

CHAPTER 6: SUB-NATIONAL INCOME AND EXPENDITURE DYNAMICS IN BANGLADESH: INSIGHTS FROM THE MACRO-GDP AND MICRO-SURVEY DATA

I. Introducing the Theme

6.1 *Bangladesh is geographically a small country with ethnically much more homogenous population than other countries in South Asia.* Nonetheless, historically it is marked with considerable regional differences in dialect, custom, agrarian relations and social development.¹²¹ Although the presence and persistence of differences in human development indicators in the country are often discussed,¹²² regional differences in income and other economic indicators are less known. This chapter seeks to advance the understanding of the regional income and expenditure differences.

6.2 *Income differences at the sub-national level matter in large part because of their impact on income growth at the national level.* For one, the growth potential of a nation would not be fulfilled if any of its major geographical/administrative units lags its own potential. Lagging regions also create clear demarcations between the “haves” and the “have-nots,” which, over the longer run, can sow the seeds for social conflict and jeopardize sustainability of good growth at the national level.

6.3 *The main policy challenge, however, is to unleash the growth potential of each region, and not pursuit of regional equality as a goal of intrinsic worth in itself.* Single-minded pursuit of regional equality can, in fact, be counterproductive – it is likely to retard the better performing areas without necessarily lifting up the lagging ones. Similar to nations, regions, too, grow toward their own economic potentials, which depend on a host of economic and social factors – some in the control of policy makers and some not. Also, as economies grow and diversify there is a tendency to reap the benefits of agglomeration economies, spatial externalities, and increasing returns to scale leading to the formation of large urban/industrial clusters and regional specialization, with implications for increasing spatial divergences.¹²³ The growth potential of the poorer regions would very much depend on informed policy choices that encourage them to benefit from the “externality-generating” activities, and facilitate flow of resources (especially manpower) to the parts of the country that are economically more dynamic.

6.4 *This chapter seeks to shed light on the sub-national differences in the levels and growth of income and expenditure in Bangladesh, although within the confines of fairly restrictive data limitations.* The chapter also identifies some factors correlated with cross-district differences in per-capita expenditure growth over FY1992-2005. Specifically, expenditure growth is found to be negatively correlated with the initial levels of expenditure inequality, gender disparity, and large landholdings, and positively correlated with the degree of urbanization and access to electricity. Also, in general, districts with lower per-capita expenditure experienced faster expenditure growth, implying mild regional convergence in per-capita expenditure, although the speed of convergence was quite slow; the estimated time to full convergence is about 90 years.

6.5 *These result are indicative at best, as the expenditure data are not representative at the district level.* Nonetheless, per-capita expenditures and per-capita GDP are tightly correlated across districts for

¹²¹ Two Bengals had historical differences in geography and subsequent social formations (Eaton (1997); Khan (2002)). However, the significant differences were observed even within Eastern Bengal, especially in terms of agrarian systems (Bose (1986)); between agrarian frontiers and settled territories (Ludden (2004)); and in respect of customs and traditions (Roy 1988).

¹²² BIDS (2001); Sen and Ali (2004); World Bank 2004.

¹²³ Rosenstein-Rodan (1943); Krugman (1992); Hoff (1998); Jalan and Ravallion (1998); Kanbur and Venables (2005).

Bangladesh: Strategy for Sustained Growth

the years for which comparable data are available. In light of that, there is some value in identifying the policy and institutional correlates – that are representative of the individual districts – of district level expenditure patterns. The exercise adds another dimension to better understanding the nature of the aggregate growth process in Bangladesh. Still, the analysis presented here is not developed enough to be able to be translated into a concrete policy message.

