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# Savings and Income Inequality in Bangladesh

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## Abstract

Whether there exists any relationship between income inequality and savings behavior has remained an inconclusive area in economics. Theoretically this relationship is ambiguous and there is a lot of scope for exploring the case for Bangladesh. We scrutinize the pattern of domestic savings and income inequality from existing literature and data and find a number of features of the relationship. Moreover, we find that the relationship of income inequality and savings in Bangladesh is not linear and that the direction of this relationship varies with changes in economic policies. Empirical evidence suggests that liberalization has increased income inequality at least initially. But Bangladesh sees stagnancy in income inequality since the mid 1990s. Hence, income inequality should not be attributed to the market economy or liberalization at the growing stage of an economy like Bangladesh.

JEL Code: E21, E22, J88, O15.
Keywords: savings, growth, inequality, investment, income distribution, consumption.

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## 1. Introduction

A large number of theories connect economic growth to income inequality. Savings is one of the underlying driving forces of economic growth along with investment (Li and Zou, 2004). For an exhaustive study on the impact of income inequality on economic growth, the knowledge on the impact of income inequality on savings is crucial.

Most of the existing theories explain the impact of income inequality on economic growth. In explaining economic growth the two underlying variables savings and investment are of importance. Savings mobilization facilitates transformation of savings into investment and income inequality influences savings mobilization. The existing theories explore the determinants of savings; however, they do not take any conclusive stance regarding the impact of income inequality on savings. Many of the empirical works undertaken to explore this relationship of income inequality with savings also find the relationship to be ambiguous. A large number of theories and empirical works exist on the relationship of savings and income inequality yet none of the works was done for the economy of Bangladesh.

Consumption and savings behavior of a country depend on the pattern of income distribution. According to economic theory (Keynesian) propensity to consume is very high for people in the low income deciles, moderate for the mid income deciles and low for the high income deciles. On the other hand, propensity to save is very high for people in the high income deciles, moderate for the mid income deciles and low for the low income deciles. The Lorenz curve shows the distribution of income within the population in an economy. The Gini index is a ratio calculated from Lorenz curve. At present, for our economy Gini index is 0.39, which means 39 percent people are living below the poverty line. Moreover, research on consumption behavior shows that our propensity to consume is 0.9. Therefore, around 50 percent population of Bangladesh lives below or near the poverty line and their consumption is very high and savings very low. With this theoretical and practical backdrop, we attempt to explore the relationship of savings and income inequality for Bangladesh.

We explore the existing theories and empirical works on several developed and developing economies regarding the relationship of savings and income inequality. With the knowledge from this existing literature, we investigate the pattern of income inequality and savings individually and also sketch out the overtime connection between them for the economy of Bangladesh.

## 2. Literature

### 2.1. Theories

Overtime, the notion that income inequality is a natural, inevitable and necessary way to economic growth evolved into quite the opposite notion. It is not an inevitable way towards growth and neither a natural or necessary one. New theories and empirical works find that income inequality under certain circumstances can appear an obstacle to growth.

Classical approach suggested that propensity to save is positively related to wealth and therefore income inequality ensures that income is going towards the agents who would tend to save more (Galor, 2009). In this line of argument inequality was good for economic growth. The neoclassical approach discarded the notion of heterogeneous agents and therefore in the neo classical approach income inequality was not a variable with impact, it was merely a consequence of economics activities (Galor, 2009). Modern theories and contemporary literature has made its path towards developing an entirely opposite notion on this relationship.

Dusenberry (1949) introduces the relative income hypothesis in his seminal work 'Income, Savings and the Theory of Consumer Behavior'. He finds that, studies based on cross sectional budget surveys (1935-36 and 1941-42) reveal an increase in savings to income ratio, whereas Kuznet's (1942) time series data on savings and income show that savings ratio is trendless. Explaining this controversy in data, Dusenberry (1949) proposes an individual consumption function that depends both on individual's current income as well as the income of the group that represents the individual in the income distribution of the economy. From this he concludes that aggregate savings ratio will be independent of the absolute level of income since, with any given income distribution each individual will have a unique function explaining his savings to income ratio.

Modigliani and Brumberg (1954) and Friedman (1957) explore the savings behavior through the permanent income hypothesis. According to the permanent income hypothesis, despite the cross-sectional correlation of savings and income, consumption ultimately coincides with income. Since, cohorts smoothen their lifetime consumption and consume savings at a future date, when they have no more income inflow.

The two theories discussed above simultaneously explain the savings behavior of an individual. Human beings are both forward looking and outward looking. Their individual satisfaction from consumption depends both on their own lifetime income as well as their reference groups' lifetime income. Savings rate increase with lifetime income and decrease with the level of income of the reference group (Alvarez-Cuadrado and Vilalta, 2016). Therefore, an increase in the variation in wages leads to an increase in savings inequality.

Schmidt-Hebbel and Serven (2000) in their paper argue that the orthodox theories connect savings positively with income inequality and yet, there exist a counter argument from the political economy perspective. They argue that firms are typically the primary source of financing private investment and they retain (save) a portion of their earning for investment. With higher inequality in the income distribution firms' savings will be higher, since firm ownership falls to the upper income groups. Therefore, inequality is good for aggregate savings. However, speaking from the political economy point of view, higher inequality leads to social tension. A society with high inequality also has greater demand for redistribution and therefore higher taxation. This higher taxation that leads to lower returns on investment results in decrease in investment. Moreover, the resulting uncertainties due to social unrest lead to decrease in investment as well. This lowering of investment would eventually upset productivity. This adverse effect on growth would reduce firms' savings.

Thus, the direction of aggregate savings will depend on how households and firms make their savings decisions. When, the decision making process of the household is same as the firm, income redistribution through taxation will lower savings. On the other hand, if the decision making process of the household and the firm differ, there is a possibility that income redistribution will increase savings. A possible explanation of the difference in the decision making processes can be that, for a sole proprietorship the firm and the owner of household might take the same investment decision while, for joint ventures this might differ.

