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# **Preliminary Evaluation of Economic Development and its Effect on Income Distribution in Bangladesh**

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## **Abstract**

*This paper investigates the progress of economic development and its effects on income distribution in Bangladesh since her independence in 1970. Various Household Expenditure Survey data are used to evaluate economic development based on per capita income, percentage expenditure on non-food items, non-agricultural occupation, population below poverty line; and family size. While the traditional Gini index, shares of income of the top and bottom deciles as well as some new measures of income inequalities are used to show income distribution in Bangladesh since independence. It is shown that Bangladesh has made noticeable economic development but income inequality has increased at a rapid pace over time since her independence. This paper also investigates the relationship between economic development and income inequalities, using a new functional form that fits the data well. Results suggest that income inequality has a significant positive effect on economic development. It reconfirms the Kuznets' (1955) hypothesis that at an early stage of development the inequality of income increases.*

## **Introduction**

This paper investigates the progress of development and its effects on income distribution in Bangladesh from the early 1970's to the end of the century. This is the time when Bangladesh achieved its independence, as well as "since 1975 the world has not only become a richer place, but the world's poor have seen their incomes grow faster than the world's rich. From this perspective, therefore the world economy has been performing a lot better in the last quarter century than in the previous two hundred years" (see J.B Delong, 2001).

Various economic, modernisation, urbanisation and demographic criteria are used in this study to measure the degree of development. This study also uses various economic inequalities such as the Gini coefficient, shares of the incomes by the top and bottom deciles, as well as the quotient and difference of the top and bottom deciles of the population using various Household Expenditure Survey (HES) data collected by the Bangladesh Bureau of Statistics (BBS). The objectives of the study are as follows.

. This study investigates how Bangladesh has performed during the last 30 years since her independence.

. It also investigates what happens to the income distribution in Bangladesh during the last three decades, which is popularly known as the world's 'period of development'.

. This study also examines whether there does exist any relationship between economic development and income inequality.

Descriptive statistics and techniques of econometrics are used to investigate the above objectives. This study is organised as follows. A brief description of the data used for the study is provided in the next section. The following section is concerned with economic development in Bangladesh. It is then followed by a discussion on the measurements of income inequalities in Bangladesh. While, the relationship between economic development and income inequalities is then presented in the next section. Finally, some concluding remarks and limitations of the study are given in the last section.

### **Data**

This study uses various Household Expenditure Survey (HES) data collected by the Bangladesh Bureau of Statistics (BBS), which is discussed as follows. The first HES was undertaken in mid fifties in Bangladesh, but was restricted to only four big cities. This was later extended to cover the rural areas to provide information about labour force inquiries. After independence, the first HES was carried out by the BBS in 1973-74. The HES was then undertaken in 1974-75, 1975-76, 1976-77, 1977-78, 1978 – 79 and 1981-82. But the detailed information of these HESs was not published. In 1983-84, the diary system for collecting information of expenditures on various consumption items was first introduced in Bangladesh and it then continued until the end of the century, even though it has undergone some changes from various versions of the HESs. We have used various information for development and inequality indicators based on the 1973-74, 1983-84, 1985-86, 1988-89, 1991-92, 1995-96 and 2000 HES data collected by the BBS for Bangladesh.

