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**Investment Absorption Capacity and Current  
Macroeconomic Conditions of Bangladesh**

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# Investment Absorption Capacity and Current Macroeconomic Conditions of Bangladesh

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**Abstract:** This paper analyzes the absorption capacity of Bangladesh economy for an increase in investment given the existing macroeconomic environments using the framework proposed by Lee et al. for the period of 1974 to 2018. To test excessive investment, we employ Granger-causality test, and also estimate the functional relationship to evaluate the impact of productivity of investment and the impact of contemporaneous investment on consumption. We find that investment granger causes consumption, implying there is excessive investment in the economy of Bangladesh. In addition, we find a number of evidences indicating the existence of constraints on the path of investment absorption capacity in Bangladesh's economy. We also find that consumption decision is not directed by its own long term path rather it is directed by investment decision.

**Key Words:** investment absorption capacity, social capital, excessive investment, capital account openness, productivity of investment.

**JEL Code:** E22, E23.

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## 1. Introduction

Most recently, with the acceleration in the journey of Bangladesh economy towards transition from low income to middle income country, discussions and contemplation about modernization of monetary policy and changes of similar prospects have raised the question whether Bangladesh should open up her capital account or not. With that question in mind we looked into the capital account scenario of Bangladesh. We learned that, capital account openness is a spectrum<sup>1</sup> and has two different viewpoints to consider; openness of inflow and openness of outflow. On the spectrum of openness of capital account inflow, Bangladesh stands at a certain point and on the spectrum of openness of outflow she stands at a different point.

Openness of capital inflow and capital outflow are two separate matters that need to be examined individually. The stimuli that impact the two aspects of capital account are different. Bangladesh's capital account inflow is comparatively more open than her capital account outflow. We looked through numerous literatures to identify the ideal course of action for Bangladesh regarding capital account at the current point of time. All of the existing literature indicates that Bangladesh needs to take a number of measures to strengthen her financial sector, infrastructure, business environment, institutional efficiency etc. before lifting up restrictions and opening up her capital account outflow to the market mechanism.

In case of capital account inflow, the suggestions, discussions and arguments do not form such a precise consensus. Also, capital account inflow of Bangladesh is already open to market mechanism to a large extent. Whether the existing openness of capital account inflow is sufficient or not depends on how well Bangladesh's economy is able to absorb the incoming capital flow at present<sup>2</sup> and whether it can benefit from more capital, given the current social, physical and socio-economic infrastructure situation.

In the fiscal year 2017-18, Bangladesh's total investment was 31.23 percent of GDP and at the same period domestic savings was 22.83 percent of GDP.<sup>3</sup> The gap between total investment and domestic savings (8.4 percent of GDP) is mitigated by foreign investment. In recent time, scholarly suggestions for the economy Bangladesh have advocated the need for increase in investment-GDP ratio, from 31.23 percent up to 34 or 35 percent, for achieving high growth targets of the government. Incentivizing foreign investment is one of the measures that can accelerate the investment-GDP ratio. In this context, it is essential to know whether the economy can absorb the increase in investment and act as the desired catalyst in generating growth.

We segment the work involved in making policy decisions on whether Bangladesh should open up her capital account or not. We focus on the issue of capital account inflow at first. To comment on whether capital account inflow in Bangladesh is currently sufficient or is there room to take policy actions to enhance capital inflow, it is important to know whether the economy can absorb additional investment given the existing macroeconomic conditions. Therefore, in this paper we attempt to answer the question, ‘Can Bangladesh’s economy absorb increase in investment efficiently given the current macroeconomic conditions?’

## **2. Literature Review**

Capital account liberalization is held under two opposing views in scholarly work, as Henry<sup>4</sup> puts it; one argument emphasizes its contribution to efficient allocation of international resources, where the other argument states that, since economies are not fully competitive and free of distortions in their mechanism, opening capital account is likely to contribute less to allocative efficiency and more to the benefit of the stronger economies. Henry also discusses the varying types of capital account openness and their impact accordingly. Rodrik<sup>5</sup> finds no correlation between economic growth of a country and its capital account openness or amount of investment. About the gains of capital account openness, Rodrik argues that, evidences regarding positive impact of opening up capital account may be biased from examples of advanced economies, which already performs well on their own. Moreover, he argues that capital account convertibility benefits countries with stronger institutions, but it does not propel quality of institutions.