Li and Zou (2004) incorporate a political economy argument for public spending in an overlapping generation model to test the classical assumptions that the working class saves zero percent of their income and entrepreneurs save the larger fraction of their income. The argument they pick is about the decision of spending on public good. Instead of a flat assumption regarding the decision of spending on public good they borrow the proposition of a voting mechanism for public good (Alesina and Rodrik, 1994; Persson and Tabellini, 1994; and Perroti 1993). Such a mechanism would bring forth the decision of the median voter. They assume that the tax rate is a function of the income distribution and from there, they conclude that if this relationship is positive then it increases taxes and as a result savings decline and for if this relationship is negative then it decreases taxes and as a result savings increases.

Borrowing constraint has an impact on the relationship between savings and income inequality (Schmidt-Hebbel and Serven, 2000). When there is a borrowing constraint, consumers tend to buffer consumption with savings (Deaton, 1991). In a situation where borrowing constraint affects the poor households more than the rich households, the opportunity of redistribution from the rich to poor lowers the need for savings. Therefore, a redistribution of income in a situation where there used to be a borrowing constraint, aggregate savings would fall. However, the individuals with a preference for buffer stock tend to gravitate towards a targeted wealth to income ratio. As a result, borrowing constraint might have less impact on savings ratio in the long run than in the short run.

Marginal propensity to consume declines with the level of wealth, therefore the individuals with low asset base tend to consume more out of wealth compared to the individuals with high asset base (Schmidt-Hebbel and Serven, 2000). With this line of reasoning any redistribution of assets towards the poor would upset aggregate savings, since their marginal propensity to consume from the increased income level would be higher than that of the rich. However, arguing from the opposite side, if the poor face greater uncertainty, are more risk averse and have limited access to risk diversification, they will tend to save more. Under such circumstances, redistribution from the rich to the poor would increase aggregate savings.

Mendes (2013) in 'Inequality and Growth: an overview of the theory' comes up with the argument of investment indivisibility. According to this argument, when productive activities require large sunk cost and people cannot turn to a credit market to borrow for investment, the only way to have a large lump of money to make investment possible is concentrating income and wealth in the hands of a small group in the society. The poor in this way would have a small share of the national income only benefitting from the 'trickle down' effect of the growth form new investments. On the other hand, an increase in inequality renders more people with lesser capacity to invest. This fall in investment can only be compensated by increased investment from those who are capable of investing as much as they want to. However, this increase in demand for capital would only happen if the interest rate falls. However, in a situation where savings is interest sensitive, a fall in interest rate would eventually discourage savings.

Workers' behavior in low paying jobs depends on the expectation of wage growth and workers' behavior near the top of the distribution depends on the possibility of job loss (Lise, 2006). According this behavior of workers towards their jobs at different points of the earnings distribution their savings behavior differ. Workers around the top of the distribution tend to save more as to insure against the potential decline in income resulting from a job loss whereas for workers with low paying jobs the cost of losing job is lower and therefore they do not tend to save much. This difference in savings behavior for high wage and low wage workers in turn generates a more equilibrium wealth distribution compared to the equilibrium wage distribution.

Individuals have the tendency to indulge in an immediate pleasure and push plans of responsible behavior into the future (Mendes, 2013). To prevent this tendency people usually rely on commitment devices. In this case the poor usually appear to have commitment devices less available in general and they tend to be less efficient as well compared to those available to the rich. The poor therefore have to rely on their self-control more to keep themselves away from spending money outside of plan. A comparatively more difficult living circumstance, uncertainty, socioeconomic restrictions along with the greater proportion of income that is used to pay for a slip in the self-retrain, the poor tend to lose more of their savings perspectives than the rich.

One more argument that is made in favor of redistribution is that of aspiration gap (Mendes, 2013). The difference between a person's present condition and that in which he wants to be in is called their aspiration gap. People tend to be motivated to overcome this gap if it lies within the realistic possibility of achieving. However, if income inequality is too high, there will be two extremes in the society. The very rich whose aspiration gap is too low and very poor whose aspiration gap is too high to create any real incentive to try to achieve that. Therefore, in a society with lower inequality aspiration gaps are likely to be within achievability and in this way peoples' aspiration motives are likely to increase savings.

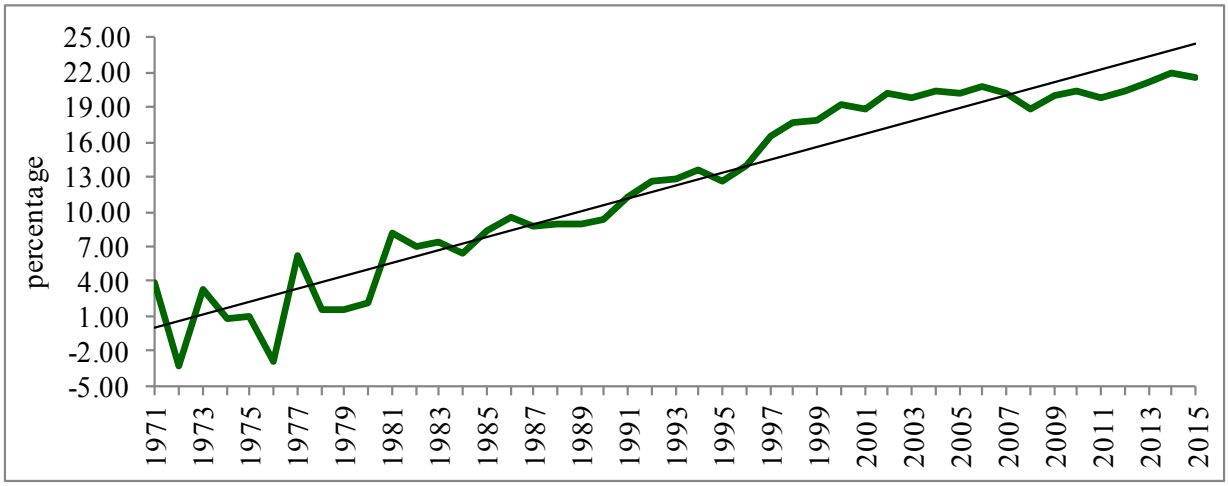
The savings motive of the rich can be explained by precautionary motive and bequest motive (Mendes, 2013). The different motives need not be exclusive: Households save for precautionary reasons but with a reasonable expectation that they will be able to pass along unspent balances to their children. As well, the empirical patterns of the data are consistent with an institutional or behavioral mechanism that systematically leads to low levels of savings among the poor. This may be caused by the absence of financial institutions such as pension plans or home ownership necessary to overcome time-inconsistent savings behavior.

