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ESTIMATING THE SERVICES SECTOR IMPACT ON ECONOMIC GROWTH OF BANGLADESH: AN ECONOMETRIC INVESTIGATION

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ABSTRACT

This study attempts to examine the contribution of the service related sector in the economic growth of Bangladesh during the period of 1973-2017. We used the Gross domestic product (GDP) as a measure of economic growth for Bangladesh. Sub-sectors of service-related sector have been used as explanatory variables along with some control variables. In this study, we apply various econometric tools like as Unit Root test, Granger causality test, ARDL Bound test, Error correction model and Co-integration test to investigate the causal relationship and the intensity of the relationship between the service related sector and gross domestic product or economic growth. Granger causality test shows the presence of uni-directional granger causality from the service related sector to gross domestic product. The error correction term implies that the short-run disequilibrium is adjusted with the long-run at the speed of 17 percent. Moreover, ARDL bound approach indicates the service related sector and gross domestic product growth are correlated both in short-run and long-run. The result shows that 1% expansion in service-related sector will result in an increase of 0.64% gross domestic product or economic growth in short-run and 0.75% of GDP in the long-run.

Contribution/ Originality: This Study Contributes to the existing literature by examining both short-term and long- term contribution of the service sector on economic growth of Bangladesh using the ARDL Bound test. This study also examines the intensify of that relationship.

1. INTRODUCTION

The contribution of the three sectors- agriculture, industry and services sums up the Gross Domestic Product (GDP) of an economy. With the change in economic structure the dominance of agriculture loses its importance while industrial sector gets more significance and service sector emerges with significant contribution to the GDP as well as a number of jobs share in Bangladesh. The service sector is also known as a tertiary sector which covers area such as retails, education, health, real estate, bank, hotels, social work, computer services, gas, electricity, water supply, media, communication and recreation.

The service sector contributed to the growth of the most economies of the world although this contribution has been argued by two schools of thought where the first one presumes that service sector plays an important role in

boosting economic growth while the other question about the causality between the service sector and the economic growth.

So obviously literature would show mixed concepts that a causal synergy works amidst the service sector and economic growth. Kuznets (1957) a Nobel Prize laureate, published a work in 1957 and found that growth of GDP is related to the service sector share.

To find out whether the service sector positively or negatively affects gross domestic product (Dutt and Lee, 1993) conducted a study employing cross-section data of three decades- 1960s, 1970s and 1980s. They found that the impact of the service sector on GDP may be up beating or down beating depending on the measurement of the role of the service sector.

An empirical investigation has been performed on the data of Saudi Arabia for the period of 1969- 2012 by Alhowaish (2014) to ascertain the effect of service sector on economic growth. This study came up with positive conjunction between the service sector and economic growth. Also a stable long-run dynamic equilibrium relationship and bidirectional causality between the above two has been found. Their study instituted a startling fact that every one percent increase in service sector output will endorse 0.93 percent economic growth.

Another study executed by Jalil *et al.* (2016) in Pakistan over the period 1960- 2014 shows that the service sector is associated with economic growth in the long run.

There are some other findings which controvert the above results of which a significant work of Baumol (1967) figures out that increasing share of service sector has an off-putting effect on economic growth.

Blomstrom suggests a one-way causal relationship with no actual feedback effects in a study performed in 1996.

In Bangladesh perspective, the contribution of service sector to the GDP is about 55.89 percent while the growth of this sector is 11.95 percent holding the position of second fastest growing employment sector in Bangladesh serving 40 percent of the total employment.

Despite keeping those contributions, few studies performed to find out the causality between service sector and the economic growth of Bangladesh. Mohammad *et al.* (2012) dissected the sectoral contribution of gross domestic product of Bangladesh. A comparative analysis of service sector contribution has also been presented here. The study found that the performance of the service sector enhances to a greater extent than agricultural sector. Again this sector contributed to job creation with 25.36 percent of an average employment.

Through exploiting time series data from 1980 to 2013 (Uddin, 2015) examined the contribution of agriculture, industry and service sector to economic growth of Bangladesh and found that each of the three economic sector has significant positive linear relationship with economic growth.

