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**Asset based poverty and wealth  
accumulation in low income households  
in Bangladesh**

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## **Asset Based Poverty: wealth accumulation in Low Income Households**

Javed Bin kamal<sup>1</sup>

### **Abstract**

Using HIES (Household Income and Expenditure Survey) data for the period of 2000, the paper aims at presenting asset based poverty information so that it is possible to provide incentive in the form of social benefit and tax to the group of people who need it most. While income based measurements and other methods are available to characterize the households under poverty, asset based measurements depict a new insight on poverty and related welfare studies. .By applying fractional polynomial regression, we found that there lies significant relationship between total asset and income. We also found the significant result for asset income, profit from enterprise, other asset (includes financial asset, jewelry), house value and other income (rent, dividend, interest) with total asset. Meanwhile, variables such as religion, gender of the household head and agricultural income are not significantly affecting total asset. We found that 30 % people possess total asset of BDT 12000, whereas 30% people have income less than BDT 19000. People accumulate asset starting from age 20 and until the age of 80 .Whereas, the education level of head of the household ranges between classes 5 to class10, when such households possess higher assets. Meanwhile except for few outliers, both asset and income are invested and managed effectively to derive return from such investment.

**JEL Classification:** D3, H5, O12.

### **I.INTRODUCTION**

Wealthy refers to those who have bank balance, house, business or cars; but wealth is something that provides protection against tough times, tuition to get private education, support to arrange sumptuous marriage ceremony, savings to go for solvent retirement life, and a facilitator of poor to achieve non poor status. Wealthy people not always accumulate wealth over time. The poor can accumulate wealth

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too and that wealth can accrue over time. Poor people can use their existing assets as collateral for borrowing, giving families a way to move up and out of poverty. Possession of assets may help to escape from the poverty trap (Carter and Barrett, 2006). First, assets can play an important role in reducing exposure to distress. Assets help provide ability to face accidents, repay debt, supplement sudden fall in income. Second, households with more assets are often able to improve their income levels by producing goods, speculating<sup>2</sup> or by lending. Third, accumulation of assets may help people move out of poverty and improve their standard of living. Policymakers concentrate on income before making policy regarding social benefits and overlook wealth. The government spends hundreds of billions of funds each year to support long term poverty reduction. Reforming policies helping families enroll in automatic savings vehicles will ensure saving opportunities for all. Hence, by understanding wealth disparities, we can identify group people who need social protection and ultimately raise themselves out of poverty.

In the next chapters, we discuss the poverty and its relationship with assets. In addition, we will explore relationship between asset and income as levels of asset holdings are strongly associated with level of income. Then we discussed the concept of wealth, asset based methods to measure poverty, comparing asset based measures with income based measure. We also discuss the output found on the basis of applying fractional polynomial regression model on micro level data in Bangladesh. Finally we conclude the paper.

## **II. LITERATURE REVIEW: METHODOLOGICAL ISSUES**

An economic approach measures poverty in terms of per capita consumption, income levels or calorific intakes. Minimum Income threshold has been accepted indicator for measuring poverty as income insufficiency can measure a person's inability to maintain a standard livelihood. Other measures such as wealth-ranking are practiced in sociology. But, according to, Deaton & Grosh, (2000), consumption is the best measure of the economic component of living standard. See Appendices A.1 for definitions of poverty by think tanks in Bangladesh for understanding of poverty criteria in Bangladesh.

Meanwhile, in recent years asset based measures of living standards have been widely used (Montgomery, Filmer & Pritchett, McKenzie). As income measure is found to be ineffective criteria of

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<sup>2</sup> Speculation is the practice of engaging in risky financial transactions in an attempt to profit from short or medium term fluctuations in the market value of a financial instruments or property.

poverty against asset based measures specifically in developing countries because income is underestimated since incomes are a basis for household taxation.