II. Income, Growth, and Inequality Variations Across Bangladesh

6.6 Bangladesh is divided into six *Divisions*, each *Division* is sub-divided into *Districts* or *Zilas*: there are 64 such *Districts* in all. The average population of each *District* is about 2 million with an average land area of about 2,250 sq.km. The *Districts* are further sub-Divided into *Thanas* (for rural areas) and one or more *Pourashavas* or *Municipalities*: in all, there are 289 *Pourashavas* and 6 *City Corporations* (Chapter 5). *Thanas* are sub-divided into *Unions* and *Unions* into *Villages*.¹²⁴

6.7 Two sets of data are used here in this chapter. One is the *District*-level macro GDP data from the 2000 Statistical Yearbook of the BBS. The other is the micro-level “consumption expenditure” (henceforth “expenditure”) data derived from the Household Income and Expenditure Survey (HIES) and aggregated at the *District* level. **Box 6.1** provides more details on the two data sets. GDP data are also used for the 20 *Old Districts* for longer inter-temporal comparisons.

Box 6.1: Regionally Disaggregated Data: Macro GDP Vs. Micro Expenditure Data

Regional income or expenditure level or growth data are difficult to come by in Bangladesh – the state of affairs for social indicators or agriculture production data is better. The BBS published GDP data at the level of the 20 *Old District* level between FY1982-99, but discontinued that subsequently. The BBS recently also published GDP data for the 64 *Districts* during 1996-2000, but then discontinued that as well. The GDP data, therefore, do not allow for any detailed analysis of growth trends at the subnational level.

The use of micro data on “consumption expenditure” aggregated at the *District* level then becomes a potentially important avenue for exploring growth dynamics. Their main advantage over the GDP data is that they cover a longer period, FY92 to FY05, deriving from the HIESs done in FY1992, FY2000, and FY2005. The micro-level expenditure data are preferred over micro-level income data from the same data source because of lower measurement error (see, Deaton 1997). One problem, however, is that the district level aggregates are not representative of the districts in a statistical sense.

Even under the best of circumstances, when micro expenditure data are, in fact, representative at the regional level, it is difficult to reconcile them with the national accounts (see Deaton and Kozel 2005 for a survey of issues in the Indian context). As a result, the regional rankings of GDP and micro expenditure data seldom match closely. The reconciliation problem can be even more pronounced for growth rates (see, for example, Azzoni et al (2005) for evidence on Brazil). Not surprisingly then there is less than one-to-one correspondence in the rankings of *Districts* by GDP and micro expenditure data. Nevertheless, there is significant congruence. The Spearman rank correlation between the GDP and expenditure rankings for the 64 *Districts* is 0.43 for the year 1996 and 0.38 for 2000. Similarly, the correlation coefficient between District-level GDP and expenditure is 0.80 for 1996 and 0.71 for 2000.

GDP and Expenditure Variations at the Divisional Level

6.8 *Per capita GDP growth in the 1980s and 1990s was strikingly similar across the 6 Divisions* (Table 6.1) – Dhaka, Chittagong, Khulna, Barisal, Sylhet, and Rajshahi. As per aggregated *Old Districts* data, annual *Divisional* growth varied in a narrow 1.8-2.8 percent range across the *Divisions* over the

¹²⁴ “Role of UNDP in Promoting Local Governance and Decentralization in Bangladesh” Report of the Initial SPPD Scoping Mission, 2002.

FY83-99 period. Similarly, as per aggregations from *District* level GDP data, *Divisional* growth in the second half of the 1990s varied within an even narrower band of 2.7-3.1 percent.¹²⁵ Another noticeable feature is that the growth acceleration at the national level since 1990 was experienced in varying degrees by each of the 6 *Divisions*. It was most pronounced in Sylhet, where per-capita growth accelerated by over 3 percentage points during the FY90-99 period compared with the FY83-89 period. Dhaka and Chittagong, with 2 and 1.3 percentage point acceleration, respectively, also saw a significant pick-up in their growth rates. On the other hand, growth in Barisal improved by a small amount. *At the same time though, a fair amount of dispersion is seen among the Divisions in their per-capita GDP levels.* In FY00, the per-capita GDP of the most well-off *Division* (Dhaka) was about 50 percent higher than that of the least well-off *Division* (Sylhet).

