointegration test to Phillips-Ouliaris Cointegration Test. This test was originally developed by Peter C. B. Phillips and S. Ouliaris (1988). There are other tests for cointegration, namely Engle Granger Cointegration Test and Johansen System Cointegration Test which require that all variables should be non-stationary at levels but stationary at first difference. But for any of the variables cointegrated at order two $I(2)$ or for variables cointegrated at different orders, these tests are no longer appropriate. Furthermore, Johansen System Cointegration Test is designed to estimate a cointegrating relationship among variables in a system of equations. In this case our best option is Phillips Ouliaris Cointegration Test.

Direct application of conventional regression techniques to Equation (1) is not appropriate since most macroeconomic time series variables are non-stationary so as to make conventional hypothesis-testing procedures based on the t , F , and X^2 test statistic unreliable. In the presence of autocorrelation and mixed order of cointegration of the variables, the most appropriate method to estimate the coefficient parameters of explanatory variables of our regression model is FMOLS (Fully Modified Least Squares). Phillips and Hansen (1990) developed the method of FMOLS to provide optimal parameter estimates of the cointegrating regressions. This method modifies least squares taking into consideration of the effects of serial correlation of the residuals and endogeneity in the regressors arising from the existence of a cointegrating relationship. We apply here the FMOLS approach as our regression model suffers from the autocorrelation problem and the variables have different orders of cointegration, i. e., some of the variables are stationary at levels and some are at first difference.

After conducting FMOLS regression, we again conduct residual diagnostics to check the validity of our model. The test for autocorrelation and the test for homoscedasticity are not required at this stage as FMOLS does correct these issues on its own. This time, we only need to check the residual plots to see whether the residuals are normally distributed using the same method applied before. In addition, we use Eviews7 statistical package software for residual diagnostics, CUSUM test, unit root test, cointegration test and FMOLS regression analysis as well as MS-Excel spreadsheet application software for data processing and representation.

6. Results

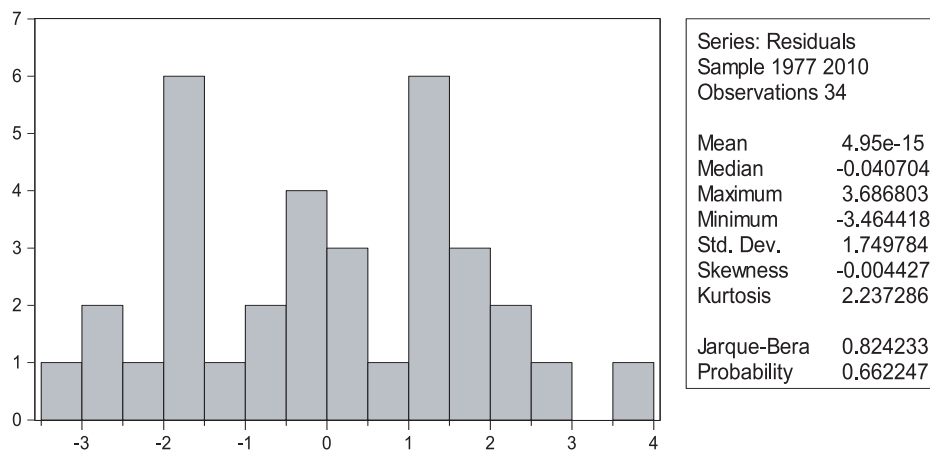
To test whether our regression model is a best regression model we conduct the following residual diagnostic tests under OLS regression analysis:

- Jarque-Bera Test to determine if the residuals are normally distributed;
- Breusch-Godfrey Serial Correlation LM Test to detect if the residuals are serially correlated;
- Breusch-Pagan-Godfrey Test to if the residuals are homoscedastic.

Figure-1 shows that the Jarque-Bera probability value is 0.662247. This value is more than 5%, so we can not reject the null hypothesis that the residuals are normally distributed.

In Table 6-1, we present the result of the test for autocorrelation of the residuals. Null hypothesis is that the residuals are not serially correlated. In this table we find that the probability value is 0.0116; which is less than 5%. Therefore we

Figure 1: Jarque-Bera Normality Test (OLS)



reject the null hypothesis and accept the alternative hypothesis that the residuals are serially correlated.

We present the heteroscedasticity test result in Table 6-2. What we find here is that the probability value of 0.5113 is more than 5%. Therefore we cannot reject the null hypothesis that the residuals are homoscedastic.

So among the three residual diagnostic tests, we fail to meet the one of serial correlation. So our regression model suffers from the problem of autocorrelated error terms.