### **Development Indicators for Bangladesh**

Bangladesh is situated in the fertile Ganges valley. It is a small country with approximately an area of 55,750 sq miles. Its present population is 126.11 million (BBS: 2000), one of the most densely populated country in the world. It was a part of India before 1947. During the British rule almost the entire country (present Bangladesh) was used as a hinterland to supply raw materials to the British industries either in UK or in India. They did not develop any industry in Bangladesh at all. In short, there was no economic infrastructure at all during the British period. After independence in 1947, Bangladesh became a part of Pakistan and it was known as 'East Pakistan'. Unfortunately, the Pakistani government treated Bangladesh like the British. They too used Bangladesh as a hinterland to get raw materials for their industries, but did not develop any economic infrastructure in Bangladesh. They further exploited the weak situation of Bangladesh and took away the proper share of national wealth from Bangladesh. More importantly, the then Pakistani Military Junta failed to handover the administrative power to the democratically elected majority party, the Awami League elected from East Pakistan, and also there was military crack down all over Bangladesh when they killed more than three million people all over the country. As a consequence, civil war broke out for "Bangladesh Self Rights" and subsequently it turned out to be the "Fight for Independence for Bangladesh." On December 16, 1970 the Pakistani army was defeated and Bangladesh became an independent country, which virtually had no economic infrastructure, and started from zero development.

The new independent Bangladesh started with zero development, but began with high hopes for economic, social and other prospects for all Bangladeshi people. In

this paper we investigate the progress of economic development in Bangladesh based on the following five broad criteria of development for the first three decades since her independence.

- . Per capita income
- . Expenditure share for non-food items
- . Share for Non-agricultural occupation
- . Family size
- . Percentage of population below poverty line

In this study, per capita income observed from the HES is used as an indicator for direct economic development rather than per capita gross national product, which was used previously by a number of authors such as Mbaku (1997), Ram (1995), Papanek and Kyn (1986), Hicks and Streeten (1979), Saith (1983), Simpson (1990) and Ahmed (2004). The development is usually judged on the basis that the higher the per capita income the higher the development and vice versa. The expenditure share for non-food items is also used as an indicator for development by many authors such as Ahmed (2004). The idea here is that the more money you spend on non-food items, the better your economic conditions. This means that if someone spends a lesser percentage of expendable money for food then the more expendable money is left for other essential items such as housing, clothing, education, etc. This implies that the higher the percentage of non-food items the higher the living standard, which implies that they will get better quality goods and services with the increasing development. Most people in underdeveloped and developing countries maintain their livelihood working in the agricultural sector. But with the progress of economic development people gain variety of skills and undertake more marketable occupations by giving up agricultural occupations. The opportunities for non-

agricultural occupations are generally created in the urban areas. Hence, as urban activities expand people try to leave agricultural occupation and take up non-agricultural occupations. The higher proportion of non-agricultural occupation leads to higher economic development. Motonishi (2003) used this criterion as an indicator for development in Thailand. In addition to these studies, there are many studies such as Kuznets (1976a) and Ahmed (2004), which showed that with the progress of development, the family size is getting smaller. This is probably because the size distribution among persons in households, by household income per person; the upper income classes is dominated by small household size. While, and the lower income classes show an overrepresentation of persons or consumers in the larger households. Thus, the very identity of the lower and upper groups on the income scale shifts as we convert a size distribution of households by income per household to a size distribution of persons by income per person. Hence the lower family size is the indication of higher development. The poverty line is usually drawn to meet the basic needs for survival with minimum dignity. Therefore the percentage of population below poverty line can be taken as a measure of development. The lesser the percentage of population below poverty line is the better the development in a developing country.

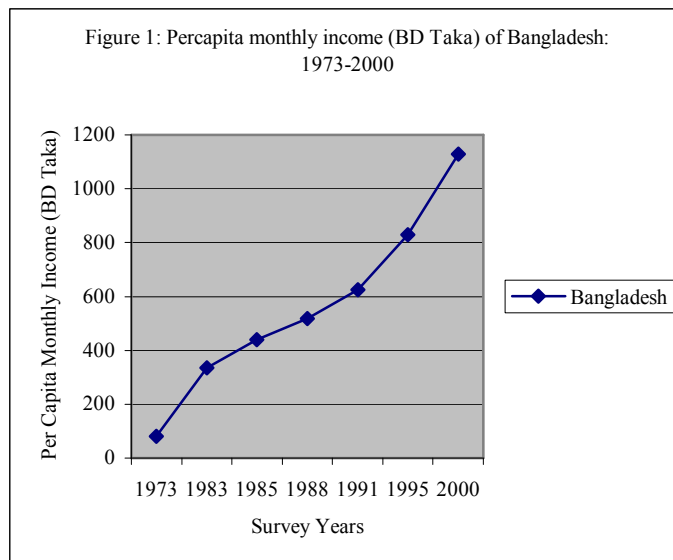
The following table 1, and Figures 1 and 2 provide per capita monthly income, percentage of expenditure on non-food items, people's occupation in non-agricultural sector, population below poverty line; and family size for Bangladesh during 1973 – 2000. It clearly shows that per capita income, percentage expenditure of non-food items, occupation in non-agricultural sector all are growing at a rapid pace. The percentage of population below poverty line declines rapidly from 81.70% in 1973 to 44.33% in

