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Inequality in Rural Bangladesh in the 2000s: Trends and Causes

S. R. OSMANI*
BINAYAK SEN*

This paper has investigated the patterns of inequality that have emerged in rural Bangladesh in the decade of the 2000s. Two findings stand out clearly– distribution of income has become more unequal over the decade, and, somewhat surprisingly, distribution of consumption has remained more or less unchanged despite widening income inequality. The main analytical task of the paper was to search for the underlying causes responsible for these two apparently contradictory trends. The root of widening income inequality was found to lie in the unequalising effects of foreign remittance, and to a lesser extent, that of income from self-employment in non-agricultural activities. These two sources of income were also the driving force behind rapid growth of the rural economy. This poses a trade-off between growth and equity, which the policymakers need to resolve – for example, by making foreign migration more affordable to people of small means. Our explanation of how consumption inequality remained stable in the face of widening income inequality turns on the consumption smoothing effect of microcredit. The hypothesis is that consumption inequality did not rise because people at the lower end of the income scale were able to enjoy higher levels of consumption at given levels of income thanks to the relaxation of liquidity constraint made possible by the rapid expansion of microcredit. The hypothesis was validated by examining the nature of consumption functions at the two ends of the decade.

I. INTRODUCTION

In many developing countries, recent upsurge in growth has been accompanied by rising inequality even as poverty has declined, and Bangladesh

* S. R. Osmani is Professor of Development Economics at the University of Ulster, UK, Visiting Professor at BRAC University, Dhaka and Visiting Fellow at the Institute of Microfinance, Dhaka, and Binayak Sen is Research Director at the Bangladesh Institute of Development Studies, Dhaka. This paper is based on research under the Dynamics of Rural Poverty Project being carried out at the Institute if Microfinance (InM) with funding from the PROSPER programme supported by UKAid from the Department for International Development (DFID), UK. The authors are grateful to DFID, InM and the members of the Project team for making this research possible. The views expressed in the paper are, however, entirely those of the authors themselves and cannot be attributed to any of the institutions involved.

is no exception in this regard (Milanovic 2005, Goldberg and Pavcnik 2007, Khan 2005, Bhattacharya and Khan 2008). For a long time the idea that growth was prone to be associated with rising equality—known as the Kuznets hypothesis—was generally accepted as an inevitable feature of the development process, until research since the 1970s began to cast doubt on the theoretical and empirical validity of the hypothesis (Kanbur 2000). However, the spectre of Kuznets seems to be coming back with a vengeance in the wake of the most recent experience of rising inequality across much of the developing world. Rising inequality raises concern not only about the poverty-reducing effect of growth here and now, but also about the prospect of poverty reduction in the future.[1] Understanding the changing pattern of inequality and its underlying forces has, therefore, become ever more important.

The present paper looks at the trend of inequality in rural Bangladesh and comes up with two major findings: (1) inequality in the distribution of income has been rising consistently at least since the early 1990s, and (2) inequality in the distribution of consumption expenditure has, however, remained remarkably stable in the recent years. The objective of the paper is to investigate the forces underlying these two apparently inconsistent trends.

Data on the recent trends of inequality are presented in Section II. An in-depth examination of the forces underlying the trend of rising income inequality is also undertaken in this section. It is shown there that the unequalising influences of foreign remittance and income from self-employment in non-agricultural activities have been the main drivers of rising inequality in rural Bangladesh. In section III, we attempt to explain the puzzling phenomenon that consumption inequality has remained stable in the face of rising income inequality. The hypothesis we offer focuses on the easing of the liquidity constraint made possible by the microcredit revolution in rural Bangladesh. A summary of the findings and some concluding remarks are offered in section IV.

II. RECENT TRENDS OF INEQUALITY IN RURAL BANGLADESH

The successive rounds of *Household Income and Expenditure Survey* (HIES) carried out by the Bangladesh Bureau of Statistics are the primary source of data on the distribution of income and consumption expenditure in Bangladesh. Although questions remain about the quality of data, these are the best large-scale representative data sets available in Bangladesh. More importantly, the data

[1]Recent research has shown that higher inequality may lead to slower growth, other things remaining the same, and thereby hamper the prospect of poverty reduction in the future (Ravallion 2009).

of different rounds of HIES are generally comparable, so that as long as the nature of biases remain unchanged one can have a reasonable degree of confidence in the nature of change revealed by these surveys, if not in the levels of variables at any point in time. After a careful scrutiny of the HIES data, Khan (2005) generated a series of estimates of inequality in both income and consumption distributions for the period between 1991/92 and 2005. We have updated this series for rural Bangladesh by using data from a large-scale household survey carried out in 2010 under the Dynamics of Rural Poverty Project of the Institute of Microfinance, Dhaka.[2,3] The resulting trend of inequality in rural Bangladesh is presented in Table I.

A couple of features of the evolving trend stand out immediately. First, the rising trend in income inequality that started in the early 1990s continued unabated in the last decade. As measured by the Gini coefficient, income inequality has increased from 0.35 in 2000 to 0.46 in 2010.[4]

Second, in complete contrast to income inequality, consumption inequality has not changed at all in the last decade, with the Gini coefficient of consumption distribution remaining stable at around 0.28.[5] In both these respects, our findings for 2010 do not spring any surprises——they merely confirm that the trends that were observed in the first half of the last decade continued in the second half as well. Other measures of inequality also tell the same story.[6]

The stability of consumption inequality has played a critical role in making possible the observed acceleration in poverty reduction in the last decade despite sharp increase in income inequality, because in standard practice poverty is measured with reference to consumption rather than income. But the fact that

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[2] The sample for this survey comprised of 6,300 households drawn from all over rural Bangladesh following a methodology very similar to that employed by HIES. For details of the sampling methodology and some general findings of the survey, see Osmani *et al.* (2011).

[3] BBS has also carried out a round of HIES for 2010. We have not been able to use it, however, as the detailed data set is not yet available. Some summary statistics have been published in BBS (2011), and we have referred to them wherever appropriate.

[4] For comparison, BBS (2011) found the Gini coefficient of rural income distribution in 2010 to be 0.43.

[5] BBS (2011) confirms this picture, as it finds the Gini coefficient of rural consumption distribution in 2010 to be 0.275.

[6] Since inequality can be measured by a variety of measures, it is important to see whether all the inequality measures tell the same story. In total we considered 12 inequality measures—ranging from the more conventional Gini index to Theil index, and Atkinson measure of inequality. All the measures tell roughly the same story. See Osmani *et al.* (2011), chapter 3.

rising inequality in income has been accompanied by stable inequality in consumption is a puzzling phenomenon——one that has not yet been fully explained. We shall comment on this puzzle——and offer a plausible hypothesis to explain it – later in this paper (Section III), but first we shall explore a bit more deeply the phenomenon of widening income inequality itself.

TABLE I
EVOLUTION OF INEQUALITY IN RURAL BANGLADESH: 1991/92 – 2010
(Gini coefficient)

Distribution of	1991/92	1995/96	2000	2005	2010
Per capita income	0.276	0.310	0.365	0.404	0.465
Per capita consumption	0.249	0.277	0.281	0.280	0.291

Notes and Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010; the earlier figures are from Khan (2005).

Widening Income Inequality: Searching for the Underlying Causes

While examining the nature of widening income inequality in rural Bangladesh, an important point to consider is whether this phenomenon afflicts some particular segments of the population more than others, for that might provide a clue as to the underlying forces behind widening inequality. For this purpose, we divided up the rural population into several groups by a number of alternative criteria——namely, occupation, landownership class, educational status and location. The results are reported in Tables II-V. Each table provides two types of information. First, it shows how the Gini coefficient of income distribution of each group changed between 2000 and 2010. This piece of information would help identify whether certain groups have become more unequal than others. Second, for each of the two years, we break up rural inequality into two parts——one part showing the contribution of inequality within groups and the other part showing the contribution of inequality between groups.[7] This piece of information will help to figure out whether the widening of inequality that is observed in rural Bangladesh came about primarily through widening of inequality within groups or between groups. That too might offer a clue as to the underlying causes.

Looking first at the occupational groups, we find that inequality increased for each of the major occupational groups——regardless of whether the households were engaged in agriculture or non-agricultural activities or depended on other

[7] For the latter purpose, we used a Generalised Entropy Index of inequality, which can be readily decomposed into "within" and "between" components, rather than the Gini coefficient, which cannot be decomposed in this way.

sources of income,[8] and regardless of whether they were self-employed or wage-employed (Table II). There is a difference in degree, however. At one end of the scale were households engaged in self-employment in non-agriculture, who experienced the sharpest increase in inequality——for them the Gini coefficient increased by 15 percentage points compared to 10 percentage points for the rural population as a whole. At the other end were casual wage labourers, in both agriculture and non-agriculture, for whom the Gini coefficient increased by only 3-4 percentage points.

TABLE II

INCOME INEQUALITY WITHIN OCCUPATIONAL GROUPS: 2000-2010

Gini Coefficient by Household Head's Occupation	2000	2010
Self-employment in agriculture	0.36	0.45
Casual labour in agriculture	0.26	0.29
Self-employment in non-agriculture	0.36	0.51
Casual labour in non-agriculture	0.27	0.31
Salaried work in non-agriculture	0.37	0.43
Others	0.41	0.50
All	*0.37*	*0.47*
Decomposition of Entropy Index GE(2) (%)		
Within groups	93.9	96.1
Between groups	6.1	3.9

Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and the figures for 2000 were calculated by us from the raw data file of HIES 2000.