Masson, Bayoumi, and Samiei (1998) examine possible determinants of private saving behavior using time-series and cross-sectional data. They work with a large sample of both developed economies and industrial economies. According to their conclusion demographics and growth rate are important in determining savings. In their paper, they also point out a threshold behavior of savings. They state that, per capita GDP increases savings when it is lower than the per capita GDP of the USA and it decreases savings when it is higher than the per capita GDP of the USA.

### 2.2. Savings Pattern in Bangladesh

We scrutinize the savings GDP ratio for Bangladesh from the period of 1971 to 2015, taking data from World Development Indicator, World Bank. Looking at savings in Bangladesh one can see that there is an easily discernible pattern.

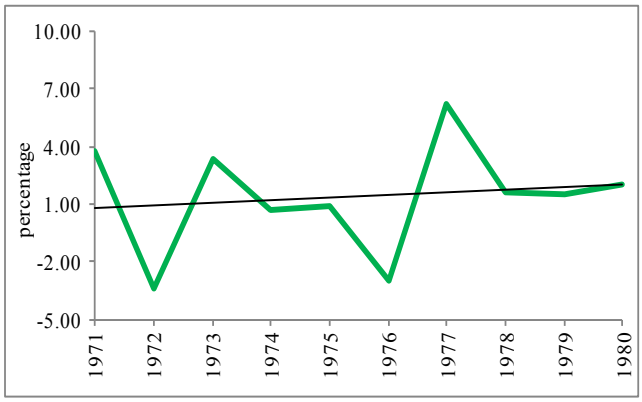
Figure 1: Savings pattern (gross domestic savings as percentage of GDP: GDS/GDP)




*Source: WDI, World Bank, 2016.*

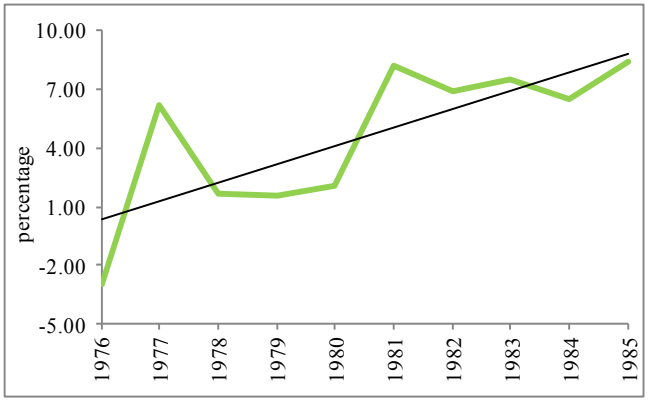
In the beginning years, savings was vulnerable and we depended heavily on aid from neighboring countries and well-wihers as we struggled to recover from the damage of war and famine. During this period of rigorous nationalization of our industries, banks, insurances and public enterprises our savings behaved rather erratically.

Figure 2: Savings pattern: GDS/GDP (1971-1980)




*Source: WDI, World Bank, 2016.*

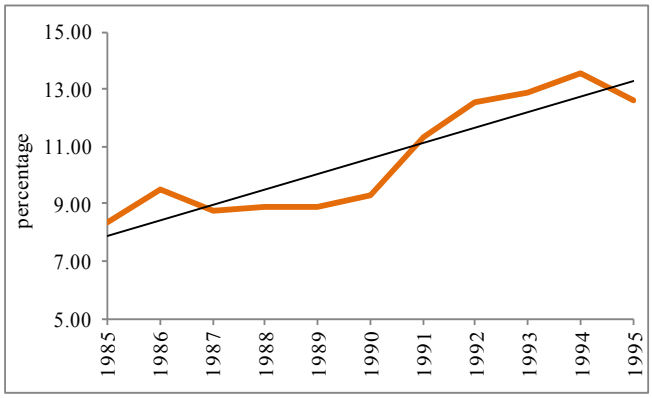
Figure 3: Savings pattern: GDS/GDP (1976-1985)




*Source: WDI, World Bank, 2016.*

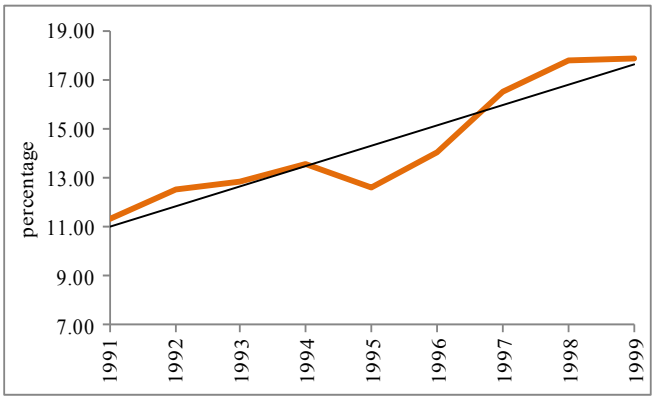
In the second half of the first decade, our savings picked up a moderate/steady pace as government began to denationalize public sector enterprises in 1976. Government announced the New Industrial Policy (NIP) in 1982 manifested in withdrawal of food and agricultural subsidies, privatization of state owned enterprises, reduction of tariff and non tariff import restrictions, boosting exports. (The Vibrant Bangladesh, Bangladesh Bank, 2015).