2000, while the family size is declining steadily. All these indicators are leading to the conclusion that Bangladesh is definitely developing since her independence in 1971. Earlier Haque (2004) has shown that there has been development in Bangladesh based on food share criterion. In this context a World Bank Study (2000) mentioned: “Bangladesh has made great strides since its independence in 1971 – in food grain production, prevention of famines, effective response to natural calamities, and achievements on social front”. This is quite consistent with our findings.

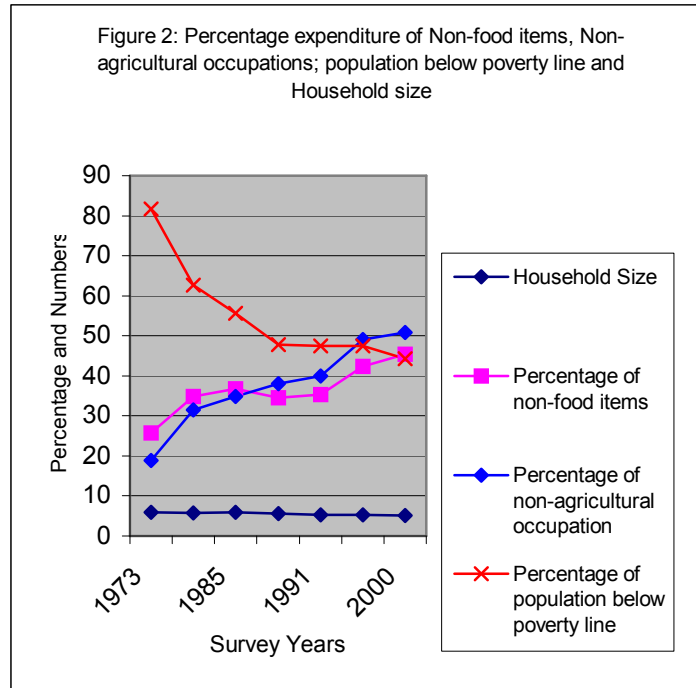
**Table 1: Development Indicators for Bangladesh: 1973 – 2000.**

| Year    | Monthly per capita income (BD Taka) | Percentage expenditure for non-food items | Percentage of people's occupation in non-agriculture | Family size | Percentage of population below poverty line |
|---------|-------------------------------------|-------------------------------------------|------------------------------------------------------|-------------|---------------------------------------------|
| 1973/74 | 80                                  | 25.80                                     | 18.1                                                 | 5.93        | 81.70                                       |
| 1983/83 | 336                                 | 34.90                                     | 31.5                                                 | 5.71        | 62.60                                       |
| 1985/86 | 440                                 | 36.70                                     | 34.8                                                 | 5.86        | 55.65                                       |
| 1988/89 | 517                                 | 34.60                                     | 38                                                   | 5.54        | 47.75                                       |
| 1991/92 | 625                                 | 35.30                                     | 40                                                   | 5.35        | 47.52                                       |
| 1995/96 | 830                                 | 42.30                                     | 49.13                                                | 5.26        | 47.53                                       |
| 2000    | 1128                                | 45.40                                     | 50.84                                                | 5.18        | 44.33                                       |

Source: Household expenditure surveys, 1988/89, 1995/96 and 2000, Bangladesh Bureau of Statistics, Dhaka, Government of the People's Republic of Bangladesh.



