DOES GLOBALIZATION ALWAYS INCREASE INEQUALITY? AN ECONOMETRIC ANALYSIS IN BANGLADESH PERSPECTIVE

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Over the past twenty years or so, Bangladesh moved firmly to embrace the wave of globalization. At present, when we concentrate on the country's income distribution, it opens a downbeat aspect of globalization. But virtually limited empirical studies examined the relationship between inequality and globalization in Bangladesh perspective. The paper considers the impact of globalization using its two proxies – foreign direct investment and trade openness – on Bangladesh entire income distribution. It also tries to find out whether gross domestic product, inflation rate and female participation in labor force have any influential effect on the income inequality. We use panel data for 26 years from 1980 to 2005 to perform the econometric analysis. The analysis reveals that globalization deteriorates inequality and its discriminating effect depends on the level of development of the country, also the increased participation of women in labor force significantly reduces inequality.

Keywords: *foreign direct investment (FDI) openness, globalization, gross domestic product (GDP), income inequality, trade openness.*

1. Introduction

Globalization is the motto of today's world. The term globalization, which is a phenomenon of the 21st century, may be interpreted as greater mobility of the factors of production (capital and labor) and greater world integration through increased trade and exchange of ideas in social, technological, cultural, political and ecological spheres beyond country's physical limits. During the last decade or so the world has witnessed the process of globalization; a process characterized by an increasing degree of market openness and more integration – among countries and within global economy in general (Nissanke and Thorbecke 2005). The official World Bank definition of globalization is as follows: 'Freedom and ability of individuals and firms to initiate voluntary economic transactions with residents of other countries'. In the book *The Political Economy of Globalization* globalization is defined by Ngaire (2000) in the following way: 'globalization rests on a tripod namely, the expansion of markets (economic), challenges to the state and institutions (political), and the rise of new social and political movements (cultural)'. While there is no consensus on what the term 'globalization' means, for the purpose of the present study the term is used to refer to the economies' greater openness through international trade and finance, or external liberalization.

1.1 Globalization in Bangladesh

Like other developing countries, Bangladesh with vulnerable geopolitical locations and weak economy, has promoted globalization as a tool for economic growth. The term globalization can be viewed as a form of economical freedom. The period from 1990 to 2001 in Bangladesh's economic history has been characterized by blind openness of the economy through accelerated trade liberalization, but proper attention has not been given on financial and fiscal reforms.

Although globalization is adopted to strengthen the economy to fight any upcoming threats, it is also associated with problems which have raised legitimate concerns, among which is the income inequality. A closer look at globalization reveals that while it has helped reduce poverty in some of the largest and strongest economies, the developing world has seen a widening gap between the winners and the losers. The share of the poorest 20 % of the world's population has shrunk from 2.3 % of the world income in 1960 to 1.1 % today – and it is still falling (EPP n.d.). Conversely, from several studies it can be concluded that the richest 10 % of the world population have increased their share in world income, independently of the trend in the overall indicator of world income distribution. In recent years, the negative impacts such as the worsening of inequality due to globalization, on the economy of Bangladesh and, more evidently, on its people's lives, have become a widely debated issue.

1.2 Globalization and Inequality: Insights from Literature

Does globalization impact the income inequality? To find the answer to this question one should analyze the previous research works conducted on the subject 'the correlation between globalization and inequality'. Many of the results indicate that globalization worsens inequality (Wagle 2007; Milanovic and Squire 2005). Kai and Hamori (2009) performed an econometric analysis to examine the relationship between globalization and inequality in sub-Saharan Africa between 1980 and 2002 and concluded that in sub-Saharan Africa, as a result of globalization, the rich had become richer and the poor had become poorer. Lee (2006) carried out a study covering 14 European countries over the period 1951 to 1992 to examine the impact of globalization on the income inequality in Europe and found that foreign direct investment had raised income inequality and that the Kuznets hypothesis was valid. It was found by Berry and Serieux (2006) that world income distribution improved in 1980 to 2000, also calculated that the share of the richest decile in world income increased from 46.6 to 49.3 per cent during the same period. In the paper *The Relationship between Income Inequality, Poverty and Globalization* Heshmati (2005) declared that inequality was negatively correlated to globalization, and globalization reduced poverty. Milanovic (2002) declared that in countries below the average income of about $PPP 5,000, the higher level of openness (imports plus exports/GDP) was associated with lower income shares of the bottom 80 per cent of population. Several studies performed by Sala-i-Martin (2002), Milanovic (1999) showed how globalization might affect the world or international income distribution principally via differences in mean per capita growth rates between the countries. According to Page (1996), with the opening of markets, it is possible that the ability to redistribute income decreases and inequality conceivably worsens. 'Globalization has dramatically increased inequality between and within nations' said by Jay Mazur, US union leader (2000).