Figure 4: Savings pattern: GDS/GDP (1985-1995)




*Source: WDI, World Bank, 2016.*

Figure 5: Savings pattern: GDS/GDP (1991-1999)

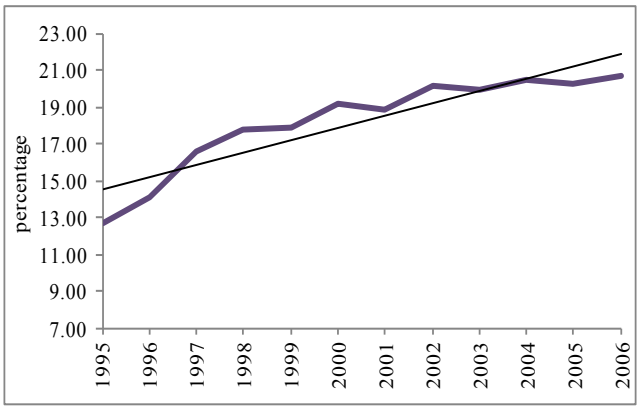



*Source: WDI, World Bank, 2016.*

With the advent of parliamentary democracy in the newly liberalized Bangladesh came financial sector reforms in 1989 to 1995, new Value added tax (VAT) in 1991, current account convertibility in 1994 and interest rate liberalization. It caused the corporate sector to be profitable, resulting in increased savings. However, denationalization caused dissaving in the public sector and that is why savings rate at this period remained low compared to other economies with the same level of per capita GDP.

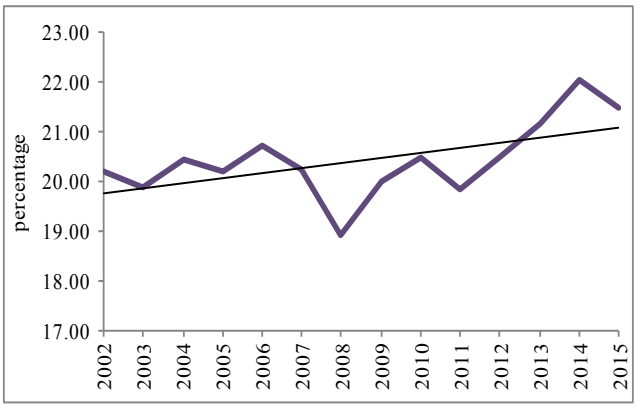
Savings rate had a steady growth since the mid 1980s which strengthened more since the early 1990s. Bhattacharya suggests that mobilization of public sector resources and import liberalization around this period without a well developed structure for domestic tax efforts slowed per capita GDP growth even with a remarkably high savings rate.

Figure 6: Savings pattern: GDS/GDP (1995-2006)




*Source: WDI, World Bank, 2016.*

Figure 7: Savings pattern: GDS/GDP (2002-2015)




*Source: WDI, World Bank, 2016.*

The rise of the savings rate seems to have stagnated during the period from 2002 to 2006 even though it stood high. During this period the central bank switched from fixed exchange rate to flexible exchange rate regime. Bhattacharya attributes this stagnated savings rate largely to deteriorating income distribution as he concludes that poor have a higher propensity to save and with a rising inequality they own a lesser proportion of the growing national income. From 2007, with some fluctuations for a few years savings rate picked up again from 2011. From 2011 to 2014 though there is an increasing trend in savings pattern in 2015 savings rate decreases and becomes 21.47 percent.

Agrawal, Sahoo and Dash (2008) studied the savings behavior of five South Asian countries. They applied cointegration method for their data for all the South Asian countries except Bangladesh using World Development Indicator of World Bank for data up to 2004. They found both total savings and private savings are stationary along with all the other variables, except income. In such a situation, income did not seem to form any long run relationship with the other variables. They applied an Autoregressive Distributive Lag model for Bangladesh. They found the impact of growth of per capita income on savings to be significant also the coefficient to be very large and significant. They also found real interest rate, banking facility to have a positive and significant effect on savings while foreign savings and dependency rate to be a negative and significant effect. They found that public savings has a negative and statistically significant relationship with private savings. They attribute the increase in tax collection and lower spending on social sectors to increase public savings reducing people's disposable income and resulting in lower private savings. Testing Granger causality for per capita income growth and savings, they found a bi-directional relationship.

### 2.3. Inequality Pattern in Bangladesh

Osmani and Sen (2011) in their paper "Inequality in rural Bnagladesh in the 2000s: Trends and causes" explore the pattern of inequality that emerged in rural Bangladesh in the decade of 2000. They explain that overall savings rate in rural Bangladesh has increased from a mere 14 percent to 22 percent during the decade and attributed this rise to the rise of savings by the top quintile from 32 percent to 54 percent along with a fall in the rate of consumption. Even though this behavior was quite plausible, the increase in dissaving (negative saving) by the bottom quintile was not equally easy to fathom. A fall in the absolute income when associated with an increased rate of dissaving can be explained by the inter-temporal optimization behavior; as one borrows to stay at the consumption level in line with the permanent income. However, in the last decade absolute income of the bottom quintile did not fall, rather it increased. Here, the negative savings even with increase in absolute income is explained as an effect of availability of easy credit.

To justify this explanation Osmani and Sen developed hypothesis about the shapes of consumption functions under different degrees of liquidity constraint and then checked the hypothesis for the experience of the last decade. Their hypothesis was that with a liquidity constraint the consumption function will be a steeper function of income and liquidity, with a lower intercept; meaning a minimum liquidity access when income is zero incontrast to an unconstrained consumption function. The data fitted this hypothesis indicting that they were already consuming very well below their permanent income level and easy availability of liquidity through the massive expansion of microcredit by the end of the decade.