Source: Household expenditure surveys, 1988/89, 1995/96 and 2000, Bangladesh Bureau of Statistics, Dhaka, Government of the People's Republic of Bangladesh.



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## Income Distribution

Income distribution is extremely important for economic, social and other development. Because it influences the cohesion of society, determines the extent of poverty for any given average per capita income and the poverty reducing the effects of growth, and even affects people's health. Hence distribution of income among its citizens for any country is very important to maintain peace and tranquillity. In recent years, we have seen that many wealthy developing countries, such as Indonesia and Iran were destroyed due to unequal distribution of income and wealth. In this section we will see how Bangladesh is doing

in terms of distribution of income for her citizens during the first phase of development since her independence, which is also the world's 'period of economic development'.

We have seen some good news earlier that Bangladesh is making good economic development. Now we want to see how Bangladesh is managing distribution of income within the country. In fact, it is a challenge for any country to maintain equity rather than efficiency. We will see what happens to income distribution during the last 30 years, the world's period of 'economic development'. Our judgement is to measure income inequality by using the following major criteria: share of the incomes by the top and bottom deciles of the population, as well as the quotient and difference of the top and bottom deciles, and the Gini coefficient, a very widely used popular inequality measure. The estimates of these indicators of income inequality for Bangladesh are presented in the following Table 2. This table clearly shows that income distribution is worsening in Bangladesh since its independence. It demonstrates that Bangladesh government and society as a whole clearly fail to maintain an egalitarian society. It is interesting to note that during 1970's and 80's Bangladesh reasonably maintained a stagnant income distribution. This is probably because most of the people were poor at that time.

But in course of time, economic development occurred as we have seen earlier and during initial stages of economic development, the rich and affluent classes take opportunities to get big business and other development operations to save more money at a higher rate compared to the rest of the population. Moreover industrialisation and the development of urban areas produce a wealthy middle class, consisting of merchants, business people,

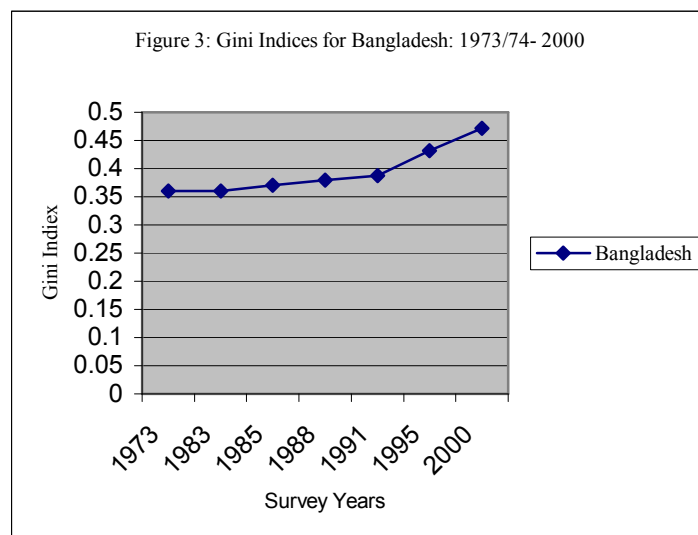
intellectuals and civil servants, all belong to the economy involving money. But, the vast majority of the rural peasant population virtually remain outside market economy. As a result, the society became more unequal in income distribution. In this regard, a World Bank Study referring to Bangladesh mentioned: “To reduce poverty, it is crucial to develop rural areas – where most of the people live”.