On the other hand, various economists argue that there is no significant correlation between globalization and inequality. Dollar and Kraay (2002) argue that trade openness had no systematic and significant effect on inequality. In one of the sensitivity runs of their main model Li, Squire and Zou (1998) had export-to-GDP (a proxy for openness) as an explanatory variable of the Gini coefficient. They found no statistically significant effect of openness on the Gini coefficient. Trade liberalization in developing countries had no significant effect on income inequality, as found by Edwards (1997).

However, it is obvious from the previous studies, that higher income inequality within countries goes with: 1) higher poverty (using World Bank data and the number of people below the Bank's international poverty line) (Besley and Burgess 2003); 2) higher unemployment; and 3) higher crime (Lee and Bankston 1999; Fajnzylber, Lederman, and Loayza 2002).

From the above literature it is obvious that a combination of equity and growth is indispensable to make the country's significant development. Because, if globalization within the current framework actually increases the inequality within and between countries, as some evidence suggests, the increases in world inequality above moderate levels may cut world aggregate demand and thereby world economic growth, making a vicious circle of rising world inequality and slower world growth. These are the underlying reasons why the study of increased inequality arising from globalization is important.

The purpose of the present study is to provide some empirical evidence of the impact of globalization on income inequality in Bangladesh. To serve the purpose, globalization is viewed purely in its economic dimensions – using the two proxies: (i) FDI openness and (ii) Trade openness. Since very few researches focus on the correlation between globalization and inequality in Bangladesh, it is believed that this research could reveal meaningful upshots.

2. Conceptual Issues

2.1. Measuring Globalization

Globalization is a broad concept, merely used to depict a variety of phenomena that reflect the increasing economic interdependence of countries. Such phenomena include flows of goods and services across borders, reductions in policy and transport barriers to trade, international capital flows, multinational activity, foreign direct investment, outsourcing, and migration. These circulations of goods, services, capital, firms, and people are believed to contribute to the diffusion of technology, knowledge, culture, and information across borders. The researchers have often used Trade and FDI openness as measures of globalization.

Foreign Direct Investment in Bangladesh
Bangladesh faces the challenges of providing a foundation for the satisfactory performance of its economy and attracting FDI in the country to promote its economic prosperity in the dynamic, complex and highly competitive world. As a developing country, Bangladesh needs FDI for its ongoing development process. Bangladesh, since its independence, is trying to be a suitable location for FDI. Special zones have been set up and lucrative incentive packages have been provided to attract FDI. However, the total inflow of FDI has been increasing over the years. According to Bangladesh Bank report, in 1972, annual FDI inflow was 0.090 million USD, and 33 years later, in 2005, the annual FDI came to 845.30 million USD and to 989 million USD in 2006.

Table 1 shows the total FDI inflow (including that in Export Processing Zones, EPZs) over the last eleven years, from 1995 to 2005. Data reveals that in 1999 there was a sudden fall in FDI, and again in 2001, mainly because of a serious political unrest, which discouraged foreign investment, and it took foreign investors several years to regain the confidence. It stabilized afterwards but remained below the average point reached during 1997 to 2000. In spite of Bangladesh's comparative advantage in labor-intensive manufacturing, the adoption of investment friendly policies and regulations, the establishment of EPZs in different suitable locations and other privileges, the FDI flows has failed to accelerate. However, in 2005 a substantial improvement has been achieved. The relative increase in the growth of FDI indicates the higher degree of integration into the world capital markets.

Table 1

The aggregate and sector-wise FDI inflow, 1995–2005
(calendar year, USD in millions)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Agriculture and Fishing (Total)	0	0.3	1.4	1.4	2.9	15.2	1.1	1.6	4.1	1.7	2.3
Power, Gas and Petroleum	3.2	47	242.1	235.2	83.5	301	192.4	57.9	88.1	124.1	208.3
Manufacturing	45.5	89.2	162.4	139.8	191.8	193.5	132.2	142.9	165.2	139.4	219.3
Industry (Total)	48.7	136.2	404.5	375	275.3	494.5	324.6	200.8	253.3	263.5	427.6
Trade and Commerce	41.3	92.3	158.9	164.3	27.5	53.2	27.6	63.7	44	66.6	130.5
Transport and Telecom	1.7	1.5	5.9	25.3	0.5	5.4	0.9	48.5	45.9	127.5	281.9
Other Services	0.6	1.3	4.6	10.5	2.9	10.3	0.3	13.7	2.9	1.1	3
Services (Total)	43.6	95.1	169.4	200	30.9	68.9	28.8	125.9	92.8	195.2	415.4
Total FDI to Bangladesh	92.3	231.6	575.3	576.5	309.1	578.6	354.5	328.3	350.2	460.4	845