Osmani and Sen (2011) updated a series of inequality estimated by Azizur Rahman Khan (2005). Khan's series was for the years 1991-92 to 2005 which Osmani and Sen updated up to 2010 for rural Bangladesh with data from the survey under the Dynamics of Rural Poverty Project of the Institute of Microfinance. They shed light on two stark features of inequality situation in rural Bangladesh from the data set; one, the rising trend in income inequality since the early 1990s and two, opposed to income inequality consumption inequality remained stable during the same period. Osmani and Sen further explored the widening of income equality. They divided total population into several groups by a number of alternative criteria——namely, occupation, landownership class, educational status and location. In their attempt to find the underlying reason of income inequality they examine the inequality situation very thoroughly exploring the changes in inequality for the income distribution of each group and also by exploring changes in inequality with each group as well as between the groups.

For the occupational groups they found that those who were self employed in non agriculture experienced the largest change in inequality situation as their Gini coefficient rose by 15 percentage points compared to a 10 percentage point increase for the rural population on the whole. The group according to land ownership the landless and the functionally landless group experienced the least increase, a 6 percentage point increase while on an average rural inequality increased by 10 percentage point. For the classification according to the education level of the household head the group with primary income but no secondary income experienced the highest rise in inequality of 16 percentage points while the group with education beyond the higher secondary level experienced the least rise in inequality of 3 percentage points.

For last category according to divisions both the top and the bottom one according to inequality position Barisal and Sylhet respectively experienced less than average increase in inequality. They then go along to examine inequality in the rural population of Bangladesh within group and between groups. They find that within group inequality accounted for 90 percent of inequality for both 2000 and 2010 and that it also increased over time. This phenomenon draws the conclusion that inequality is present in all socio economic groups.

They further divide the rural households into quintile from the ascending order of income per capita and examine the inequality situation. They compared the growth of per capita income of each quintile and the ratio of per capita income of each quintile to the first quintile's. Data reveals that per capita income increased the fastest for the richest quintile as well as the ratio of per capita income of richest quintile to the poorest quintile. The ratio of per capita income of the poorest quintile to the richest quintile went up to 9.7 percent in 2010 from 6.3 percent in 2000. Also growth of per capita income was higher for richer quintiles.

They conclude from here that the rise in inequality of the last decade was due to a sharp increase in the income of the richest quintile of the population compared to the others. Moreover, from a percentile growth incidence graph they show that, growth in per capita income was above the men income only after the 80th percentile. Compelled by these finding they explored the income component-wise growth for the top five quintiles of income groups. Non-agriculture income sources and especially foreign remittance turned out to have very high growth contributing to rural income inequality.

They further perform a Gini-decomposition for three broad categories of income source, namely agricultural income, non-agricultural income and transfer income. Defining marginal effect as the effect of one percentage change in the income from a certain income source in Gini coefficient they find that transfer income causes the most inequality in rural Bangladesh while income from agriculture causes the least. Similar effects are found with respect to magnitude of change as well. However, the contribution of income from non-agriculture sources on inequality remained the same over the years while the impact of transfer income increased and accounted for as much as 80 percent rise in inequality in rural Bangladesh.

To examine why these two sources of income cause inequality they identified three criteria of judgment; the distribution of income from that source, the correlation of income from that source with the total income and the share of income from that source in the total income. For remittance income and non-agriculture self employment income both correlation with and share of total income increased for income from these two sources. Moreover, their data set permit them to suggest that households involved in both of the earning sources were already from the better off segment of income level who are more likely to be capable of spend the large initial expense of such endeavours and seize such opportunities.

Kamal (2014) in his paper "Asset Based Poverty and Wealth Accumulation in Low Income Households in Bangladesh" in December 2014 they bring forth information about asset based measurement of poverty for Bangladesh with the argument that wealth based disparities can identify which group in the population needs social protection. In doing that they picked out a few useful savings behavior of households. They distinguish between buffer assets and productive assets, where buffer assets are accrued at the opportunity cost of productive assets and the at the cost of foregone consumption. Another thought provoking argument that they raise is that, the burden of high lending rate is eventually born by the consumers as they make purchases.

Osmani (2015) in his paper "Linking Equity and Growth in Bangladesh" in January 2015, A Background paper prepared for The Seventh Five Year Plan of the Government of Bangladesh, explores the idea that growth and inequality have a two-way-causation impacting each other simultaneously. Kuznet's 'inverted U' hypothesis in the early years (1955) was that rising inequality was part of the growth process. Long debates and empirical experiments did not find any concrete relationship between growth and inequality. However, this hypothesis proved real for the Asian countries. With this new awakening Kuznet's hypothesis asks for a more thought-out interpretation. Perhaps the interpretation is that, even though the market has a natural tendency to have rising inequality with rising growth it is not 'a law' and can be countered with effective policy choices.

The inevitable question then rose that does the policy intervention have any trade-off with growth. To answer this very crucial question the other side of the causation needed to be explored; the impact of inequality on growth. Osmani (2015) identified four channels that transmit the impact of inequality on growth. Savings is one of them.

### 2.4. Discussion

As we discussed the inequality pattern and savings behavior in Bangladesh and the existing theoretical and empirical work in the field, we came to understand a few of the features of the relationship and the perspective of the relationship in Bangladesh.