Table 6.1: GDP Levels and Growth by Division

Division	Aggregated From District Level Data			Aggregated From "Old District" Data		
	GDP per capita (current prices)	GDP Share in Total (%)	GDP per capita growth	GDP per capita growth		
	FY00	FY00	FY96-00	FY83-89	FY90-99	FY83-99
Dhaka	22303	37.7	2.9	1.3	3.3	2.4
Chittagong	18128	19.3	2.8	1.7	3.0	2.5
Khulna	17875	11.6	3.1	2.6	3.0	2.8
Barisal	15383	5.8	3.0	2.1	2.2	2.2
Sylhet	14886	5.2	2.7	0.0	3.1	1.8
Rajshahi	15174	20.4	3.4	1.8	2.6	2.3
National	18511	100	2.3	1.6	2.9	2.4

Source: BBS, and Staff calculations

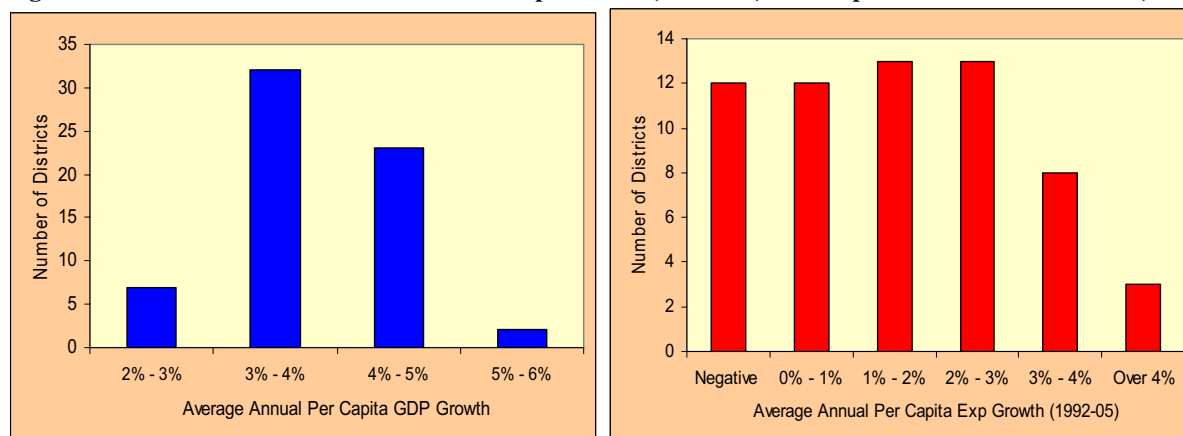
GDP and Expenditure Variations at the District Level

6.9 GDP data for the next administrative level, the *District*, are available for a relatively short period of FY96-00, although additional insights can be obtained from *District*-level expenditure data from the HIES, since they cover a longer period, FY92-05.¹²⁶ *As in the case of the Divisions, per-capita GDP growth was relatively uniform across the Districts.* Almost 90 percent of the *Districts* experienced average growth in the 3-5 percent range during FY96-00, none of the *Districts* experienced negative growth and only two experienced growth of over 5 percent (**Figure 6.1**). *The per-capita expenditure growth rates, on the other hand, were much more varied, with average annual growth varying between -4.8 and 6.2 percent over FY92-05.* Almost one-fifth of the *Districts* recorded negative expenditure growth over this period, while another one-fifth recorded positive but less than 1 percent growth (**Figure 6.1**).

¹²⁵ It must be noted that the data compiled by BBS at the level of the 20 "old districts" are of fairly weak quality. For one, these are based on the 1968 SNA, whereas the 1993 SNA is currently being used. The *District* level data, on the other hand, address some of these quality concerns.

¹²⁶ Although expenditure data are not representative at the *District* level, these are tightly correlated with GDP data across districts. Still, the *District* level aggregations are to be interpreted with caution.

