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CONTENTS

List of Tables, Figures, Appendix Tables and Map

ACRONYMS

BBS	Bangladesh Bureau of Statistics
BIDS	Bangladesh Institute of Development Studies
CBN	Cost of Basic Need
HIES	Household Income and Expenditure Survey
HPI	Human Poverty Index
HYV	High Yielding Varieties
IMR	Infant Mortality Rate
LFS	Labour Force Survey
MFI	Microfinance Institution
NGO	Non-government Organisation
OLS	Ordinary Least Square
RPCE	Real Per Capita Expenditure
TFR	Total Fertility Rate
WFP	World Food Programme

FOREWORD

This research study was funded by the BIDS Research Endowment Fund (REF) which provides a window for the BIDS researchers to conduct policy oriented research on priority development challenges facing Bangladesh.

In 2009, BIDS received Tk. 200 million from the government to create the REF to carry out policy research at the Institute. The creation of BIDS-REF has significantly enhanced our scope of conducting institutional research. Under the BIDS-REF, several research studies have been initiated with the expectation that this will enable the researchers to bring their knowledge into the mainstream of development research and evidence-based policy making in the country through conducting policy relevant works.

These research studies are included in the Annual Research Programmes (ARPs) of BIDS which are prepared every year through a rigorous and participatory process in consultation with the government, civil society, private sector and other concerned stakeholders. As such, several of these studies are undertaken in response to emerging challenges and/or at the request of the government and other agencies.

This is for the first time that BIDS is publishing the BIDS-REF study reports as a part of its commitment to establishing transparency and accountability to its stakeholders including fellow researchers and policymakers who are working towards promoting evidence based policies in Bangladesh. I hope the study report will be useful to all stakeholders concerned with the theory and practice of development in general and of Bangladesh in particular.

I would like to express my deep appreciation to all my colleagues in BIDS who have cooperated and contributed to the preparation and publication of these research studies. I would also like to express my deep gratitude to the Hon'ble Minister of Planning and Chairman of BIDS Board of Trustees and its distinguished members who are providing continuous guidance and support to BIDS in the effort to further concretising its long term vision of being part of a process that places BIDS firmly on the level of engagement in furthering better research and better policy leading to better Bangladesh.

July 2014

Mustafa K. Mujeri
Director General

Executive Summary

I. The Declining East-West Divide

The term "East-West divide" as a way of describing regional disparity in Bangladesh has emerged in the policy discourse only in the 2000s. The administrative divisions belonging to the western part of the country are traditionally considered to be economically backward than the areas located in the eastern part of the country. This has been partly supported by the Household Income and Expenditure Survey (HIES) data. The successive HIES rounds since 1983/84 showed the welfare level to be higher in the East than in the West, as measured by the level of per capita consumption expenditure. Large spatial poverty differentials between the eastern and western regions have also been recorded by successive "poverty mapping" exercises starting from the late 1990s.

In a way, this was not altogether unexpected, especially following the Partition of 1947. The western part of East Bengal lacked economic integration with Dhaka and Chittagong while all its former economic links with Calcutta became severed. This led to the relative economic isolation of the western part from the rest of the country. In contrast, higher degree of agricultural prosperity and industrialism flourished in the eastern part. In this backdrop, the coinage of the term "East-West divide" hardly came as a surprise. But, some important moments of development dynamics across the two regions have been missed out in the characterisation of the regional divide. For instance, *it glossed over the question whether the East-West divide in welfare (measured in terms of consumption expenditure) has been declining rapidly*, and if so, why.

The previous literature has mostly concentrated on mapping the differences in regional welfare based on income poverty and human development data. This literature has attested attention mainly to the issue of *persistence* of the regional welfare gap. The issue of whether and why the matched regional welfare gap has been declining over the 2000s largely escaped the attention of this literature. Such questions are bound to arise, sooner or later, especially after the release of the 2010 HIES data. The latter indicated *substantial narrowing down* of the initial regional welfare gap between 2000 and 2010, as expressed in the *faster pace of poverty reduction* in the economically backward western regions than in the eastern parts of the country. What explains this surprising turn-around? This question lies at the heart of the present study.[1]

We approach this question from different angles. We attempt to quantitatively capture the persistence of regional welfare gaps, recent trends of decline in these gaps, and analyse the factors that may have contributed to the reduction of these gaps. The study deploys a range of statistical and econometric techniques to achieve these analytical objectives.

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[1]The trend of regional convergence in welfare was earlier noted by Sen and Ali (2009), but they discussed it mainly in the context of human development.

II. Regional Welfare Gap: Role of "Initial Conditions" and Policies

We highlight the role of several factors that helped to narrow down the regional welfare gap. The declining role of "adverse initial conditions" is one factor. The heightened role of factors associated with contemporary development dynamics provides other possible explanations. The latter includes urbanisation, human capital and migration. We argue that a combination of all these factors has helped to reduce the regional welfare gap.

Varying Initial Conditions in the West

Initial conditions were not as bad in the western region of Bangladesh as in case of some other lagging regions of the world. The study notes several contextual factors that anticipated the narrowing of the "East-West divide" in the second half of the 2000s.[2]

Theoretical approaches in the literature on the regional differences in development highlight the role of adverse geography, non-inclusive institutions and lack of policy responses.[3] In the Bangladesh case, we have argued that *the assumed presence of adverse geography and non-inclusive institutions cannot be held as explanations for the persistence of the regional welfare divide*. They are only partly (at best) applicable with respect to the western region. We further argue that *the role of policies has been most important (instrumental)* in shaping the dynamics of the regional divide.

Several factors led to the declining regional disparity. First, unfavourable initial conditions such as adverse geography in the West were already moderated by the development dynamics of the last two decades marked by faster agricultural growth and specialisation in the West. Second, this agricultural growth was not any growth, but growth accompanied by the development of pro-poor agrarian institutions. The latter included favourable changes in the land-tenure, including the rise of "pure tenants" and increase in the share of land under fixed tenancy.[4]

Third, the "economic density" factor also increased in the West with the growth of medium and small sized cities, resulting in more diversified economic activities.[5]

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[2]In this study, we use the terms East-West divide, regional divide, regional gap, regional welfare gap, and regional disparity inter-changeably. The term "West" is used to denote the western regions of the country (areas falling into the western side of the Jamuna river) comprising of Barisal, Khulna, Rajshahi and Rangpur administrative divisions. Similarly, the term "East" describes the eastern regions of the country (areas falling into the eastern side of the Jamuna river) and include Dhaka, Chittagong and Sylhet administrative divisions.

[3]Myrdal's (1957) hypothesis of "cumulative causation" provides one set of explanations. The other line of inquiry sees regional dualism as a temporary phenomenon, largely to be overcome in the process of development itself. Williamson (1965) shows that regional inequality may actually follow an inverted-U curve, with "pull" effects emanating from the favoured region being weak in the early stage of development and stronger in the later stages.

[4]On this dynamics of development of agrarian institutions in the 2000s, see Hossain *et al.* (2012).