Table 6-1: Test for Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	4.797873	Prob. F(2,27)		0.0165
Obs*R-squared	8.915117	Prob. Chi-Square(2)		0.0116
Test Equation:				
Dependent Variable: Residual				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Foreign Aid	-0.384184	0.530922	-0.723617	0.4755
FDI	0.466790	1.595179	0.292625	0.7720
Remittance Inflow	0.195652	0.288630	0.677865	0.5036
Trade	-0.106654	0.117482	-0.907835	0.3720
C	2.944261	3.409214	0.863619	0.3954
Residual (-1)	0.602748	0.194701	3.095762	0.0045
Residual (-2)	-0.162249	0.214489	-0.756443	0.4559
R-squared	0.262209	Mean dependent var		4.95E-15
Adjusted R-squared	0.098256	S.D. dependent var		1.749784
S.E. of regression	1.661598	Akaike info criterion		4.034678
Sum squared resid	74.54453	Schwarz criterion		4.348929
Log likelihood	-61.58952	Hannan-Quinn criter.		4.141846
F-statistic	1.599291	Durbin-Watson stat		1.753991
Prob(F-statistic)	0.185775			

Next we run the CUSUM test to identify if there is any structural break or abrupt change in the variables of the regression model. In Figure-2, the red lines are upper and lower limits of the tests at 5% level of significance. The blue line is CUSUM line. If the CUSUM line is between the red lines of significance, then we cannot reject the null hypothesis that there is no structural break in the model. As in our case, the blue line is within the two red lines, so our model pass the CUSUM test that there is no structural break in the model.

The results of the standard ADF unit-root tests are summarized in Table 6-3. The ADF test results show that for the variables Trade, Foreign Aid and Remittance Inflow, in the level form, the null hypothesis of a unit root cannot be rejected at the conventional significance levels when a constant is included in the test, but the null hypothesis of a unit root is rejected for these variables in first difference form. These results suggest that these time series variables in this study are series, so they are all stationary in the first difference form. So is the variable FDI but only with the inclusion of both the slope and constant. Gini Coefficient is stationary only at level form when a constant is included in the test. In all other cases this variable shows unit root property. When both a constant and a slope are included

Table 6-2: Heteroscedasticity Test of the Residuals

Heteroscedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	0.775393	Prob. F(4,29)		0.5502
Obs*R-squared	3.284993	Prob. Chi-Square(4)		0.5113
Scaled explained SS	1.478470	Prob. Chi-Square(4)		0.8304
Test Equation:				
Dependent Variable: Residual ²				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.165819	6.078988	1.178785	0.2481
Foreign Aid	-1.162072	0.992841	-1.170452	0.2513
FDI	-0.920483	3.238116	-0.284265	0.7782
Remittance Inflow	-0.467823	0.496809	-0.941656	0.3541
Trade	0.033701	0.198420	0.169845	0.8663
R-squared	0.096617	Mean dependent var		2.971691
Adjusted R-squared	-0.027987	S.D. dependent var		3.355221
S.E. of regression	3.401849	Akaike info criterion		5.421568
Sum squared resid	335.6047	Schwarz criterion		5.646033
Log likelihood	-87.16666	Hannan-Quinn criter.		5.498117
F-statistic	0.775393	Durbin-Watson stat		1.545797
Prob(F-statistic)	0.550204			

in the test, all the variables except Foreign Aid are non-stationary at levels, but at difference form all the variables except Gini Coefficient are of $I(1)$ series (stationary). Therefore, we find that the variables show mixed order of integration.