A key research issue is that large numbers of individuals and households are unable to accumulate key assets. The factors which affect how individuals use their assets are very important, for example education, experience. The inability to use assets effectively may lead a person to stay in chronic poverty; while the ability to earn an handsome risk adjusted return on assets may be an important factor get free from poverty .Besides, having more assets also plays an important role in measuring social status, and potentially identifying those people who need more attention from public policy interventions. However, poverty reduction policy should focus on what poor people have (assets) as much as what they lack (Moser, 1998), and help them to accumulate assets and manage it effectively.

In a study of rural areas in four African countries, Ellis and Freeman (2004) found that land productivity increased with income level and asset accumulation. Meanwhile, Rigg (2006) argues that land is not enough for poor rural households to escape poverty. He argued that rural livelihoods have become separated from agricultural production; besides the importance of nonagricultural activities has been increasing. Rigg strongly challenges the idea that solution to rural poverty lies within rural areas and within agriculture (the ‘yeoman farmer fallacy<sup>3</sup>’).In addition, owning a house has been very important for asset based poverty. Low income people having a house can accumulate wealth and replay debt. But assets themselves are not sufficient; institutions and technology are also important (Barrett, 1999).

### **What is Wealth?**

Wealth is measured as total assets minus total liabilities. Assets are the sum of financial assets (such as bank accounts, stocks, bonds) and nonfinancial tangible assets (such as homes and real estate, businesses, jewelry and vehicles). Liabilities include both unsecured debt (such as credit card balances) and secured `debt (such as mortgages and vehicle loans).Households save both in the form of conventional buffer assets (e.g. grain stocks and other safe savings instruments) and in the form of productive assets. Buffer assets accrue at the opportunity cost of productive assets, as well as at the cost of foregone consumption.

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<sup>3</sup> In the late 14th to 18th centuries, yeomen were farmers who owned land (freehold, leasehold or copyhold). Their wealth and the size of their landholding varied. Often it was hard to distinguish minor landed gentry from the wealthier yeomen, and wealthier husbandmen from the poorer yeomen.

In this paper, we used ideas such as net worth, asset and savings to characterize households under poverty which are follows:

$$\text{Wealth/ Net worth } t = (\sum_{i=1}^t \text{Asset } i + \sum_{i=2}^t \text{Asset return } i) - (\sum_{i=1}^t \text{debt } i + \sum_{i=2}^t \text{cost of debt } i) + (\sum_{i=1}^t \text{Retained income } ) \text{----- (1)}$$

$$\text{Asset } t = \sum_{i=1}^t \text{Investment } i - \sum_{i=1}^t \text{Sale of asset } i \text{----- (2)}$$

$$\text{Savings}_t = \text{Income } t + \text{Net worth }_{(t-1)} - \text{Consumption}_t - \text{Invesyment } t \text{----- (3)}$$

Where, t= terminal time

**Income vs. Wealth:**

Income inequality and wealth inequality change over time. If neither has improved, in such cases income gap has stayed the same. In common misconception is that poor or even low-income families cannot save.