Bangladesh started to liberalize its capital account since 1997 through easing restrictions<sup>6</sup>. Bashar and Khan<sup>7</sup> test the hypothesis whether trade liberalization and financial account liberalization led to higher economic growth in Bangladesh. Even though trade liberalization shows significant positive impact for the growth of the economy of Bangladesh; for capital account liberalization, they find insignificant impact. Infrastructure and good governance were identified as preconditions for benefitting from financial liberalization.

Haque<sup>8</sup> investigates the impact of private and public investment on economic growth in Bangladesh. He cites cross country analysis with evidence that both input and their productivity are important factors for economies in transition period with high growth. Also, that input productivity is required to be sustainable for a long period rather than being very high. He sees in his paper that productivity growth contributed very little to the overall growth of Bangladesh’s economy. Other country experiences evidence that Total Factor Productivity (TFP) growth is dependent on human capital development,

physical capital development (including infrastructure), financial development, technology absorption, and openness (especially in terms of openness to imports). Haque therefore, suggests for emphasis on the above issues for achieving sustainable growth; and advises efficiency in resource utilization across sectors among other things.

In March 2013 Lee, Syed and Xueyan<sup>9</sup> from Asia Pacific Department of IMF investigate on China's investment situation. Among a number of successful endeavors, proposing a possible framework for identifying excessive investment was the first one in the paper. In June 2013, Pettis<sup>10</sup>, professor of Finance at Peking University's Guanghua School of Management and expert on China's economy wrote an article that the above mentioned IMF Working Paper supports his contention that, "...China has overinvested beyond its capacity to absorb capital." Pettis cites a number of scholarly comments<sup>11,12</sup> that argues China's investment is too low and it can benefit from increasing its investment and makes his case that answer to whether China's investment is too low or not can vary by the choice of methodology in determining optimal level of capital for any economy. Professor Pettis argues that the optimal level of investment depends on an economy's ability (workers' and businesses') to absorb additional capital stock and he refers to this ability as social capital.

Section I and section II of Chapter 9 and Chapter 15 of the 'Guidelines for Foreign Exchange Transactions-Volume I' of Bangladesh Bank<sup>13</sup> outlines the current legitimate practices regarding inflow and outflow of foreign currency in Bangladesh. Along with the above mentioned guidelines, Bangladesh Bank provides answers to some frequently asked questions<sup>14</sup> on their official website regarding what is permissible and what what is not permissible in foreign currency transactions in the economy. According to the guidelines, currency outflow is restricted to payments for medical and educational purposes; along with a limited amount of outflow for travelling purpose. On the other hand, currency inflow is comparatively liberal. Foreigners, non-resident citizens and travelling citizens are allowed to invest in the domestic economy and transfer their earning to their native country or country of residence, respectively. Investment can be direct, in bonds, stocks, shares and securities as well as in partnership or individual entrepreneur. Foreign investors are also allowed access to government facilities and institutional support subject to permission from appropriate authorities.

### 3. Conceptual Framework

Excessive investment is defined as investment that does not create future flow of goods and services. The portion of investment that contributes to productive capital stock adds goods and services to the following year's GDP. On the other hand, the portion of investment that remains unutilized within a reasonable timeframe adds to the current GDP, however, it does not add anything to the following year's GDP. In general, investment raises capital stock which induces demand and growth. However, if rate of investment is higher than the rate of absorption of investment into productive sectors, investment renders underutilized; which reduces the marginal product of capital.

Considering the production side of the economy, from the functional relationship presented by Lee et al.<sup>15</sup>, we take,

$$k_u = \textit{used capital stock} \text{ and} \\ k_w = \textit{unused or wasted capital stock}.$$

$k_u = \sum(I_{u,t} - \delta_t I_{u,t})$ ; where, is  $I_{u,t}$  the flow of investment, that is used, for time  $t$  and  $\delta_t$  is the rate of depreciation for time  $t$ . As  $k_w$  is wasted capital stock, its depreciation rate is equal to its own growth rate,  $I_w$ .

Considering the expenditure side of the economy, taking the arguments from Lee et al.<sup>16</sup>, current investment contributes to current corporate income and household income as well as future corporate income and household income. Corporations and households then make consumption decision and, depending on the consumption decision, investment decision is made. However, if investment is large enough such that it remains unutilized after the production process, it, on the contrary to general theory, influences consumption decision. In that case, investment contributes to current income/ GDP, however, it does not add to future flow of goods and services. From the concept above, Lee et al.<sup>17</sup> define measure of productivity of investment,  $GDP_{adj,t}$ ; according their definition,

$$GDP_{adj,t} = GDP_t - I_t ,$$

is the productivity of investment up to  $t - 1$  period.