Figure 2: CUSUM test for Change Detection

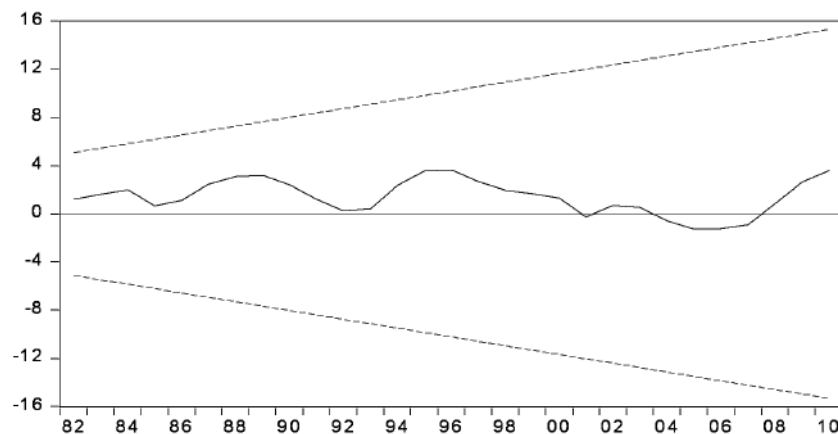


Table 6-3: Results of ADF unit root test

	Constant Only		Constant and Slope					
	Levels	1 st difference	Levels	1 st Difference	Levels	1 st Difference	Levels	
Gini Coefficient	-3.1842**	[1]	-2.28855	[0]	-3.19439	[1]	-2.26437	[0]
Trade	-0.0225	[0]	-5.31712*	[0]	-1.82535	[0]	-5.42921*	[0]
Foreign Aid	-1.13704	[0]	-8.04661*	[0]	-4.25220**	[0]	-7.84897*	[0]
FDI	2.08204	[6]	-0.41116	[7]	1.49192	[7]	-4.74288*	[5]
Remittance Inflow	0.90870	[0]	-4.01387*	[0]	-0.67716	[0]	-4.05464**	[0]

Note: The computed t statistics for variables in levels and in first differences are presented in the Table. ***, **, and * indicate significance at the 10%, 5%, and 1% levels respectively. The numbers in the brackets [] are the optimal lags, selected according to the Schwarz selection criterion.

Then we perform Phillips-Ouliaris test for cointegration to investigate the possible cointegrating relationship among the variables and the results are summarized in Table 6-4. In the Table, we find no *P* value falling below or being

Table 6-4 : Phillips-Ouliaris Cointegration Test

Null hypothesis: Series are not cointegrated				
Cointegrating equation deterministic: C				
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth)				
Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
Gini Coefficient	-3.761099	0.2841	-17.82942	0.3998
Foreign Aid	-3.429011	0.4195	-18.91874	0.3367
FDI	-4.489482	0.0953	-22.15525	0.1842
Remittance Inflow	-3.418567	0.4241	-18.71447	0.3481
Trade	-4.707452	0.0651	-25.61937	0.0826

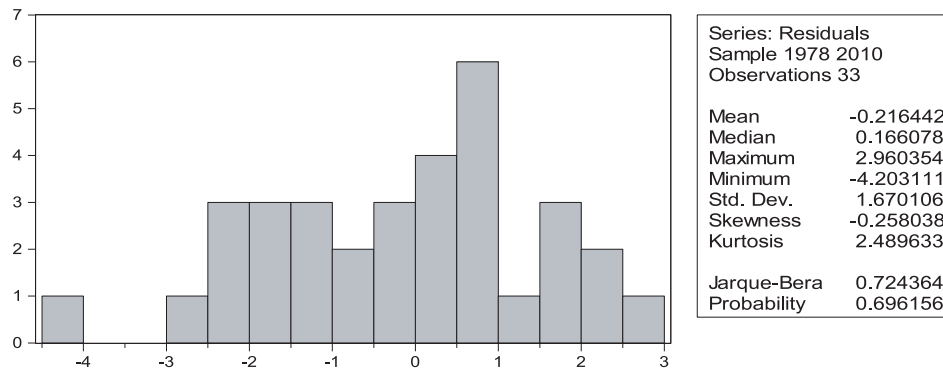
*MacKinnon (1996) p-values.

Intermediate Results:

	AGN	AID	FDI	REM	TRADE
Rho - 1	-0.556736	-0.477018	-0.743733	-0.562312	-0.767308
Bias corrected Rho - 1 (Rho* - 1)	-0.540286	-0.573295	-0.671371	-0.567105	-0.776345
Rho* S.E.	0.143651	0.167190	0.149543	0.165890	0.164918
Residual variance	2.129187	0.252347	0.025774	0.363700	3.806592
Long-run residual variance	2.028136	0.321571	0.021438	0.367703	3.887315
Long-run residual autocovariance	-0.050526	0.034612	-0.002168	0.002001	0.040361
Bandwidth	NA	NA	NA	NA	NA
Number of observations	33	33	33	33	33
Number of stochastic trends**	5	5	5	5	5

**Number of stochastic trends in asymptotic distribution

Figure 3: Jarque-Bera Normality Test (FMOLS)



equal to 5%. Therefore we cannot reject the null hypothesis that there is no cointegrating relationship among the dependent variable and the independent variables in the regression model.

As our regression model suffers from autocorrelation in the error terms and its variables show differing orders of cointegration, we ran a cointegrating regression analysis using FMOLS (Fully Modified Least Squares) approach. The FMOLS regression results are summarized in Table 6-5. Before looking into Table 6-5, we first look into Figure-3.