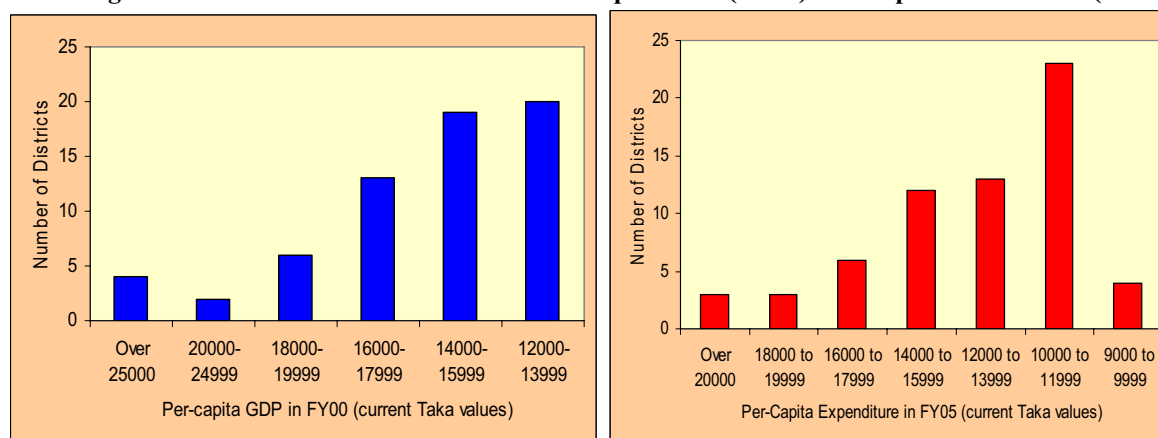
Figure 6.1: District-Level Variations in Per Capita GDP (FY96-00) and Expenditure Growth Rates (FY92-05)



Source: BBS, HIES and Staff Calculations

6.10 *Considerable dispersion in both GDP and expenditure levels can be seen among the Districts.* In FY00, the average per-capita GDP of the top five *Districts* was about two-and-a-half times that of the bottom five *Districts*. Per-capita GDP of Dhaka, the most well-off *District*, was three-and-a-half times that of the least well-off *District* (Gaibandha) in FY00. Moreover, as seen in **Figure 6.2**, in FY00, per-capita GDP in three-fifths of the *Districts* was less than Tk.16,000, while only four *Districts* – Dhaka, Gazipur, Narayanganj, and Chittagong – had per-capita GDP of over Tk. 25,000. The ratio of the top and bottom five *Districts* in terms of per-capita expenditure was also close to 2.5 in FY00 and in FY05. In FY05, per-capita expenditure in only three *Districts* was over Tk. 20,000, while in three-fifths of the *Districts* it was less than Tk. 14,000. **Annex Table 6.1** shows GDP and expenditure level and growth information for all *Districts* for which such data are available.

Figure 6.2: District-Level Variations in Per Capita GDP (FY00) and Expenditure Levels (FY05)



Source: BBS, HIES and Staff Calculations

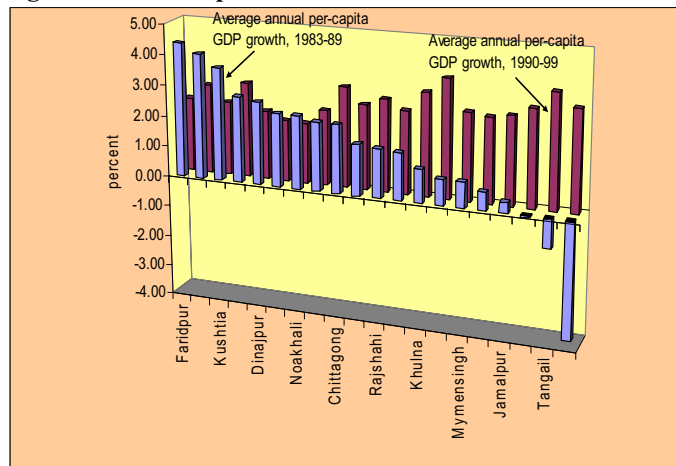
6.11 *Growth patterns across Districts show mild evidence of convergence in expenditure levels.* In general, as also discussed later, *Districts* with lower initial expenditure levels in FY92 saw higher growth in their per-capita expenditure over the FY92-05 period. Comparisons between the richest and poorest *Districts* were even more striking. Average per-capita expenditure growth in the 5 *Districts* with the lowest per-capita expenditure in FY92 – Patuakhali, Gopalganj, Gaibandha, Netrokona, and Tangail – was 3.9 percent, compared with an average growth of 0.8 percent in the 5 *Districts* with the highest per-capita expenditure – Dhaka, Nilphamari, Sylhet, Chittagong, and Narayanganj. Furthermore, while six of

