

# **THE CONTRIBUTION OF EXPORT AND IMPORT OF INFORMATION & COMMUNICATION TECHNOLOGY (ICT) SERVICES TO GDP IN BANGLADESH**

**Nesar Ahmed**  
**Banker**  
**Bank Asia**  
**nesar@bankasia.com.bd**  
**www.bankasia.net**

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## **ABSTRACT**

The focus of the paper is on examining the long-run and potentially relationship between ICT services and economic growth performance of Bangladesh, in part to test the endogenous technology growth model and detail description of the data series used to proxy measures of ICT services, followed by analysis of the relationship between the ICT services and GDP in Bangladesh. The paper provides evidence of inconceivable growth of the macro-economic indicators Gross Domestic Product (GDP), Communications, computer, etc. (% of service exports, BoP) (EXPORT) and Communications, computer, etc. (% of service imports, BoP) (IMPORT) over the past three decades. The percentage of GDP occupied by each of the EXPORT and IMPORT indicator is in significant level in recent time though their contribution were little in 1981-2010. The multiple regression analysis based on data from 1981 to 2010 indicates that the growth of Bangladesh economy. The trend of the series GDP, EXPORT and IMPORT are increasing and showed an inconceivable growth in every series over the years.

## **I. INTRODUCTION**

Services of Information & Communication Technology (ICT) in Bangladesh have become a common phenomenon in recent years. In the late 1990s, various technologies have been applied to support the unique characteristics of Bangladesh, including variables are computers, mobile phone, land phone, internet etc which activities are electronic data interchange, interactive voice response, voice mail, email, on-line conferencing, and web service delivery. A time series analysis of the data from Bangladesh shows that one of the ICT services indicators has long-run effects on the output per worker. ICT services indicators are an indispensable resource for the socio-economic development of any country as it is needed and utilized by society for its development and prosperity. The Gross Domestic Product (GDP), EXPORT and IMPORT are the most important macro-economic indicators for a country. These indicators are the integral

part of the total developmental effort and national growth of all economies including Bangladesh. The increased level of export of goods and services can play an important role in the development plan of Bangladesh where foreign exchange scarcity constitutes a critical bottleneck. The EXPORT can largely meet 'foreign exchange gap' and EXPORT growth would increase the IMPORT capacity of the country which would boost up industrialization as well as overall economic activities. Despite high pressure on the IMPORT bills due to price hike of crude oil and other essential commodities in international market, Bangladesh's foreign trade remains at a satisfactory level (Bangladesh Economic Review, 2010). However, the balance of trade of Bangladesh remained in deficit. The objective of trade policy throughout the 1990's was to promote rapid export growth by reducing and eliminating the anti-export bias prevalent in the economy (Shahabuddin et al, 2004). ICT services (Information and Communication Technology) are effectively showing new dimensions to old institutional setups. There is a reinforced thrust for an informed and participatory citizenry for efficient e-governance. It goes without saying that impact of ICT services on institutional changes is fast spreading across the boundaries of social and political arrangements of societies.

One of the traditional ways to test the relationship between two variables is to apply Ordinary Least Square Estimation. Pohjola (2001) endogenous GDP growth rates on a number of independent variables and found three knowledge related variables, education, openness to trade, and the availability of communications infrastructure, positively correlated to GDP growth. Bruinshoodf & Ter Weel (1998) used OLS and found results suggesting a positive correlation between the R&D intensity of a sector and the wage premium of white-collar to blue-collar workers. Morissette & Dolet (1998) found via OLS estimation, that IT application users generate more income than non-users. However, it is important to identify whether these relationships are fundamental or 'spurious'. For this we need to consider the order of integration of the data and the potential for co-integration or spurious regression. As suggested by Lee & Gholami (2001), relying solely on OLS estimation sometimes creates the time series problem of 'spurious regression' which is often neglected or ignored. An approach which removes the spurious regression problem is co-integration estimation.

The paper are to show the growth of the macro-economic indicators GDP, EXPORT and IMPORT, to measure the contribution of EXPORT and IMPORT to the GDP from the existing data set and lastly to measure the future contribution of EXPORT and IMPORT to GDP from the our results. This article explores the major role ICT services indicator and its impact on the user communities in Bangladesh. Equal importance is also given to how the communities are getting the latest information facilities through ICT services and explores how ICT services can be strapped up to promote development of the rural communities in Bangladesh that is future directions for further development of ICT services in Bangladesh. Model specification, data and methodology are given in section II. Section III and IV show analytical analysis and discusses empirical results on developments in trade of ICT services and economic growth over the past thirty years, while the final section concludes the study is to examine the linkages between trade of ICT services and economic growth on the economy of Bangladesh.