[5]World Bank (2009) highlights the role of "economic density" as a positive factor underlying convergence over time in the living standards between leading and lagging regions.

Fourth, typically the lagging regions lag behind not only in income/consumption, but also in respect of social and human developments. This is not the case in Bangladesh. Adverse geography in the western region did not discourage human capital accumulation or human development in a broad range of indicators. Remarkably, the West had the advantage of relatively *high* initial human development status that compared favourably with the East—a unique feature not found elsewhere in South Asian context.[6]

Fifth, the West also responded very well to the placement of innovative modern institutions such as MFI. The concentration of MFIs has been *higher* in the West—a result of deliberate social policy of MFI programme placement in the poor areas.[7] This had positive influence on human development indicators, especially empowerment of women.

Equalising Role of Public Policies

The policy responses to the East-West divide also played an important role in reducing the welfare gap between the two regions. Three key dimensions of the policy response may be highlighted: the first one relates to public investments in physical infrastructure, the second factor relates to public investments in human development, and the third factor pertains to social protection and ecological vulnerability.

Firstly, considerable investments were made in public infrastructures (roads, culverts, bridges) which led to improved connectivity between the East and West as well as better communication within the lagging regions. The construction of the Jamuna Bridge in 1998, which required massive public investment supported by external aid, is a case in point. The Jamuna Bridge literally connected the entire region of the West (especially the North-West) with the eastern parts of the country and helped its integration with national and global economic opportunities, including trade, migration and investment.[8] There has also been an impressive change in respect of within and between region road connectivity. The inhabitants of the West now have increasingly better access to domestic and international economic migration opportunities with gradual improvement both in connectivity and information flows. A national labour market has been formed in the process of economic growth, with migration gradually emerging as a promising driver in reducing the regional welfare gap through the channels of domestic and foreign remittances.

Secondly, the expansion of schooling in the West over the past two decades was also an important policy component. However, the quality divide in human capital still persists between the two regions. The latter is indirectly suggested by the continued

[6]In the Indian context, for instance, the lagging regions in terms of income/consumption also had lower human development compared to the leading regions (World Bank 2008a).

[7]This has been evident from the spatial distribution of MFI loans and loanees in the 1990s and 2000s according to PKSF Thana-level data.

[8]Past studies showed considerable economic impact of the Jamuna Bridge. Hossain *et al.* (2012) review the existing evidence.

higher concentration of the centres of excellence at all levels of education in the eastern regions. Nevertheless, in respect of key education and health indicators such as enrollment rates at primary and secondary levels, female education, contraceptive prevalence and fertility rate the East-West divide has virtually disappeared in the 2000s.

Thirdly, the western regions have much higher exposure to ecological risks than in the eastern regions. From this angle, public policies of flood protection, disaster mitigation and social protection have been helpful in reducing environmental vulnerability of the West, thus creating more human investment opportunities in the lagging region.[9]

III. The Dynamics of Regional Gap: Results of the Quantile Regression

All these contextual factors need to be kept in view in interpreting the results of the quantitative exercise using a quantile regression framework. The quantitative results highlight the importance of three sets of factors—urbanisation, human capital and migration—as being crucial to the understanding the dynamics of the East-West divide. Each of these factors is reviewed in turn in the subsequent three sections sequentially.

Role of Urbanisation

With increased "economic distance" from growth centres, welfare of the people residing in the lagging areas can drop considerably. The quantile regression results confirm that the additional benefits derived from urbanisation by the households from the East were considerably higher compared to the households from the West. *This is valid for all the survey rounds of HIES (2000, 2005 and 2010), and this conclusion is valid for households at all quantile levels*. This is not surprising due to the presence of two major growth centres, namely Dhaka and Chittagong, in the East. One interesting feature, however, is that the additional welfare effects for residing in urban areas between the two regions have diminished over time. Thus, the matched effects between the two regions decreased from 17 per cent in 2000 to only 11 per cent in 2010. This may be due to the adverse effects of increasing congestion diseconomies associated with urbanisation in the East. It is possible that the disadvantage of the "congestion diseconomies" may have eroded some of the earlier advantages of the "agglomeration economies" associated with large cities such as Metropolitan Dhaka.

The other possibility is that urbanisation has also become more visible in the West itself. Although urbanisation has accelerated at a remarkably faster pace in the decade of the 2000s, it has contrasting regional dynamics. The rapid growth in urban population—as per the HIES—encompassed not just the eastern (leading) region but also the western (lagging) region. Thus, the proportion of population residing in urban areas has increased from 35 per cent to 37 per cent in the East, but rose sharply from 28 per cent to 35 per

[9]There is a tendency to invest less in household human capital in the face of ecological vulnerability. In general, long-term private investments are much less in ecologically vulnerable areas due to investment uncertainty.

cent in the West. Clearly, the initial urban edge historically enjoyed by the eastern region has declined remarkably in the decade of the 2000s.

Role of Human Capital

Additional benefits of agglomeration economies in urban areas create incentives for human capital accumulation. Human capital seems to be a disequalising force contributing to the persistence of the East-West divide. Two points are noteworthy. First, although access to human capital (endowment) is similar across regions, *the returns to human capital are found to be higher in the eastern (leading) region in all HIES rounds of the 2000s*. Second, returns to education for each extra year of schooling have actually increased for the entire sample over the 10-year period covered by these surveys. The incremental gains are higher in the East, registering an *additional* 1.8 per cent return compared to the average pay-off to the human capital in the West in 2010. The corresponding figure for the additional return to schooling in the East for 2000 was about 1 per cent. This suggests that the *extra pay-off to human capital in the leading region has almost doubled* during the 2000s.

This is consistent with the prediction of increasing return economics of human capital in the more urbanised setting. People with the same level of education are likely to have higher incomes in a more urbanised setting. They also have greater chances of income mobility based on human capital by taking the advantage of global economic opportunities that come almost to the urban door-step. This may also capture the effects of residing in the close proximity to the state (as well as private corporate agencies) in terms of getting improved access to trade-related information and jobs in the formal sector.

However, average effects conceal significant variation across quantiles. Thus, only the upper quantiles seem to have reaped the benefits of higher returns on human capital in the East. As a result, unequal returns to human capital continue to persist as one of the main sources of welfare gap across quantiles within the East.

The contrasting regional pattern is revealed more clearly once the returns on human capital by quantiles are calculated separately for leading and lagging regions, respectively. *The pattern of increasing returns on human capital at the upper quantiles is found valid only for the East. In contrast, the returns to education are similar across quantiles in the West*. This suggests that unequal effects of human capital are likely to be an important source of within-sector inequality in case of the East, but not in the West.

Similarity of educational returns across quantiles in the West and higher educational returns for the upper quantiles in the East also indicate the *potential welfare gains for the more educated workers in migrating out of the West.* This may create constraints to sustaining accelerated regional growth in the West as the latter looses more educated workers in the process of national growth.

The out-migration of more educated workers from the West could have been compensated by increased flow of domestic remittances from the East however. This

forms the central assumption in the model underlying "unbalanced regional growth, balanced regional development" adopted in World Bank (2009). To this issue, we now turn.