Lee et al. summarize by identifying two empirical concepts to test whether there is excessive investment in an economy or not. (i) If there is excessive investment, then investment will Granger-cause consumption. (ii) The channel connecting investment and income/ GDP will be weaker, i.e. the chain of events where investment leads to higher capital and higher capital leads to higher growth or income. Hence, investment will have stronger association with corporate income rather than household income; as household

income depends on share of labor cost which in turn comes from utilization of investment. We test the first concept in this paper.

#### 4. Empirical Tests

##### 4.1. Methodology

Testing the first empirical concept is conducted in two steps; one is a simple granger causality test of investment and consumption relationship and the other is seeing the impact of productivity of investment of the previous time period and the impact of contemporaneous investment on consumption. If consumption growth is self-directed it will have a trajectory along its own long run path, and on the other hand, if it is driven by investment decision it will fluctuate and move away from its own long run trajectory and take the form of a shadow of investment decision. The later scenario appears when investment is in excess to what is necessary and can be tested through the granger causality test.

Putting the second concept to test, the functional relationship for seeing the impact of productivity of investment of the previous time period and the impact of contemporaneous investment on consumption would look like:

$$Consumption_{t-j} = F(GDP_{adj,t-j}, I_{t-j}), \text{ where } j = [0, \dots] \dots \dots (i)$$

Lee et al. define productivity of investment of immediate previous period is as the quantity of goods and services produced in the current period (the gap between current GDP and current investment). As we worked with time series data, estimating a time series equation for consumption required inclusion of variables, other than the once related to our research interest, which explain consumption. Prioritizing parsimoniousness of the model we decide a model through trial and error process and conduct OLS estimation. The statistical significance and magnitude of the coefficient of  $GDP_{adj,t}$  is our prime interest. It is an indicator for investment effectiveness i.e. contribution of past investment to capital stock and hence growth. A small value of this coefficient would imply that past investment has little impact on productivity, and was most likely excessive compared to the economy's capacity to absorb investment. Moreover, a larger coefficient of  $GDP_{adj,t}$  would imply self-sustaining consumption and the economy's ability to absorb investment, whereas, a larger coefficient of  $I_t$  would suggest wasted investment and constraint in absorption capacity.<sup>18</sup>

##### 4.2. Data

We use national level data of annual frequency from 1974 to 2018 from the World Bank databank; data for the years 1972 and 1973 are omitted as we find some unusual behavior in the data of those two time points. We work with three variables: Gross capital

formation, final consumption expenditure and GDP, all in local currency unit. The metadata definitions for these variables as provided by World Bank databank are:

**Final consumption expenditure** (formerly total consumption) is the sum of household final consumption expenditure (formerly private consumption) and general government final consumption expenditure (formerly general government consumption). Data are in constant local currency. We use final consumption expenditure as 'consumption' in this paper.

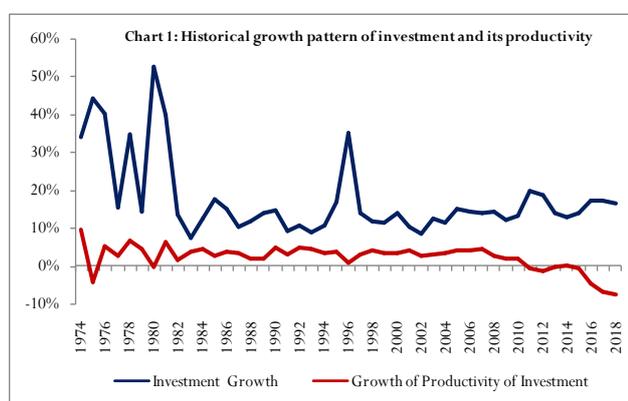
**Gross capital formation** (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and "work in progress." According to the 1993 System of National Accounts, net acquisitions of valuables are also considered capital formation. Data are in constant local currency. We use gross capital formation as 'investment' in this paper.

**GDP** is the sum of gross value added by all resident producers in the economy plus any product taxes and less any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant local currency.

We calculate growth for each of the above variables from their level data.

### 4.3. Results and Analysis

Historical trend of investment and its productivity is plotted in chart 1. We can see that there have been large fluctuations in investment growth; however growth of productivity of investment has been relatively steady over the same period, except the persisting downward trend since 2015.