the top 10 *Districts* in FY92 (in terms of per-capita expenditure) experienced negative growth over the FY92-05 period, each of the bottom 10 *Districts* experienced positive growth.

GDP Growth Variations at the Old District Level

6.12 *The growth acceleration at the national level in the 1990s appears to have been shared across much of the country (Figure 6.3).* Per capita GDP growth was higher in the FY90-99 period compared with the FY83-89 period in 14 out of the 20 *Old Districts*. All 6 *Old Districts* which experienced a growth slowdown in the latter period were among the seven fastest growing *Old Districts* in the FY83-89 period. Furthermore, the three slowest growing *Old Districts* in the FY83-89 period experienced the fastest acceleration in their per-capita growth in the latter period.

Figure 6.3: Per-Capita GDP Growth Across the Old Districts



Source: HIES and Staff Calculations

How “High” is Regional Inequality?

6.13 *To estimate spatial inequality, we consider the contribution of variation in per capita expenditure across Districts to per capita expenditure variation across all individuals.*¹²⁷ This assesses to what extent regional inequality in Bangladesh accounts for the total inequality (i.e. inequality in the inter-personal income) in the country. The matter assumes special significance for the 1990s when the standard measures of inequality such as Gini index show sharp rise both for expenditure and income data.¹²⁸

6.14 *The Theil index of inequality is well-suited for the analysis and is calculated in Table 6.2.*^{129,130} Three results are noteworthy. First, as with the conventional Gini index, the Theil measure of inequality shows a sharp increase in inter-personal inequality in expenditure during the 1990s. Second, both within-District and between-District components of interpersonal expenditure inequality rose during this period with slightly higher pace of increase recorded for the latter. Third, and more importantly, the contribution of between-District inequality to total interpersonal inequality was relatively modest – between District

¹²⁷ On this, see Kanbur and Venables (2005).

¹²⁸ See, World Bank 2003 and Osmani et al (2003) for trends based on expenditure data; Khan and Sen (2004) for trends based on income data.

¹²⁹ See, Bourguignon (1979); Cowell (2000); Conceicao and Ferreira (2000); Elbers et al (2005).

¹³⁰ The measure used here is Theil L or mean log deviation. This belongs to the general entropy class of inequality measures, with the aversion parameter to inequality among the poor being set to zero.

inequality accounted for only about 17 percent of total inequality in FY00.¹³¹ In short, the bulk of the total interpersonal inequality is explained by within-*District* inequality.¹³²

Table 6.2: Between and Within-Group Decomposition of Theil Index of Inequality at District-Level

Level of Decomposition: 64-District	1991/92	1999/2000
Number of Sub-Groups	61	63
Within-Group Inequality	0.11 (85%)	0.16 (83%)
Between-Group Inequality	0.02 (15%)	0.03 (17%)
Total Inequality	0.13 (100%)	0.19 (100%)

Source: HIES and Staff calculations

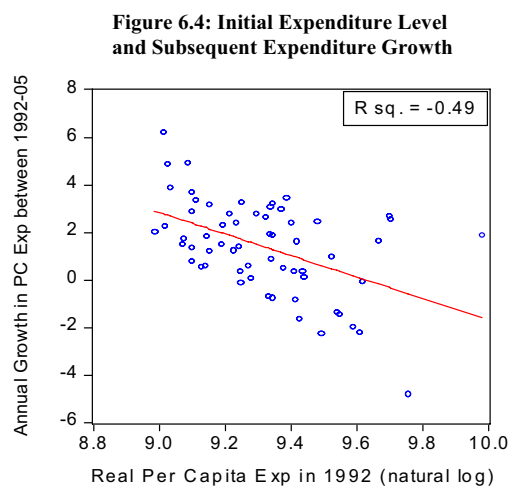
Note: Figures in parentheses represent percentage contribution of each component of inequality to total inequality.