Table 2, and Figures 3 and 4 clearly show that income shared by the lower 10% population is only 1.84%, while top 10% shared more than 40% in 2000. It is indeed a wider gap between rich and poor. It is indeed a rapid worsening situation. When we compare the Gini coefficient to measure the income inequality, the picture still remains gloomy. In 1988/89 the Gini coefficient was 0.379, but it reaches to 0.472 in 2000. This is indeed a big unequal distribution of income for a society within only 10 years. The rate at which this unequal distribution of income is occurring is indeed frightening and should be checked immediately. A World Bank Study also found similar picture and recommended: “Poverty in Bangladesh must be reduced by helping agricultural and rural non-farm sectors grow faster and by strengthening rural institutions that empower rural people to improve their income and welfare”. Failure to do so, may lead to another bout of devastation, in the country, as we have seen recently in Iran and Indonesia.

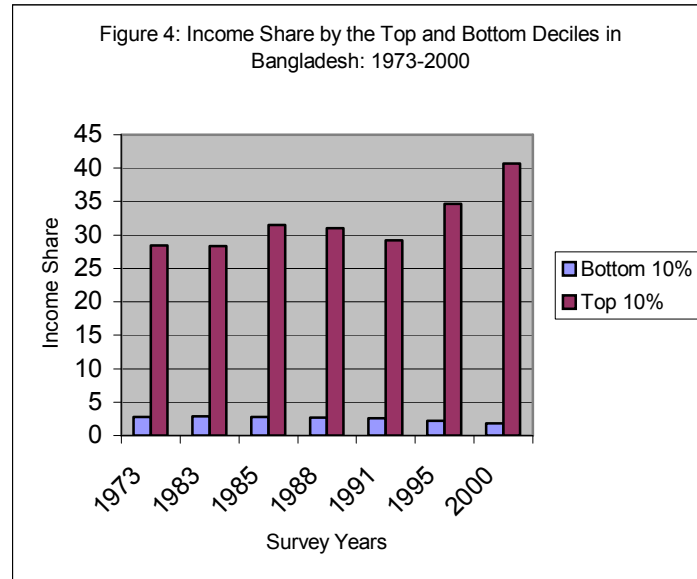
**Table 2: Measures of Income Inequality in Bangladesh: 1972-2000.**

| Year    | Income share of lower 10% (BD) of the population | Income share of higher 10% (TD) of the Population | Gini coefficient | Income Share Ratio (TD/BD) | Income Share Gap (TD-BD) |
|---------|--------------------------------------------------|---------------------------------------------------|------------------|----------------------------|--------------------------|
| 1973/74 | 2.80                                             | 28.40                                             | 0.36             | 10.14                      | 25.6                     |
| 1983/83 | 2.89                                             | 28.30                                             | 0.360            | 9.79                       | 25.41                    |
| 1985/86 | 2.81                                             | 31.46                                             | 0.370            | 11.20                      | 28.65                    |
| 1988/89 | 2.64                                             | 31.00                                             | 0.379            | 11.74                      | 28.36                    |
| 1991/92 | 2.58                                             | 29.23                                             | 0.388            | 11.33                      | 26.65                    |
| 1995/96 | 2.24                                             | 34.69                                             | 0.432            | 15.49                      | 32.45                    |
| 2000    | 1.84                                             | 40.72                                             | 0.472            | 22.12                      | 38.88                    |

Source: Household expenditure surveys, 1988/89, 1995/96 and 2000, Bangladesh Bureau of Statistics, Dhaka, Government of the People's Republic of Bangladesh.



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### The Relationship between Economic Development and Income Inequality

The relationship between economic development and income inequality of a country has long been studied since Kuznets' (1955) pioneering work, which demonstrates that income inequality increases at an early stage of development. Since then, particularly during the last couple of decades a huge number of studies have been written on the topic. In short, Kuznets' hypothesis has received considerable attention in the literature of development and distribution of resources. Many authors such as Kuznets (1955, 1976a, 1976b), Cromwell (1977), Fields (1979, 1994), Knight (1976), Nugent (1983), Robinson (1976), Papanek (1978), Papanek and Kyn (1986), Simpson (1990), Ikemoto and Uehara (2000) developed theoretical models to explain the hypothesis. But

there are others who did not support the hypothesis among them Braulke (1983), Ram (1995), Saith (1983) and Anand and Kanbur (1984) are important.

