

BANGLADESHI SHORT-RUN AND LONG-RUN MARGINAL PROPENSITIES TO CONSUME : AN ANALYSIS

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Abstract: *The short-run and long-run marginal propensities to consume are the critical figures determining consumption, investment, government expenditure, import, and export multipliers as indicatives how effective and costly national macroeconomic policy actions. Empirical results reveal that both Bangladeshi short- and long-run marginal propensities to consume are smaller than unity. Additionally, from Keynesian macroeconomic theory, the magnitude of the MPC in the economy determines the consumption, investment, government expenditure, and import and export multipliers. Therefore, the smaller the MPCs, the smaller the multipliers are, the larger the countercyclical the policy adjustment must be to achieve a certain countercyclical macroeconomic policy objective.*

Keywords: *Consumption, MPC, Bangladesh*

Introduction

In the age of globalization, international economies are integrated. Cyclical fluctuations in economic activities resulted in to periodic increases in unemployment and inflation as well as external sector disequilibria (Gbosi, 2001) are more contagious. Internally, unstable investment and consumption patterns, improper public policy implementation, and changes in expectations for policy outcomes are some of the factors responsible for economic instability. External factors found to affect economic stability negatively include war, social upheaval, population growth, and migration; and technological transfer acceleration.

Independence of Bangladesh occurred after bloody war and get rid of oppression from West Pakistanis who for the period of 1947 to 1971 used this area as a place for sucking masses and repatriating fund from the country. By the mid-1960s, West Pakistan was encouraging from Ayub's "Decade of Progress" with its successful green revolution in wheat and from the expansion of markets for West Pakistani textiles, while East Pakistan's standard of living remained at an abysmally low level. Bengalis were also upset that West Pakistan, the seat of the national government, received more foreign aid. (Source : https://en.wikipedia.org/wiki/East_Pakistan). Bangabandhu Sheikh Mujibur

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Rahman father of the nation led the war against Pakistanis and get rid of oppression from the Pakistanis. He served the country's President and also premier between 1972 and 1975. He tried to improve the economy at different fonts. Murder of sheikh Mujibur Rahman was unfortunate. From January 2009, Sheikh Hasina Wazed has been devoting herself for the economic growth of the country. Per capita income of the country rises to \$1466 (Source: Daily Star, Bangladesh, April 6, 2016). As income rises, consumption of masses of the country also rises. Now we want to examine the short run and long run consumption pattern of the country.

In his sentential General Theory (1936), Keynes argued that the task of restoring these macroeconomic variables back to their long-term trends cannot be left to supply and demand. Governments must utilize countercyclical monetary and fiscal policy are instruments to manage their economies. Fiscal policy uses the government's taxation and spending powers, while monetary policy relies on the manipulation of interest rates or the money supply.

The short-run and long-run marginal propensities to consume are the critical figures determining consumption, investment, government expenditure, import, and export multipliers as indicatives how effective and costly national macroeconomic policy actions. In so far as it can be ascertained, except for Nwabueze Joy Chioma (2009), there has been no empirical investigation into the magnitudes of the short- and long-run marginal propensities to consume in the Bangladeshi economy. Therefore, the contribution to the literature of this investigation is to empirically estimate the two measures (short- and long-run) of marginal propensities to consume.

The remainder of the study is organized as follows: the immediately following section briefly reviews the literature; the next section discusses the methodology and model specification; the subsequent section reports the empirical results; and the final section provides some concluding remarks and policy implications.

Review of Literature

The demand-side macroeconomic school of thought has long claimed a causal relationship between consumption and GDP growth, which is the theoretical foundation for the countercyclical macroeconomic policy framework. The consumption theory in macroeconomics clearly articulates that the level of aggregate consumption stands as one of the main determinants of the GDP. Additionally, the theories argued that the marginal propensity to consume of an economy critically determines the effectiveness of macroeconomic policy measures because the short- and long-run marginal propensities to consume are the main factor determining the consumption, investment, government expenditure, and export and import multipliers of the economy.