Notes: GE(2) is a member of the class of Generalised Entropy measures of inequality——it is equal to the half the square of coefficient of variation.

Dividing the population by landownership class, we find once again that inequality increased for each group of households, but here too there was a difference in degree (Table III). The landless group experienced the least increase in inequality – just 6 percentage points, well below the rural average of 10 points. For the next higher group, called the functionally landless, the increase in inequality was exactly equal to the rural average, and for each of the three higher groups it was more than the average. Thus, while every landownership group was afflicted by the phenomenon of widening inequality, the truly land-poor ones (i.e. the landless and the functionally landless) experienced it rather less than the landowning class.

[8] Households whose occupation is categorised as "others" depend mainly on rents, remittances, pension, interest income, etc.

TABLE III
INCOME INEQUALITY WITHIN LANDOWNERSHIP GROUPS: 2000-2010

Gini Coefficient by Landownership Status	2000	2010
Landless	0.35	0.41
Functionally landless	0.32	0.42
Marginal farmer	0.35	0.48
Small farmer	0.35	0.46
Medium/Large farmer	0.39	0.52
All	*0.37*	*0.47*
Decomposition of Entropy Index GE(2) (%)		
Within groups	96.0	94.5
Between groups	4.0	5.5

Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and the figures for 2000 were calculated by us from the raw data file of HIES 2000.

Notes: (1) GE(2) is a member of the class of Generalised Entropy measures of inequality – it is equal to the half the square of coefficient of variation.

(2) Landless means no agricultural land at all; functionally landless means ownership up to 0.5 acre; a marginal farmer owns between 0.51 and 1.5 acres; a small farmer owns between 1.51 and 2.50 acres; and large/medium farmers own more than 2.5 acres.

When the households are classified by the educational status of the household head, we find a similar pattern——widening inequality was a common experience for all the groups with some variation in degree (Table IV). The sharpest increase in inequality is found among those who had passed the primary level but not completed the secondary level (16 percentage points), and the least increase is observed among those who had gone beyond the higher secondary level (3 percentage points).

TABLE IV
INCOME INEQUALITY WITHIN EDUCATIONAL GROUPS: 2000-2010

Gini Coefficient by Educational Status	2000	2010
Illiterate	0.31	0.39
Less than primary	0.34	0.42
Primary plus	0.34	0.50
Secondary plus	0.38	0.46
Higher secondary plus	0.43	0.46
All	*0.37*	*0.47*
Decomposition of Entropy Index GE(2) (%)		
Within groups	90.5	96.0
Between groups	9.5	4.0

Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and the figures for 2000 were calculated by us from the raw data file of HIES 2000.

Notes: GE(2) is a member of the class of Generalised Entropy measures of inequality – it is equal to the half the square of coefficient of variation.

Finally, when we group the households by the (old) divisions in which they live, we once again find that inequality has widened in every division without exception (Table V). Barisal, which had the lowest degree of inequality to begin with, and Sylhet, which had the highest, both experienced less than average increase in inequality over the decade, but no division was spared from the trend of growing inequality.

TABLE V
INCOME INEQUALITY WITHIN DIVISIONS: 2000-2010

Gini coefficient by Division	2000	2010
Barisal	0.34	0.39
Chittagong	0.38	0.46
Dhaka	0.37	0.49
Khulna	0.32	0.44
Rajshahi	0.35	0.47
Sylhet	0.39	0.45
All	*0.37*	*0.47*
Decomposition of Entropy Index GE(2) (%)		
Within divisions	98.3	99.6
Between divisions	1.7	0.4

Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and the figures for 2000 were calculated by us from the raw data file of HIES 2000.

Notes: GE(2) is a member of the class of Generalised Entropy measures of inequality – it is equal to the half the square of coefficient of variation.

One conclusion presents itself starkly from the preceding discussion – widening of inequality was a pervasive phenomenon in rural Bangladesh, affecting almost every group of people regardless of their occupation, landownership, education and location. A few groups——e.g., landless households, casual wage labourers, and households whose head had more than higher secondary level of education——can be counted as exceptions, since the rise in inequality they experienced (3-4 percentage points increase in Gini) was way below the rural average (10 points). But that does not detract from the validity of the broad generalisation that whatever had caused the widening of rural inequality in the last decade was transcendental in nature, and was not related to specific group characteristics.

This conclusion is further strengthened by examining the decomposition of inequality into within-group and between-group components, as reported in Tables II-V. The first point to note is that whichever way we classify the households, within-group inequality is by far the predominant component, accounting for over 90 per cent of inequality in both 2000 and 2010. These particular numbers are not too important by themselves as they depend very much on the particular measure of inequality chosen and the level of aggregation

chosen while forming the groups. What is more enlightening, however, is how the division between the two components has changed over time. There we find that the predominance of the within-group component has actually increased over the decade (with the sole exception of grouping by landownership status). This once again suggests that the underlying causes of widening inequality are essentially transcendental in nature——permeating almost every socio-economic group.

In order to identify the nature of these forces, we proceed to undertake a more disaggregated analysis of income distribution going beyond the aggregate measure of Gini coefficient. In particular, we look at the quintile distribution, dividing up the rural households into five equal-sized groups after arranging them in the ascending order of per capita income. Table VI presents some revealing statistics for the quintile distribution. The first column shows the quintile-specific growth rate of per capita real income during the period 2000-2010.[9] The next two columns provide——for 2000 and 2010 respectively——information on each quintile's per capita income as a ratio of that of the first quintile (i.e., the bottom 20 per cent of the population).

The first point to note from this table is that per capita incomes of richer quintiles increased systematically faster than those of poorer quintiles, which suggests that the forces behind rising inequality operated throughout the range of income distribution. A closer look, however, reveals that by far the strongest effect was felt at the very top end of the distribution. This is revealed by examining how the ratio of per capita incomes between the bottom quintile and the richer quintile changed between 2000 and 2010. As can be seen from Table II, while the ratio increased for each quintile it is only for the top quintile that the increase was really spectacular——going up from 6.3 to 9.7; for the rest of the quintiles the increase was quite modest. This means that the sharp rise in income inequality observed during the last decade was primarily a case of the top quintile running away much faster than the rest of the population.

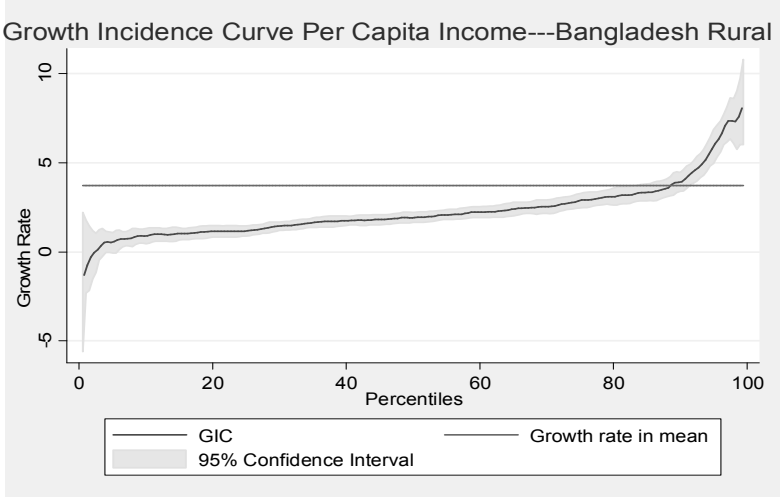
[9] In order to calculate real incomes at 2010 prices, the nominal incomes obtained from 2000 HIES were adjusted with a composite price index constructed by combining the Rural Consumer Price Index (CPI) published by the Bangladesh Bureau of Statistics and the internal price indices obtained from the HIES. For the rationale of using the composite index, see Appendix A2 of Osmani *et al.* (2011), especially footnote 13.

TABLE VI
QUINTILE DISTRIBUTION OF PER CAPITA INCOME IN RURAL BANGLADESH: 2000 – 2010

Quintile	Annual growth rate	Ratio to 1st Quintile	
		2000	2010
1	0.81	1.00	1.00
2	1.43	1.62	1.72
3	1.94	2.15	2.40
4	2.62	2.95	3.53
5	5.31	6.28	9.72
All	3.17	2.76	3.48

Notes and Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and the figures for 2000 were calculated by us from the raw data file of HIES 2000.

The same phenomenon can be seen graphically with the help of the Growth Incidence Curve given (Figure 1), which shows the growth rates of income at the most disaggregated level——for each percentile. It may be seen that for most of the income distribution, growth in per capita income was below the growth of mean income; it was only well after the 80th percentile that growth rate rises above the average level——confirming that it is the top quintile that mainly accounts for rising income inequality.