Since with the passage of time the size of Bangladesh economy is becoming larger and more diversified, sectoral contribution also changes. To be on the right track of development, measuring the impact of service sector growth on economic growth is very much required. This study, therefore, aims at finding out the causality by estimating the growth effects of service sectors using appropriate as well as systematic econometric technique and analysis with annual data over the period 1973-2017. The study proceeds as the following frame with an overview of the Bangladesh economy and its sectors in section 2; with section 3 covering analytical setting. Section 4 Estimation strategies; Section 5 Variable construction and data; Section 6 exhibits the empirical results and findings; and Section 7 concludes the study.

2. AN OVERVIEW OF BANGLADESH ECONOMY AND ITS SECTORS

Over the last couple of years Bangladesh economy is growing and diversifying with the continuous acceleration of the economic wheel in various financial along with economic activities. Three basic sectors- Agriculture, Industry and Service respectively defined as primary, secondary and tertiary sectors categorized this economy. Agriculture is considered as the core sector of the economy since independence. This labor intensive sector with an abundance of labor supply has made Bangladesh economy an agro-based one. However, with the persisting expansion of the

economic activities, contribution of agriculture sector is declining over time. Currently it contributes around 14.1 percent to the Gross Domestic Product where its growth is 3.06 percent.

The secondary sector- Industry, includes Mining and Quarrying, Manufacturing, Electricity, Gas and Water supply & Construction. Manufacturing works as an engine of economic growth since industrial goods and products have high income elasticity of demand (Kaldor, 1967). In Bangladesh industries could not develop much in a better way due to political instability and lapses of infrastructural development. Notwithstanding these factors, this sector is contributing around 30.37 percent to GDP and the growth is 17.21 percent.

Service sector includes Wholesale and Retail trade, repair of motor, Hotel and Restaurants, Transport, Storage and Communication, Financial Intermediaries, Real estate, Renting and business activities, Public Administration and Defense, Education, Health and Social Works and Community, Social and Personal Services. This sector contributes 52.10 percent to GDP in FY2018.. So this sector is working for its latent demand as well as attracting large portion of workforce for its nature of absorbing people. In developing or least developing countries, where manufacturing is not showing rapid growth enough to absorb people with low skills and education, there service sector becomes larger and effective. Since this sector contributes significantly to the GDP and to employment share in Bangladesh, researchers and economists are becoming very much concerned about this sector and its growth effect.

3. ANALYTICAL SETTING

Our interpretation expresses the relationship between Gross domestic product and agriculture, Industry and service sector as like production function type:

$$GDP_t = f(AGS_t, INS_t, SES_t) \quad (1)$$

In Equation 1, AGS_t articulates Agriculture sector output, INS_t Industry sector output, and SES_t Services sector output.

The total differentiation for linearization is formulated as follows:

$$dGDP_t = D_A dAGS_t + D_I dINS_t + D_S dSES_t \quad (2)$$

Hence, D_A, D_I and D_S represent the partial derivatives of agriculture, industry and service sector, respectively. Calculate the economic growth using Equation 2 dividing by GDP:

$$\frac{dGDP}{GDP} = \frac{D_A}{GDP} dAGS_t + \frac{D_I}{GDP} dINS_t + \frac{D_S}{GDP} dSES_t \quad (3)$$

After that, using augmented Equation 3 with sector output, we calculate the elasticities:

$$\frac{dGDP}{GDP} = \frac{D_A}{GDP} dAGS_t \frac{AGS_t}{AGS_t} + \frac{D_I}{GDP} dINS_t \frac{INS_t}{INS_t} + \frac{D_S}{GDP} dSES_t \frac{SES_t}{SES_t} \quad (4)$$

Again,

$$\frac{dGDP}{GDP} = \frac{\partial f}{\partial AGS_t} \cdot \frac{AGS_t}{GDP_t} \cdot \frac{dAGS_t}{AGS_t} + \frac{\partial f}{\partial INS_t} \cdot \frac{INS_t}{GDP_t} \cdot \frac{dINS_t}{INS_t} + \frac{\partial f}{\partial SES_t} \cdot \frac{SES_t}{GDP_t} \cdot \frac{dSES_t}{SES_t} \quad (5)$$

Through generalization

$$\frac{dGDP}{GDP} = \varepsilon_A \frac{dAGS_t}{AGS_t} + \varepsilon_I \frac{dINS_t}{INS_t} + \varepsilon_S \frac{dSES_t}{SES_t} \quad (6)$$

Hence, $\varepsilon_A, \varepsilon_I$ and ε_S representagriculture, industry and service sector output elasticities. Above Equation 6 generalized by $\frac{dGDP}{GDP}, . \frac{dAGS_t}{AGS_t}, . \frac{dINS_t}{INS_t}$ and $\frac{dSES_t}{SES_t}$ to represent model.