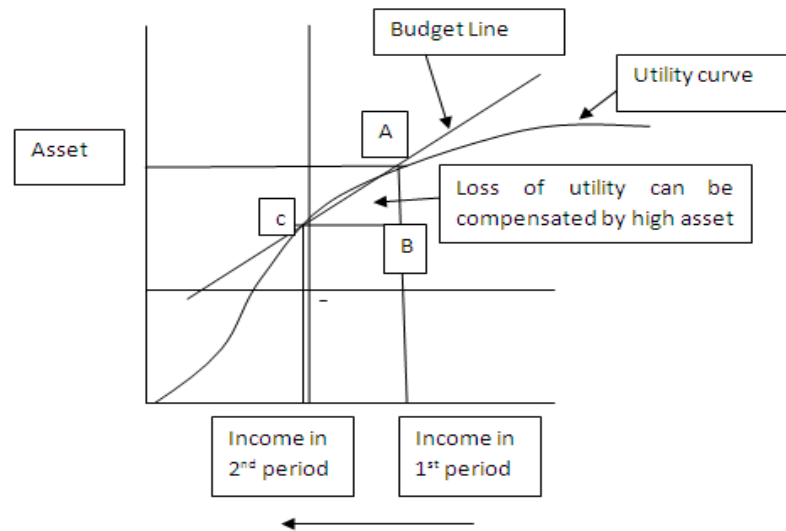
Low income households accumulate wealth in several patterns. Oliver and Shapiro (1990) used the data from 1984 found that one-third of households had zero or negative net financial assets ,whereas median net financial assets were about \$2,600. The average American household can sustain three months without earning with their available net financial assets., Wolff (1998) used survey of consumer finances of 1995 and found that families in the middle quintile have financial wealth sufficient to replace current income for 1.2 months, those in the second quintile for 1.1 months, and those in the bottom quintile could not replace current income.

Wolff (1998) showed net worth among low-income families declined for a significant period in the 1980s and 1990s, whereas mean wealth among the bottom 40 percent of the population fell sharply, from \$4,400 in 1983 to \$900 in 1995. This was accompanied by a decline in wealth and home ownership rates for households between the ages of 25 and 44. There is great heterogeneity in wealth holdings. Wolff shows that in 1995, the top 1 percent of households held over 38 percent of all net worth (other than social security and pensions), and the top 5 percent held 60 percent of net worth, while the bottom 60 percent of households held less than 5 percent of net worth.

### What is an asset-based approach?

An asset based approach involves how asset enables households to overcome shortfall in income and to continue sustainable consumption level. Households are observed to transition from poor to non-poor status (and vice versa) overtime.

**Diagram1 : Income Asset interaction grid.**



Source: Author

In the above diagram, we can see that due to a fall income from first period to second period utility level may fall from A to C. But sale of asset may help to return same utility level as 1<sup>st</sup> period.

### Hypotheses:

Our null hypothesis is that asset cannot be explained by flows such as income and its subgroups such as wage income, agricultural income, asset income, and profit from business, gender, religion and

education of household heads. In addition to that we want to see which components of asset itself are significantly affecting total asset such as land value, financial assets and jewelry, equity contributed in firms, livestock, forestry, house value and agricultural asset

**Model Setup:**

Linearity is assumed for continuous predictors, for example, the weight, height of a person. In most cases, linear functional relationship or a step function is assumed for such continuous predictors. However, the assumption of linearity may be incorrect, also may lead to a mis-specification of fitted model. But, models assuming non-linearity may lead to good fit of the data. Fractional polynomial method look for best fit functional forms for continuous covariates as well as it eliminates insignificant covariates.

Royston and Altman (1994) explained regression models based on fractional polynomial functions of a continuous covariate (see also sauerbrei and Royston (1999)). Fractional polynomials are used in regression models to fit non-linear functions because linear and quadratic functions are limited in fitting curve shapes.

A polynomial of degree m may be written as

$$\beta_0 + \beta_1x + \beta_2x^2 + \dots + \beta_mx^m \text{ -----(4)}$$

whereas fractional polynomial of degree m has m integer and or fractional powers  $p_1 < \dots < p_m$

$$\beta_0 + \beta_1x^{(p_1)} + \beta_2x^{(p_2)} + \dots + \beta_mx^{(p_m)} \text{ -----(5)}$$

where ,

$$x^{(p)} = \begin{cases} xp & \text{if } p \neq 0 \\ \log x & \text{if } p = 0 \end{cases}$$

x must be positive. A Fractional Polynomial of first degree (m = 1) involves one power or log transformation of x. Fractional Polynomial functions may be extended to include repeated powers. An fractional polynomial of degree m with exactly m repeated powers of p is defined as

$$\beta_0 + \beta_1 x^p + \beta_2 x^p \log x + \dots + \beta_m x^{(p)} (\log x)^{m-1} \text{-----}(6)$$