This raises the question: what explains the disparate fortunes of the top quintile vis-á-vis the rest of the population? A clue to the answer can be found by examining the sources of income growth for the various quintiles. Table VII

gives quintile-specific growth rates of the three broad components of income—namely, agricultural income, non-agricultural income and transfer income; in addition, it also gives growth rates of the foreign remittance component of transfer income in view of the rising importance of remittances for the Bangladesh economy.[10]

TABLE VII
ANNUAL GROWTH RATES OF COMPONENTS OF INCOME BY INCOME QUINTILES: 2000 – 2010

(per cent)

Quintile	Total income	Agricultural income	Non-agric income	Transfer income	Foreign remittance
1	0.81	0.44	1.60	-0.80	-6.14
2	1.43	2.60	0.27	1.67	0.79
3	1.94	2.88	0.63	5.19	4.16
4	2.62	3.79	0.79	7.00	8.38
5	5.31	3.53	4.05	10.58	11.51
All	3.17	2.75	1.97	8.24	9.83

Notes and Sources: Growth rates are in per capita terms. The estimates of income for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and those for 2000 were calculated by us from the raw data file of HIES 2000.

It may be seen from this table that the top quintile does not differ all that much from the next two quintiles in respect of growth of agricultural income but it does differ sharply in respect of both non-agricultural income and transfer income, especially the foreign remittance component of the latter. Foreign remittance has been the most rapidly growing component of rural income during the last decade, with its share in total income going up from 7 per cent in 2000 to over 15 per cent in 2010. As much as 45 per cent of the incremental per capita rural income between 2000 and 2010 was contributed by foreign remittance. And almost 90 per cent of the incremental remittance income went to the top quintile.[11] Thus the distribution of remittance income, and to a lesser extent the distribution of non-agricultural income, seem to have played a major role in causing widening of rural inequality over the last decade.

A Decomposition Analysis of Income Inequality

To further assess the relative importance of different sources of income to widening inequality in rural Bangladesh, we undertook a Gini decomposition

[10] In addition to foreign remittances, transfer income also includes domestic remittance, government transfer, and private charity.

[11] For detailed statistics on the changing structure of income and its distribution across quintile groups, see Appendix Tables A.1 and A.2.

exercise by adapting a procedure suggested by Lerman and Yitzhaki (1985). This exercise was carried out at two levels——first at the level of three broad categories of income source and then at a more disaggregated level.

Tables VIII and IX present the results of the decomposition exercise for three broad categories of income source——namely, agricultural income, non-agricultural income, and transfer income. Table VIII shows the marginal effects of different sources of income on inequality (as measured by the Gini coefficient) in the years 2000 and 2010. The marginal effect is defined as the percentage change in Gini as a result of one per cent change in a source of income. A positive figure indicates that the source in question has an unequalising effect i.e., higher income from this source would lead to greater income inequality, other things remaining the same. Conversely, a negative figure indicates that the source of income in question has an equalising effect. One may thus surmise from Table VIII that agricultural income has an equalising effect on rural income distribution, while both non-agricultural income and transfer income have unequalising effects. This is true for both 2000 and 2010.

From the point of view of dynamics of inequality, it is important to note, however, that while the sign of the marginal effect has remained unchanged during the decade of the 2000s for all three components, the magnitude of the effects has behaved in rather disparate ways. For agricultural income, the marginal effect has remained more or less the same at around 13 per cent; for non-agricultural income it has declined from 6.8 per cent to 1.7 per cent, while for transfer income it has increased sharply from 6.9 per cent to 11.9 per cent. Transfer income has clearly played the leading role in exacerbating income inequality in rural Bangladesh. Not only did it have the strongest unequalising effect to begin with (in 2000), the strength of its unequalising effect has also increased sharply over time.

TABLE VIII
MARGINAL EFFECT OF BROAD SOURCES OF INCOME TO RURAL INCOME INEQUALITY (GINI) : 2000 - 2010
(per cent)

Sources of income	2000	2010
Agricultural income	-13.7	-12.6
Non-agricultural income	6.8	1.6
Transfer income	6.9	11.1

Notes and Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and the figures for 2000 were calculated by us from the raw data file of HIES 2000.

It is in fact possible to measure the extent to which the three broad components of income have contributed to the rise in income inequality in rural Bangladesh. This can be done with the help of the following formula[12]:

$$G = \sum_{k=1}^{n} G_k R_k S_k \qquad 1$$

where G is the Gini coefficient of overall income distribution, k (= 1, …, n) refers to the components or sources of income, the product $G_kR_kS_k$ is the contribution of the kth source to the overall Gini coefficient (G), G_k is the Gini coefficient of the distribution of income from the kth source, R_k is the correlation coefficient between income from the kth source and total income, and S_k is the share of the kth source in total income.

To see the intuition behind this formula, note first of all that if R_k is positive, i.e., if income from the kth source is positively correlated with total income, any inequality in the distribution of income from the kth source will contribute positively to inequality in overall income distribution; conversely, if R_k is negative. The magnitude of this contribution will depend partly on the value of R_k itself – the higher the absolute value of R_k the bigger will be the contribution to overall inequality, other things remaining the same. Partly, the magnitude of the contribution will also depend on inequality in the distribution of income from the kth source (G_k) and on the share of this source in total income (S_k). Given a positive R_k, higher values of G_k and S_k will entail a bigger positive contribution to overall income inequality (G). By the same token, given a negative R_k, higher values of G_k and S_k will entail a bigger negative contribution to overall income inequality. The kth source's contribution to overall inequality can thus be measured by the product $G_kR_kS_k$.

The summary results of this decomposition exercise are reported in Table IX.[13] The first two columns show the relative contributions of the three broad components of income to the Gini coefficients of overall income distribution in the years 2000 and 2010 and the final column shows their relative contributions to the *change in Gini* between the two years.[14]

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[12] This decomposition formula was derived by Lerman and Yitzhaki (1985), extending a procedure first suggested by Shorrocks (1982). The formula for marginal effects was derived by Lopez-Feldman (2006). For an intuitive explanation of the decomposition formula as well as an early application, see Stark *et al.* (1986).

[13] The detailed estimates of G_k, R_k and S_k on the basis of which these summary results are derived are reported in Appendix Tables A.3 and A.4.

[14] The contribution of a particular component of income to the *change* in Gini can be measured by the difference ($\Delta G_kR_kS_k$) of its contributions to the *level* of Gini between

It is evident that in both 2000 and 2010 non-agricultural income accounted for by far the largest part of the Gini coefficient, the rest being shared equally by agricultural income and transfer income. This means that the unequal distribution of non-agricultural income was mainly responsible for overall inequality in both the years. We are more interested, however, in the factors behind the *change* in inequality between the two years as distinct from the *level* of inequality in either year. And in that context, the picture turns out to be quite different. Over the decade, the contribution of non-agricultural income to the overall Gini has remained constant, while that of transfer income has more than doubled. As a result, the relative contribution of non-agricultural income has declined and that of transfer income has increased sharply. As the final column of Table IX shows, non-agricultural income contributed hardly anything to the rise in inequality between 2000 and 2010. Instead, transfer income accounted for as much as 80 per cent of the rise in inequality, with the rest being accounted for by agricultural income.[15] Transfer income is thus found to be primarily responsible for rising income inequality in rural Bangladesh.

TABLE IX
CONTRIBUTIONS OF BROAD SOURCES OF INCOME TO CHANGE IN RURAL INCOME INEQUALITY: 2000 - 2010

Source of income	Contribution to Gini		Contribution to the change in Gini (%)
	2000	2010	
Agricultural income	0.078	0.097	19.0
Non-agricultural income	0.216	0.217	0.8
Transfer income	0.071	0.152	80.2
Total income	0.365	0.465	100.0

Notes and Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and the figures for 2000 were calculated by us from the raw data file of HIES 2000.

The preceding discussion was carried out at a relatively high level of aggregation. In order to get a clearer picture of the drivers of inequality in rural

two points in time. This follows from the additivity property of equation (1). Since $G = \Sigma G_k R_k S_k$, we must have $\Delta G = \Sigma \Delta G_k R_k S_k$.

[15] While agricultural income has an equalising effect on inequality, the strength of its equalising nature has weakened slightly over time——as evidenced by the fact that the marginal effect has increased from -13.6 to -12.6 per cent (Table VIII). That is why agriculture has made a positive contribution to rising inequality.

Bangladesh, we carried out a similar decomposition exercise at a disaggregated level. The results are reported in Table X, which shows the marginal effects on inequality in the years 2000 and 2010 as well as the relative contributions to the change in inequality over the decade.

Considering the marginal effects first, it may be noted that wage labour——in both agriculture and non-agriculture——has the most equalising effect on rural income distribution. Self-employment in agriculture also has an equalising effect, and this effect has become even stronger over the decade. By contrast, self-employment in non-agriculture has an unequalising effect. The same is true also of salary income in non-agriculture, but its effect has weakened considerably over the decade——as the marginal effect has declined from 8 per cent to just under 3 per cent. Among the components of transfer income, both government transfer and private charity have equalising effects, as expected; however, remittance income has an unequalising effect, and this is especially true of foreign remittance. The unequalising effect of foreign remittance was already high at 7.4 per cent in 2000; by 2010 it increased further to 11.4 per cent.

Turning now to the *change* in inequality, it is striking that foreign remittance alone accounts for 70 per cent of the rise in inequality over the decade of the 2000s. It is thus the role of foreign remittance that lies behind our earlier finding that "transfer income" is primarily responsible for rising income inequality in rural Bangladesh. The next most important factor is self-employment in non-agriculture, which accounts for 40 per cent of the increase in Gini. It is noteworthy that two other components of non-agricultural income——namely, salary income and "other income"——made a negative contribution to the change in Gini.[16] This helped offset the positive contribution of income from self-employment, which led to the result noted earlier (Table IX) that non-agriculture as a whole made almost zero contribution to the change in inequality. This should not, however, detract from the fact that income from self-employment in non-agriculture did have a strong unequalising effect in rural Bangladesh, second only to foreign remittances.