Otherwise, may that equation four modifying by sectoral rather than elasticities. According to classical theory of factor pricing, all economic factors would get remuneration through their marginal physical productivity under perfect competition in the economy. So, $D_A = \theta_A, D_I = \theta_I$ and $D_S = \theta_S$ and Equation 5 can be rewritten as:

$$\frac{dGDP}{GDP} = \theta_{At} . \frac{AGS_t}{GDP_t} . \frac{dAGS_t}{AGS_t} + \theta_{It} . \frac{INS_t}{GDP_t} . \frac{dINS_t}{INS_t} + \theta_{St} . \frac{SES_t}{GDP_t} . \frac{dSES_t}{SES_t} \quad (7)$$

And

$$\frac{dGDP}{GDP} = \theta_{At} . \frac{dAGS_t}{AGS_t} + \theta_{It} . \frac{dINS_t}{INS_t} + \theta_{St} . \frac{dSES_t}{SES_t} \quad (8)$$

In Equation 7, θ_{At}, θ_{It} and θ_{St} are shows that value added in the agriculture, industry and service sector to total Gross domestic product. That means tertiary sector is important to demonstrate of Gross domestic product. In Bangladesh, tertiary sector is significant contributor for economic development, this analysis calculate the reduced-form bivariate model to investigate long term impact of service sector on total real gross domestic product. According to Singh (2010) the calculated equation is

$$lngdp = \alpha_0 + \alpha_1 ln\ ses_t + \epsilon_t \quad (9)$$

$lngdp$ Present logarithm of real Gross domestic product and $lses$ present logarithm of share of services.

Many economists express disagree about the Service sector impact on Gross domestic product of various economies, so the evolution of Equation 9 outcome is necessary. Therefore, we use some scientific constant to ascertain stability of direction and variable relevance of service. Production function based prior investigation suggests some kind of variables affecting real gross domestic product such as accumulation of human capital (Lucas, 1988) openness to trade (Lucas, 1988; Young, 1991) and price (Sidrauski, 1967).

Moreover, historically suggested that the various section of business is impressive in prosperous of economic development and the housework services are established as strain for economic development. Though Pugno (2006) reconciled this riddle in the theory of endogenous growth by pondering that accumulation of physical capital, educational activity and medical services. So, we in corporate various subsector shares in the statistical measurement for economic growth.

4. ESTIMATION STRATEGIES

According to time-series analysis, many econometricians recommended that must be examining long term relationship among non-stationary time series. There are suggested many econometric technique for examine the long-term relationship among non-stationary data variable. This study uses bivariate co- integration tests of Johansen (1988;1991) and Johansen and Juselius (1990) to calculate the long-term relationship during natural logarithm of real Gross domestic product and natural logarithm of service sector.

However, following estimation procedure may use equal order of regression model in time series data. Initially we examine the properties of data series time period. Therefore many test for data series are addressed in this

analysis. We use Phillips–Perron and augmented Dickey–Fuller (ADF) tests to examine the integration order among the series. For equal integration order we may apply co-integration techniques like Johansen and Juselius (1990).

The long –term relationship and minimum one way Granger causality exists among the variables in case of variables are co-integrated. In 1964, Sargan (1964) developed Error Correction Model (ECM) and Engle and Granger (1987) simplified this method in 1987.ECMs helped to rectifyshort term disequilibrium in the long term and analysis long-term and short-term causal relationship during co-integrated time series. We define the ECMs against our bi- variate model as stated below:

$$\Delta\ ln\ \ gdp_t = \beta_0 + \sum_{i=1}^{m} \gamma_{1i} \Delta\ ln\ gdp_{t-i} + \sum_{i=1}^{n} \gamma_{2i}\ \ lnser_{t-i}\ \ + \mu ECM_{t-1} \quad (10)$$

$$\Delta\ ln\ \ gdp_t = \emptyset_0 + \sum_{i=1}^{m} \delta_{1i} \Delta\ ln\ ses_{t-i} + \sum_{i=1}^{n} \delta_{2i}\ \ lngdp_{t-i}\ \ + \varphi ECM_{t-1} \quad (11)$$