## II. DATA AND METHODOLOGY

### II.1 Data Sources

The paper outlines GDP determining by the asymmetric effects of ICT services trade policy. The time-series model is presented and an analysis of the difference in the asymmetric expansionary effects of ICT services trade policy on GDP within countries, Bangladesh, is presented. The paper used the data of the three indicators, GDP, EXPORT and IMPORT for the past three decades starting from year 1981 to 2010 from the “World Development Indicators (WDI-CD Rom), 2011” published on April, 2011 by The World Bank. The data are denominated in U.S dollars (U.S \$) and come from the World Development Indicators (WDI) database of the World Bank. There is an approach to explain the factors determining the GDP. The elasticity approach focuses on the EXPORT and IMPORT as the major determinant of the GDP.

### II.2 Analytical Framework

The regression equation as the test is applied to log-linear form for estimation:

$$\ln(GDP) = \beta_0 + \beta_1 \ln(EXPORT)_t - \beta_2 \ln(IMPORT)_t + \mu_t \quad (1)$$

Where  $\ln$  is natural log, GDP is gross domestic product, EXPORT is Communications, computer, etc. (% of service exports, BoP) at current U.S \$ price, IMPORT is Communications, computer, etc. (% of service imports, BoP) at current U.S \$ price, and  $\mu$  is well behaves error term and  $t$  is the period of time from 1981 to 2010.

The expected signs are  $\beta_0 > 0$ ,  $\beta_1 > 0$  and  $\beta_2 < 0$  respectively. We expect  $\beta_1 > 0$ , In general, increase in EXPORT will increase fiscal surplus if revenue is generated in the same proportion. We expect, again,  $\beta_2 < 0$ , the degree of fiscal deficit is an important factor that determines the ICT services trade position.

To estimate the model, a multiple regression analysis was used in order to reflect the explanatory nature of the variables. To verify the validity of the model, two major evaluation criteria were used: (i) the a-priori expectation criteria which is based on the signs and magnitudes of the coefficients of the variables under investigation, (ii) Statistical criteria which is based on statistical theory, which in other words is referred to as the Least Square (LS) consisting of R-square ( $R^2$ ), Adjusted  $R^2$ , Akaike info criterion (AIC), Schwarz criterion (SC), F-statistic and Durbin-Watson (D-W) test. A widely used multiple regression framework is taken to separate out the effects of key macroeconomic factors, EXPORT and IMPORT, on GDP.

## III. RESULTS AND DISCUSSION

The diagnostic check of stationarity, and considered series is carried out by Least Squares (OLS) test by multiple regression analysis. Given these stylized facts and despite the limitations in our analysis, it seems important to take into consideration the factors that may be driving open economy. The purpose of this paper is to determine the exogenous effect of trade policies on GDP in Bangladesh.

**Regression equation,**  $\ln(GDP) = \beta_0 + \beta_1 \ln(EXPORT)_t - \beta_2 \ln(IMPORT)_t + \mu_t$

$$\ln(GDP) = 12.91938 + 3.152976 \ln(EXPORT)_t - 0.833703 \ln(IMPORT)_t + \mu_t$$

The regression results for dependent variable of GDP in Table 1 – whether EXPORT and IMPORT emphasizes that data in long time series must be trended so that the estimated coefficients are founded by LS method. In the case of the LS with fixed effects analysis, a highly significant coefficient of EXPORT and IMPORT on GDP is obtained. The results reported in regression equation is generally satisfactory in the sense that signs of the coefficients are mostly as expected and they are statistically significant at the usual levels of confidence on economic growth in Bangladesh. We found a negative significant relationship between IMPORT and GDP growth, implying that the estimated coefficient - 0.833703 implies that IMPORT-GDP ratio by one percentage increase GE leads to ER growth by - 0.833703 percent per annum, and positive significant relationship between EXPORT and GDP growth, implying that the estimated coefficient 3.152976 implies that EXPORT-GDP ratio by one percentage increase EXPORT leads to GDP growth by 3.152976 percent per annum.