[16] Exactly why these components helped reduce inequality needs further investigation.

TABLE X
CONTRIBUTION OF DETAILED SOURCES OF INCOME TO CHANGE IN INEQUALITY: 2000 - 2010

(per cent)

Source of income	Marginal effect on Gini		Contribution to the change in Gini
	2000	2010	
Agriculture			
Self employment	-0.7	-4.6	3.3
Wage labour	-15.0	-10.0	6.2
Rental income	2.1	2.0	9.5
Non-agriculture			
Self employment	4.8	4.7	40.9
Wage labour	-6.0	-5.7	3.4
Salary income	8.0	2.9	-24.6
Rental income	0.4	0.5	2.0
Other income	-0.5	-0.8	-20.9
Transfer			
Foreign remittance	7.4	11.5	70.9
Domestic remittance	0.8	0.2	8.7
Government transfer	-0.4	-0.1	0.8
Private transfer	-0.9	-0.6	0.2
Total per capita income	…	...	100.0

Notes and Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and the figures for 2000 were calculated by us from the raw data file of HIES 2000.

Further insight into the processes of inequality can be gained by trying to identify the particular aspects of foreign remittance and self-employment in non-agriculture that were responsible for rising inequality. Recall that the contribution of any given source of income to overall inequality depends on three parameters – namely, the correlation of income from that source with total income (R_k), inequality in the distribution of income from that source (G_k), and the share of the source in total income (S_k). It is, therefore, of some interest to ask how these three parameters have changed over time to aggravate rural inequality and, if possible, to identify the parameter(s) that could be held primarily responsible for rising inequality.

Table XI provides the relevant information. It may be noted that there is a common pattern between the two main sources of income that are primarily responsible for widening income inequality. For both of them, there is very little change in the degree of inequality in their distribution across households i.e., G_k is fairly constant. The other two parameters, however, have changed in an inequality-augmenting manner. Thus, the positive correlation between the source

income and overall income (R_k) has gone up from 0.54 to 0.64 for self-employment in non-agriculture and from 0.77 to 0.86 for foreign remittances. These two sources of income have thus become more closely aligned with overall income i.e., the tendency for the richer households to have greater access to these sources of income has increased over time. As a result, even a constant inequality in the source itself has translated into greater inequality overall. This effect has been strengthened by the fact that the shares of these sources in total income (S_k) have also increased at the same time. This is especially true of foreign remittances, whose share in rural income has doubled within a decade——going up from 7 per cent in 2000 to 14 per cent 2010.

TABLE XI
TWO MAIN SOURCES OF WIDENING RURAL INEQUALITY: 2000 - 2010

Sources of widening inequality	R_k		G_k		S_k		Contribution to G	
	2000	2010	2000	2010	2000	2010	2000	2010
Foreign remittance	0.77	0.86	0.96	0.95	0.07	0.15	0.15	0.27
Self-employment in non-agriculture	0.54	0.64	0.86	0.88	0.17	0.21	0.19	0.26

Notes and Sources: (1) R_k is the correlation coefficient between source income and overall income, G_k is the Gini coefficient of the source income, S_k is the share of the source in total income, and G is the Gini coefficient of overall income distribution.

(2) The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and the figures for 2000 were calculated by us from the raw data file of HIES 2000.

We noted earlier that widening of income inequality has been a pervasive phenomenon in rural Bangladesh, and we have just observed that it is the unequalising effect of foreign remittance, and to a lesser extent that of income from self-employment in non-agriculture, that has been primarily responsible for widening inequality. The implication must be that these two factors, and especially foreign remittance, have been the pervasive force that has permeated all socio-economic groups and aggravated the within-group inequality for most of them. This is in fact borne out by data. The shares of income coming from remittance and self-employment in non-agriculture for various socio-economic groups have been put together in Table XII. It may be observed that the share of remittance has gone up significantly over the last decade for almost all the groups. For many of them, the share of income from non-agricultural self-employment has also gone up, although not as pervasively as in the case of remittance. Together, these two factors are responsible for the observed pervasive increase in inequality across the socio-economic groups.

TABLE XII
SHARES OF FOREIGN REMITTANCE AND SELF-EMPLOYMENT IN NON-AGRICULTURE BY SOCIO-ECONOMIC GROUPS: 2000-2010
(percentage share of total income)

Socio-Economic Groups	Share of self-employed non-agricultural work		Share of foreign remittance	
	2000	2010	2000	2010
By Occupation				
Self-employment in agriculture	10.3	10.9	10.5	14.5
Casual labour in agriculture	*4.5*	*3.7*	*1.7*	*2.8*
Self-employment in non-agriculture	63.0	65.3	2.4	4.7
Casual labour in non-agriculture	*4.9*	*9.2*	*0.8*	*2.1*
Salaried work in non-agriculture	12.3	5.4	4.6	5.3
Others	19.4	10.4	21.6	46.1
By Landownership				
Landless	*24.0*	*28.3*	*8.0*	*11.0*
Functionally landless	18.4	20.6	6.1	16.3
Marginal farmer	17.3	20.1	7.9	18.7
Small farmer	16.4	17.7	11.3	16.2
Medium/Large farmer	10.9	27.1	4.5	11.5
By Education of Household Head				
Illiterate	16.1	19.1	7.8	13.1
Less than primary	23.7	27.3	5.7	11.8
Primary plus	20.2	29.1	7.4	16.9
Secondary plus	19.5	21.6	6.2	15.8
Higher secondary plus	*26.1*	*22.7*	*7.5*	*6.9*
By Division of Residence				
Barisal	*19.6*	*18.6*	*3.0*	*13.5*
Chittagong	22.7	23.3	17.4	26.5
Dhaka	22.6	23.5	6.6	17.2
Khulna	17.9	23.0	0.3	5.3
Rajshahi	14.0	27.3	0.7	4.2
Sylhet	*11.0*	*27.4*	*11.5*	*16.8*
All	*19.0*	*24.4*	*7.4*	*13.9*

Notes and Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, and the figures for 2000 were calculated by us from the raw data file of HIES 2000. For details, see Appendix tables A.3 and A.4.

It may be recalled that a few groups were exceptions to the trend in the sense that for them within-group inequality increased much less than the average. We have highlighted these exceptions in bold italics in Table XII. It is interesting to observe that for most of these groups the increase in the share of foreign remittance was also much less than the rural average. Thus while the average share of foreign remittance for rural households as a whole increased by about 7 percentage points—the extent of increase was just over 1 percentage point for casual labourers in both agriculture and non-agriculture and only 3 percentage points for landless households. For households whose head had passed higher secondary level, the share of foreign remittance actually declined slightly. Not surprisingly, these groups came to experience much less increase in within-group inequality compared to the rest.

Not all the exceptions can be explained in these terms, though. For instance, looking at grouping by Division of residence, we had earlier noted two exceptions——namely, Barisal and Sylhet. Of these, the case of Barisal, in particular, cannot be explained entirely in these terms because the share of foreign remittance did go up sharply there. The fact that the share of income from non-agricultural activities slightly declined may have mitigated it to some extent; yet it seems reasonable to suspect that some other factors may have been at work in Barisal, and to a lesser extent in Sylhet, to keep inequality from rising as fast as in the rest of the country (as noted earlier in Table V). On the whole, however, it is fair to conclude that it is the unequalising effects of foreign remittance and income from self-employed non-agricultural activities that explain both the pervasiveness of widening inequality throughout rural Bangladesh as well as most of the exceptions to this pattern.

This then leads to the question: why were these two sources of income so unequalising in nature? A source of income will aggravate inequality if it accrues mainly to those who are already at the upper end of the income scale. In order to demonstrate that this is indeed the case with the two sources we have identified, one would ideally need panel data, which we do not have.[17] It so happens, however, that the InM Poverty Dynamics Survey of 2010 contains data that can indirectly throw some light on this matter. The survey collected information on the assets owned by the households at the very inception of the household (i.e., at the time the household was formed), and this information can be used to identify the households that were better off to begin with i.e., even before they began to receive remittances.

As can be seen from Table XIII, remittance-receiving households were on the average endowed with a much higher initial level of assets compared to those who do not receive any foreign remittance. Since households with higher initial levels of endowments are also likely to have, on the average, higher overall income, other things remaining the same,[18] we may infer that remittance income happens to accrue more to those who already have higher overall income. This means that it is the initially better off households who were more able to benefit from remittance income. This is not surprising since sending people abroad involves an initial lumpy expenditure and the households that are better off to

[17] Merely to demonstrate that remittance income goes mostly to those who are currently better off does not prove the point because they might have become better off only after receiving the remittance. What needs to be shown is that they were relatively better off even before receiving remittance, and for that we need panel data.

[18] For evidence on the close correlation between initial assets and current standard of living, see Osmani (2011).

begin with are more likely to be able to incur such expenditure. Our evidence shows that the positive correlation between remittance income and total income is in fact becoming stronger over time, as indicated by the rising value of parameter R_k discussed above. As the correlation has become stronger, and the share of remittances in total income has doubled within a decade, the flow of remittances from abroad has inevitably become a strongly unequalising force in the rural economy of Bangladesh.