Role of Economic Migration

The issue to consider is whether economic migration from the West to the main growth centres of the East can be an important channel for addressing the challenges of inclusive development for the lagging region. As the level of income is higher in the East, workers at all quantile levels migrate from the West and enjoy higher returns on their labour and human capital endowments. If there are no structural constraints to labour mobility between regions, high labour mobility to the East may help to reduce regional dualism through the channel of domestic remittance. The Bangladesh experience provides some support to this.

In the social segment spanning 25th to 50th percentiles, the matched returns are higher for the East. This shows the incentives for this group of population (corresponding to "moderate poor" and "vulnerable non-poor") to migrate out of the West. Interestingly, the return to domestic migration for the poorest 5 per cent is also higher in the East, suggesting clear welfare gains to the extreme poor in migrating from the West to the East.[10] The latter may take part in the relatively high growth urban construction and transport activities in the East fueled, in turn, by remittance flows and general linkage effects due to higher growth.

The return to international migration for each quantile is similar across regions. This is because the pattern of international migration is not dictated by the internal growth dynamics alone; many from the lagging districts have been able to migrate abroad in the past decade and in increasing numbers. This also indicates the potential for international migration to reduce further the East-West divide.[11]

IV. Decomposing Regional Welfare Gap: Endowment vs. Return Effects

In all survey rounds, *the regional welfare gap is mostly the result of higher returns to the assets* in the East. The endowment differences between the regions have had little influence on either the initial persistence or subsequent narrowing of the East-West divide. *While some of the asset endowment effects were actually favouring the lagging region, the difference in the returns to the assets in the leading region far outweighed this endowment edge of the West*. For example, the average years of schooling as well as the amount of operating land was initially higher in the West (in 2000); this edge continues to be retained in 2010, at least for the upper quantiles residing in the West. The average

[10]This is in line with the anecdotal evidence whereby many of the rickshaw pullers of Dhaka city seem to be recent migrants from Barisal and Rangpur.

[11]International migration, however, can be a disequalising factor in the context of each region considered separately. There is some evidence to this effect; on this issue, see Osmani and Sen (2011).

household size—a major determinant of schooling and investment decisions—was also consistently lower in the West compared to East in both 2000 and 2010.

Among the return effects, two factors stand out from the policy point of view. In 2010, *human capital accounts for 52 per cent of the total effects accruing to the return dimension* (coefficient effects); in 2000, such factor was negligible statistically. The other factor is *urbanisation, which accounted for 25 per cent of the total return effects in 2000 and 23 per cent in 2010*. Together human capital and urbanisation accounted for three-fourth of the total return effects in 2010. This is consistent with the prominent role attributed to human capital and urbanisation, as diagnosed earlier.

Among the endowment effects, the unequal access to foreign remittance stands out. Interestingly, the factor of more land availability in the West has been an equalising factor, reducing the regional gap in welfare. However, its overall quantitative weight in explaining the regional gap is rather modest.

V. Presence of Neighbourhood Effects

The present study has also examined the issue of "neighbourhood effects"—as additional potential force for fostering spatial integration—in the spread of economic development by taking the example of literacy and poverty (both measured at the upazila level considered to be the spatial unit). *The results confirm the statistical presence of such effects, which indicates even stronger possibility of faster reduction of the regional gaps in economic and social indicators*. The process of "catching up" works through the mechanism of social learning and social interaction carried over geographically proximate relatively homogenous communities.[12]

VI. Policy Recommendations

Several policy suggestions follow from this study. The key idea is to promote further labour and resource mobility between the regions. The results re-stress the point of fostering growth in the leading (eastern) region as the main centre of gravity for economic activities, while, at the same time, improving labour mobility from the lagging (western) region. We have identified four sets of policies in this regard that are connected with the results of the present study.

Enhancing Incentives for Skill Acquisition

The first set of policies would require improving the quality of human capital to upgrade the employable skills of population, especially in the lagging region. This will enhance labour migration from the lagging to the leading region as well. Broad-based access to human development as well as human capital development across leading and lagging regions in Bangladesh creates favourable economic and social initial conditions needed for regional convergence in living standards. However, as mentioned earlier, the

[12]The spatial convergence model where social learning and social interaction effects have been identified as drivers of spatial diffusion has been discussed elsewhere in the context of fertility across regions; on this aspect, see Dev *et al.* (2002).

returns to human capital are found to be higher in the eastern (leading) region in all HIES rounds of the 2000s, and the extra pay-off to human capital in the leading region has almost doubled during the 2000s.This may be related to the supply side of the human capital formation. The quality of human capital is not the same across the regions. Households residing in the West, who have the same level of education as the East, may have lower English language proficiency and computer literacy. The regional return differences in human capital may also convey varying demand conditions in the two regions: the lagging areas may lack adequate job opportunities consistent with the skill attainment. From this observation, two kinds of policy interventions may be considered.

First, the issue of varying schooling quality across the regions needs to be addressed by setting up common standard of teaching method and facilities ensuring improved English language proficiency, mathematics, and computer literacy. This relates to technical and vocational education as well.

Second, encouraging diversified economic activities, especially modern industrial and service sector establishments in the lagging regions, will generate employment that rewards higher skill attainments and human capital. This will enhance incentives for skill acquisition in the lagging region. This, of course, needs to be done in tandem with the logic of the economic growth process that takes into account the benefits of agglomeration economies, costs of congestion diseconomies, and the imperatives of regionally inclusive development. A disproportionate emphasis on infrastructure investments in the lagging region needs to weigh against the potential efficiency loss associated with the neglect of modern infrastructural needs in the East, especially in the area of urban transport infrastructures and connectivity to the ports, which is also no less pressing.

Improving Connectivity: Road, Bridge, Gas and Power

The second set of policies would require substantial improvements in respect of connectivity within and between regions. Here the focus needs to be on forging closer alliance of the lagging regions with larger urban centres and strategic growth poles. But, this will also demand investment in infrastructures in the lagging (western region) itself. Admittedly, this strategy needs to be calibrated by the compulsions of maintaining growth momentum at the national level without incurring significant efficiency loss that often comes with the blind pursuit of regionally equitable policies.

Nevertheless, it is also clear that *considerable room exists for accelerated growth in the West without distorting the growth process in the East*. The pace of economic diversification—by tapping the full potentials of industrialisation and relocation of industrial units from the East to the West—is particularly held back by the lack of investment in gas and power connectivity in the western region. For example, industrial growth such as the development of readymade garment sector in Khulna city is being hindered by the lack of energy (gas) access at affordable prices.

The Jamuna Bridge was possibly a prime factor behind the trends of regional growth/ poverty convergence that we saw in the second half of the 2000s. A second such strategic

initiative in the form of *Padma* Bridge would have provided further boost to the regional growth in the West. In short, improved urban infrastructure and connectivity through gas, power and bridge would provide a significant stimulus to the growth of industrialism and service sector growth over and beyond agricultural diversification that is already happening in the West. Such factors need to be encouraged further in the West if only to promote growth of the medium-sized cities as Khulna and Bogra. These infrastructural investments would have integrated the western regions better with global and regional economic opportunities that are currently availed mainly by the eastern regions.