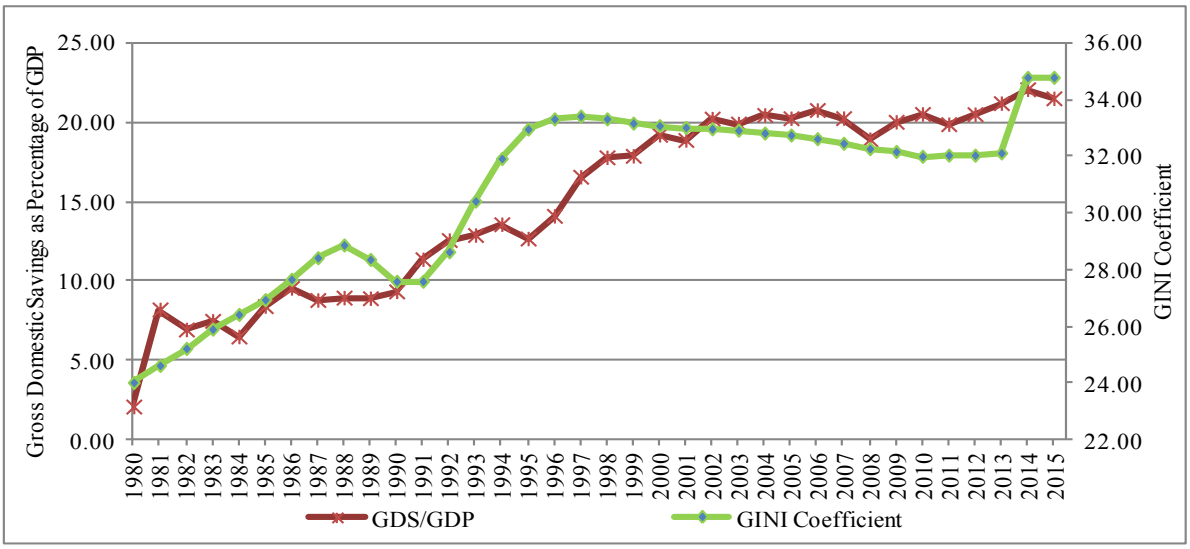
a. Gross Domestic Savings as percentage of GDP can be interpreted as average propensity to save, i.e. the increase in savings on an average due a one unit increase in GDP on an average. It is different from marginal propensity to save. The average propensity to save in Bangladesh has been on a growing trend and has had a faster growth than that of GDP itself.
b. Income inequality in Bangladesh measured by gini co-efficient has been growing till the late 1990s and attained a peak during the mid 90s. After that it continued on a slow falling trend.
c. The work of Osmani and Sen (2011) provides a vital point about the economy of Bangladesh. We learn that the poor among our rural population is consuming below their permanent income level and that easy access to credit impacts their savings behavior heavily. Even

though credit availability initially triggers dissaving in this population, the duration and extent of available credit may have some different impact.

d. Osmani and Sen (2011) also find that consumption inequality in Bangladesh unlike income inequality remained almost the same since the early 1990s.
e. Kamal(2014) summarizes that the burden of high lending rate is eventually borne by the consumers. This leads to the conclusion that if the upper income class of the society consists mostly of entrepreneurs, high disparity in lending and deposit rate becomes an automatic mechanism for increasing inequality.
f. Real interest rate is an important variable for the relationship of income inequality and savings behavior. Therefore, the relationship of real interest rate and savings for Bangladesh needs to be explored as well.
g. The ease of savings mobilization, availability of savings instruments and the existence and extent of social safety nets are important factors in determining the impact of income inequality on savings behavior.
h. The degree of inequality, especially the extent of access to opportunities is also an important determinant of savings and income inequality relationship (Mendes 2013).
i. Looking at GDP growth and gini coefficient (Figure 3 in appendix) we see no co-movement between them. This implies that if we aim for less inequality it would not hamper growth for Bangladesh.

### 2.5. Income inequality and savings to GDP ratio in Bangladesh

Figure 8: Gross domestic savings as percentage of GDP (GDS/GDP) and Gini Coefficient



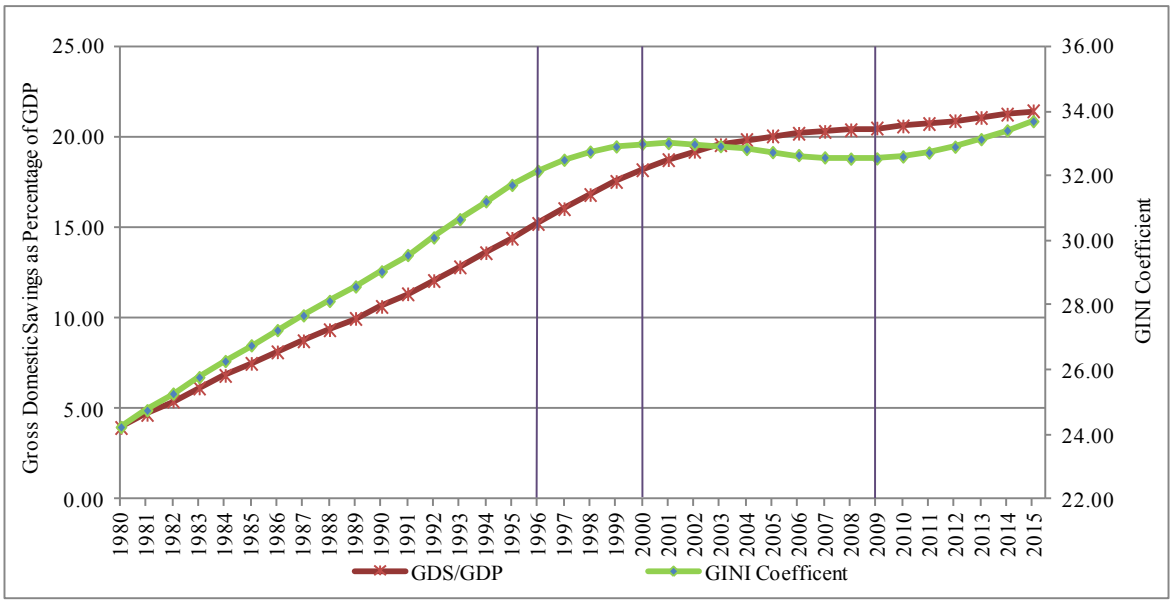

*Source: WDI, World Bank, 2016.*

Now if we look at gross domestic savings as percentage of GDP and Gini Coefficient we can see that from 1993 till 2002 inequality grew and then fell, while within this time savings took an upward pace. At the peak of Gini coefficient savings growth sharpened. Since 2002 Gini coefficient continued to fall and savings continued on the rising path with only a temporary setback in 2008, around the time period of global financial crisis.