Tapsin, and Hepsag (2014) completed a fairly thorough survey of literature on the relationship between consumption and gross domestic product. Guisan (2001) provided an extensive review of causality and cointegration between private consumption and GDP in twenty-five OECD countries over the period of 1960-1997. Guisan (2001) suggested using a country's own GDP (excluding GDPs of other countries in the group)

as the sole explanatory variable in the investigating process. Guisan (2004) again evaluated the power of Granger Causality, Modified Granger Causality, Engle-Granger Cointegration, Two Stage Least Squares, and Hausman tests in detecting the causal relationship between real consumption and GDP in Mexico and the United States. He reported the existence of a strong degree of causal dependence of private consumption on GDP and a lower dependence when the variables are reversed.

More recently, Gomez-Zaldivar and Ventosa-Santaularia (2009) further investigated the causality between consumption and GDP in Mexico and the United States. The authors found no evidence of either causality or cointegration between Mexican series for consumption and GDP; but, in the case of the US series, the authors found that the two are cointegrated, with a unidirectional causality from consumption to GDP. Mishra (2011) investigated the dynamic relationship between real consumption expenditure and economic growth in India over the period of 1950-2008 and found a long-term unidirectional causality from real consumption expenditure to economic growth. However, the author reported that there is no short-term Granger causality between these two macroeconomic variables.

Alimi (2013) studied the relationship between consumption expenditure and income in Nigeria. The model was tested by ordinary least squares for the period of 1970-2011. The authors estimated the marginal propensity to consume and average propensity to consume and found that as income increases, the average propensity to consume is reduced, but although marginal propensity to consume is less than one and it is not stable in the long run. Nwabueze Joy Chioma (2009), analyzed the casual relationship between gross domestic product and personal consumption expenditure using the data from Nigeria for the years of 1994 – 2007. The author indicated that an increase in gross domestic product has no significant effect on the personal consumption expenditure and the gross domestic product explained about 3.5% of the personal consumption expenditure in Nigeria.

Ofwona (2013), reported that consumption is determined by income in Kenya over the period 1992. ГЕНЧЕВ, (2012), studied the relationship between income and consumption in Bulgaria and Russia over the period 1990-2010 and found that there exist positive and significant long run relationship between gross national income and consumptions for both Bulgaria and Russia.

As to China, Blanchard and Giavazzi (2005) articulated that China began the process of rebalancing its economy after perusing the export-led development strategy for decades. This is the right move for China since there are increasing signs that the economy has proceeded too far into manufacturing for export markets, to the point that the country's capital stock is misallocated: too much in manufacturing, too little in the domestic service industry—in particular in the provision of health services.

Bangladeshi Economy

After its independence from Pakistan on December 16th, 1971, Bangladesh followed a socialistic economy and nationalized all industries. There were critical shortages of essential food grains and other staples because of wartime disruptions. Foreign exchange

resources were minuscule, and the banking and monetary system was victimized due to war's impact. Even though with a large work force, the majority of them were of under trained and underpaid workers and largely illiterate, unskilled, and underemployed. Commercially exploitable industrial resources, except for natural gas, were lacking. Inflation, especially for essential consumer goods, ran ramped around 100 percent. The war of independence had crippled the transportation system.