For example, an fractional polynomial of second degree (m = 2) with repeated powers of 0.5 is

$$\beta_0 + \beta_1 x^{(.5)} + \beta_2 x^{(.5)} \log x \text{-----}(7)$$

The linear predictor for a fractional polynomial of order M for covariates is as follows:

$$\beta_0 + \sum_{m=1}^M \beta_m X^{pm} \text{-----}(8)$$

Power pm is chosen usually restricted set of powers is { -2,-1,-.5,0,.5,1,2,3}.

Estimation involves a systematic search for best power that fit the data best because values of the power are not known. If the values of the power were known .fractional polynomials would become a multiple regression model with coefficients  $\beta_0 \beta_1 \dots \beta_m$  . For each combination of power, deviance is measured and lowest deviance is considered as best fit.

Empirical specification of our model is as follows:

$$\begin{aligned} \text{Asset} = & \beta_0 + \beta_1 \text{income}(i)^{p1} + \beta_2 \text{income}(i)^{p2} + \beta_3 \text{other income}^{p3} + \beta_4 \text{total profit}^{p4} + \\ & \beta_5 \text{asset income}^{p5} + \beta_6 \text{agricultural income}^{p6} + \beta_7 \text{religion}^{p7} + \beta_8 \text{gender}^{p8} + \\ & \beta_9 \text{house value}^{p9} + \beta_{10} \text{other asset}^{p10} + \epsilon \text{it} \text{-----}(9) \end{aligned}$$

**Data:**

We used data from HIES (Household Income and Expenditure Survey) 2000 of Bangladesh. Using Stata, we perform necessary data management function to get our desired data set. There are 7440 households in the data set.

The following components of household wealth have been used for finding total asset:

Main home: The value of home.

- (1) Firm and business: The equity contributed by gift, own source and savings.
- (2) Financial Assets: value of shares of stock of publicly held corporations.
- (3) Checking and saving accounts: value of checking or saving accounts.
- (4) Land Asset.



(5) Livestock.

(6) Forestry.

(7) Agricultural Asset.

While, following components have been used for calculating income flows:

1) Wage and salary income

2) Other income (income from rent , other income from property, dividend and profit from stock and partnership, interest from bank and other sources)

3).Nonagricultural income (profit from enterprise)

4) Agricultural income: It includes follows:

a) Income from crop

b) Income from fishery

c) Income from forestry

d) Income from livestock product

e) Rental from agricultural asset

f) Expenses related to agricultural activities

Agricultural income = a+b+c+d+e-f

Our summary of our dataset are as follows:

**TABLE I**  
**SUMMURY OF DATA SET**

*Amounts are in Bangladeshi taka*

	No. of Obs (households)	Mean	Min	Max
Total asset	7440	88045	-595500	14,000,000
Income	7440	58325	-24405	9232000
Net agricultural income	3917	9390	-126171	1282850

Expenses on agricultural Inputs	3917	4904	0	545300
Total agricultural income	4157	13637.9	-18690	1595800
Asset income	3893	847.47	-40000	120000
Fish farming income for 12 months period	4799	1769.071	0	150000
Income from crop	3387	10141	0	1320000
Total profit from business	2442	49331	-18000	3495000
Other income	7440	17960	0	9130000
Salary income	2666	37432	0	1465000

Source: Authors' own calculation.

We used data from HIES for the period 2000. Meanwhile, data for the year 2005 and 2010 are available. Our purpose is to address relationship between asset and income flows and gender, religion, house value and other asset, thus the scope of the paper does not cover time varying relationship between asset and income.