Promoting Gainful Economic Migration

The potentials for the equalising role of domestic migration/remittance can be further increased through greater inter-regional (and inter-city) connectivity as well as by developing a rapid mass transit system facilitating temporary (daily) commuting from the West to the East.

Role of international migration has been important in reducing the East-West divide. There is a case for potential policy support here to extend financing facility (financing international migration) to the poor households residing in the lagging regions. This is because international migration requires considerable initial private investment, and migration finance policy can be an important part of regional development policy.

Reducing Risks and Vulnerability

The third set of policies relate to undertaking measures that would further reduce risks and vulnerability inflicting the West much more than the East. After all, the oft-quoted model of "unbalanced growth-balanced development" is based on the model of deliberate human capital accumulation. But, the opportunity for deliberate human capital accumulation is not same regionally. Some initial investments in reducing risk and uncertainty in the lagging region are needed before one expects to see a full-blown process of deliberate human capital accumulation. Investment in food security is one such pre-condition for human capital. Ensuring food security, in turn, requires measures for fertility control and increasing agricultural productivity, which can eventually pave the way for exit from traditional rural occupations and encourage faster labour mobility in and out of the lagging region.

CHAPTER 1

THE EAST-WEST DIVIDE: THE TERMS OF A DEVELOPMENT DEBATE

1.1 The Birth of an Idea

The idea of the "East-West divide" within the rubric of what now geographically constitutes Bangladesh may of recent policy origin, but it has a mythical past. The folk-story citing the epic Mahabharata mentioned that the great Pandavas from the North came to Bengal during their exile years. Their journey, however, stopped at the western banks of Jamuna. The story goes that they looked at the vast sea-like expanse of the river and decided not to cross it. Part of their reluctance, no doubt, stemmed from the lack of practical means to cross the river on their own. After all, the Pandava brothers were no Vikings; they were mighty warriors of the land and not of the sea or sea-like mighty rivers that passed through the Bengal delta.[1] But, there was another motivation behind their reluctance. The Pandavas were cautioned by the Aryan Rishis who suggested that the inhabitants on the "other side" might not provide them a friendly refuge, and even if they did, it was not advisable to go there, since those unwelcoming strangers in the mist allegedly follow "barbaric customs and culture." The Pandavas took the ancient advice quite seriously and left the place. It is said that the term *panadavborjito* (the place rejected by the Pandavas) in Bangla actually refers to the "other side" of the Jamuna i.e. the eastern part of the territory now constituting Bangladesh. The irony of the story is that in course of time it is the eastern region that would become wealthier and more populous. The entire region would be marked by higher density of agricultural population compared to the western part, as new farm areas were increasingly brought under cultivation through forest-clearing operations even as late as the 19th century. But the initial idea of "geographic remoteness" remained and eventually entered into the vernacular of the public imagination as the East-West divide.

Mythical aspects apart, two visible initial conditions led to the persistence of the idea of East-West divide in the modern period. First, the geographic line of divide coincided with the course of the river Jamuna: the western side of the river represented the West, while the eastern side of the river represented the East. This generated a sense of geographic and economic isolation even in the modern period. Second, the major industrial centres built around jute and cotton textile manufacturing—such as Dhaka, Narayanganj, and Chittagong—were located mainly in the eastern region. The only exception was the Khalishpur industrial belt in Khulna that fell in the western region. The tradition of industrialism was already stronger in the eastern part during the British rule, and can actually be traced back to the period even before the advent of colonialism. Asim Roy's *Banga-Brittanto* (Annals of Bengal) provides eye-witness accounts by foreign travelers about the famous textile centres that they saw in the old capital of Dhaka producing Maslin variety cloths; a large part of the latter went to export markets. The locational advantage of these industrial units in the eastern part seemed to be related to

[1]The vernacular expression "*kul nai kinara nai*" indicates the sea-like expanse of some of the East Bengal Rivers.

the ease of communication with the rest of the South Asia by the river mode of transport. This was evident in the case of industrial belt that grew around Dhaka and Narayanganj. These vibrant cities/market centres were situated in the banks of two once-prominent rivers, namely, Buriganga and Shitolakhya. The eastern part also had the advantage of the sea route with the rest of the World, as in the case of Chittagong where trade and maritime transport flourished. One economic implication of this locational advantage is that Bengal/Bangladesh did not historically experience the curse of landlocked status, the latter being cited often as a key cause of long-term sluggish growth.[2]

The term "East-West divide" was coined first in the policy discourse of the late 2000s. In the backdrop of the above two factors—relative economic isolation of the western part and higher degree of agricultural prosperity and industrialism of the eastern part—this came hardly as a surprise. Genealogically, the concept of the "East-West divide"—in the context of development debate in Bangladesh—can be traced back to a World Bank report released in 2008 (World Bank 2008b). Although the report was about poverty assessment, it went beyond that, attempting to examine the regional differences in development at large. A heightened sense of addressing regional differences was already anticipated by the initiatives of "poverty and human poverty mapping" that was first carried out in the 1990s (BIDS 2001). Geographic maps of poverty captured the regional variation in the living standard across administrative divisions and districts.[3] Similar maps were produced for the human poverty index (HPI) and for child malnutrition in the beginning of the 2000s. Persistence of the poverty and human development differentials across regions led to the questioning of the causes underlying such differences (Sen and Ali 2009).

However, the initial debate that was triggered by the World Bank report went further than just attesting to the presence or persistence of such regional differences in development. Often the concept of East-West divide is interpreted as if the economy has segmented into two economic zones, or better still, into "two economies," each having its own growth and development dynamics. To recall, this came in the backdrop of the then emerging discourse of the "Bangladesh paradox," whereby the disjuncture between improved growth/development performance and deteriorating governance was highlighted as a development puzzle. The discourse on the East-West divide provided a regional slant to this puzzle: *while national growth was accelerating, the regional differences sharpened*. In terms of aggregate growth rate, the economy was performing better by the passing of each decade, and so was its human development performance. The Bangladesh economy experienced an average annual growth rate of around 6 per cent since the early 2000s. In terms of per capita income, the improvement was even more remarkable—around 4.5 per cent per annum—due to sharp decline in population growth rate since the decade 1990s. However, the growth process was seen as being internally fractured along the line of regional divide. Growth was there, but not all the regions shared in it. It was in a sense an economic indictment on the lack of inclusiveness of the overall growth process.

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[2]On the long-term detrimental effects of landlocked status of a country on growth, see Sachs *et al*. (2001). We shall take up this issue later.

[3]On the issue of poverty mapping technique, see Elbers *et al.* (2005).