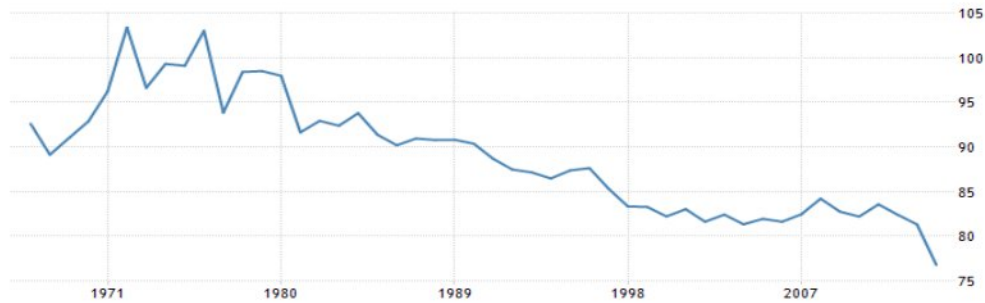
Road and railroad bridges had been destroyed or damaged, and were in poor repair. The newly independent nation was still recovering from a severe cyclone that hit the area in 1970 and cause 250,000 deaths. Her neighbor, India, a very poor nation and without any ability of giving aid to other nations came forward immediately with critically measured economic assistance in the first months after Bangladesh achieved independence from Pakistan. Between December 1971 and January 1972, India committed US\$232 million in aid to Bangladesh from the politico-economic aid India received from the USA and USSR.

After 1975, Bangladeshi government began to turn their attention to developing new industrial capacity and rehabilitating its economy. Beginning in late 1975, the government gradually liberated the economy by giving greater scope to private sector participation in the economy, a pattern that has continued. Many state-owned enterprises have been privatized, with banking, telecommunication, aviation, media, jute including a range of other vital sectors have been privatized. Inefficiency in the public sector. External resistance to develop the country's richest natural resources, and power sectors including infrastructures in destitution have all contributed to increase economic growth rate.

In the mid-1980s, there were encouraging signs of progress. Economic policies aimed at encouraging private enterprise and investment, privatizing public industries, reinstating budgetary discipline, and liberalizing the import regime were accelerated. From 1991 to 1993, the government successfully followed an enhanced structural adjustment facility (ESAF) with the International Monetary Fund (IMF) but failed to follow through on reforms in large part because of preoccupation with the government's domestic political troubles.

In the late 1990s the government's economic policies became more entrenched, and some of the early gains were lost, which was highlighted by a precipitous drop in foreign direct investment in 2000 and 2001. In June 2003 the IMF approved 3-year, \$490-million plan as part of the Poverty Reduction and Growth Facility (PRGF) for Bangladesh that aimed to support the government's economic reform program up to 2006. Seventy million dollars was made available immediately. In the same vein the World Bank approved \$536 million of interest-free loans. In 2010 Government of India extended a line of credit worth \$ 1 billion to counter-balance China's close relationship with Bangladesh.

As to the consumption share of GDP, data from World Bank, plotted Figure in 1 indicates, the Bangladeshi household consumption as percent of gross domestic product increased for a short period of time after its independence and then began to oscillate around a fairly sharp downward trend to 71.59 percent in 2014.



Data source: World Bank

Figure 1

The World Factbook published by CIA on May 18, 2016 reported that Bangladesh's economy has grown roughly 6% per year since 1996 despite political instability, poor infrastructure, corruption, insufficient power supplies, slow implementation of economic reforms, and the 2008-09 global financial crisis and recession. Although more than half of GDP is generated through the service sector, almost half of Bangladeshis are employed in the agriculture sector with rice as the single-most-important product.

Garment exports, the backbone of Bangladesh's industrial sector, accounted for more than 80% of total exports and surpassed \$25 billion in 2015. The sector continues to grow, despite a series of factory accidents that have killed more than 1,000 workers, and crippling strikes, including a nationwide transportation blockade implemented by the political opposition during the first several months of 2015. Steady garment export growth combined with remittances from overseas Bangladeshis - which totaled about \$15 billion and 8% of GDP in 2015 - are the largest contributors to Bangladesh's sustained economic growth and rising foreign exchange reserves.

With the decline in crude prices impacting the fortunes of oil exporters, remittances from workers from Gulf Cooperation Council (GCC) countries to Bangladesh appears to have been hit already. The Middle East is home to a large Bangladeshi diaspora and the six GCC countries—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates—account for around 68 percent of Bangladeshi workers abroad. The majority of migrant workers in GCC countries are low-skilled that include construction workers. Predictably, remittances from Bangladeshis abroad are correlated with investment demand in the Gulf countries, which includes spending on construction projects. Bangladesh's remittances amounted to around \$15.3 billion in 2014-15, which was 7 percent higher than the level of remittances the year before.