Figure-3 presents the required information for checking whether the residuals (which we get after running FMOLS regression analysis) are normally distributed. The figure illustrates that the residuals are normally distributed and we cannot reject the null hypothesis due to P value being greater than 5%. In other words, the residuals show randomness in their distribution. Therefore our model is a valid model.

Now we look into Table 6-5 (the following page). Here we notice that the value of the correlation coefficient R^2 is 0.729249, meaning that the explanatory variables can explain 72.9% of the total variability in the explained variable. This means that there is a strong relationship between the explained variable and the explanatory variables. (R^2 is smaller than the Durbin Watson statistic (1.046200) which is another good sign). Therefore, the hypothesis H_1 of our study “Globalization affects income inequality significantly” is not rejected.

We further find that the P values of the variables Foreign Aid, FDI, Remittance Inflow and Foreign Trade are 0.3904, 0.0251, 0 and 0 respectively. This means that FDI, Remittance Inflow and Foreign Trade have a significance influence on Gini Coefficient as their P values are less than 5%. But Foreign Aid has no

Table 6-5: FMOLS Test

Dependent Variable: Gini Coefficient

Method: Fully Modified Least Squares (FMOLS)

Included observations: 33 after adjustments

Cointegrating equation deterministics: C

Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Foreign Aid	-0.485632	0.556682	-0.872368	0.3904
FDI	-4.236372	1.789968	-2.366731	0.0251
Remittance Inflow	-2.225335	0.275901	-8.065707	0.0000
Trade	0.637408	0.109195	5.837351	0.0000
C	31.77445	3.438577	9.240582	0.0000
R-squared	0.729249	Mean dependent var		37.18368
Adjusted R-squared	0.690570	S.D. dependent var		3.469410
S.E. of regression	1.929909	Sum squared resid		104.2873
Durbin-Watson stat	1.046200	Long-run variance		3.446038

significant influence on Gini Coefficient as its P value is more than 5%. Significantly it cannot explain the variability in the Gini Coefficient.

Now the question remains as to which of the variables among FDI, Remittance Inflow and Foreign Trade affect Gini Coefficient positively and which affect it negatively. To answer this question we have to look at the signs of the respective coefficients of these variables. From Table 6-5, we see the values of the coefficients of the variables FDI, Remittance Inflow and Foreign Trade are respectively -3.72, -2.16 and 0.59. These coefficients imply that-

- FDI and Remittance Inflow affect Gini Coefficient negatively. An increase in FDI or in Remittance Inflow or in both reduces the value of Gini Coefficient and vice versa.

This finding leads us to conclude that we reject hypothesis H_3 of our study that “Increase in FDI increases income inequality” and we cannot reject hypothesis H_4 that “Increase in Remittance decreases income inequality”.

- Conversely, Foreign Trade and Gini Coefficient have a positive relationship between them. Increase in trade leads to an increase in the value of Gini Coefficient.

Therefore, we cannot reject the hypothesis H_2 that “Increase in trade increases income inequality”. Anyway, we reject hypothesis H_5 that “Increase in Foreign

Trade decreases income inequality”, as the corresponding P value of Foreign Aid is more than 5% ($0.3904 > 0.05$).

7. Interpretations

The results we just found provide the answer to our research question, regarding what the impact of economic globalization is on income inequality in Bangladesh. As we know, the value of Gini Coefficient lies between 0 and 1 where 0 means perfect equality and 1 means perfect inequality in income distribution. Therefore the economic interpretation of the result obtained from our regression analysis is that there is a significant relationship between globalization and income inequality in Bangladesh. But we cannot say that all the factors of globalization play a significant role in increasing or decreasing income inequality in the country. As our result suggests-

- An increase in international trade deteriorates income distribution (alternatively it increases income inequality, because it increases the value of Gini Coefficient),
- Contrarily, increase in foreign direct investment and personal remittance inflow into the country improves income distribution (it decreases income inequality) and vice versa.
- But regarding foreign aid what our empirical results suggest is that it does not have any significant influence on increasing or decreasing income inequality in Bangladesh.

It seems quite clear that the findings of our study do not support the neoclassical view regarding the role of international trade (Stolper-Samuelson) that the productivity of labour tends to increase with trade liberalization in developing countries whose labour endowments are abundant (as Bangladesh is considered to be a labour abundant country), which leads to a reduction in wage inequality. But these findings support the Mundell's hypothesis (1957) that the FDI flows from developed countries to developing countries are likely to increase labour productivity and real wage, and thus the FDI flows to developing countries should reduce income inequality.