The country's polity long resisted the idea of economic, administrative and political devolution of power of the centre to more sub-regional levels, citing the logic of the unitary state, small geographic expanse, and relatively homogenous population in language-ethnic terms. Such devolution might have been seen as a natural policy response to persistent regional differences in welfare in large countries such as India, Brazil, Russia, or China, where the dichotomies between the leading and the lagging regions were indeed created in the process of national economic growth. But, to tie the same logic of devolution with regional disparity in the context of a smaller geography with largely homogenous population, as in Bangladesh, was viewed with considered largely "unwarranted," even viewed with some suspicion. One interpretation as to why the policy makers in Bangladesh have been sensitive to any suggestion of persistent, or worse still, growing regional disparity may lie in its immediate political past. After all, Bangladesh itself was born out of the "two economy" discourse that pinpointed growing regional disparity within the framework of the united Pakistan. The regional divide issue provided the raison d'être for the 6-points autonomy movement and, failing that, supplied the analytical foregrounding for the eventual emergence of Bangladesh as a separate state.[4] Set against this backdrop, the above-mentioned World Bank report helped to break the shackle of old mindset, and triggered, for the first time, a serious debate about the causes of persistent divide between the eastern and western regions of the country. The debate was not restricted to academic sphere only. The government of the day under the military-driven civilian caretaker government even formed a "high-level Committee" to examine the causes of the East-West divide and suggest possible policy responses to it.

However, the recent HIES data provided an intriguing twist to this story. The 2010 report of the household income and expenditure survey (HIES) conducted by the Bangladesh Bureau of Statistics (BBS) revealed a sharp fall in poverty rates, especially in the former Rajshahi and Khulna divisions (BBS 2011). This sharp poverty reduction in the western region of the country in the second half of 2000s suggested a possible "poverty convergence" across the administrative divisions of the East-West divide and rekindled the earlier debate but in a new light. As expected, faster progress in reducing poverty in the West was underpinned by a declining interregional welfare gap (taking per capita consumption expenditure as the "welfare indicator"). The heightened tension built around regional disparity was eased. The lost case for "regionally inclusive" economic growth was to some extent restored by the same stroke, but the questions remain begging as to the drivers of this potential turn-around. It is to this question we shall return in the present study.

1.2 Defining the Divide

A few remarks on the definitional origins of the terms East and West in the context of Bangladesh would be in order. We identify two distinct regions in Bangladesh from

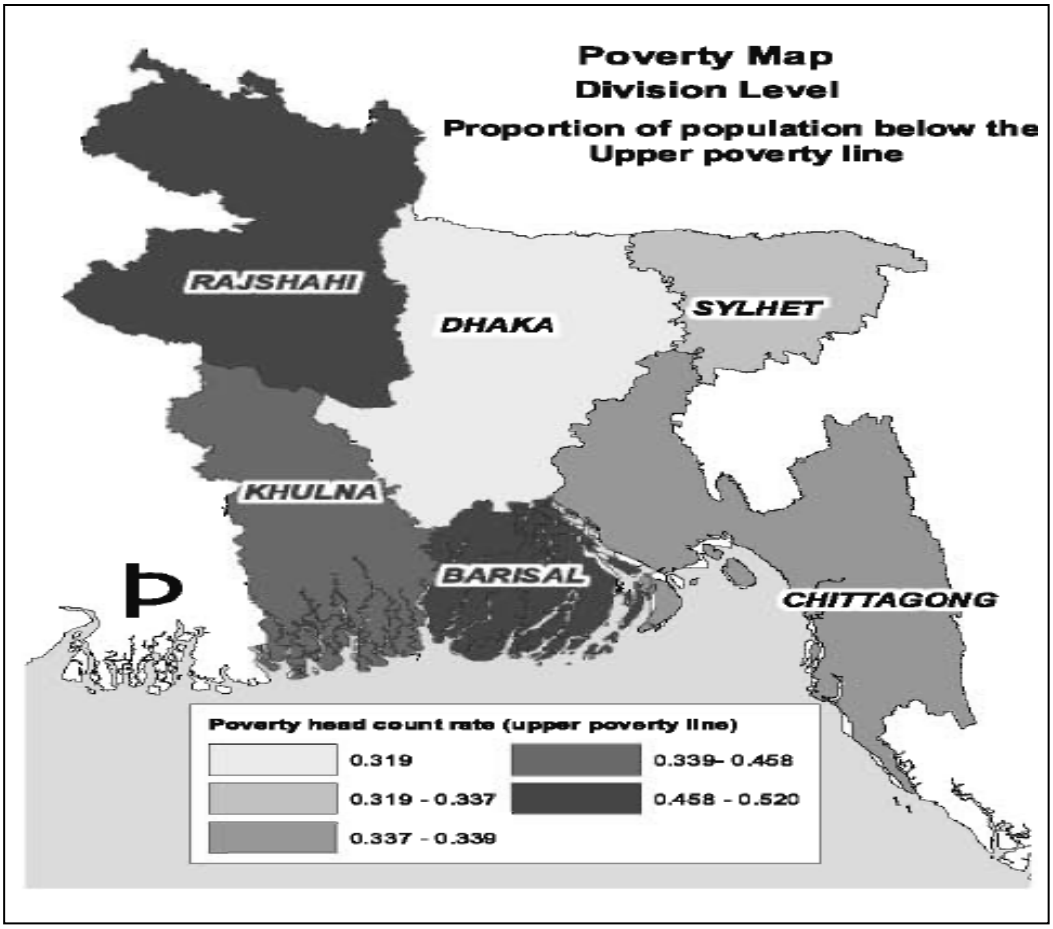
[4] The level of policy sensitivity can be guessed by the following anecdotal remark. In the middle of the 1990s, one key government policy maker in Bangladesh openly commented in a national seminar on "poverty mapping in Bangladesh" that "the exercise of poverty mapping may need to be discouraged, as it may lead to a heightened sense of regional differences and hence, disparities. We came out of Pakistan era, and now need to devise better terms suitable for an ethnically homogenous independent country."

geographic and economic considerations. Historically, Dhaka and Chittagong are the major growth centres of the Bangladesh economy and most industrial activities are concentrated in these two divisions. Moreover, availability of energy, especially natural gas, and proximity to the major seaport, helped these places to become the "nerve centres" of the economy. There is also a clear geographical partition formed by the rivers in the Bangladesh map. Historically, no direct road and railway communication existed between the eastern and western parts of the country till the inauguration of a bridge over the river *Jamuna* in 1998. Four administrative divisions namely Barisal, Khulna, Rajshahi and Rangpur constitute the western region which we term as "the West" (lagging region); while three other administrative divisions of Dhaka, Chittagong and Sylhet constitute the eastern region which we term as "the East" (leading region). The logic behind terming the West as the lagging region compared to the East can also be seen in the division level poverty map of Bangladesh that was made based on poverty incidence in 2000 (Map 1.1).[5] All divisions in the western region had much higher poverty incidence than in the eastern region. The regional disparity can also be seen in the variation in average monthly per capita consumption expenditure. From the available surveys, it appears that the income (expenditure) gap between the East (leading region) and the West (lagging region) persisted over first half of the last decade and narrowed sharply in the second half of the last decade. The gap between the East and the West in average living standard (as measured by real per capita consumption expenditure) has increased marginally from 33 per cent in 2000 to 34 per cent in 2005, but decreased sharply to 20 per cent in 2010. Thus, the overall outcome for the decade of 2000s is one of significant decline in regional gap—from 33 per cent in 2000 to 20 per cent in 2010.