The other factor behind rising inequality—namely, income from self-employment in non-agricultural activities—is less closely aligned to overall income than foreign remittances. However, the important point is that the degree of alignment is going up over time (R_k going up from 0.54 in 2000 to 0.64 in 2010); and this trend, combined with the fact that the share of this source of income is also rising, has exerted an upward pressure on rural inequality. Why exactly the degree of alignment is going up is difficult to gauge. It is possible that as the rapid transformation of the economy is creating new opportunities for engaging in various non-agricultural pursuits, it is the better off households who are more able to seize those opportunities. But this is merely a hypothesis at this stage; further research is needed in order to test the validity of this or other hypotheses.[19]

TABLE XIII
INITIAL ENDOWMENTS OF HOUSEHOLDS: RECEIVERS VERSUS NON-RECEIVERS OF FOREIGN REMITTANCE

Initial Endowments	Receivers	Non-receivers	t-value
Land (decimal)	93	65	4.9
Non-land physical asset ('000 Taka)	317	53	4.9
Schooling of household head (year)	4.9	3.6	7.3

Notes and Sources: (1) Initial endowments refer to the assets owned by a household at the time the household was formed.
(2) Non-land physical assets are measured at the constant prices of 2010.
(3) Data are from the InM Poverty Dynamics Survey 2010.

III. STABILITY IN CONSUMPTION INEQUALITY: AN EXPLANATION

We now turn to the puzzling phenomenon that during the last decade inequality in consumption has remained virtually unchanged in spite of sharply rising inequality in income. To the extent that the marginal propensity to

[19] In particular, one would need to have access to panel data, which are currently not available. The InM Poverty Dynamics Study intends to undertake panel surveys every three years starting from 2010. As and when data from these surveys become available, it would be possible to examine more effectively issues of the kind raised above.

consume falls at higher levels of income, it is plausible that consumption inequality would not rise as much as income inequality. But that alone cannot explain why consumption inequality should not change at all. For that to happen, the propensity to consume must rise at the bottom end of the scale at the same time that the propensity to consume falls at the top, so that the relative consumption distribution may remain unchanged in the face of rising income inequality. This has indeed happened, as we shall presently see. The question is why has the propensity to consume risen at the lower end? We offer an explanation in terms of gradual relaxation of liquidity constraint over time.

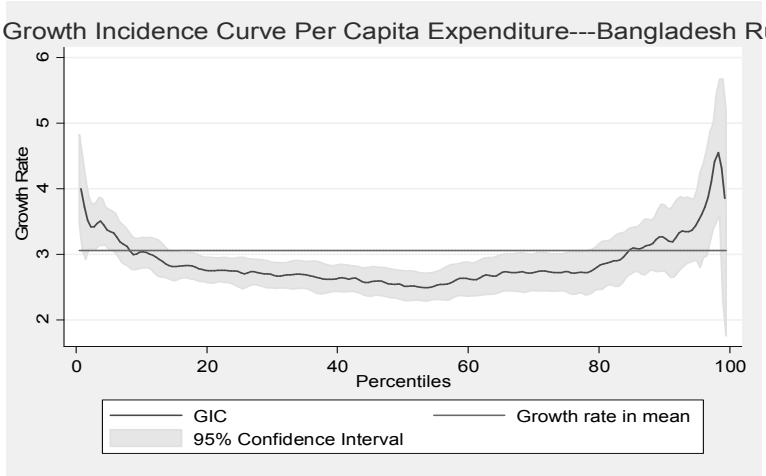
Let us first consider the dynamics of consumption and saving behaviour in rural Bangladesh during the last decade. As can be seen from Table XIV, the overall savings rate in rural Bangladesh has gone up impressively——from 14 per cent in 2000 to 22 per cent in 2010, but this has been driven mainly by the top quintile, whose savings rate has shot up from 32 to 54 per cent. During the same period, the top quintile has also enjoyed a huge increase in per capita income, which went up from Tk 43,000 to Tk 76,000 per annum (at constant prices of 2010), helped mainly by foreign remittances, as we have noted before. With increases in income of this order of magnitude, a sharp fall in the rate of consumption——and correspondingly a sharp rise in the rate of savings——is not at all implausible.[20]

What is more remarkable, however, is what has happened at the bottom end of the scale. As can be seen from Table XIV, there has been a very sharp increase in the rate of dissaving (negative savings) by the bottom quintiles. As a consequence, the rate of consumption has risen much faster for the bottom quintiles as compared to the top. In real terms the consumption level of the bottom quintile has increased by almost 4 per cent per annum as against less than 2 per cent for the top quintile. In fact, the rate of growth in consumption is seen to fall systematically for the richer quintiles——in a mirror image of what has happened to the rate of growth in income. The Growth Incidence Curve for consumption expenditure shows this picture vividly (Figure 2), where, in contrast to the Growth Incidence Curve for income shown in section II (Figure 1), the rate of growth of consumption falls almost throughout the spectrum. It is this sharp rise in consumption at the lower levels of income——made possible by increased

[20] This can happen with or without a decline in the marginal propensity to consume. Even if the marginal propensity remains unchanged, the average rate of consumption will still fall——and correspondingly the rate of savings (i.e., savings as a ratio of income) will still rise——so long as there is an autonomous element in the consumption function, as is always allowed for in standard specifications of the short-run consumption function.

negative savings——that has mainly prevented consumption inequality from rising despite very sharp rise in income inequality.

FIGURE 2



Therefore, in order to explain the observed stability in consumption inequality we need to explain the reasons behind increased rates of negative saving on the part of the bottom quintiles. The phenomenon of negative saving – i.e., consuming more than the income earned——is in fact quite common at lower levels of income and is perfectly consistent with inter-temporal optimisation behaviour. When faced with income shocks that bring current income below some notion of a "permanent income" that people might have, they may rationally choose to dissave or borrow at present with the intention of balancing it with savings out of higher income in good times in the future, so that they may maintain a smooth pattern of consumption over time.[21] What needs to be explained, however, is why has the rate of negative saving by the bottom quintiles increased so sharply over the last decade? If income falls in absolute terms the rate of negative saving may of course rise, but that is not what has actually happened. Income inequality may have increased but this does not mean that the poor have become poorer in absolute terms. In reality, even the bottom quintiles have experienced positive growth of real income, albeit at a much slower rate than the top quintiles (Table XIV). With higher real incomes, they

[21] For evidence on such consumption smoothing on the part of the poor, see, among others, Collins *et al.* (2009) and the references cited therein.

would have been expected to save more and thereby bring down the rate of negative savings[22]; instead they have done the opposite.

TABLE XIV

SAVINGS RATES AND GROWTH OF INCOME AND CONSUMPTION BY INCOME QUINTILES: 2000 AND 2010

(per cent per annum)

Quintile	Rate of savings (per cent)		Rate of growth (per cent per annum)	
	2000	2010	Income	Consumption
1	-0.45	-0.91	0.81	3.63
2	-0.01	-0.24	1.43	3.45
3	0.05	-0.05	1.94	2.99
4	0.13	0.12	2.62	2.78
5	0.32	0.50	5.31	2.05
All	0.14	0.19	3.17	2.61

Notes and Sources: The figures for 2010 are our own estimates based on InM Poverty Dynamics Survey 2010, while those for 2000 were calculated by us from the raw data file of HIES 2000.

Why has this happened? One possible explanation lies in the relaxation of liquidity constraint made possible by rapid expansion of microcredit during the last decade. Very briefly, the argument goes as follows. The consumption and saving behaviour that was observed in 2000 was heavily conditioned by the stringent liquidity constraint that the poor people had to face. This constraint arose partly because they owned very little liquid assets and partly because they did not have access to credit at affordable rates of interest. Due to this constraint, when some of the poor people faced a negative income shock and their actual income fell below permanent income, they could not undertake the "desired" level of negative savings that was required by inter-temporal optimisation. Thus, the relatively low rate of negative saving that we observe at the bottom end of income distribution in 2000 was not made out of choice; rather it was forced by the lack of access to borrowing. The next decade has witnessed an explosion of microcredit that has resulted in a significant easing of the liquidity constraint faced by the rural poor. As a result, poor people who end up with unusually low incomes because of negative income shocks can now get closer to the "optimum" level of borrowing and maintain their consumption level in line with permanent

[22] Cross-sectionally (as distinct from over time), the rate of negative saving does go down at higher levels of income, as can be seen from Table XIV.

income, and our hypothesis is that this is what is reflected in higher rates of negative saving at the bottom end of income distribution in 2010.