We tested for unite root for the series gini-coefficient and gross domestic savings as percentage of GDP. We found that gross domestic savings as percentage of GDP is a non-stationary process, I(1). However, Gini-coefficient as expected is a stationary process, I(0); given the few data points that we have from.

We tested for granger causality between first difference of Gross Domestic Savings as percentage of GDP and Gini-coefficient. We found no causal relationship between savings and income inequality. This finding is contradictory to the finding that the relationship of savings and inequality is bi-directional in the case of Bangladesh in Agrawal, Sahoo and Dash's work in 2008. Thus the relationship demands further work.

Figure 9: Gross domestic savings as percentage of GDP (GDS/GDP) and Gini Coefficient, the trend




*Source: WDI, World Bank, 2016.*

The above image shows the Hordrick-Prescott trend line for gini coefficient and savings GDP ratio. We can see that savings GDP is has an increasing trend while gini coefficient has an increasing trend initially and then a decreasing trend. Since 1980 up to 1996 both savings GDP ratio and gini coefficient, the measure of income inequality, increased sharply. In the mid 1990s the growth of income inequality slowed down however, savings ratio continued at its sharp pace. In the beginning years of the 2000s income inequality started falling and the growth of savings ratio slowed down.

The economic liberalization of the mid 1990s in Bangladesh starting with the financial sector reforms in 1989 to 1995; new Value added tax (VAT) in 1991, current account convertibility in 1994 and interest rate liberalization caused the corporate sector to be profitable. It increased the income capacity of the poor and increased savings. In the absence of adequate number of data observations we cannot apply econometric tools however, we can visualize that liberalization brought a change in the relationship of income inequality and savings ratio.

Feraboli and Trimborn (2008) answer the question how different households are affected by trade liberalization by investigating the impact of Ukraine's Association Agreement with European Union. They conclud that trade liberalization in itself is did not make any pareto improvement in Jordan. They also find that in the long run income gap will increase due to trade liberalization as rich households experience comparatively larger capital income in the long run due to more investment incentive.

Ben Naceur and Zhang (2016) examine the impact of financial development on income distribution. They find that among the several dimensions of financial development: financial access, efficiency, stability and liberalization, financial liberalization aggravates income inequality. Moreover, it is the development of the banking sector than the stock market that has consequential influence on changing income inequality. They therefore prescribe macroeconomic stability and reforms in order to ascertain poverty reduction and income equality from financial development and liberalization.

Evans (2014) explored the impact of financial liberalization on income inequality for a number of developed and developing economies. He finds that financial growth mostly aggravates inequality. However, from the evidence of Brazil and Germany he concludes that cautious government policy can counter this effect of liberalization on inequality.

As long as the return on capital exceeds the rate of growth of the economy it causes the concentration of wealth to increase in the long run (Piketty, 2014). It is called the Piketty condition. This and the empirical evidences fit the notion that across all the countries wealth is more strongly concentrated than income. Therefore, a sufficiently large enough difference between the return on capital and the rate of growth of the economy is the reason behind wealth inequality.

In this context, Kramer (2015) in his paper "Inequality dynamics with different saving ratios" argues that the term sufficiently large enough is of prominence because, part of capital earning is used for consumption. Therefore, an explicit explanation of the Piketty condition could state that for inequality to intensify the proportion of savings from the return on capital needs to exceed the rate of growth of the economy.

The findings for Bangladesh however, on liberalization and income inequality as shown in figure 8 and 9, do not endorse the story of increasing income inequality with the pace of liberalization as suggested in the studies of Feraboli and Trimborn, Ben Naceur and Zhang, and Evans.

## 3. Conclusion

We have collected and summarized the existing literature regarding the impact of income inequality on savings. As mentioned before a literature survey on this relationship concluded that most recent theoretical studies do not find any concrete relationship. Moreover, the empirical studies do not find any significant relationship between the two variables. Both theoretically and empirically this relationship is ambiguous and there is a lot of scope for exploring the case of Bangladesh.

Savings behavior in Bangladesh needs to be explored thoroughly with more data. We did not find any exhaustive work on the subject. Deeper scrutiny with component wise break down of savings for private and public savings, and further within private savings, corporate savings and household savings is necessary.

The pattern of movement of savings and income inequality in Bangladesh answers two questions about their relationship:

i. Whether savings and income inequality has a strictly linear relationship?
ii. Does the direction of the correlation differ with different policies?

The series of income inequality and savings demonstrate a non linear relation. Savings behave differently at different level of income inequality. Moreover, this non linear relationship is due to changes in economic policy. From our data set we can see that economic liberalization has improved the inequality situation of our country and caused savings GDP ratio to increase.