Comparison of regional poverty rates further illustrates the above point of declining regional gap. Poverty statistics over time for the regions are presented in Table 1.1. We present here the head count poverty rate based on "upper poverty line" as well as "lower poverty line" following the cost of basic need (CBN) method. From Table 1.1 it may be seen that the regional poverty rates, based on both sets of poverty lines, are higher in the West compared to the East in all the survey rounds. However, poverty rates of the two regions converged significantly over the period of 2005-2010. Rural poverty rates in the both regions are similar in 2010 and the only divergence that still persists is due to the significant difference in urban poverty between the two regions. Poverty reduction in the West was dramatic over the period of 2005-2010. Extreme and moderate poverty have declined by about 13 and 15.5 percentage points in the West compared to 3 and 4 percentage points, respectively, in the East over the same period. In short, the decline of both rural extreme and moderate poverty was more rapid in the western region over the period of 2005-2010.

[5] Rangpur Division was part of Rajshahi Division then.

Map 1.1: Division Level Poverty Map of Bangladesh (Source: BBS, Dhaka)



The similar picture emerges when one considers the gap in per capita real consumption expenditure between the regions (Table 1.2). The East-West gap in expenditure has increased by 33 per cent in 2000 to 36 per cent in 2005, but dropped to 16 per cent in 2010. In the case of rural poverty, the matched expenditure gap for rural areas in 2010 is only 7.4 per cent down from 19 per cent in 2000, implying substantial fall in rural welfare gap across regions. However, the matched regional gap for urban areas is still considerable in 2010 at 26 per cent, though even here there is an encouraging drop from a very high gap of 40 per cent in 2000.

Despite the recent narrowing of the welfare gap between East and West, the overall poverty incidence still remains higher in the western region. While the East-West divide is on decline, it has not disappeared altogether. But an encouraging shift has been observed, and we need to understand the causes of such turn-around. If such favourable trends can be sustained through additional policy stimulus, the issue of regional divide as a barrier to inclusive growth and development will cease to exist in not so distant future.

Table 1.1

Region wise Incidence of Poverty (HCR) by CBN Method (in percentage)

	2010			2005			2000		
Using the Lower Poverty Line									
	National	Rural	Urban	National	Rural	Urban	National	Rural	Urban
East (Leading Region)	15.4	21.1	4.1	18.7	23.2	9.2	31.3	37.2	18.0
West (Lagging Region)	20.5	21.1	17.3	33.8	35.0	27.9	37.9	39.3	28.4
National	17.6	21.1	7.7	25.1	28.6	14.6	34.3	37.9	20.0
Using the Upper Poverty Line									
East (Leading Region)	28.8	35.1	15.5	32.9	37.7	22.6	45.9	51.2	35.9
West (Lagging Region)	35.2	35.3	33.9	49.7	50.8	43.8	52.5	54.2	40.0
National	31.5	35.2	21.3	40.0	43.8	28.4	48.9	52.3	35.2

Source: HIES Data. Population weights given in HIES data have been used to derive the regional estimate.

Table 1.2

Region wise Per-capita Consumption Expenditure

	2010			2005			2000		
Per-capita Consumption Expenditure (in Tk. at constant price)									
	National	Rural	Urban	National	Rural	Urban	National	Rural	Urban
East (Leading Region)	1322	1083	1735	979	817	1241	885	678	1264
West (Lagging Region)	1137	1008	1373	720	632	887	663	566	901
National	1237	1048	1572	856	726	1082	786	626	1122

Source: HIES Data. Population weights given in HIES data have been used to derive the regional estimate. Figures are rounded.

1.3 Theoretical Approaches

What explains this trend reversal in persistence in regional inequality in the second half of the 2000s? One obvious starting point to consider the existing theoretical approaches that explored the issue of spatial inequality.[6] The literature distinguishes three broad approaches that can explain persistent regional gaps both within and across countries. These relate to the role of geography, institutions and policies. Each is briefly reviewed in turn keeping in view the applicability of each of these factors in the specific context of Bangladesh.

1.3.1 Role of Geography

One strand of this literature highlights the effects of physical geographical constraints on the choice of economic activities. Sachs *et al.* (2001), for instance, have argued that the landlocked countries suffer from long-term growth disadvantages compared to the countries with open access to the sea route. In the Bangladesh case there is some truth to

[6] We follow closely in this sub-section the discussion presented in Kanbur and Venables (2005) and Sen (2010).

it as most of the areas in the western region historically lacked access to port, or at least, not had comparable access enjoyed by the East well-connected through roads with the main sea-port Chittagong. There is some evidence that the distance to international port matters for growth even in Bangladesh (see, for instance, Deichmann *et al.* 2008). However, one needs to recognise that the southern part of the West also had port access initially. Mongla in the Khulna division is, however, still a poorly functioning sea-port, operating at below capacity, but its potentials can be enhanced greatly through appropriate policy support and infrastructural investments. With the possibility of strengthening the rail-road-port linkages in the Khulna region and the opening up of trade-transit-investment opportunities in the South Asian sub-region as a whole (encompassing India, Nepal and Bhutan), at least the southern part of the East-West divide can overcome the present geographic disadvantage in the near future. The other important caveat is that the "natural" disadvantage of adverse geography may not be that natural at all; rather it may be a product of uneven distribution of public infrastructure. But, as Kanbur and Venables (2005:5) note "this simply pushes the question back one stage—the effect of geography on the provision of such an uneven distribution of public infrastructure."

The second strand of this literature underscores the importance of economic geography from the vantage point of location and agglomeration externalities as key determinants of spatial concentration of economic activity ("economic density" captured by the level of urbanisation and urban proximity) and welfare. From this angle, location of large cities becomes an important factor of economic affluence and growth not just for the city dwellers but also for the surrounding areas. Higher economic density offers benefits of agglomeration economies and provides better incentives for human capital accumulation, leading to long-term divergence between regions (World Bank 2009). Deichmann *et al.* (2008) report a significant effect of proximity to cities on rural diversification and specialisation along with the presence of some agglomeration economies around the cities. In the decade of the 2000s, especially after the opening up of the Jamuna Bridge, the geographic constraints on the connectivity of the western region with large cities in the East have been eased considerably. As a result, the flow of workers, goods and services entering the East from the lagging region has increased considerably. This, in turn, has encouraged economic diversification (especially agricultural production and trade) in the West. Also, the decade of the 2000s has seen the growth of urbanisation in the West with the emergence of medium sized cities such as Khulna, and new urban concentrations in Bogra and Rangpur. In short, the lagging West was also catching up albeit slowly in promoting the role of the urban factor in regional development.