### III RESULTS FROM EMPIRICAL EXCERCISE

The regression result shows that total asset (House Value, Enterprise Equity Share, Other Asset, Land and Property Asset) has significant relationship with income (Wages and salary, profit from Enterprise, Other income, agricultural income, other income), other asset (Jewelry .Financial Assets etc), house value, and profit from business at 5% significance level. Income is very significant in building asset. House value is illiquid asset, thus when any shortfall of income is faced by consumers, they can

immediately sell their house at once for maintaining livelihood. However, if one has more than one house, he or she can lease the asset and enjoy some revenue. Ornaments, financial assets, bank deposit may work as liquid asset in vulnerable time or in time of financial need. If the house is mortgaged, than the scenario is difficult for maintaining a certain standard of living. As non -payment of such debt may lead to leave the house. Often poor people lose their house as they cannot pay their loans from lenders. Agricultural income is not significant to total asset. Policymakers should take care of people involved in agriculture, as agriculture is backbone of Bangladesh and without proper development of farmers, it would be difficult for the economy to thrive. As agricultural income is very low, it would be tough for the people in agriculture profession to accumulate wealth.

**TABLE II REGRESSION RESULT**

R2(adjusted)=.8774 R2=.8786 F=735.34 P(F)=0.0000 Number of observation= 1027		
	Coefficient	P value*
Constant		0.000
Income 1	1238028	0.000
Income 2	-908527	0.000
Asset income	-2.268138	0.000
Total profit	-.3017069	.030
Total other income	-.0091097	.962
Total agricultural income	.1193245	.448
Religion	-312.2564	.979
Gender	-8952.719	.716
House value	1.061701	0.000
Other asset	2.420582	0.000

Gender and religion of household heads are not significant to total asset at 5% significance level. It means that the asset building in a household does not depend on whether household head is male and female. This is because more and more woman is participating income and revenue generation process,

and accumulation of wealth process as well. As a result, women are equitably doing well in running families along with men. Religion does not affect total asset which implies that religious background does not affecting in having jobs, or in doing well in businesses.

**TABLE III**  
**PERCENTILES OF INCOME AND ASSET DATA**  
**PER CAPITA (AMOUNT IN BANGLADESHI TAKA)**

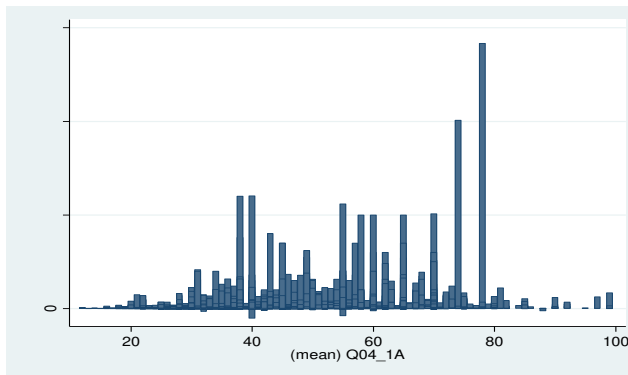
<b>Variable</b>	<b>Obs</b>	<b>Percentile</b>	<b>Centile</b>
Total asset	7440	10	0
		20	5000
		30	12000
		40	20000
		50	30000
		60	45000
		70	65000
		80	100212
		90	195000
Income	7440	10	2704
		20	10451
		30	19000
		40	27504
		50	36000
		60	46528
		70	60000
		80	80683
		90	120000

If we look at percentile or distribution of both income and asset data, it can be found that bottom 10 percent of people hold total asset amounting BDT 0, whereas income for that group is just around BDT 2704. If we see the top 10 % of the people holding total asset of about BDT 195,000 and income for top 10% people is BDT 1,20,000. As per distribution of asset and income, wealth accumulates faster as income rises. As MPC (marginal propensity to consume) fall with increase in come. At the same time, MPS (marginal propensity to savings) rises with increase in income. In addition, due to diminishing marginal utility, people reduce consumption once they are satisfied. For example, a solvent person will buy a car, but buying fifth car will not appeal him much unless buying car is a hobby to such person.