What evidence can be offered in support of this hypothesis? A direct test of the hypothesis would require information on how liquidity constraint has actually changed at the household level over the last decade. It should be emphasized that the mere fact that the extent of borrowing by poor households has gone up over the last decade does not by itself constitute conclusive proof that the liquidity constraint has eased. For, expansion of credit can occur without a corresponding easing of the liquidity constraint. For example, it is possible that people's desired borrowing was itself going up, presumably because of rising income, and that actual borrowing was merely keeping pace with it. In that case, the fact of credit expansion cannot by itself be interpreted as evidence that the liquidity constraint has eased. For such interpretation to be valid, it is first necessary to demonstrate that there existed a liquidity constraint in 2000——in the form of a gap between desired and actual borrowing——and that the gap has become smaller by 2010. The kind of information that is necessary to arrive at such a judgement can in principle be collected through properly designed household-level surveys, but unfortunately they do not actually exist for the time period under consideration.[23]

This means that a direct test of our hypothesis is not possible. We have, however, devised an indirect test that bypasses the need for actually estimating the extent of liquidity constraint. Our test requires only the estimation of a consumption function——a relationship between household consumption and household income, and we do have surveys for the relevant period that contain the information necessary for this purpose. For 2010, we can use the InM Poverty Dynamics Survey and for 2000 we can use the Household Income and Expenditure Survey (HIES) of the Bangladesh Bureau of Statistics——the same two surveys that we used earlier for studying income inequality in section II.

An Indirect Test of the Hypothesis of Softening Liquidity Constraint

Our strategy is first to develop a testable hypothesis about the shapes of consumption functions under different degrees of liquidity constraint and then to check if this hypothesis is borne out by the experience of the last decade. We shall first demonstrate theoretically that the shapes of the aggregate consumption function would change in a predictable way as the economy moves from a scenario of a stringent liquidity constraint to a scenario of a less stringent one. We shall then demonstrate that between 2000 and 2010 the aggregate

[23] A Survey on Access to Financial Services carried out by the Institute of Microfinance (InM) in 2010 does contain the information required to estimate the degree of liquidity constraint in that year, but there is no comparable survey for 2000 or thereabout.

consumption function did change in the way predicted by theory, which would constitute an indirect evidence that the liquidity constraint faced by the rural people of Bangladesh has indeed become more relaxed over the decade.

In Figure 3, the line AB represents the "unconstrained" short-run consumption function——the one that would prevail without any liquidity constraint. In line with the permanent income hypothesis, households whose actual income falls below their permanent income would resort to negative saving if they did not face any liquidity constraint. In Figure 3, such households have actual incomes below Y* and their consumption levels lie on the segment AF of the AB line. However, if some of these households face a binding liquidity constraint, they will not be able to operate on the AB line as their consumption will fall short of the desired level; how short would depend on how strongly the liquidity constraint binds.

Assume (without loss of generality) that households with permanent income up to Y′ face a binding liquidity constraint, and those with permanent income above Y′ do not.[24] Now consider the set of all households whose current (as distinct from permanent) income lies below Y′. This set can be thought of being composed of two distinct subsets. The first subset comprises those households whose permanent income is above Y′ but because of some negative income shock their actual income has fallen below Y′. The second subset consists of those households for whom both permanent and actual incomes are below Y′. By denoting actual income by Y and permanent income by Y^p, and using *i* to denote the *i*th household, we can formally define these two subsets as follows:

$$S_1 = (\forall i \mid Y_i < Y' < Y_i^p) \tag{2}$$

$$S_2 = (\forall i \mid Y_i < Y' \text{ and } Y_i^p < Y') \tag{3}$$

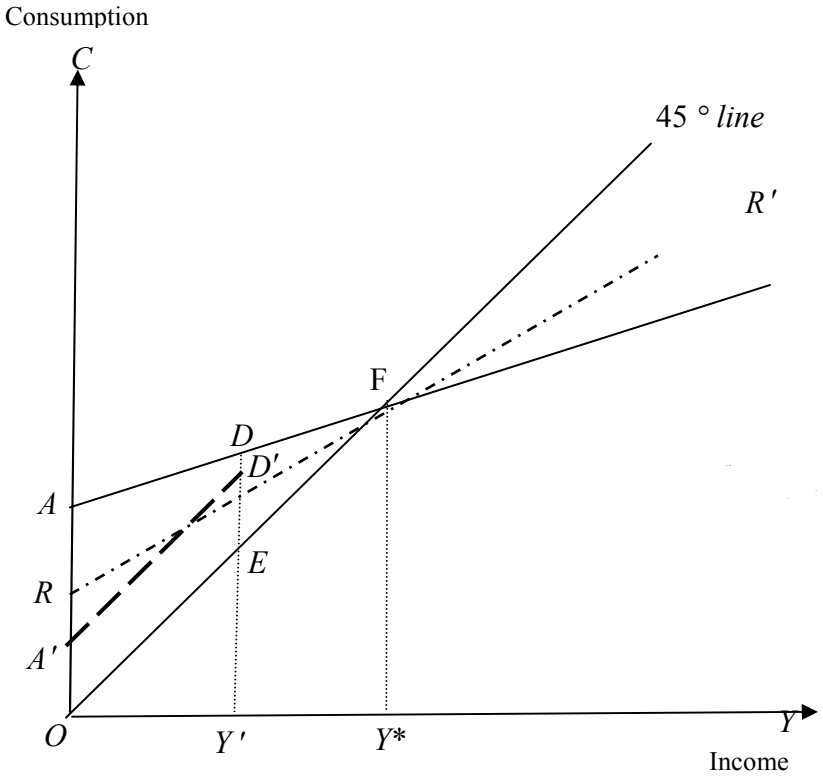
S_2 can be further subdivided into two parts depending on whether actual income falls short of or exceeds permanent income:

$$S_{2a} = (\forall i \mid Y_i < Y_i^p < Y') \tag{4}$$

$$S_{2b} = (\forall i \mid Y_i^p < Y_i < Y') \tag{5}$$

[24] Y′ could be interpreted as the poverty line, but it need not be. It is quite some possible that the moderately poor people do have access to credit and only the extremely poor don't, in which case Y′ would be below the poverty line; on the other hand, it is also possible that the liquidity constraint extends even to some of the marginally non-poor people, in which case Y′ would be above the poverty line. For our purposes, it doesn't really matter exactly where Y′ is, so long as it divides the entire population into two groups such that those with permanent income below it face liquidity constraint and those above it don't.

FIGURE 3: Consumption and Saving Behaviour with and without Liquidity Constraint



By assumption, households in the first subset S_1 do not face any liquidity constraint; therefore, their consumption will lie on the line segment AD. Households belonging to S_2 do face a liquidity constraint, and for simplicity of exposition we make the extreme assumption that they do not have access to credit at all nor do they have any liquid assets to dispose of. Therefore, when their actual income falls short of permanent income——as in the case of S_{2a}——they are obliged to consume exactly what they earn i.e., their consumption will lie on the line segment OE along the 45° line. What happens when their actual income exceeds permanent income——as in the case of S_{2b}——is slightly trickier to gauge. In principle, they could save a large part of the difference between

actual and permanent incomes so that it may be used in bad times i.e., when they find themselves in S_{2a}. However, there is enough evidence that poor people find it very difficult to save up front without some kind of compulsion – such as the compulsion to repay debts[25], so that one may assume that people belonging to S_{2b} also consume what they earn i.e., their consumption will also lie on the line segment OE as in the case of S_{2a}.

We thus have two types of consumption behaviour by households whose actual income falls below Y′ ($Y_i < Y'$). There are some (S_1) who do not face liquidity constraint and their consumption function will be represented by the line segment AD. And there are others (S_2) who do face a liquidity constraint and their consumption function will be represented by the line segment OE. The combined consumption function of all those with $Y_i < Y'$ will be a weighted average of AD and OE – for example, a line segment such as A′D′. As for those with $Y_i > Y'$, the relevant consumption function is the line segment DB. Thus, for the population as a whole, the aggregate consumption function will be a step function involving the segments A′D′ and DB.

We can now analyse the consequences of relaxing the liquidity constraint. If more and more people have access to credit over time, i.e., if the liquidity constraint is relaxed, the subset S_2 will gradually shrink and the subset S_1 will expand. Therefore, the segment A′D′, which is a weighted average of AD (the consumption function of S_2) and OE (the consumption function of S_1), will gradually converge to AD, and the aggregate consumption function for the population as a whole will converge to AB. Our hypothesis is that this is what has happened in rural Bangladesh over the last decade, thanks to the rapid expansion of microcredit. In other words, we postulate that the situation in 2000 was closer to the step function A′D′-DB, whereas the situation in 2010 was closer to the smooth function AB.

One way of testing this hypothesis is to note the differences one would expect to observe if one were to try to fit empirically a linear consumption function under the two alternative scenario of with and without liquidity constraint. The linear regression line fitted to the data under the (relatively) unconstrained scenario will approximate the line AB, whereas a linear regression line fitted to the constrained scenario (where the step function A′D′-DB represents the underlying consumption function) would resemble the line RR′. The difference between the two regression lines is that the unconstrained line (AB) would have a higher intercept and a smaller slope than the constrained line (RR′).

[25] For the relevant evidence and insightful discussion on the theoretical issues arising out of it, see Banarjee and Duflo (2011) and Collins *et al.* (2009).

We thus arrive at the testable hypothesis that a linear regression line fitted to the data for 2010 will have a higher intercept and a smaller slope compared to a linear regression line fitted to the data for 2000. In order to test this hypothesis, we fitted two linear consumption functions to the data of 2000 and 2010 within the same range of income,[26] and the results can be seen in Table XV. It is evident that the results strongly support the hypothesis: the estimated intercept is considerably higher for 2010 and the slope is smaller, and all the coefficients are highly statistically significant.