Since Equation 9, *ln sers* causal of *ln gdp* evenμ is significant level (the long-term causation) or jointly all γ are significant level (short-term causation). Likewise Equation 11 present, *ln gdp* causal of *ln sers* even φ is significant level (the long-term causation) or jointly$\delta$are significant level(short-term causation).

Pesaran *et al.* (2001) proposed autoregressive distributed lag (ARDL) bounds approach to help identify robustness in co-integrated variable. When small sample size, Johansen and Juselius (1990) co- integration procedure are not applied (Mah, 2000). Moreover no co-integration relationship during variable I (1) in small sample size time series (Kremers *et al.*, 1992). Thus economic researchers apply ARDL approach for identify long term relationship among time series variable due to that procedure advantage against other econometric con-integration procedure. In terms of small size sample, ARDL method is much better than Johansen and Juselius cointegration approach (Pesaran and Shin, 1998). Again, ARDL modeling technique is free from the restrictive assumption of same order integration . The endogeneity is not a bproblem for ARDL approach due to free of their residual correlation. In 1999, Pesaran and Shin proposed ARDL model must be discern between explanatory and dependent variables, and solve the estimason even endogenity exist in the explanatory variables (Pesaran *et al.*, 2001). Hence, the ARDL procedure apply in this research analysis and solve the following regression model.

$$\Delta\ ln\ \ gdp_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta\ ln\ gdp_{t-i} + \sum_{i=1}^{p} \alpha_{2i}\ \ lnses_{t-i}\ + \sum_{i=1}^{p} \alpha_{2i} \Delta W_{t-i} + \gamma_1\ \ ln\ gdp_{t-1} + \gamma_2\, ln\ ses_{t-1} + \gamma_3\, ln\ W_{t-1} + \vartheta_t \quad (12)$$

Where α_0 present stochastic drift component and ϑ_t present white noise. Again, the summation sign in the first part of the Equation 12 is error correction model and γ_i represent long-term relationship in the second segment of this equation .The null hypothesis is H_0: $\gamma_1 = \gamma_2 = \gamma_3 = 0$(the nonexistence of long-term relationship) in this Equation 12, again H_1: $\gamma_1 \neq 0$, $\gamma_2 \neq 0$, $\gamma_3 \neq 0$ is alternative of the null hypothesis.

Pesaran *et al.* (2001) shown the F statistics calculation process which value is match with two critical values.

The regression model 13 and 14 will be stipulated for the Granger causality test in vector error correction mechanism:

$$\Delta\ ln\ \ gdp_t = \beta_0 + \varphi_{11}^{p}(L)\Delta lngdp_t\ \ + \varphi_{12}^{p}(L)\Delta\ lnses_t\ \ + \sigma_1 E_{t-1} + \epsilon_{1t} \quad (13)$$

$$\Delta\ ln\ \ ses_t = \beta_1 + \varphi_{21}^{p}(L)\Delta lnses_t\ \ + \varphi_{22}^{q}(L)\Delta \ln gdp_t\ \ + \sigma_2 E_{t-1} + \epsilon_{2t} \quad (14)$$

where$\varphi_{ij}^{p}(L) = \sum_{n=1}^{p_{ij}} \varphi_{ij} L^{1}and\varphi_{ij}^{q}(L) = \sum_{n=1}^{Q_{ij}} \varphi_{ijn} L^{1}$ hence lag operator is L, which applies that

(L) Δ ln gdp_t = Δln gdp_{t-1}. E_{t-1} refer to the error correction determinant tools for one lagged period, and ϵ_{1t} and ϵ_{2t} present random mean zero errors which are serially independent with finite covariance (Narayan and Smyth, 2004). In Equation 13, present Δ lng dp_t is regressand and Δlnses_t is regressor, although the inverse situation for Equation 14. E_{t-1} captures the speed of adjustment of the variables in Equation 13 and 14.