A third strand of literature focuses on the adverse geography seen as producing unfavourable economic environments. The latter determines the choice of economic activities (risk averse but low productivity crop choices, multiplicity of low-return occupations that are designed primarily to insure against the income/production shocks). These areas tend to be mainly agricultural as frequent episodes of ecological vulnerability breeds uncertainty and are likely to depress the level of long-term private investments in high-return non-agricultural activities that require stable production environment. There

is some truth in this proposition in Bangladesh with the incidence of poverty being higher in such environments (Yunus and Sen 2012, Shahabuddin 2010).

1.3.2 Role of Institutions

There is no singular definition of "institution"—it can be economic, social, cultural, and political. Accordingly, the institutional literature underpinning the regional divide is rather heterogeneous, examining wide-ranging factors, ranging from the long-term effects of land tenure relations such as large landholding, conservative social norms, innovative economic institutions such as microfinance institution (MFI), to traditions of competitive democracy. Banerjee and Iyer (2005) show that areas marked by oppressive land-tenure such as *Zamindari* system had lower growth in land productivity as well as reduced investment in human capital (schools) compared to the more inclusive *Ryotwari* system of land ownership.[7] There is some truth in this in Bangladesh, where the overall *Zamindari* system prevailed. As is known, the land-system in the eastern Bengal also differed historically, resulting in varying long-term agricultural growth performances. The system of large-landholding and sharecropping (with forms of share rent executed often on most adverse terms for the tenants) was predominant in the North-West (Rangpur, Dinajpur) and in the South (Barisal)—both falling into the lagging western region by definition. These areas were late entrants into the green revolution of HYV rice compared to the areas of the small landholder agriculture dominated by peasant ownership in parts of West (Comilla, Noakhail, Dhaka).

However, an important feature of the agrarian dynamics of the last decade has been the gradual takeover by the green revolution of the most parts of the western region. The development of productive force in agriculture in the country as a whole also changed the nature of the land-tenure, resulting in the significant rise of the pure tenants, dramatic increase in the share of leased-in land, and the noticeable decline of share rent with ascendancy of cash fixed rental as a form of rent (Hossain *et al.* 2012). The large part of the western region (with the exception of, perhaps, the southern territory of it) also experienced similar "progressive" changes from the poor's point of view. All these changes must have had incentive-enhancing effects for the growth in the land productivity in the West, thus helping the reduction of welfare gap in the East-West divide.

Another important feature of development in the West has been the relatively higher concentration of MFIs compared to the East (World Bank 2008). The economic backwardness did not prevent the adoption of innovative and modern economic institution such as MFI. This had beneficial effects on several fronts. The social norm changing role of MFI has been conducive to the adoption of improved human development practices such as favourable attitude to girls schooling, better sanitation and health practices and population control. As would be discussed in Chapter 2, the West has actually out-performed the East both in terms of lowering the TFR, girls schooling, and the child mortality rate. All these changes took place in the backdrop of relatively backward economic infrastructure in the West, suggesting that the disadvantages of

[7]For similar argument, see also Engerman and Sokoloff (2000).

physical infrastructure can be compensated up to a considerable point by the placement of progressive social institution.

1.3.3 Role of Policies

This strand of literature highlights the importance of economic and social policies to overcome the aforementioned disadvantages of adverse geography and non-inclusive institutions associated with the lagging region. In the Bangladesh case, we have argued that the presence of such adverse institutions is only partly applicable with respect to the western region; in fact, the situation in these dimensions was moderated further in the process of economic growth. The policies emphasized in this line of inquiry focus on two central elements: (a) the creation of human capital in the lagging region through broad-based human development polices, and (b) the development of basic infrastructure such as connectivity through easily roads and bridges. Both these elements figure prominently in the policy package that was offered to the western region. However, the West is still lacking in gas, power and port facility. The quality of education also varies considerably between the regions, as notable in the differences in English language proficiency and computer literacy.

1.4 Analytical Framework for the Study

Discussion of the available theoretical approaches to understanding of the regional divide motivates the selection of factors in the empirical exercise undertaken in the subsequent chapters. We focus on three main avenues, namely, urbanisation, human capital and migration (domestic and international), that may have relevance in understanding the earlier persistence and subsequent decline of the East-West divide in welfare gap.

The literature on persistent (or rising) regional inequality in welfare between the leading and the lagging regions is premised on the ground that the leading region may be characterised by higher returns to assets (human capital) and greater agglomeration economies from higher economic density (urbanisation). The leading region may also be exposed to greater economic opportunities such as access to international migration (foreign remittance). This could explain why the regional inequality was persistent in Bangladesh till 2005. However, the same analytical apparatus can be used to explain regional convergence in the second half of the 2000s. For instance, access and quality of education can go up at a faster pace in the lagging region due to deliberate public policy focus. The urbanisation can proceed at a faster pace in the lagging region due to congestion diseconomies in the leading region. Access to international migration can also pick up in the lagging region, as information about the overseas job market becomes more available in the lagging region.

Accordingly, we consider three possible sources of regional divergence in welfare, and examine how their relative importance has changed across the three survey rounds. First, the advantage of the leading region lies in higher economic density of activities. The level of urbanisation was historically much higher in the East, with Dhaka and Chittagong as the leader of urban growth. Since the mid 1980s, the two other districts (Gajipur and Narayangonj) also started urbanising rapidly, partly to avoid congestion in

the already highly dense Dhaka city. While this has not happened on a similar scale and magnitude elsewhere outside the East, the extent of urbanisation showed encouraging signs in the West as well. Thus, the share of urban population was only 28 per cent in 2000 in the West, but rose to 35 per cent in 2010. The matched figures for 2000 and 2010 were 35 per cent and 37 per cent, respectively. This means that increase in the share of urban population in the western region was actually higher during the decade of the 2000s. Overall, we expect a high correlation between the extent of urbanisation and welfare gains.

Second, notwithstanding the spread of basic human development across regions in Bangladesh, it is possible that the quality of human capital (schooling quality) is higher in the East, resulting in more remunerative occupational choice for people educated there. As a result, migrants from other western regions with lower quality of human capital may not be employed readily in the relatively high paying jobs in the East. One counteracting tendency, however, is that the nature of the present growth process is highly labour-intensive, and as such does not require a large injection of human capital. The labour market story of Bangladesh's progress over the past two decades is largely about the ascent of the relatively unskilled (or low-skilled) labour through export-led growth of readymade garments, construction and rural non-farm sector activities (see, Hossain *et al.* 2012).

It may be noted that the problem for the western region is not so much in the access to education, but in respect of improved quality of education. The highest schooling years, as estimated from the HIES data, shows little variation across the East-West divide. Indeed, if anything, the matched figure is slightly higher for the western region in 2000 and 2010. The same applies to the case of female schooling where the western region is actually slightly ahead of the eastern region.