Source: Enterprise Survey, the source of the current data set is conducted by Statistics Department of Bangladesh Bank on a calendar year basis.

FDI brings much-needed foreign funds for current investment, but it also creates long-term obligations in the form of future repatriation of profit earned by the foreign investor. Another troublesome aspect is the round tripping of capital that finds original investment (including intra-company debt and interest) and domestic capital reinvested as 'FDI', because of discriminatory taxation policy that favors FDI over domestic investment.

Trade Policy of Bangladesh
Bangladesh joined the World Trade Organization (WTO) in 1995 to avail the advantages of an open and liberal trading system. In Bangladesh, the trade liberalization process started in the mid-1980s. Export diversification and import liberalization received the highest priority in early years. Towards the end of the 1980s, the import liberaliza-

tion leapt forward. The government took a number of bold steps, which included liberalization of the trade and foreign investment, strengthening the financial sectors, closing and privatizing some loss making State-Owned Enterprises (SOE) and taking steps to improve governance.

2.2. Measuring Inequality

Trends in Income Inequality in Bangladesh

Substantial equity problems have emerged in the distribution of the gains from globalization among individuals, organizations, nations, and regions. Indeed, many of the ains have been going to the rich nations or individuals, creating greater inequalities and leading to potential conflicts nationally and internationally. Since the worsening income distribution within countries continue to be a subject of heated debate, it becomes necessary to perform empirical analysis to measure this inequality.

Bangladesh witnessed an accelerated growth and a faster reduction of poverty in the decade of the 1990s, compared to the 1980s, but also a widening of income inequality. GDP grew at the annual average rate of 4.8 % in the 1990s compared to 3.7 % in the 1980s. At the same time, an unexpectedly early demographic transition brought population growth down from 2.4 % to 1.8 %. As a result, the growth in per capita income witnessed an even faster acceleration compared to overall GDP – from 1.6 % per annum in the 1980s it went up to 3 % in the 1990s. For an average Bangladeshi, the income had grown by about one-third over the decade as a whole. This was not nearly as spectacular income growth as observed in many other parts of Asia, but at least it represented a significant advance over the previous decade when per capita income grew by only one-sixth (Osmani 2005).

Table 2

Annual average growth rates of the Bangladesh economy, 1980/81 to 1999/2000

Sector	Five year average				Decadal average	
	1980/81–1984/85	1985/86–1988/89	1990/91–1994/95	1995/96–1999/00	1980/81–1989/90	1990/91–1999/00
GDP	3.72	3.74	4.40	5.21	3.73	4.81
Population	2.13	2.19	1.98	1.60	2.16	1.79
Per capita GDP	1.59	1.55	2.41	3.61	1.57	3.01

*Source:* Computed from BBS (2000) and BBS (2001a).

The faster income growth was accompanied by some widening of income inequality, in both urban and rural areas. Thus, the Gini coefficient of consumption expenditure for urban areas had gone up from 0.30 in 1983–84 to just 0.32 in 1991–92, but then increased sharply to 0.38 by 2000. The rural areas also experienced a similar trend. After remaining roughly constant around 0.25 during the 1980s, the rural Gini increased steeply to 0.30 in the year 2000 (calculated from BBS 2001b).

2.3. Women in the Workforce

The past decades observed a spectacular increase in the female participation in the labor force from countries all over the world. Right after World War II the civilian labor force

participation for women was a paltry 32 %. It is nice to see that today, however, some six decades later that rate has climbed in excess of 70 % (Davis 2002). In fact, women's participation in the labor force increased particularly in the 1980s and 1990s – the era of globalization. In Bangladesh, female participation rate in labor force increased from 23.9 % in FY00 to 29.2 % in FY06 according to the Bangladesh Bank Policy Paper, 2008.