**FIGURE 1**

**ASSET ACCUMULATON AND MANAGEMENT PATTERN**

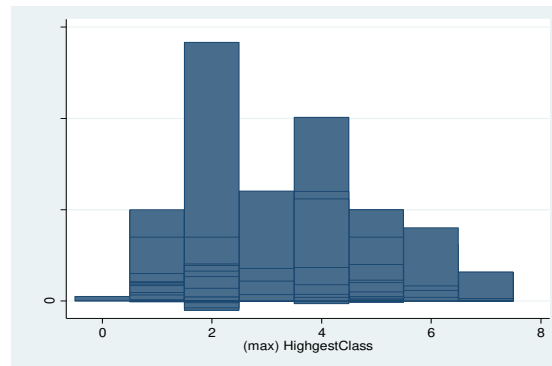
**A ) Total Asset Vs. Age of the Household Hea**



**C) Total asset VS Asset Income**

**B) Total Asset Vs. Highest Class Attendedb House Hold Head**

The Code are 1 = Class 1-5, 2=Class 6-10, 3= Class 11, 4=Graduate, 5=Postgraduate, 6=Medical/Engineering, 7=Others, vocational, diploma.



**D) Income Vs Asset Income**

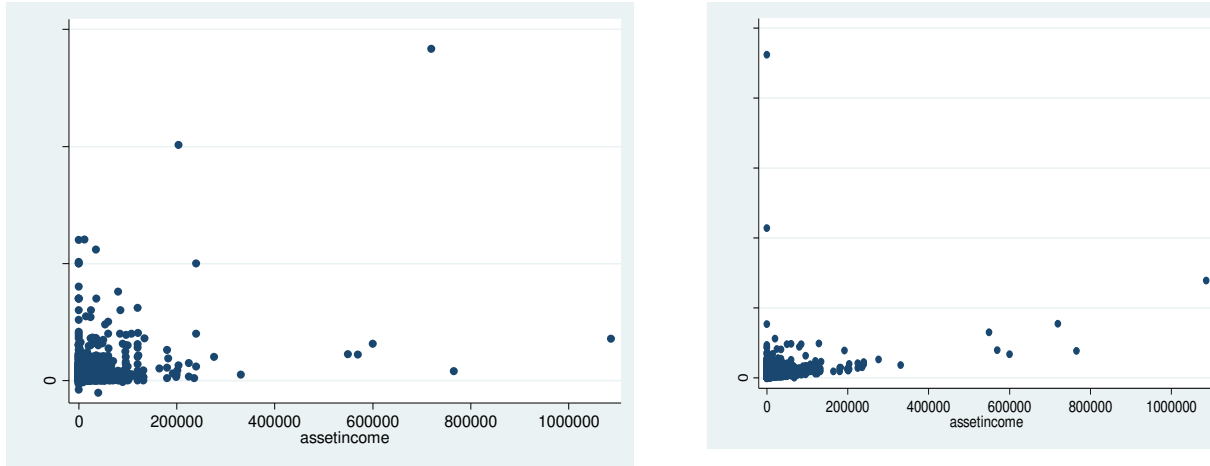


Figure 1 (A) shows that people accumulates asset starting from age 20 and until the age of 80 .Whereas, 1(B) shows that the education level of head of the household ranges between classes 5 to class10, when such households posse' higher assets. Meanwhile 1(C) and 1(D) show that except for few outliers, both asset and income are invested and managed effectively to derive return on such investment.