5. VARIABLE CONSTRUCTION AND DATA

We shall estimate the service sector share on real gross domestic product (GDP) use basic bivariate model. But this can show an unconvinced result though service sector share in GDP is turn into inverse direction although real GDP and value added increasing rate are turning into parallel direction. Consequently, we will incorporate various elective factors to test the strength of the assessed models. We pursue the traditions and measure the economic development along real GDP. The other significant variable is significant share of GDP. Likewise we take a few sub-parts of service sector to examine the strength of our model. We are intrigued to examine Pugno (2006) and Baumol (1967) argument whether the business or housework servicers are essential for the economic development. Therefore, we consider wholesale and retail trade (wrt), financial intermediation (fi) and transport and communication (tc) in the gross value-added services. According to Pugno (2006) the household services are estimated by spending on education (edu) and health and social work (hlt).The capital, inflation, and trade openness are used for growth regression. The major sources of the data are Asian productivity organization and Bangladesh bank.

6. EMPIRICAL RESULT

Table-1. Unit Root Tests.

Series	Level				First Difference			
	ADF		PP		ADF		PP	
	Constant	Constant & Trend	Constant	Constant & Trend	Constant	Constant & Trend	Constant	Constant & Trend
lgdp	4.6897	-1.7404	6.9634	-1.7736	-7.0526*	-9.5939*	-6.6896*	-9.1772*
lser	2.6581	-0.5425	2.2163	-0.754	-1.9568	-5.7719*	-5.8760*	-5.9755*
lwrt	1.6101	-2.3369	4.7258	-2.3023	-1.6597	-7.5370*	-7.3722*	-16.9924*
lcsps	0.8169	-0.8913	0.5398	-1.5328	-7.6649*	-5.6203*	-7.4367*	-7.3148*
ltsc	1.3647	-1.1486	3.3243	-0.5252	-2.156	-2.7362	-2.9405**	-3.456***
lrera	2.7533	3.8638	5.5446	2.9663	0.0918	-0.8794	-1.0473	-2.1033
lfin	-1.4614	-2.1307	-1.4614	-2.1959	-6.1583*	-6.2680*	-6.1583*	-6.2581*
lcap	0.9408	-4.5396*	2.3882	-5.6157*	-3.4499**	N/A	-3.2205**	N/A
lopen	-1.42	-3.0859	-1.3152	-3.2029	-8.1017*	-8.0872*	-8.7300*	-8.8377*
lcpi	-1.958	-3.4771	-3.1289**	-3.8214**	-15.4915*	-15.7785*	N/A	N/A
Series	**Innovative outliers**				**Additive Outliers**			
	Level		**First Difference**		**Level**		**First Difference**	
	t-statistic	**Break Time**	**Break Time**	**t-statistic**	**t-statistic**	**Break Time**	**Break Time**	**t-statistic**
lgdp	1.9791	1989	2004*	-9.0454	-1.1227	2003	2004*	-9.1252
lser	-0.8229	1998	1998*	-6.7476	-1.3193	1988	1999*	-6.85
lwrt	-1.4208	1995	1994*	-7.6431	-5.4907	1985*	N/A	N/A
lcsps	-1.6508	2000	1989*	-7.6409	-1.3741	1997	2006*	-7.7609
ltsc	-0.9152	1999	1997***	-4.9491	-3.0115	1986	19997***	-4.3415
lrera	-3.2637	2015	2006*	-31.7243	-1.6963	2001	1997*	-20.0224
lfin	-2.2453	2001	2011*	-6.6111	2.0711	2001	1985*	-6.4439
lcap	0.5542	1993	2015*	-8.2073	-1.1285	2007	1985	-4.0796
lopen	-4.6008	2003**	N/A	N/A	-1.9536	1992	1989*	-16.7402
lcpi	-3.2491	1994	2013	-8.2874	-3.2889	1994	2006*	-8.4853

***, **,* indicates significance at 10%, 5% and 1%, respectively.

In analyzing time-series data, we have to check the stationary properties of the data. To check the stationary properties, we use most popular methods: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The results are shown in Table 1. From results, it is evident that for some variables both tests give contradictory results. Most of the variables are non-stationary at levels and become stationary at first difference. Since most of the variables are I (0) and some variables are I (1), the best technique is ARDL cointegration approach.