It is evident from previous studies that for many women, globalization has resulted in an improvement in their economic and social status as a result of their inclusion into the global production system and the wage employment gave them a greater economic independence than earlier. Since employment provides the key link between economic growth and poverty, the increased participation of women in the labor force will help to reduce poverty as well as inequality in income distribution.
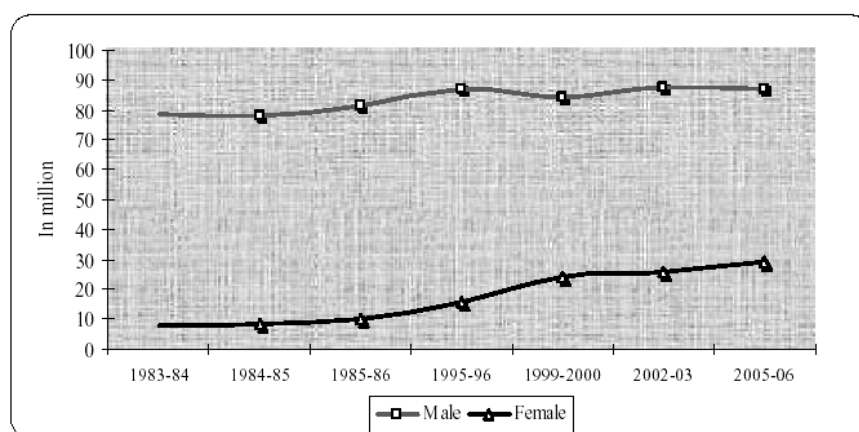
Fig. 1. Trends in labor force participation rate
Source: LFS 2005–06, BBC.

3. Data and Methodology

3.1. Data

The estimated household income inequality (EHII index), an index of estimated household income inequality, is obtained from the University of Texas Inequality Project (UTIP). Data regarding trade volume are collected from the successive issues of Household Income and Expenditure Survey (HIES), Bangladesh Bureau of Statistics. FDI data are obtained from UNCTAD (United Nations Conference on Trade and Development), 2000.

3.2 Model

To investigate the question whether a causal link between the increase in income inequality and globalization can be established, the study fitted a model based on the unbalanced panel data from 1980 to 2005 and the empirical specifications are as follows:

$$Y_{it} = \alpha + \beta L_{it} + \gamma \left(L_{it} * I_{it} \right) + \eta X_{it} + e_{it}, \tag{1}$$

where, Y_{it} indicates the inequality measure; L_{it} represents the globalization measure; I_{it} denotes the logarithm of GDP per capita; X_{it} is a vector of explanatory variables, and e_{it} denotes random disturbance (*i:* country, *t:* time).

3.3. Construction of Variables

Dependent Variable: Income Inequality
Estimated Household Income Inequality, obtained from Estimated Household Income Inequality Data Set (EHII index), is used as an inequality measure. Estimated Household Income Inequality is the estimate of gross household income inequality, computed from a regression relationship between the Deininger & Squire inequality measures and the UTIP-UNIDO pay inequality measures, controlling for the source characteristics in the D&S data and for the share of manufacturing in total employment.

Explanatory Variables: Openness and Other Potential Determinants of Inequality
A globalization measure (L_{it}) is included to assess the impact of globalization on inequality and two 'standard' globalization variables, namely openness – the share of combined exports and imports in GDP – and the share of foreign direct investments in GDP of the recipient country are employed as the globalization measure following empirical literature such as Milanovic (2002) and Wade (2004).

The interaction term between globalization and the logarithm of GDP per capita is included to determine whether the globalization-elasticity of inequality depends on the level of the country's development. In poor countries as suggested by Milanovic (2002) and Wood (1995), since globalization benefits only those with basic and high education, and lowers the income share of those with no education, it is assumed that the equalizing effect of globalization increases as the national income level increases.

In addition to these, logarithm of GDP per capita, inflation rate, and participation of women in labor force are included in the model as the explanatory variables. Inflation is measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.

3.4. Methodology

Randomness of Sample
The assumption of randomness of the sample is essential for all tests and it is checked for this study through the 'Run test'. There are several methods for testing the randomness of the observed data, but among those the Run test, sometimes also known as the Geary test, is usually used since it is easy to apply. This Run test is a nonparametric test. The test begins with the null hypothesis that the sample is random and checked for variables used in the regression model with the cutoff point as median. From the test results it can be concluded that whether the sample data set is random or not.