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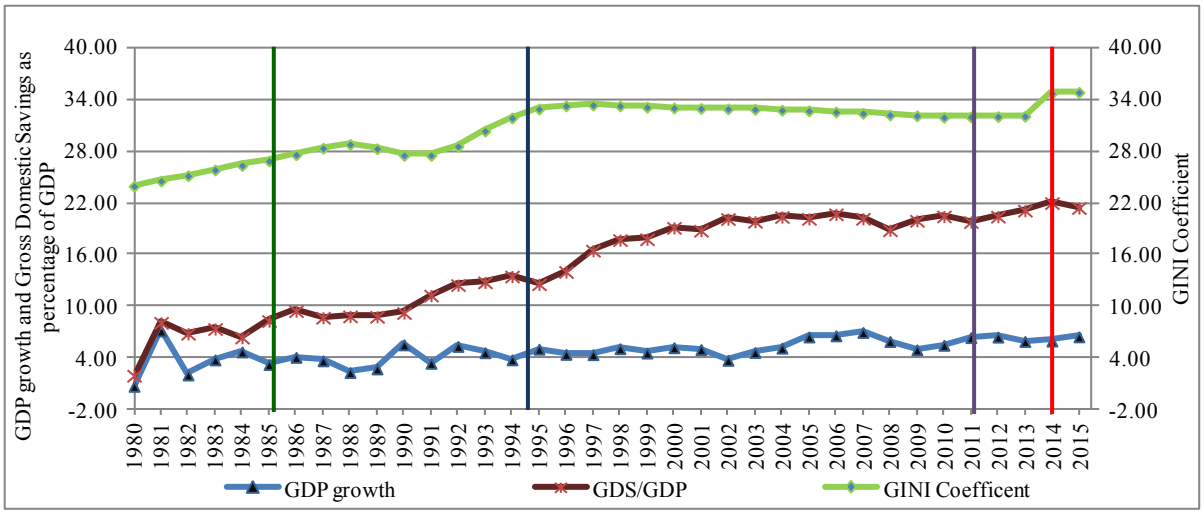
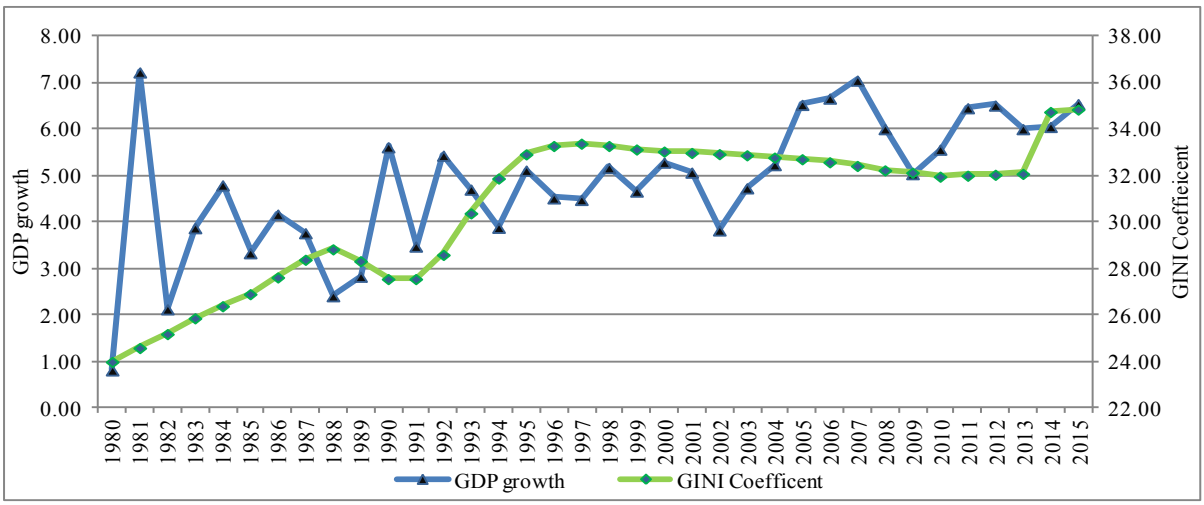
## APPENDIX

Figure 1: Gross domestic savings as percentage of GDP, Gini co-effiecient and GDP growth



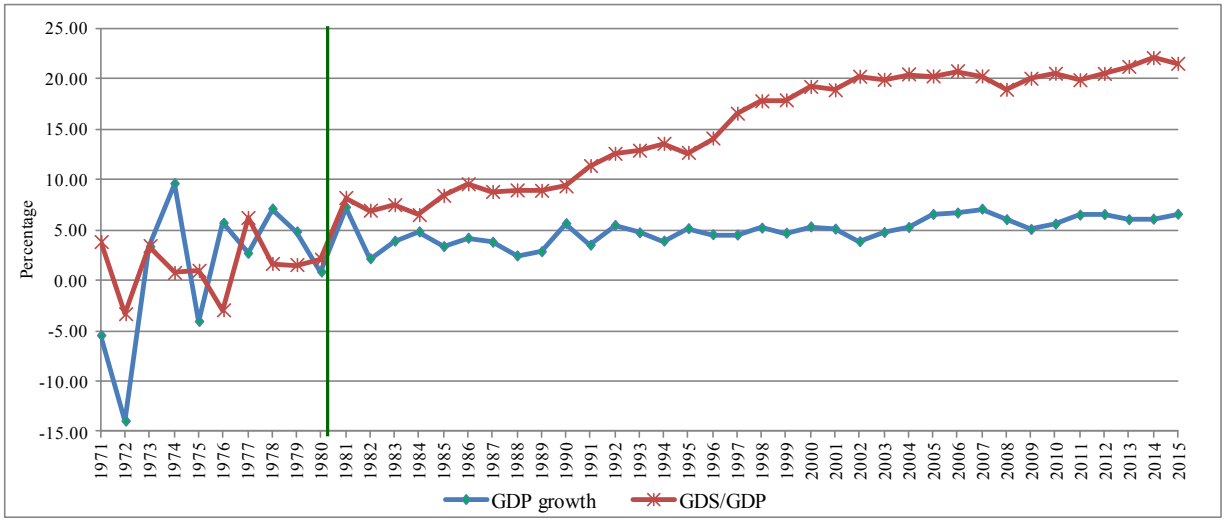

*Source: WDI, World Bank, 2016.*

Figure 2: GDP growth and Gini coefficient




*Source: WDI, World Bank, 2016.*

Figure 3: GDP growth and gross domestic savings as percentage of GDP (GDS/GDP)




*Source: WDI, World Bank, 2016.*

Table 1: Pairwise Granger causality test for change in gross domestic savings as percentage of GDP and Gini Coefficient

Pairwise Granger Causality Tests
Date: 09/24/16 Time: 11:45
Sample: 1960 2015
Lags: 2

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|---|---|---|---|
| GINI does not Granger Cause SAVINGS | 32 | 0.69325 | 0.5086 |
| SAVINGS does not Granger Cause GINI | | 0.89895 | 0.4188 |

*Source: WDI, World Bank, Bangladesh, 2016.*