III. Correlates of Sub-National Expenditure Dynamics

6.15 In this section we test for the correlations between cross-*District* per-capita expenditure growth over FY92-05 and available policy and institutional variables. The choice of the variables is essentially dictated by data availability – for instance, a notable omission is a proxy for saving/investment across the *Districts* as the relevant data are not available. *District* level GDP data are not used since they cover just four years – FY1996-2000.

Key Bivariate Relationships

6.16 *Districts with lower per-capita expenditure in FY92 experienced faster subsequent growth in per-capita expenditure.* This is consistent with the predictions of standard neo-classical growth models, as per which regions would converge toward a (more-or-less) common steady-state under conditions of similar production functions and economic conditions shaping growth. In this case, *Districts* that are further away from the steady state, i.e., the poorer regions, would grow faster by accumulating faster the factors of production, and vice versa for the richer regions. A pattern of mild unconditional convergence in expenditure level may be seen in **Figure 6.4**. Perhaps, the lack of ethnic fragmentation along caste-ethnicity lines combined with high population density fostered faster “geographic diffusion”, especially in terms of information/knowledge diffusion. There are many such examples of fairly rapid spread of new “technology” such as from Green Revolution,¹³³ fertility control,¹³⁴ and microfinance group formation, which could have contributed to this observed convergence.¹³⁵ Homogeneity of population also allows greater mobility of labor within the country, which, through remittances, fosters faster convergence in expenditures across geographical units. It is important to note,



Source: HIES and Staff calculations

¹³¹ This is similar to what has been reported for some of the African and Latin American countries such as Madagascar, Mozambique and Ecuador (in all these countries the matched contribution was restricted to 20-25%) but much lower than other larger economies such as Russia (33%). See Kanbur and Venables (2005).

¹³² Analysis of inequality in interpersonal income per se goes beyond the scope of the present paper. Factors contributing to rising inequality as seen through the prism of income source-decomposition analysis has been discussed elsewhere (see, for instance, Khan and Sen (2001); Khan and Sen (2004)).

¹³³ Ahmed et al (2000).

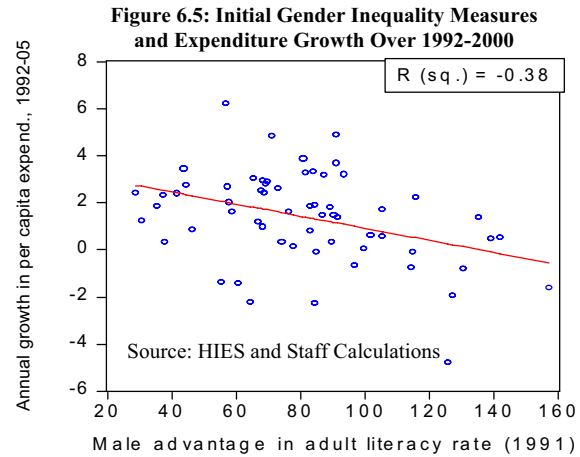
¹³⁴ Amin and Basu (2000), and Dev et al (2004).

¹³⁵ Morduch and Aghion (2005).

however, that the convergence rate indicated by the relationship in **Figure 6.4** is very slow: it would take close to 150 years for the *Districts* to converge fully to a single level of per-capita expenditure at the indicated pace.

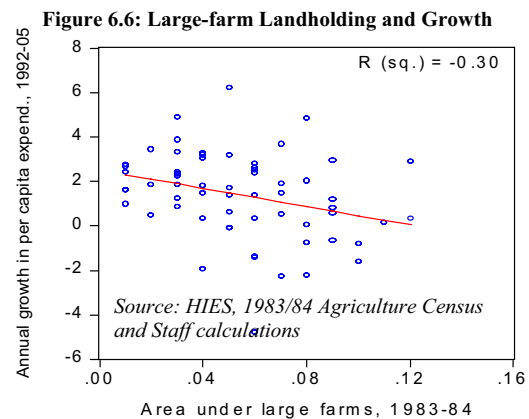
6.17 Districts with higher gender inequality experienced slower growth.