TABLE XV

ESTIMATED AGGREGATE CONSUMPTION FUNCTIONS: 2000 AND 2010

Variable	Coefficient	Std. error	t-value	P > |t|	95% conf. interval	
Constant						
2000	5394	155.4	34.7	0.000	5089	5698
2010	11221	237.4	47.3	0.000	10756	11687
Per capita income						
2000	0.5948	0.00788	75.4	0.000	0.5793	0.6103
2010	0.4529	0.01029	44.0	0.000	0.4327	0.4731

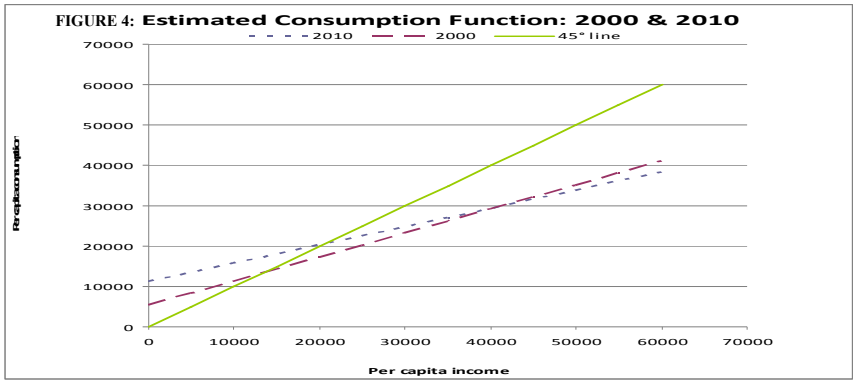
Notes and Sources: (1) The figures for 2010 are our own estimates based on *InM Poverty Dynamics Survey 2010*, while those for 2000 were calculated by us from the raw data file of HIES 2000.

(2) The regression for 2000 was run after converting all figures into constant prices of 2010, in order to ensure comparability of the intercept term.

For a more vivid picture, we plotted the two estimated regression lines in Figure 4. It is indeed striking how the estimated line for 2010 resembles the theoretical unconstrained regression line AB in Figure 3 and the estimated line for 2000 resembles the theoretical constrained regression line RR′.[27] The evidence is thus consistent with the hypothesis that over the last decade liquidity constraint faced by the rural people has eased considerably.

[26]The chosen range was up to Tk 60,000 per capita per year in the constant prices of 2010. This range covers close to 98 per cent of the sample of 2000 and 92 per cent of the sample of 2010. The main reason for this truncation was that if there is any nonlinearity in consumption function then, in view of the very large increases in income that occurred at the top end of the distribution in 2010, fitting linear regressions across the entire range might cause too much distortion to allow proper testing of our hypothesis. In any case, since we are interested in testing differences in constrained and unconstrained behaviour at given (low) levels of income, it makes sense to restrict the comparison to the same (relatively low) range of incomes.

[27]We are not suggesting that the estimated line for 2010 is the exact empirical counterpart of the theoretical unconstrained line AB, because it is possible that the liquidity constraint still remained binding for some of the poor people in 2010. The only claim is that it is a closer approximation of the theoretical unconstrained line than the one estimated for 2000.



It is thus fair to conclude that the relaxation of liquidity constraint made possible by rapid expansion of microcredit over the last decade has allowed people at the lower end of the income scale to better achieve their optimum level of consumption smoothing. This has entailed much higher levels of consumption for given levels of income in 2010 as compared with 2000, as reflected in higher rates of negative saving at low levels of income. The resulting more-than-proportionate increase in consumption at the lower end of the income scale in 2010 is a plausible explanation of why consumption inequality has remained stable despite a sharp increase in income inequality during the last decade.[28]

[28] While this explanation gives credit to the expansion of microcredit for ensuring stability in consumption inequality, it should be emphasized that the present analysis does not fully account for the distributional impact of microcredit. In principle, microcredit can influence the distribution of consumption through two channels – namely, income augmentation and consumption smoothing. The present analysis has only considered the channel of consumption smoothing (at given levels of income), whereby borrowers use part or whole of the loan to finance consumption. Recent evidence shows that over half of the microcredit borrowers do use credit for this purpose (Osmani *et al.* 2011); so consumption smoothing is clearly an important channel. However, nearly half of the borrowers use their loan mainly for directly productive purposes, and it has been shown through careful econometric analysis that they are on the whole able to raise their living standards by augmenting their income and consumption (Osmani 2011). This additional channel will have to be taken into account in any complete analysis of the distributional impact of microcredit. We have not considered this channel here because it was not germane to our purpose. In so far as microcredit goes mainly to the poor people, the income augmentation channel will serve to counter the effect of rising income inequality that stems from other forces (such as remittance), and to that extent it will also serve to soften the consequent widening of consumption inequality, but it cannot explain stability in consumption inequality in the face of widening income inequality. For that we need some explanation of increased negative savings at the bottom of the income scale and only the consumption smoothing channel of microcredit is relevant in that context.

IV. SUMMARY AND CONCLUSIONS

This paper has investigated the patterns of inequality that have emerged in rural Bangladesh in the decade of the 2000s. Two findings stand out clearly—— distribution of income has become more unequal over the decade, and, somewhat surprisingly, distribution of consumption has remained more or less unchanged despite widening income inequality. Both these trends are continuation of a pattern that was already emerging in the 1990s, and have been noted by others before. The main analytical task of the paper was to search for the underlying forces responsible for these two apparently contradictory trends.

The trend of widening income inequality was found to be a pervasive phenomenon, afflicting nearly all segments of the rural population. When the households were classified into a number of groups by different criteria——such as occupation, or landownership, or education, or geographical location—— almost all the groups were found to have witnessed increased inequality over the decade, with a few notable exceptions. By breaking up overall inequality into within-group and between-group components, it was observed that it was mainly the within-group component that was increasing over the decade, whichever way the households were classified. The implication is that the forces causing widening inequality were essentially transcendental in nature cutting across all types of households rather than tied to specific characteristics such as occupation, landownership, education or location.

The search for these transcendental forces led us to turn our attention away from groups classified by specific characteristics towards income groups, as they include households with all different characteristics. It was observed that the widening of the overall income inequality was the result primarily of the income of the top quintile (i.e., richest 20 per cent of the households) running away much faster than the rest of the population. Probing into the sources of income growth, it was found that the main difference of the top quintile from the rest lay in the especially sharp growth they enjoyed from two particular sources——namely, foreign remittances and self-employed non-agricultural activities. Of the two, foreign remittance played by far the bigger role. As much as 45 per cent of the incremental rural income between 2000 and 2010 was contributed by foreign remittance, and almost 90 per cent of the incremental remittance income went to the top quintile.

An analysis of the marginal effects of different components of income on overall inequality showed that both foreign remittance and income from self-employment in non-agriculture were highly unequalising in nature, i.e., any increase in their share of income would lead to greater inequality, other things remaining the same. As it happened, the shares of both these components did

increase markedly over the decade—–from 7 to 14 per cent for foreign remittance and from 19 to over 24 per cent for self-employment in non-agricultural activities. Moreover, the unequalising marginal effect of remittance itself increased over time. All these forces have combined to aggravate rural inequality. A decomposition analysis showed that foreign remittance alone accounted for about 70 per cent of the increase in inequality between 2000 and 2010, and self-employed non-agricultural activities accounted for 40 per cent.[29]

Thus, it is the unequalising effect of foreign remittance, and to a lesser extent that of income from self-employment in non-agriculture, that has been primarily responsible for widening inequality. These two forces have permeated all the socio-economic groups and aggravated within-group inequality for most of them. The share of remittance has gone up significantly for almost all the groups. For many of them, the share of income from self-employment has also gone up, although not as pervasively as in the case of remittance. Together, these two factors are thus clearly responsible for the observed pervasive increase in inequality across the socio-economic groups.

The unequalising effect of foreign remittance stems from the fact that sending people abroad involves an initial lumpy expenditure and that it is the initially better off households that are more likely to be able to incur such expenditure. Our analysis reveals that remittance-receiving households were on the average endowed with a much higher initial level of assets compared to those who did not receive any foreign remittance. This suggests that remittance income tends to accrue more to those who already have higher overall income, which makes the increased flow of remittance an unequalising force. Why income from self-employment in non-agricultural activities also tends to be unequalising is more difficult to gauge. It is possible that as the rapid transformation of the economy creates new opportunities for engaging in various non-agricultural pursuits, it is the better off households who are more able to seize those opportunities. But this is merely a hypothesis at this stage; further research is needed to throw light on this issue.

The second part of the paper was concerned with explaining the observed stability in consumption inequality. Widening income inequality should normally have been associated with widening consumption inequality as well by raising

[29] While their contributions add up to more than 100 per cent, this was balanced by a couple of other sources of income (such as salary income and 'other income'), which made a negative contribution to the change in inequality.

consumption more at the upper end of the scale. This did not happen; instead it was actually at the lower end of the income scale that consumption increased faster, leading to increased rates of negative savings at low income levels. Any explanation of the observed stability in consumption inequality will have to explain why and how did the households at the lower end of the distribution resort to increased rates of negative savings.