About 64 percent of this growth came from GCC countries. However, in the first seven months of FY16, total remittances declined by 1.1 percent. Decline in remittances from GCC countries constituted nearly 2.2 times the total decline. Historically, we find a fairly strong correlation (0.65 statistically significant coefficient) between oil price and remittances from GCC countries.

Methodology

To specify the model for this investigation, following Green (2008) to let L be the lag operator where $Lz_t = z_{t-1}$ and $L^2z_t = z_{t-2}$; then, the dynamic regression model, expressed in equation (1).

$$y_t = \theta + \sum_{i=0}^{\infty} \phi_i x_{t-i} + \zeta_t \quad (1)$$

can be rewritten as

$$y_t = \theta + \sum_{i=0}^{\infty} \phi_i L^i x_t + \zeta_t \quad (2)$$

Also, let $B(L)$ be a polynomial in L , where $B(L) = \omega_0 + \omega_1 L + \omega_2 L^2 + \dots$. Considering a common polynomial in the lag operator that is in the form,

$$A(L) = 1 + aL + (aL)^2 + (aL)^3 + \dots = \sum_{i=1}^{\infty} (aL)^i$$

if $|a| < 1$, then $A(L) = \frac{1}{1-aL}$.

Also, a distributed lag model in the form

$$y_t = \alpha + \beta \sum_{i=0}^{\infty} \gamma^i L^i x_t + v_t$$

can be rewritten as:

$$y_t = \alpha + \beta(1 - \gamma L)^{-1} x_{t-1} + v_t \quad (3)$$

if $|\gamma| < 1$; then equation (3) is defined by Green (2008) as the moving average form or distributed lag form. Multiplying through by $(1 - \gamma L)$ and collecting like terms yield the following autoregressive form,

$$y_t = \alpha(1 - \gamma L) + \gamma y_{t-1} + \beta x_t + (1 - \gamma L)v_t$$

More conventionally, the above expression can be expressed as:

$$y_t = \beta_0 + \beta_1 y_{t-1} + \beta_2 x_t + \varepsilon_t \quad (4)$$

It should be noted here that equation (4) is the reduced form of the indefinite distributed lag model expressed in equation (1); therefore, β_1 is the sum of all the impacts of a change in x_t on y_t in all subsequent periods. This study defines C_t and Y_t as household consumption expenditure and national income, respectively and follows Green (2008) to use the procedure deriving equation (4) to specify a reduced formed consumption function with short-run and long-run marginal propensities to consume may be written as:

$$\ln C_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln C_{t-1} + \varepsilon_t \quad (5)$$

As articulated by Green (2008), in this specification, β_1 is the short-run marginal propensity to consume (MPC_s) (elasticity since the variable are in logs). The null hypothesis that the contemporaneous marginal propensity to consume, MPC_s , is equal to 1, $H_0 : \beta_1 = 1$, can be tested using the linear restriction on the estimated coefficient of equation (5) that provides the calculated $t_{(n)}$ and $F_{(1,n)}$, where n is the degrees of freedom.

Additionally, the long-run marginal propensity to consume is MPC_l where

$$MPC_l = \frac{\beta_1}{(1 - \beta_2)} \quad (6)$$

To test the null hypothesis that MPC_l is greater than or equal to 1, note that if $MPC_l = 1$, then $\beta_1 = 1 - \beta_2$, or $\beta_1 + \beta_2 = 1$. Consequently, the null hypothesis that $H_0 : \beta_1 + \beta_2 = 1$ can be tested with a linear restriction on the estimated coefficients of equation (5). The test-statistic for this hypothesis is $t_{(n)}$ or $F_{(1,n)}$, where n is the degrees of freedom.