In this study, we have used per capita income based on HESs instead of per capita GNP, which was used by a number of authors such as Saith (1983), Papanek and Kyn (1986), Ram (1995) and many others. The main purpose here is to find a relationship between per capita income (an indicator of economic development) and income inequality (based on various income inequality measures), which is provided in the following section.

### **Methodological Development and Its Applications**

It is expected for a country, which has undergone economic development that income inequality will continue to increase for a relatively long period of time unless explicit countervailing measures are taken. Bangladesh is relatively a new country and hence its income inequality is expected to grow as we

have seen in section 4, probably because the government's failure to implement countermeasure initiatives to reduce income inequality. For this study we are basically using time series data, which can shed more light on the evaluation of distribution. They not only refer directly to the secular trends, but also more likely to compare data quality. Fishlow (1972), Wesskoff (1970) and many others used time series data to establish the relationship between economic development and income inequality. In this section we will try to examine whether there does exist any relationship between economic development and income inequality in Bangladesh?

Selecting a best functional form that fits the data well is very important, since its estimated parameters appreciably depend on the functional form used. In this respect, many authors such as Saith (1983), Papanek and Kyn (1986) and many others used second-degree polynomials in logarithms in per capita GNP to test the Kuznet's hypothesis. However, the hypothesis does not really need or even suggest such a functional form. It may consist of a wide variety of functional forms that provide the fact that inequality first rises with income (economic development) then declines. Moreover, finding a best functional form that fits the data well is really an empirical issue. Hence, we have fitted many functions including the following widely used functional forms to establish the relationship between economic development (per capita income) and various income inequality measures (Gini index, shares of the top and bottom deciles of the population; as well as the quotient and the difference of the top and bottom deciles) obtained from various HESs conducted by the BBS.

(i) Linear (L):  $\text{Inequality} = \alpha + \beta (\text{per capita income}) + \varepsilon$

(ii) Semilog (SL):  $\text{Inequality} = \alpha + \beta \log (\text{per capita income}) + \varepsilon$

(iii) Semi-log Quadratic (SLQ):  $\text{Inequality} = \alpha + \beta \log (\text{per capita income}) + \gamma \log (\text{per capita income})^2 + \varepsilon$

(iv) Double Semi-log (DSL):  $\text{Inequality} = \alpha + \beta (\text{per capita income}) + \gamma \log (\text{per capita income}) + \varepsilon$

where  $\alpha$  is the intercept term,  $\beta$  and  $\gamma$  are the regression coefficients, which are expected to be positive and negative respectively, and  $\varepsilon$  is the error term, which follows NID (0, 1). Traditionally, per capita gross national product and its derivatives are used to measure economic development. But, in this study, per capita income obtained from the HES is used for economic development.

Inequalities are measured by five quantities: the Gini index, shares of the top and bottom deciles of the population; as well as the quotient and the difference of the top and bottom deciles. The Gini index is widely used to measure income inequality. Also the top and bottom deciles are used to measure income inequality by many authors such as Harding (2001), Harding and Greenwell (2002), Saunders (2003), Ahmed (2004), Mbaku (1997). Mbaku (1997), Smeeding (2000), Barrett et al. (2000), and others have used the quotient of the shares of income by the top and bottom deciles as the measure of income inequality. In addition to these, we have also used the difference between the shares of incomes made by the top and bottom deciles as a measure of inequality of income. It can be regarded as a superior measure over other inequality measures, because this will clearly provide a better understanding about the actual gap between the poor and the rich. We have used all these as separate dependent variables and run the above regressions, using the Ordinary Least Square (OLS) Method. The SPSS computer software is used for this purpose.