Normality Test
If the sample is proved to be random on the basis of the Run test, then the next step is to test for the normality assumption. It is also known as 'goodness of fit test' which is applied to determine whether a set of random samples comes from a population with specific distribution. To test the null hypothesis that the sample is drawn from a normally distributed population, the nonparametric Kolmogorov–Smirnov goodness of fit test (Chakravarti *et al.* 1967) can be used. If the test statistic result shows that the null hypothesis is rejected then the only option available is to run a nonparametric test. There is a graphical method to detect the normality assumption, called normal Q-Q plot for any specified variable. If the data come from a normally distributed population, then

the observed values (the dots on the normal Q-Q chart) will fall exactly along the straight line.

Akaike Information Criterion (AIC)

The idea of imposing a penalty for adding regressors to the model has been carried in the AIC criterion, which is defined as:

$$AIC = e^{2k/n} \sum u_i^2 \Big/ n \, ,$$

Where, k is the number of regressors (including the intercept) and n is the number of observations. In comparing two or more models, the model with the lowest value of AIC is preferred.

Tobit Model

The Tobit Model is an econometric, biometric model proposed by Tobin (1958) to describe the relationship between a non-negative dependent variable Y_i and an explanatory variable (or vector) X_i.

The model supposes that there is a latent (*i.e.* unobservable) variable Y_i^*. This variable linearly depends on X_i via a parameter (vector) β which determines the relationship between the explanatory variable (or vector) X_i and the latent variable Y_i^* (just as in a linear model). In addition, there is a normally distributed error term U_i to capture random influences on this relationship. The observable variable Y_i is defined to be equal to the latent variable whenever the latent variable is above zero and zero otherwise.

$$y_i = \begin{cases} y_i^* & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases}$$

where, $y_i^* = \beta x_i + u_i$, and $u_i \sim N(0, \sigma^2)$

A sample in which information on the regressand is available only for some observations is known as a censored sample and a tobit model is appropriate to analyze such a sample, that is why the tobit model is also known as a censored regression model. Some authors call such models limited dependent variable regression models because of the restriction put on the values taken by the regressand. Since we have panel data on the regressors for 26 years (1980 to 2005) except the regressand for which data on 18 years were available, we use tobit model to analyze the sample.

4. Empirical Results

For checking the randomness of the observed data, this study performs first the Run test. The test begins with the null hypothesis that the sample is random and checks for the variables inequality measure, globalization measure, logarithm of GDP, inflation rate and participation of women in labor force. The test results show that the null hypothesis cannot be rejected at 5 % level of significance, that is, the sample data set is random. Since the sample is proved to be random on the basis of the Run test, the next step performed is the test for normality assumption. The two graphs in figure 2 show Q-Q charts of GDP and log of GDP respectively.
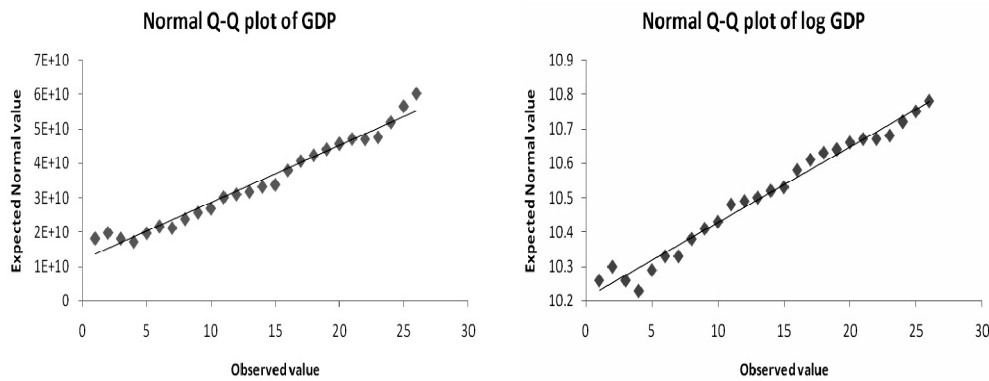
Fig. 2. Normal Q-Q plot

Figure 2 shows that the expected straight line is deviated from the observed sample values of GDP, while the normal Q-Q plot of log GDP shows that observed points almost fall into the normally distributed straight line.