Data and Empirical Results

Data

This study uses available annual data on Bangladeshi national income and household consumption expenditure over the period from 1986 to 2015. All data series were obtained from the IMF databases. The annual Bangladeshi logarithmic national income and household consumption expenditure are denoted by $\ln Y_t$ and $\ln C_t$, respectively.

The mean of the logarithmic Y_t during the sample period was 24.61, and ranged from 23.65 to 25.45 with a standard error of 0.52. The mean private consumption, C_t , over the same period was 24.32, and ranged from 23.56 to 25.06 with a standard error of 0.43. Their correlation was 99.83 which is fairly high.

Empirical Result and Discussion

The estimation results for equation (5), using the annual data from Bangladesh over the period 1986-2015, are summarized in Exhibit 1

Exhibit 1: Estimation Results for Equation (5), Bangladesh's Short- and long- Run MPCs

$$\ln C_t = 3.41535158 + 0.76567560 \ln Y_t + 0.08508347 \ln C_{t-1} + \varepsilon_t$$

(0.35775324) (0.05880061) (0.06986414)

$\bar{R}^2 = 0.996317$; Log likelihood = 67.2723; DW = 1.3536; $F_{(2,26)} = 3,788.0674^*$; AIC = -4.432570

Note: Data from International Financial Statistics, IMF.

As articulated in the Methodology section, given the estimated coefficients for equation (5), the short-run MPC_s for the Bangladeshi economy is 0.76567560. Based on the strengths of the calculated $t_{(26)} = 3.985068$ and $F_{(1,26)} = 15.880765$, the null hypothesis that $H_0 : \beta_1 = 1$ should be rejected at any conventional level of significance.

Additionally, the numerical value of long-run MPC_l is derived by equation (6) to be:

$$MPC_l = \frac{0.76567560}{(1 - 0.08508347)} = 0.836880$$

which seems to be low as comparable to corresponding figures in the advanced and emerging economies. Also, a formally statistical analysis of the estimation results indicates that based on the strengths of the calculated $t_{(26)} = 9.780096$ and $F_{(1,26)} = 95.650275$, the null hypothesis that $H_0 : \beta_1 + \beta_2 = 1$ should be rejected at any conventional level of significance. Rejection of the null hypothesis indicates that the long marginal propensity to consume in Bangladeshi economy is significantly less than 1.

Concluding Remarks and Implications

Over the recent past, steady garment export growth combined with remittances from overseas Bangladeshis - which totaled about \$15 billion and 8% of GDP in 2015 - are the largest contributors to Bangladesh's sustained economic growth and rising foreign exchange reserves. However, the decline in crude prices impacting the fortunes of oil exporters, remittances from workers from Gulf Cooperation Council countries to Bangladesh appears to have been hit already. Additionally, the Bangladeshi steady garment export growth is facing tough competitions from Vietnam, Cambodia, and soon Myanmar. Thus, fiscal and monetary policies will be a natural actions taken by the government to manage the economy.

Marginal propensities to consume are the most important variables determining the effectiveness of countercyclical macroeconomic policy actions. As it can be ascertained, there has been no empirical investigation into the magnitude of the short- and long-run marginal propensity to consume in Bangladeshi economy, so in future a research on this area should be undertaken along with income saving and investment level change.

In efforts to fill out the literature gap, this study specifies and using available Bangladeshi annual data to estimate a distributed lag model whose estimated coefficients allows us to derive the short- and long-run marginal propensities to consume. The empirical results reveal that the Bangladeshi contemporaneous MPC_s is 0.76567560 and long-run MPC_l is 0.83688028.

From Keynesian school of thoughts, the magnitude of the MPC in the economy determines the consumption, investment, government expenditure, import and export multipliers, in the fashion that the smaller the MPC, the smaller the multipliers are, the larger the countercyclical the policy measure must be to achieve a certain macroeconomic policy objective.

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