#### IV POLICY RECOMMENDATION

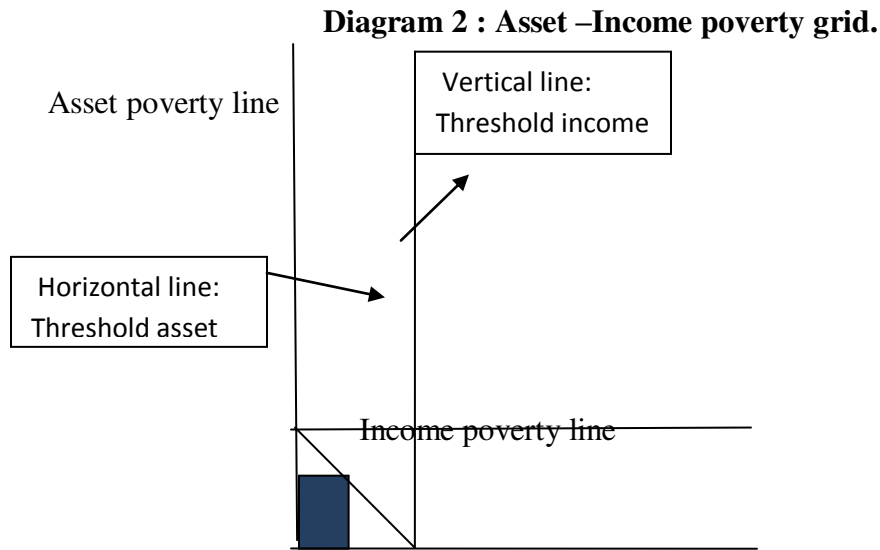
Apart from education for people , public policy are mostly concentrated on social programs to meet basic consumption need .Such policies prioritizes income distribution of population. An asset-based approach is recommended to balance this traditional approach, which may lead to long-term development of low income households.

We believe that social benefit program and tax policy should be aligned to derive optimum benefit from any fiscal policy and ultimately to reduce gap between the rich and poor. The following diagram divides people into two categories based on income and asset, here we avoid middle class portion

**TABLE IV: POOR-RICH CLASSIFICATION BASED ON INCOME AND ASSET**

	Poor	Rich
Income	Low	High
Asset	Low	High

Source: Author



In above diagram people staying in blue shaded area are worse off, as they neither have much asset nor much income to sustain their life. We assumed equality in income and asset poverty measures. We believe that a poor person is not capable of paying their debt. A person with low debt, when fall in distress, can borrow and lead existing lifestyle for some time. Meanwhile a person having asset, with low debt can sell liquid asset immediately and illiquid asset in the long run to maintain existing living standard at least.

We recommend following tax for above four groups:

**Savings tax:** Government should impose tax on savings in bank fixed deposits (above set amount) in order to discourage savings, as more savings will go to banks and banks will lend at higher interest rate, thus eventually savers need to bear the burden when they purchase goods from a producer who borrowed fund from a bank at high cost. Besides savings will reduce consumption and often investment. If savings is invested in income generating asset by the savers, then it can be welcomed. Also savings is done through buying government securities, prize bonds, savings certificate is welcomed as government will reinvest or spend for public welfare. Savings income tax may be reduced for low amounts of savings.

**Asset Subsidy:** If anyone invests in assets, he or she can be given a certain rebate in tax liability. As assets generates cash or used in production, creating employment and work.

**Debt tax:** Debt is discouraged, thus if anyone has substantial amount of debt, tax should be imposed. As high debt comparing asset may make an entity bankrupt. Business firms often prefers debt due to tax deductibility, business should provide very low rate tax on debt along with tax on earnings.

TABLE V: HYPOTHETICAL DEBT TAX CALCULATION

	Scenario without debt tax	Scenario with debt tax	
Earnings Before Interest and Tax	12	12	
Tax on debt		0.1	Debt 20 , interest rate 10%
Interest	2	2	Debt tax rate 0.50%
Earnings Before Tax	10	9.9	
<b>Tax 5%</b>	0.5	0.45	
Net income	9.5	9.45	

Source: Author

There are four types of people in a society. Following diagram shows

TABLE VI : FINANCIAL STATUS CLASSIFICATION

High Income High Asset	High Income Low Asset
Low Income High Asset	Low Income Low Asset

Source: Author.