We run a lot of regressions including 20 regressions generated from the above four functional forms for 5 different income-inequality measures. Our judgement to select a best functional form is based on the grounds of goodness of fit, using the adjusted coefficient of determination (Adj.  $R^2$ ). This is quite justified because in

the above four equations [(i) – (iv)], we have the same dependent variable and different number of independent variables, hence for comparison purposes the coefficient of determination needs to be adjusted with respect to the degrees of freedom for each model. The estimated adjusted coefficients of determinations (Adj.  $R^2$ ) for different functional forms are presented in the following Table 3. It is clear from this table that the Adj.  $R^2$  values of DSL function for all inequality measures are very high, indicating the DSL function fits well to Bangladeshi data. It is clear from this table that the DSL function is the best functional form that dominates other functions on the grounds of goodness of fit. Hence, the estimated parameters along with other statistics will only be given for this DSL functional form for any subsequent analysis. It should be mentioned that Haque (2005) first used this DSL function for the Australian family budget analysis. This function has the pleasing feature that it is quite flexible in that it gives rise to a wide range of shapes.

The estimated parameters together with other statistics for the DSL functional form are presented in Table 4. This table shows that the adjusted  $R^2$  values for all inequality measures are very high, indicating that the double semi-log function fits well to the data to measure the relationship between economic development and income inequalities for Bangladesh.

**Table 3: The Adjusted Co-efficient of Determination (Adj.  $R^2$ )**

| Functional Form          | Measurements of Income Inequality |            |            |            |            |
|--------------------------|-----------------------------------|------------|------------|------------|------------|
|                          | Gini                              | TD         | BD         | TD/BD      | TD – BD    |
| Linear (L)               | 0.875                             | 0.766      | 0.834      | 0.780      | 0.780      |
| Semi-log (SL)            | 0.453                             | 0.379      | 0.386      | 0.337      | 0.385      |
| Semi-log Quadratic (SLQ) | 0.974                             | 0.792      | 0.986      | 0.883      | 0.817      |
| Double Semi-log (DSL)    | 0.987                             | 0.845      | 0.989      | 0.942      | 0.868      |
| <b>BEST Function</b>     | <b>DSL</b>                        | <b>DSL</b> | <b>DSL</b> | <b>DSL</b> | <b>DSL</b> |

Source: Household expenditure surveys, 1988/89, 1995/96 and 2000, Bangladesh Bureau of Statistics, Dhaka, Government of the People's Republic of Bangladesh.

**Table 4: Regression Results for DSL function along with other statistics for Bangladesh\***

| Independent Variables & Other Statistics | Dependent Variables |                    |                     |                    |                   |
|------------------------------------------|---------------------|--------------------|---------------------|--------------------|-------------------|
|                                          | Gini                | TD                 | BD                  | TD/BD              | (TD-BD)           |
| Constant                                 | 0.5060<br>(0.000)   | 43.862<br>(0.011)  | 1.248<br>(0.004)    | 29.395<br>(0.008)  | 42.614<br>(0.012) |
| Per capita income                        | 0.00020<br>(0.000)  | 0.02057<br>(0.016) | -0.00192<br>(0.000) | 0.02256<br>(0.002) | 0.0225<br>(0.012) |
| Log of per capita income                 | -0.0854<br>(0.003)  | -8.872<br>(0.131)  | 0.899<br>(0.001)    | -10.951<br>(0.018) | -9.770<br>(0.105) |
| Adjusted $R^2$                           | 0.987               | 0.846              | 0.990               | 0.942              | 0.868             |
| D-W Statistics                           | 3.091               | 1.91               | 3.207               | 1.604**            | 1.937             |
| Mean                                     | 0.3944              | 31.9714            | 2.5429              | 13.117             | 29.429            |
| C.V                                      | .1069               | .1392              | .148                | .335               | .163              |

\* Two tailed significant-values are presented in the parentheses.