Table-2. Cointegration test of the model.

H_0	H_1	Trace Statistics	Critical value (0.05)
Johansen Cointegration test			
r=0*	r=1	31.5904	25.8721
r≤1	r=2	10.2108	12.5180

* At 5% significance level, Trace test indicates 1 Cointegrating equation.

To determine the long run relationship between lgdp and lser, we use Johansen Cointegration test and the result is summarized in Table 2. At 5% significance level, the null hypothesis of zero cointegrating equation is rejected. So, lgdp and lser variables are cointegrated. That is, long-run relationship exists between current GDP and service sector of Bangladesh.

Table-3. ARDL Bound Test.

Model	Lower Bound	Upper Bound	F- Statistic	Decision
lgdp=f(lser)	4.94	5.73	10.11**	Long run relationship exists
lgdp=f(lcsps)	5.59	6.26	6.51***	Long run relationship exists
lgdp=f(lwrt)	4.94	5.73	8.95**	Long run relationship exists
lgdp=f(ltsc)	6.56	7.30	14.44**	Long run relationship exists
lgdp=f(lrera)	6.56	7.30	7.49**	Long run relationship exists
lgdp=f(lfin)	4.94	5.73	12.64**	Long run relationship exists
lgdp=f(lser, lcap, lopen, lcpi)	2.26	3.48	4.07**	Long run relationship exists

***, ** indicates significance at 10% and 5% respectively.

For robustness purpose, we use ARDL bound test to examine long run relationship. The result is summarized in Table 3. We estimate seven different models to test long-run relationship. Among the seven models, six models contain single measure of service sector. In Seventh model, we include some other control variables to test the significance of the service sector. The results indicate a long run relationship among the variables.

Table-4. Lag Order Selection.

Lag	Log L	LR	FPE	AIC	SC	HQ
1	366.686	N/A	6.53e-10	-15.4738	**15.3099***	**-15.4133***
2	340.737	7.3481	**6.53e-10***	**-15.476***	15.1485	-15.3553

* indicates lag order selected by the criterion.

From Table 4, the optimal lag order is 1 as it is supported by SC and HQ criteria.

Table-5. Granger causality Test.

Null Hypothesis	F - Statistic	Probability	Direction of causality
lgdp does not Granger Cause lser	0.7362	0.3959	Unidirectional causality
lser does not Granger Cause lgdp	3.18412	0.0818	

Source: Author's calculation using EViews 9.

In Johansen Cointegration test and ARDL bound test, we have established long run relationship among the variables. But we don't establish the casual relationship among them. For this purpose, we use Granger Causality

test. The results from Table 5 indicate that the hull hypothesis of no causal relationship between lgdp and lser is rejected at 10% level of significance. So, unidirectional causality exists from service sector to GDP of Bangladesh.

Table-6. Short-run Coefficients of ARDL Models.

lgdp is dependent variable

Regressor	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
lser	0.6389* (0.1636)						0.2556** (0.1251)
lcsps		0.0395 (0.1371)					
lwrt			0.1072*** (0.0655)				
ltsc				0.1070** (0.0410)			
lrera					0.0549** (0.0216)		
lfin						-0.0270 (0.0229)	
lcap							0.1760*** (0.1014)
lopen							-0.0215 (0.0215)
lcpi							0.1001 (0.0739)

Source: Author's calculation using EViews 9.

Table-7. Long run estimates through ARDL.

lgdp is dependent variable

Regressor	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
lser	0.7525* (0.2339)						0.6888** (0.3204)
lcsps		0.4053 (1.1530)					
lwrt			0.6199** (0.2187)				
ltsc				0.4562* (0.0943)			
lrera					0.2662* (0.0635)		
lfin						0.5501* (0.1154)	
lcap							0.0982 (0.7469)
lopen							0.8218 (1.4009)
lcpi							-0.4558 (0.6589)
ECM_{t-1}	-0.1668* (0.0608)	-0.054 (0.0725)	-0.173** (0.0735)	-0.2345* (0.0732)	-0.2061* (0.0657)	-0.041** (0.0157)	-0.063** (0.0310)
Standard errors of the coefficients in parenthesis. **,* indicates significance at 5% and 1%, respectively.							
Diagnostics test@							
Functional form	0.200	0.8822	0.2673	00.0015	0.4201	0.3003	0.6266
Normality	02780	0.1940	0.2176	0.1068	0.0033	0.0161	0.3402
Heteroscedasticity	0.0034	0.0088	0.1013	0.0000	0.0000	0.000	0.6453
Serial correlation	0.8029	0.1940	0.4671	0.4095	0.6935	0.9015	0.9458

@ Table represents probability values.