Our own explanation runs in terms of a possible relaxation of the liquidity constraint faced by poor consumers, which was made possible by rapid expansion of microcredit during the last decade. The argument goes as follows. The consumption and saving behaviour that was observed in 2000 was heavily conditioned by the stringent liquidity constraint that the poor people had to face. Due to this constraint, when some of the poor people faced a negative income shock and their actual income fell below permanent income, they could not undertake the "esired" level of negative savings that was required by inter-temporal optimisation. Thus, the relatively low rate of negative saving that we observe at the bottom end of income distribution in 2000 was not made out of choice; rather it was forced by the lack of access to borrowing. The next decade has witnessed an explosion of microcredit that has resulted in a significant easing of the liquidity constraint faced by the rural poor. As a result, poor people who end up with unusually low incomes because of negative income shocks can now get closer to the "optimum" level of borrowing and maintain their consumption level in line with permanent income, and our hypothesis is that this is what is reflected in higher rates of negative saving at the bottom end of income distribution in 2010.

A direct test of this hypothesis was not possible because of lack of data on liquidity constraints at the two ends of the decade. However, we devised an indirect test based on aggregate consumption function. First, it was demonstrated theoretically that the shapes of the aggregate consumption function would change in a predictable way if the economy moves from a scenario of a stringent liquidity constraint to a scenario of a less stringent one. It was then empirically shown that between 2000 and 2010 the aggregate consumption function did change in the way predicted by theory, which constitutes an indirect evidence that the liquidity constraint faced by the rural people of Bangladesh did indeed become more relaxed over the decade.

Therefore, it is plausible to argue that the relaxation of liquidity constraint made possible by rapid expansion of microcredit over the last decade has allowed

people at the lower end of the income scale to better achieve their optimum level of consumption smoothing. This has entailed much higher levels of consumption for given levels of income in 2010 as compared with 2000, as reflected in higher rates of negative saving at low levels of income. The resulting more-than-proportionate increase in consumption at the lower end of the income scale in 2010 is a plausible explanation of why consumption inequality has remained stable despite a sharp increase in income inequality during the last decade.[30]

We may conclude by noting a couple of policy implications of the findings of the paper. First, one of our major findings was that the two main factors that drove the growth of the rural economy——namely, foreign remittance and income from self-employment in non-agricultural activities——were also the factors that were mainly responsible for widening rural inequality. There would thus appear to exist a trade-off between growth and equity in rural Bangladesh. But the existence of this trade-off does not have to be accepted as immutable for policy purposes. Increased flow of remittances must be encouraged by all means, but in order to avoid, or at least to minimize, the trade-off, attempts must be made at the same time to ensure that people with small means are also able to access remittance income. At present, remittance tends to be unequalising because it is mostly the better off households who are able to incur the initial lumpy expenditure that has to be incurred in order to send people abroad. Policies should aim firstly at reducing the size of initial expenses by removing the varieties of transaction costs that people often face in arranging migration, and secondly at offering credit facilities to those who cannot afford to incur the lumpy expenditure but are otherwise able and willing to undertake migration.

[30] It should be noted that our hypothesis does not imply that microcredit borrowers are sustaining higher consumption by accumulating debts because our argument does not rest on the idea of permanent or repeated borrowing. On the contrary, the scenario we are considering is one where only people with temporarily low incomes (i.e., lower than permanent income) borrow in order to maintain their 'normal' level of consumption, repaying the loan in good times by making additional savings; so, the question of accumulating debt does not arise. This of course raises the question: then how does loan-financed negative saving persist over the years? The answer lies in noting that negative income shocks strike randomly, afflicting different sets of people at different times, so that the set of people who face unexpectedly low incomes would vary from year to year. In other words, there would be a good deal of churning at the lower end of the income scale, and therefore the set of borrowers is not constant from year to year. Every year, even as old borrowers repay their loan, new victims of negative income shocks become new borrowers and keep up the high rate of loan-financed negative savings at the aggregate level.

Our second major finding was regarding the role of microcredit in ensuring stability of consumption inequality by allowing better opportunities for consumption smoothing. Stability in consumption distribution has played an important role in the recent past in translating satisfactory rates of economic growth into equally satisfactory rates of poverty reduction.[31] Whether growth will continue to have strong poverty-reducing effect in the future depends very much on whether consumption inequality continues to remain stable or not. If our explanation of stability in terms of microcredit is valid, this in turn would depend on whether microcredit continues to soften the liquidity constraint further. There are, however, reasons to be skeptical on this score. Recent evidence shows that the expansion of microcredit has reached a stage where further expansion will not be easy (Osmani *et al.* 2011). If the expansion of microcredit slows down, so will the pace at which liquidity constraint is relaxed. In that event, consumption inequality will no longer remain stable in the face of widening income inequality. As income inequality increases, so will consumption inequality, which will weaken the poverty-reducing effect of growth.

So far, widening of income inequality has not posed an obstacle to poverty reduction in rural Bangladesh because microcredit has served to decouple consumption distribution from income distribution by increasing the scope for consumption smoothing, and it is the distribution of consumption that matters for poverty. As soon as the expansion of microcredit slows down, this decoupling will cease to exist and consumption distribution will begin to follow the path of income distribution. Increased income inequality will then become a matter of serious concern not only in its own right but also for the sake of poverty reduction. Therefore, if the policymakers are serious about pro-poor growth, they will have to be serious about tackling income inequality as well.

[31] Since poverty is typically measured with reference to consumption levels, constancy in consumption inequality implies that any growth in average income is reflected into almost proportionate decline in poverty. On recent records on growth and poverty reduction, see Osmani (2011).

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APPENDIX TABLE A.1

QUINTILE DISTRIBUTION OF INCOME BY SOURCES OF INCOME IN RURAL BANGLADESH: 2000

(per capita annual income)

Quintile	Total Income	Agricultural income	Non-agricultural income	Transfer income	Foreign remittance
1	7202	4117	2648	437	67
2	11670	5071	5840	760	178
3	15456	6106	8233	1117	435
4	21281	7328	11879	2074	1113
5	45232	12440	25166	7627	5802
All	19877	6948	10581	2348	1475

Notes and Sources: (1) Our estimates from the raw data file of HIES 2000.
(2) Per capita annual income is at 2010 prices. A reflator of 1.87 was used to convert 2000 figures into 2010 prices.

APPENDIX TABLE A.2

QUINTILE DISTRIBUTION OF INCOME BY SOURCES OF INCOME IN RURAL BANGLADESH: 2010

(per capita annual income)

Quintile	Total Income	Agricultural income	Non-agricultural income	Transfer income	Foreign remittance
1	7811	4302	3105	404	35
2	13450	6556	5997	897	193
3	18730	8112	8765	1853	653
4	27559	10626	12852	4081	2488
5	75882	17590	37448	20843	17247
All	27155	9110	12864	5181	3766

Notes and Sources: (1) The estimates are based on *InM Poverty Dynamics Survey 2010*.
(2) Per capita annual income is at 2010 prices.

APPENDIX TABLE A.3
GINI DECOMPOSITION OF RURAL INCOME BY SOURCE OF INCOME: 2000 (per capita income)

	Sk	Gk	Rk
Agriculture	*0.3498*	*0.5742*	*0.3884*
Self employment	0.2012	0.7411	0.4772
Wage labour	0.1145	0.7779	-0.1481
Rental income	0.0341	0.9358	0.6277
Non-agriculture	*0.5236*	*0.5764*	*0.7154*
Self employment	0.1728	0.8587	0.5418
Wage labour	0.0800	0.8884	0.1050
Salary income	0.1289	0.8976	0.6597
Rental income	0.0066	0.9835	0.6184
Other income	0.1353	0.6288	0.5610
Transfer	*0.1266*	*0.8788*	*0.6379*
Foreign remittance	0.0705	0.9624	0.7684
Domestic remittance	0.0402	0.9268	0.4751
Government transfer	0.0029	0.9574	-0.1468
Private transfer	0.0131	0.9324	0.1274
Total income (per capita)	*1.0000*	*0.3649*	

Notes and Sources: (1) Our estimates from the raw data file of HIES 2000.

(2) S_k stands for the share of each source of income in total income, G_k refers to the Gini coefficient of the distribution of source income, and R_k stands for the Gini correlation of income from source k with the distribution of total income.

APPENDIX TABLE A.4
GINI DECOMPOSITION OF RURAL INCOME BY SOURCE OF INCOME: 2010
(per capita income)

	S_k	G_k	R_k
Agriculture	*0.3348*	*0.5728*	*0.5061*
Self employment	0.2065	0.6618	0.4772
Wage labour	0.0845	0.8009	-0.1481
Rental income	0.0438	0.9414	0.6277
Non-agriculture	*0.4501*	*0.6694*	*0.7193*
Self employment	0.2144	0.8822	0.5418
Wage labour	0.0807	0.8670	0.1050
Salary income	0.0821	0.9413	0.6597
Rental income	0.0079	0.9910	0.6184
Other income	0.0651	0.6522	0.5610
Transfer	*0.2151*	*0.8950*	*0.7869*
Foreign remittance	0.1506	0.9482	0.7684
Domestic remittance	0.0545	0.9398	0.4751
Government transfer	0.0014	0.9962	-0.1468
Private transfer	0.0086	0.9415	0.1274
Total income (per capita)	*1.0000*	*0.4635*	

Notes and Sources: (1) The estimates are based on *InM Poverty Dynamics Survey 2010*.

(2) S_k stands for the share of each source of income in total income, G_k refers to the Gini coefficient of the distribution of source income, and R_k stands for the Gini correlation of income from source k with the distribution of total income.