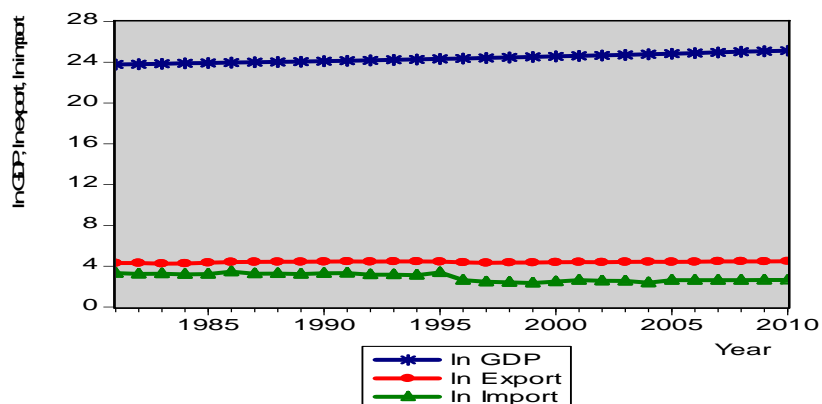
**Table-1: Results of regression analysis**

**Least Square Method for Period 181 to 2010  
Dependent Variable: LN GDP**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_EXPORT	3.152976	0.459236	6.865695	0.0000
LN_IMPORT	-0.833703	0.077767	-10.72054	0.0000
C	12.91938	2.058597	6.275816	0.0000
R-squared	0.868297	Mean dependent var		24.38888
Adjusted R-squared	0.858541	S.D. dependent var		0.415047
S.E. of regression	0.156104	Akaike info criterion		-0.781954
Sum squared resid	0.657945	Schwarz criterion		-0.641835
Log likelihood	14.72932	F-statistic		89.00320
Durbin-Watson stat	2.123015	Prob(F-statistic)		0.000000

The R-square ( $R^2$ ), Adjusted  $R^2$ , Akaike info criterion (AIC), Schwarz criterion (SC), F–statistic and Durbin-Watson (D-W) test is, concerned with the overall explanatory power of the regression analysis, used to test the significant contribution of each of the independent variables on the dependent. At 1%, 5% and 10% level of significance, F testing used to measure goodness fitting of model parameters estimated and as the p value of F statistics is very low i.e. zero. The model, therefore, is a significant, because F and p-values for the relationships, GDP and EXPORT; GDP and IMPORT, are statistically significant and include enabled a better fit of the model, as reflected in the higher within- $R^2$  and adjusted- $R^2$  statistic and estimated of explanatory variable show significantly produces better results indicating 0.868297 and 0.858541. D-W test show that multiple correlation coefficient to measure the strength of relationships correlation, adjusted  $R^2$  or coefficient  $R^2$ , which indicates the proportion of explained changes to the overall

changes. At 5% level of significance, the calculated value for D-W, 2.123015, is greater than 2, i.e. there is negative serial correlation. D-W statistic, to sum up, show that two our explanatory factors, one, EXPORT, has a significantly positive impact on GDP and second, IMPORT, significantly negative impact on GDP.



From figure- trends of GDP, EXPORT and IMPORT of ICT services in Bangladesh, FY 1981-2010, of a country is generally taken as an increase in the standard of living of its inhabitants. Bangladesh's economy has gone through a various stages of decline and high economic growth over the three decades (1981-2010). Average GDP from independent of Bangladesh and gradually increase till to date with significantly. Figure show a tendency of GDP, EXPORT and IMPORT of ICT services over a period of 1981-2010 in the specific context of Bangladesh. The trend of GDP continued to show a rising in FY 1981-2010. The availability of foreign exchange is appreciated of Bangladesh's currency in achieving a reasonably high economic growth by reducing the current account deficit; it also reduced its external borrowing as well as external debt burden. Thus, the sustainable level of foreign exchange is expected to be an important prerequisite for accelerating the trade balanced in Bangladesh.

## V. CONCLUSION

GDP has increased over the last decade in Bangladesh, whereas the distribution of income has remained unevenly spread across geographical regions and between countries. Multiple regression analysis generally found evidence supporting of ICT services and economic growth in Bangladesh sharing a significant relationship and show results have found little support for the relationship between the two variables across countries. The results presented here from Bangladesh suggest that, over a very short and limited time period, ICT services appears to cause GDP and not vice versa. The prime priority of Bangladesh government is to ICT services and ICT services led growth theorist suggests the use of power of Information and Communication Technology (ICT services) for poverty reduction, good governance, and development. However, it poses a serious challenge for the Government of Bangladesh to take the benefits of ICT services to the whole people who form the greater section of the population.

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