Conceptually, gender inequality can affect growth through two principal transmission mechanisms. With higher gender inequality, especially in human capital, there is less likelihood of female voice and female agency, leading to high fertility and high population growth regime, which in turn, has adverse impact on the subsequent per capita income growth.¹³⁶ The second channel is through malnourished mothers (resulting from gender biases) having malnourished children, who then tend to have poor schooling performance, which can lead to lower future productivity, thus depressing the rate of long-term growth.¹³⁷ As a proxy for gender inequality we use initial male advantage in adult literacy rates.¹³⁸ Gender inequality measured as such is seen to be negatively and significantly correlated with subsequent growth in per-capita expenditure (**Figure 6.5**). One implication of this is that the recent progress in reducing gender inequality in schooling (through incentive schemes) and in child mortality holds promise for long-term growth in Bangladesh.



6.18 Initial inequality in landownership is negatively correlated with growth.

Feudalism in land relations has been identified as a particularly sclerotic factor negatively influencing investment in new technology in agriculture and slowing down the pace of broad-based human development.^{140,141} Bangladesh, however, saw semi-feudalism only in patches: in the traditional Jotdari belt of North Bengal corresponding to upper Rangpur and Dinajpur districts in the Rajshahi division; in the haor areas of the Sunamganj basin of the Sylhet division; and in some parts of the South where “reverse *tebhaga*” prevailed.¹⁴² Even so, as seen in **Figure 6.6**, “share of cultivated land under large-



¹³⁶ See, Eastwood and Lipton (1998).

¹³⁷ See, Glewee and King (2003); Osmani and Sen (2004).

¹³⁸ This is measured as $100 * (\text{male adult literacy rate in 1991} - \text{female adult literacy rate in 1991}) / (\text{female adult literacy rate in 1991})$.

¹³⁹ See, Alesina and Rodrik (1994); Deininger and Square (1996); World Development (2005).

¹⁴⁰ See, Sobhan (1992) for a cross-country survey.

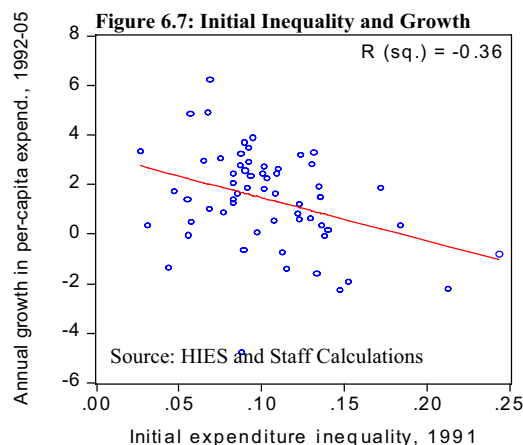
¹⁴¹ There is a large-body of old-generation “mode of production” and new-generation “growth” literature on this subject. World Development Report, World bank, 2006, provides a useful survey on why high land inequality matters. See, Easterly 2000 on the long-term impact of feudalism on growth in Pakistan; Bardhan 1996 on the general importance of land-reform for faster progress in agricultural technology and human development; Dreze and Sen (2000) on contrasting regional growth experiences in the context of India.

¹⁴² “Reverse *tebhaga*” corresponds to the system where tenants are supposed to give two-third share of the produce to the landlord although the costs of production were entirely borne by them. This has become much less common these days even in the once-prevalent Southern pockets.

Bangladesh: Strategy for Sustained Growth

landholding” (i.e. with land-size greater than 7.5 acres according to the 1983/84 Agricultural Census) is negatively correlated with expenditure growth at the *District* level.