\*\* Indicates a very mild autocorrelation problem exists.

The D-W statistics show that there is no autocorrelation problem, and hence we do not pursue further into the first-order autoregressive AR1 and augmented Dickey-Fuller (ADF) test. More importantly, this table also shows that the regression coefficients for per

capita income for all inequality measures are positive except the bottom decile, which is expected. Conversely, the sign of the regression coefficients for log of per capita income of all measure of inequalities are negative except bottom decile, which is also expected. This means that the regression coefficients all have expected signs for Bangladesh. This reconfirms the Kuznet's hypothesis that at an early phase of development the inequality of income would increase and at a later time it would probably decrease.

The mean inequality for all indicators shows that high-income inequality exists within Bangladeshi people. The reported coefficient of variation reconfirms that income is very highly variable and a very high-income inequality exists among Bangladeshi people during the period of 'economic development.' More importantly, it shows that income inequality is increasing over time in Bangladesh since her independence.

## **Conclusions**

Some concluding remarks are made in this section. In this paper we have investigated economic development during the last 30 years since the independence of Bangladesh, which is also the world's 'period of economic development'. This paper confirms that Bangladesh has made good economic development in terms of per capita income, shares of non-food items and non-agricultural occupation, percentage of population below poverty line as well as family size. More importantly, it becomes apparent that developing countries can make progress towards development if they get opportunity for development. This is good side for developing countries. But, when we look at the distribution of income in terms of income shares at the top and bottom deciles, their quotient and differences and

the Gini index, we found that the income distribution in Bangladesh has worsened with the progress of economic development. More importantly, the gap between rich and poor in Bangladesh is getting bigger and bigger as economic development progresses.

This analysis indicates that Bangladesh government and the society as a whole have failed to make an egalitarian society, probably because of the first phase of development, which is expected from a developing country, despite her economic development. However, this is a good time for Bangladesh government to intervene and make sure that the benefit of economic development is shared by all people, such that everybody will have a fair go. Failure to do so may indicate that the country will be heading to another social unrest and economic ruin.

Finally we have estimated the relationship between income inequalities and economic development (taking per capita income as an indicator for economic development), and we found that the DSL functional form is appropriate for Bangladesh, indicating that income inequality will continue to rise with the rise of economic development. We have introduced some additional income inequality measures such as the quotient and the difference of the top and bottom deciles, as well as we have used per capita income rather than per capita gross domestic product as an indicator of economic development, which has been taken from various HESs undertaken at various point in the last quarter of the last century. Actually, we have used time series data to see the change of economic development and income inequalities over time.

This paper challenges the belief that income inequality has negative relationship with economic development. These trends prompted a surge of interest in

the relationship between economic development and income inequality and in particular, a reassessment of how a country's level of economic development predicts its subsequent rate of income inequality. This paper directly estimates how changes in income are related with changes in inequality within a given country. Results suggest that in the short and medium term an increase in a country's economic development has a significant positive relationship with income inequality. It is too early however to draw any definitive conclusions, because of unavailability of enough data to accurately measure this relationship.

Even within this short term with small number of data points for Bangladesh, positive relationship between economic development and income inequality is proven to be robust. This study has investigated how these two variables and their underlying determinants are interconnected. We have seen some positive relationship between economic development and income inequality by testing regression coefficients, but further tests are needed when more observations are available. This paper suggests undertaking further assessment of the reduced form of the relationship between these two variables, and also more theoretical and empirical work evaluating the channels through which economic development and income inequality and any other variables are related. More importantly, estimation of income inequality elasticity will be more interesting to understand the extent of the income inequality problem, which is related to the increase of income, and is left for further study (The estimation of income inequality elasticity and the rate at which it increases are now under study and will be reported once completed. This will be more valuable to make proper social policy for the wellbeing of the people of the country).

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### **Biographical Sketch**

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