At the same time, our study findings reject the arguments made by Feenstra and Hanson (1997), Figini and Gorg (1999), Bergh and Nilsson (2010), Edwards (1997) and Dollar and Kraay (2001); because, Feenstra and Hanson (1997) and Figini and Gorg (1999) state that FDI inflow increases income inequality in the developing countries, Bergh and Nilsson (2010) state economic globalization positively affects

income inequality, and Edwards (1997) and Dollar & Kray (2001) state trade liberalization does not increase income inequality in the developing countries. Moreover, our study findings also reject the conclusions of Mahler et al. (1999) and Mah (2003) who do not find any statistically significant relationship between FDI inflow and income inequality in the developing economies.

On the other hand, our study results are consistent with the results of Mescher and Vivarelli (2007) who find that foreign trade brings adverse consequences in terms of income distribution in the low income countries (we have mentioned earlier in the introduction section that Bangladesh is a low income country). In addition, our study results partially support the dependency theorists' arguments that trade and FDI inflows deteriorate income inequality in the developing countries (which is supported by Firebaugh & Beck, 1994; Stringer, 2006).

8. Recommendations

Globalization is irresistible and inescapable. It can affect an economy both negatively and positively. In any case, we should not simply turn our back and embrace it blindly. We have to be prepared, we have to plan, and we have to formulate policy so that globalization can bring about sustainability in the development of our economy. We have to take corrective measures in order to ensure that the adverse consequences of globalization do not befall us. We cannot allow our economy to grow in a fashion that will create a few hundred or thousand billionaires at the cost of the tens of millions of common people. Following the findings of our study we recommend the following measures be taken by the government of Bangladesh in dealing with the income inequality problem while maintaining sustainable growth and development processes:

- To attract more and more FDI flow in the country, the government should improve the existing investment environment. For this, government may increase investment incentives or may reduce the exchange rates up to a tolerable limit by posing no obstacle to the growth process of the economy; nevertheless, FDI in the labour intensive sector should be given special preference.
- The government should increase investment in skilled labour production so that manpower entrance into the international labour market can increase, leading to higher remittance earning. Our country is not capital abundant, but the country is abundant in human resources which should be allowed to move freely around the world. By exporting manpower, we must try to have our due share in the free market economy

- Our findings show trade increase income inequality. So, should we stop trading? The answer is obviously no, we cannot ignore it, as trade is the engine of an economy. Rather we have to change the pattern of trade. The government should change its trade policy so as to increase exports and decrease imports of labour intensive goods. The government may increase import duties and increase export subsidies for this purpose. Additionally, the government should also encourage domestic production of imported labour intensive goods.
- The government needs to increase investment in education so that human resources can develop up to the global standard. The government also needs to ensure access to high quality education and introduce apprenticeship (study and work facilities together) for the marginal mass of the country.
- Good foreign relations with the more advanced countries may mean an increase in FDI, an increase in export of labour intensive goods, and an increase in the manpower export for the country. Therefore, the government should place more emphasis on foreign relations.
- The government should enforce and enhance the progressive taxation system (intended for the people with high income) in order to redistribute national income in such a way that does not hinder economic growth. But the labour intensive industries should be excluded from this consideration.
- At the same time, a minimum wage law should be formulated in the country in order to ensure that marginal workers are not exploited.

And finally, for the developing countries, it is high time to be united to face the adverse effects that globalization results in. If globalization is properly guided, it can result in a more equitable world order.

9. Conclusion

The relationship between Economic globalization and income inequality is very complex and difficult to measure due to the lack of data of certain areas and factors. The relationship between globalisation and income in equality differs depending on regions, time periods, methods of analysis etc. We have examined the impact of recent economic globalization (measured by trade, FDI inflow, foreign aid and remittance inflow) on income inequality in Bangladesh using time series data for the period of 1977-2010. The ADF unit root test indicates that the

variables are cointegrated at different orders. The Phillips-Ouliaris cointegration test indicates the existence of no cointegrating relationship in the regression model. In the presence of autocorrelation we run FMOLS (Fully Modified Least Squares) regression technique. Findings show FDI inflow and remittance inflow have played an important role in improving income distribution in Bangladesh, whereas, trade does the opposite, and foreign aid is insignificant in the model. This confirms that there is a significant relationship between economic globalization and the disparity in the distribution of national income in Bangladesh. The empirical results suggest that Mundell's hypothesis (1957) is verified in Bangladesh. Nonetheless, these results do not accord with Stolper-Samuelson theorem (1941).

The findings of the study have some important policy implications. The government of Bangladesh should consider different development strategies and relevant policy options in order to reduce income inequality. The government may make some solid plans and formulate policies accordingly to encourage FDI inflow and remittance inflow in the country. The government may also consider bringing about changes in the tax and subsidy systems and using them to lessen the severity of income inequality.

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