6.19 ***Initial expenditure inequality is negatively associated with expenditure growth.*** The literature is increasingly looking at the possible adverse influence of high initial income (expenditure) inequality on the rate of subsequent growth as well as on the pace of future poverty reduction.¹⁴³ Initial inequality can reduce growth by adversely affecting investment in human capital. Initial inequality can also increase credit constraints by reducing access to collateralizable assets, thus adversely affecting potential investment. Further, high initial inequality may lead to low poverty-responsiveness of growth creating social unrest or political tensions, which in turn, may generate investment uncertainty, depressing growth. In some circumstances, especially in democracies (though not typically an empirical regularity in the context of developing countries), high initial inequality can lead to electoral pressures “from below” on the part of have-nots for additional poverty-transfers likely to be financed through greater distortionary taxation on the rich investors. This, in turn, can have negative impact on productive investment and growth. The inequality measure used in this exercise relates to “mean log deviation” (see, **Annex Table 6.3**). **Figure 6.7** shows a significant negative relationship between initial expenditure inequality and subsequent growth.



Sub-National Expenditure Dynamics: Results of the Multivariate Analysis

6.20 ***Each of the variables noted above is also significantly correlated with per-capita expenditure growth in a multivariate regression analysis*** – with per-capita expenditure growth as the dependent variable and the rest as explanatory variables (**Annex Table 6.2**). As predicted, and consistent with the bivariate relationships seen above, expenditure growth is negatively and significantly correlated with initial levels of expenditure, gender inequality, asset inequality, and income inequality. In addition, we also include in the regression access to electricity and degree of urbanization in 1991 as explanatory variables, although in separate regressions since the two are highly correlated. ***The coefficients for both access to electricity and degree of urbanization are positively and significantly correlated (at the 99 percent level) with expenditure growth in the multivariate regression.*** It is worth noting that both variables vary considerably across *Districts*. In 1991, access to electricity varied from just 2 percent in the Kurigram district to 69 percent in the Dhaka district. Similarly, the degree of urbanization varied from only 7 percent in the Gopalganj district to 88 percent in the Dhaka district.

6.21 ***Results further indicate the presence of “conditional” regional convergence:*** i.e., *Districts* with lower initial per capita expenditure tended to have higher growth in expenditure per capita. ***However, the speed of convergence is quite slow***— the estimated time for full convergence in per-capita expenditure is about 90 years.

¹⁴³ Ray (1998) surveys the literature on the effect of inequality on growth. Ravallion (1997) and (2000) discusses impact of inequality on poverty reduction.

IV. Discussion of Results and Implications for Policy

6.22 This chapter highlighted the considerable (although not unusual in any sense) spatial variability in GDP and expenditure levels and in expenditure growth in Bangladesh. Results presented in the chapter indicate that the level of inequality between *Districts* accounts for less than one-fifth of the total inequality in the country: interpersonal inequality accounts is the main contributor to that. The chapter also showed expenditure growth at the *District* level to be negatively correlated with initial levels of gender disparity, expenditure inequality, and asset inequality, and positively correlated with initial access to electricity and degree of urbanization. It further showed some evidence that *Districts* with lower initial per capita expenditure, in general, appear to have grown somewhat faster, indicating mild convergence in expenditure per capita among the *Districts*. Any convergence among *Districts* is quite slow, however. Unconditional convergence – the rate at which convergence would take place without addressing the major policy and institutional differences among *Districts* – could take more than 150 years. Policy support for the lagging regions, therefore, is clearly quite important for shared growth within the country.

6.23 *Is there, then, a role for “regional policy” that can help accelerate convergence among sub-national units? If so, what forms it should take?* Unfortunately, analytical limitations at this stage prevent us from making a clear leap from identifying factors that are correlated with and possibly impact regional growth to elaborating clear policy choices that would address growth constraints at the regional level. Sub-national income dynamics are also shrouded in economic and political complexities that need to be further explored. Particular consideration has to be given to the information, resource, and capacity constraints within which policy makers operate. Our emphasis at this stage was simply to highlight the differences in sub-national income and expenditure dynamics and provide a preliminary assessment of the possible causes, in order to also better understand the growth process at the national level.