We apply basic granger causality test on country level time series data, for the first step. Granger-causality examines whether to predict the current value of the dependent variable, conditional on its own lags, require any additional information in the lagged values of the explanatory variable.<sup>19</sup> We find investment growth and consumption growth as well as GDP growth to be stationary at level. We ran VAR estimation for consumption and found that consumption is explained by its own past value up to two

lags, confirmed by the majority of lag length information criteria and a stationary error variable. VAR estimation for investment on the other hand yields that three of its own lags are relevant in explaining investment. We then tested whether investment Granger-causes consumption for Bangladesh, in order to investigate whether private consumption is self-directed or not. The result of the test is given in table 1.

**Table 1:** Does Investment Granger-Cause Consumption

$H_0$ : No Causality			
Sample size: 1974-2018, observations = 45	Lag	P-Value	Result
Investment Granger-Cause Consumption (Null hypothesis tested for national level data)	2	0.0037	Reject

We find that for Bangladesh, investment Granger-causes consumption up to two years; it indicates that there is excessive investment in the economy of Bangladesh.

In the second step, we estimate equation (i) and obtain the results presented in table 2. We find private consumption has a positive relationship with investment of contemporaneous time; however the magnitude is very small and the coefficient is insignificant. We also find that private consumption has a significant negative relationship with 1 year lag of investment. A positive relationship of consumption with contemporaneous investment along with a negative relationship with the immediate previous period's investment suggest that, the existence of investment absorption constraints needs to be investigated in more details. Moreover, we find that consumption depends very little on its own immediate previous lag and that it has a significant relationship with its own four years' previous lag. This may also call for an in depth investigation of the deviations of consumption path from its own long run trajectory.

However, we found that private consumption is significantly dependent on,  $GDP_{adj,t}$ , productivity of investment of immediate previous period. Haque<sup>20</sup> in his investigation of the relationship of public and private investment with economic growth in Bangladesh find that the complete impact of public and private investment installment reaches maturity in approximately three years time.<sup>21</sup> Therefore, positive relationship with immediate previous period's investment productivity and at the same time negative relationship with three years' consecutive lags still calls for further investigation of existence of investment absorption constraints in Bangladesh.

**Table 2:** Identifying Excessive Investment: Is Private Consumption Self-Sustaining?

Sample: from 1974 to 2018, total 45 observations

Dependent Variable: *Consumption\_gr* C

Variables	Coefficient	Variables	Coefficient
<i>Consumption_gr</i> <sub>t-1</sub>	0.237 (0.175)	<i>GDP</i> <sub>adj_gr,t-2</sub>	-0.275 (0.238)
<i>Consumption_gr</i> <sub>t-2</sub>	-0.110 (0.148)	<i>GDP</i> <sub>adj_gr,t-3</sub>	-0.687*** (0.178)
<i>Consumption_gr</i> <sub>t-3</sub>	-0.005 (0.125)	<i>I_gr</i> <sub>t</sub>	0.106 (0.063)
<i>Consumption_gr</i> <sub>t-4</sub>	0.281*** (0.121)	<i>I_gr</i> <sub>t-1</sub>	-0.136*** (0.034)
<i>GDP</i> <sub>adj_gr</sub>	0.892*** (0.310)	<i>I_gr</i> <sub>t-2</sub>	-0.036 (0.029)
<i>GDP</i> <sub>adj_gr,t-1</sub>	-0.812*** (0.322)	<i>I_gr</i> <sub>t-3</sub>	0.014 (0.025)
C	0.062*** (0.018)		

\*\*\* indicates significant at 1% level of significance.

The obscurity in the results of econometric estimation may be given some perspective from the historical trend of investment growth and its productivity presented in chart 1. The fluctuation in investment growth during 1974 to 1984, the conflicting movement of investment growth and its productivity in 1996 and the divergent pattern since 2015 calls for in depth study of the matter with higher frequency sector-wise segregated data.

## **5. Conclusion and Future Research Prospects**

This paper seeks answer to the question, whether Bangladesh's economy can absorb increase in investment efficiently given the current macroeconomic conditions. We find a number of evidences that indicate that there exist constraints on the path of investment absorption capacity in Bangladesh's economy; that is increase in investment faces obstacles in being efficiently utilized into production process given the current macroeconomic conditions. We also find that consumption decision is not directed by its own long term path rather it is directed by investment decision.

This paper is the first of many research endeavors measuring the social capital situation in the economy of Bangladesh. Moreover, finding a threshold for investment absorption capacity will bring to light insights about Bangladesh's social capital situation. Finding a threshold for optimal investment for the economy of Bangladesh with respect to its social capital situation can propel effective policy actions in future. Furthermore, the similar analysis can be conducted for division and sector level data. Such analysis would help us identifying area and sector specific policy needs.

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