Table 6 shows that in model 1, lser has significant positive effect on lgdp in short-run. That is, elasticity of real GDP with respect to service sector is 0.64 which means that if service sector is increased by 1% real GDP will increase by 0.64% and vice-versa. In models 2 to 6 several business and household related service variables have been used as explanatory variables and the results show that all variables have significant positive impact on

economic growth except financial and insurance which has negative impact in short-run and the result is statistically insignificant. To justify robustness of the result, we include some additional variables such as physical capital, trade openness and inflation in the model. From model 7, it is evident that in short-run Trade openness has negative effect and CPI has positive effect on economic growth although the result is not statistically significant.

ARDL bound test gives us the long run relationship among the variables and the Granger Causality test provides the direction of causality. Now it is easy to find out the error correction model for long run elasticities by using ARDL estimators. Table 7 contains the results.

Table 7 indicates that in model 1, lser has significant positive effect on lgdp. That is, service sector of Bangladesh has significant favorable effect on gdp growth. To examine the effect of sub sectors, we estimate seven models. In models 2 to 6 some business and household related service variables are used as explanatory variables and the results show that except cpi all variables significantly affect the gdp growth. To justify robustness of the result, we include some additional variables such as physical capital, trade openness and inflation in the model. From model 7, it is evident that the sign and significance of the model remain robust and results do not change. The signs of additional variables are consistent with the priori expectation.

In Table 7, last row shows the ECM term of the respective model. The term has expected negative sign and the result is significant for all models except model 2. The negative ECM term implies that any short run disturbance will converge to long run equilibrium. The value of ECM term measures the speed of adjustment of a short run shock which varies for each model. Specifically, in model 1 ECM value of -0.1668 implies that it will take approximately six years to adjust any exogenous shock in the economic growth. Similarly, ECM values of -0.173, -.2345,and -0.2061, imply that it will take approximately six years, four years, and five years, to adjust a short run shock with long run equilibrium.

The reported P-values of diagnostic tests in the table imply that the null hypothesis of correct functional form, normal distribution of error term, homoskedastic errors and no serial correlation exist for the most of the models.

7. CONCLUSIONS

This research article analyses the share of service sector in the real gross domestic product, whether service sector is related with business and household related activity. This business and household service sector activities are significantly correlated with economic development of a country and also the major contributor in the economy of Bangladesh. The service sector share in Bangladesh economy remains stable at above 50 percent over a long period. In recent time, Bangladesh achieved miracle economic growth compare to other competitive developing country. From 2010 to current fiscal year, Bangladesh witness stable gross domestic product growth. For this reason, we solve the bivariate regression model by using ARDL approach during the timeframe of 1973-2017 which was proposed by Singh (2010). We utilize Augmented Dickey– Fuller test and Phillips– Perron tests to discover the order of integration in our time series data. Both tests show that some variables are stationary at level, I(0) and some variables are stationary at first difference, I(1).,. Therefore, we use ARDL procedure to solve the error correction model as this model is applicable when model has mixture of I(0) and I(1) variables . Granger causality test shows the presence of uni-directional granger causality from the service related sector to gross domestic product. Moreover, ARDL bound approach indicates the service related sector and gross domestic product growth are correlated both in short-run and long-run. The result shows that 1% expansion in service related sector will result an increase of 0.64% of gross domestic product(GDP) or economic growth in short-run and 0.75% of GDP in the long-run. Therefore, Our result suggests that the advancement of service related area may increase the development of Bangladesh economy. Consequently, the decision maker in a country should focus on the business or household-related administrations with the goal that the development of this sector ought to be sustainable. Moreover, it is essential to citation here that Bangladesh initiates some policy to ensure sustainable development in services sector.

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