This study employ the tobit model on equation (1) since we have time series data on the explanatory variables for 26 years (1980 to 2005) except the dependent variable (estimated household income inequality) for which data on 18 years are available. To judge the adequacy of this regression model we use Akaike's Information Criterion (AIC) and Bayesian Information Criterion (BIC). The results show that for this model, values of AIC and BIC are the lowest, 108.21 and 115.18 respectively. Table 3 shows the regression results of the model where FDI to GDP ratio is employed as the globalization measure. The result shows that globalization measure is positively related with inequality; implying that increased openness negatively affects the income shares of the poor people. This is not consistent with the neoclassical theory predicting that globalization diminishes inequality. It also shows that the coefficient on the interaction between the globalization measure and the logarithm of GDP per capita is significantly negative at 5 % level of significance, indicating that the effect of globalization on inequality could be declined as countries get richer.

With reference to the explanatory variables, the logarithm of GDP is significantly positive at 5 % level of significance. Another variable – participation of women in labor force – has also significant effect on inequality. The negative value of its coefficient suggests that inequality decreases with the increasing participation of women in the labor force.

Table 3

Determinants of inequality: tobit model estimates

Variables	Coefficient	Std. error	t	$P > t$	[95 % conf. interval]
1	2	3	4	5	6
FDI to GDP ratio	107.2625	69.76301	1.54	0.145	−41.4338 255.9589
Interaction term	−9.441944	6.460661	−1.46	0.016	−23.21252 4.328628
Logarithm of GDP per capita	67.35678	27.99157	2.41	0.029	7.694159 127.0194

1	2	3	4	5	6
Inflation rate	.0245272	.2335806	0.11	0.918	−.4733379 .5223924
Women labor force participation	−23.35917	6.490008	−3.60	0.003	−37.19229 −9.526042
Constant	285.9782	210.2223	1.36	0.194	−162.1001 734.0566
Number of uncensored observations Log likelihood LR chi-square Probability > chi-square					20 −47.106542 17.22 0.0041

Table 4 shows the results of the model using a trade (export and import) to GDP ratio as the globalization measure. In this case none of the variables are significantly associated with the dependent variable and this was the finding of Nath and Mamun (2004).

Table 4

Determinants of inequality: tobit model estimates

	Coefficient	Std. error	t	P > t	[95 % conf. interval]
Trade (Export+Import) to GDP ratio	.8576612	14.73454	0.06	0.954	30.54827 32.26359
Interaction term	−.1081483	1.417646	−0.08	0.940	−3.129789 2.913492
Logarithm of GDP per capita	12.3914	34.69572	0.36	0.726	−61.56077 86.34357
Inflation rate	.0283446	.284186	0.10	0.922	−.5773836 .6340728
Women labor force participation	−3.054109	4.800013	−0.64	0.534	−13.28509 7.176877
Constant	44.08933	515.3839	0.09	0.933	−1054.425 1142.604
Number of uncensored observations Log likelihood LR chi-square Probability>chi-square					20 −50.248764 10.94 0.0527

5. Conclusion

It is conceivable, and important, that the proportion of the world's population living in excessive poverty probably fallen over the past two decades or so, having been rising for decades before then. But the income inequality is becoming an important threat to the world economy since several studies, carried on income distribution, suggest that world income inequality has been rising during the past two to three decades. If global inequality is widening, we cannot conclude that globalization in the context of the dollar-Wall Street regime is moving the world in the right direction and international atten-

tion is required to this aspect. Relatively few studies were targeted at measuring inequality empirically. Most of the studies focused on poverty, with inequality analyzed in the process, by computing Gini coefficients, Theil indices, and Lorenz curves. In this paper we try to investigate the question whether a causal link can be established between the increase in income inequality and globalization on Bangladesh context. We also attempt to find the answer of the question, whether increasing GDP and participation of women in the labor force have any impact on the rising inequality?

This paper has shown that, globalization, when measured by the FDI openness, is negatively correlated with the inequality and states that increased openness results in greater inequality, that is, reduces income share of the poorest deciles in poor countries. The analysis also reveals that this increased inequality could be lessened with the economic development of the country. As for the other variables (logarithm of GDP, participation of women in labor force and inflation rate), we find that the logarithm of GDP is significantly positive and the other variable, participation of women in labor force has also significant effect on income inequality. The negative value of its coefficient suggests that inequality decreases with the increasing participation of women in the labor force. However, the analysis does not reveal any effect of inflation rate on the income distribution.

From the above synthesis we can conclude that, unless globalization is cautiously managed, poor countries and poor people will become increasingly marginalized. Globalization needs more management – to open opportunities for the poorest countries, not close or restrict them in order to create employment and avoid greater economic disparities – both among and within countries. The study also implies that developing country like Bangladesh should consider inequality at the national level as a target of public policy in order to bring it to a point of sustained economic growth and development.

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