The tax rate applicable for both income and asset for above four groups are follows:

**Low Income Low Asset:** We suggest that low income tax is imposed on this group and social benefit should be provided effectively so that this people can uphold their status over time.

**High Income High Asset:** we suggest high income tax bracket for this group, as this group has high asset, low asset subsidy can be applicable.



**High Income Low Asset:** we suggest High income tax for that group with High asset subsidy in order to encourage them to accumulate asset.

**Low Income High Asset:** we suggest low income tax and low asset subsidy for this people.

A dynamic status over time for a person from poor to non poor or non poor to poor:

**TABLE VII: DYNAMIC POVERTY AND SOCIAL WELFARE**

Time period		1 <sup>st</sup> period	2 <sup>nd</sup> period	3 <sup>rd</sup> period	4 <sup>th</sup> period No social welfare		5 <sup>th</sup> period Social welfare	
Consumption (standard of living above poverty line)	0	8	8	8	0	8	?	8
Income (Above poverty line is 8 )	0	10	12	8	0	0	0	4
Net worth	0	2	2.2	2.42	2.64	0	0	0
Investment	0	2	0	2	0	0	0	0
Asset@ 10% return	0	2	2.2	4.42	4.84	0	0	0
Debt@ 10% interest	0	0	0	2	2.2	0.52	0.52	0.52
Savings @ 10% interest	0	0	4	4.4	4.84	0	0	0
Social welfare								4

Source: Author

Low-income household are not targeted in asset based programs. As such people do not own homes, investments, or retirement accounts. Besides, they do not have asset accumulation incentives for getting waiver in income tax liability. Asset-based policy would improve the welfare of low-income households in ways that traditional income-support policy cannot. Asset-based policy includes policies to promote the accumulation of financial wealth, tangible property, human capital, social capital, political participation and influence, cultural capital, and natural resources.

Few recommendations are made as follows to reduce asset gap between rich and poor. In addition, by accumulating wealth the poor are expected to sustain a standard living.

- 1) Long term savings incentive such as tax benefit and low income tax should be offered to low income, low asset people.
- 2) Programs needs to be telecast in radio and TV regarding issues on asset management and asset building, savings, good health care etc in naive language.
- 3) Co-operatives and banks should provide asset management lessons to low income people in villages.
- 4) Implementation of no premium social insurance for low income, low asset households to better face physical and financial hazards.

## V CONCLUSIONS

In this paper, an attempt has been made to provide meaningful insight on poverty via asset based information. Such asset based measurement constitutes new class of poverty measurement, along with conventional flow or income based poverty. The income distribution of the society and implementation of social benefit plans towards targeted poor people becomes more logical and viable through asset based information, as such information can provide an actual reflection of an economy and its agent's financial position. Finally, formulation of anti-poverty policy becomes ethical as every class of the society is given preference. To gain success, the challenge is to identify the populations least able to accumulate assets over time, as people change their asset based financial position over time. It is possible to do further research with different data sets and regions. Results may vary over time and over geographical region.

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#### APPENDICE A.1

<b>Organization</b>	<b>Term used To define poverty</b>	<b>Definitions</b>	<b>Sources/References</b>
BIDS	Extreme poor	Own less than 5 decimal of land and have no cultivated land Suffer chronic food deficit Fully dependant on manual labour Per capita income annually less than BDT 2800 No access to health facility Live in thatched roof	Rethinking rural poverty Bangladesh A case study by Hossain Jillur Rahman and Mahbub Hossain
BRAC	Poor	Own less than 10 decimal of land Fully dependant on seasonal wage labour Suffered from recurrent food insecurity Have no or very few productive assets. Female headed household with single income earner Have poor housing	Challenge the frontier of poverty reduction march 2001, targeting ultra poor , targeting social constraints Published by BRAC centre

Woman with disabled  
husbands.