Third, even with similar quality of human capital migrants from the West may be reluctant to migrate out to the East because of other disincentives. These disincentives originate from diverse sources. Lack of physical proximity—adequate connectivity—to the centre of higher economic growth is a well-known example. While this has been historically the case, the connectivity context has changed for better in the western region, especially in the decade of 2000s. The construction of Jamuna Bridge has played an important role in reducing transports costs between the eastern and western regions (Hossain *et al.* 2012). The other source of disincentives relates to greater exposure to environmental (including climate) risks in the western region. Greater exposure to risks may reduce incentive to invest in human capital and generally discourage long-term investment. Thus, the level of coastal poverty is higher than the average poverty with much of the coastal areas falling into the western region (Yunus and Sen 2012). The latter is also more susceptible to river erosion, salinity, drought and flood related problems (Shahabuddin 2010). However, there has been some tangible progress in increasing risks mitigation and vulnerability reduction in the western region. The major breakthrough in this regard came in the area of agricultural production. With the introduction of salinity-resistant varieties and crops of short-duration maturity in flood-prone areas, and faster agricultural diversification in the Northwestern parts of the country encouraged by the

construction of Jamuna Bridge—the preexisting risks and uncertainties in agricultural production and income have been reduced considerably.

The upshot of the above is to point out two possibilities relevant to the present study. First, all the abovementioned sources may have led to relatively low returns to assets in the lagging region and hence, contributed to the persistent regional gap in average consumption expenditure observed during the period till 2005. Second, dynamics of regional development in the second half of the 2000s may have been different. The force of the factors of persistence may actually have reduced in the recent years for the reasons cited above. As a result, the regional gap in welfare has become diminished. The challenge is to test these propositions with empirical data.

1.5 Structure of the Report

The report is divided into 5 chapters. After the introductory chapter that highlights the main theoretical approaches to understanding the regional divide, the second chapter discusses the variation of human development indicators across the two broadly classified leading and lagging regions.[8] A favourable human development situation in the West, pre-existing before the onset of decline in the inter-regional welfare gap during the second half of the 2000s, forms the initial condition of subsequent regional convergence in welfare.

The third chapter provides the main results of the report by deploying a quantile regression technique to isolate the factors that are deemed to be the most contributory to the decline in the East-West divide. The key welfare measure that has been considered in this exercise is the real per capita consumption expenditure. The chapter highlights the role of urbanisation, human capital and migration as the main avenues through which the West started catching up with the East during the 2000s. The results for all the three survey rounds of HIES that have been conducted in the decade of 2000s are presented to capture the contrasting dynamics in the East-West divide and also to check the robustness of some of the conclusions. This chapter also presents the Blinder-Oaxaca decomposition of the observed aggregate regional gap in welfare into "endowment" and "return" effects. The Machado-Mata decomposition does the same but at the quantile levels, thus sheds light on the proximate causes for the inter-quantile differences between the two regions.

The fourth chapter identifies spatial externalities as an additional source of declining welfare gaps between the two regions. Deploying spatial econometrics it tests the presence of "neighbourhood effects" in the spatial data on welfare (poverty and literacy) defined at the upazila level. Presence of neighbourhood effects, as detected by this exercise, suggests the possible additional pathway of faster diffusion of new ideas and new technologies that can bridge the East-West divide further.

The fifth chapter provides summary messages emerging from the report and presents key policy implications.

[8]Broad classification, however, is not always accurate as there are pockets of lagging areas within the leading region and vice versa. But, the persistence of these pockets needs to be dealt with as a separate issue and does not appear to be relevant to the main issue of explaining the aggregate differences between the two main regions.

CHAPTER 2

IS THERE AN EAST-WEST DIVIDE IN HUMAN DEVELOPMENT?

The presence of East-West divide is evident in a number of economic indicators of well-being. This includes improved economic opportunities, better infrastructure, and greater extent of urbanisation, leading to faster economic growth, higher incomes and lower poverty in the East compared to the West. This, however, does not mean that the western region has altogether lagged behind in other dimensions of well-being. As the present chapter will show, the West actually had advantage over the East in a number of aspects of human development, and hence had built-in favourable social initial conditions for attaining improved long-term growth performance. This is an important regional attribute of the West that needs to be kept in view in analysing the recent decline in East-West divide in economic indicators (as attempted in the subsequent chapters). This is important because Bangladesh is somewhat unique in this respect when compared with the South Asian and/or global instances of regional divides. In most other examples, the lagging regions were historically underdeveloped in both economic and non-economic aspects of well-being and progress. The northern regions of India lagged behind the leading southern regions in respect of human development as well as economic development. Northern and Central Punjab of Pakistan dominated over the rest in both economic and social indicators. The western region of Brazil trailed behind the eastern region both economically and socially. The same applies to the western region of China in comparison to its eastern and southern parts.

While the western region of Bangladesh lacked the level of industrialism found in the eastern region, it had one secret advantage where it was leading all along. This relates to early decline in fertility, faster progress in reducing mortality rates and achieving gender parity in social indicators and overall edge in literacy, schooling and women's empowerment. The country as a whole achieved higher level of human development and social progress at a relatively lower level of economic development in global comparisons. We argue that the path of achieving this feat was first tried out at the regional level. The West took the first step even though it was poorer in comparison with the rest of the country and eventually demonstrated the potentials of such development pursuits to the rest of the society. Not that the West was always the pace setter in human and social developments historically. The achievements of the West in these development areas are of recent origin. They were partly influenced by policies (social marketing of contraceptives and low-cost immunisation had a better success in the West) and partly by institutions (higher concentration of MFIs/ NGOs in the West is a case in point).[1] This development story thus forms the starting point of our investigation, as it has important implications in understanding the subsequent regional convergence in growth and poverty observed in the second half of the 2000s. We present this story through the prism of several key indicators of human and social developments and check the robustness of the

[1]On these aspects of attaining faster human development at a lower level of income in the West, see BIDS (2001), Dev *et al*. (2002), Mujeri and Sen (2005), Mahmud (2008), Sen and Ali (2009).

overall cross-regional trends by taking recourse to several survey rounds, including DHS and MICS.

2.1 Variation in Human Poverty Index

Consistent with the theme of East-West divide in the country, the focus of the chapter is on the variation in human development situation between the two regions in the country (the "East" comprising Dhaka, Chittagong and Sylhet divisions, and the "West" comprising the rest) and its changes over time. Among the indictors of interest in this respect, the UNDP-proposed human poverty index (HPI) has been taken into consideration in the first place, which has been supplemented by the presentation of some key social indicators, such as total fertility rate (TFR), infant mortality rate (IMR), under-five mortality rate (U5MR), child malnutrition (underweight), rates of immunisation (full), deliveries in the institutions, literacy rate (7+), net attendance rates at both primary and secondary, and access to sanitary toilet and electricity. Human poverty focuses on three aspects of human deprivations: deprivation in longevity, deprivation in knowledge and deprivation in economic provisioning. These dimensions are given equal weights in the construction of HPI. HPI focuses of the deprived segments of the population. This is consistent with the standard practice of confining poverty measures exclusively to the deprived segments. The values of human poverty index for eastern and western regions as well as the country as a whole and its changes over 2004-2011 are presented in Table 2.1. The results show that the country has achieved notable progress in reducing human poverty over this period. The incidence of human poverty has declined from 39.83 in 2004 to 28.11 in 2011, a reduction of 11.72 points over a period of seven years or so according to the latest available data.

Significant trends have, however, been observed in terms of the value of HPI between the eastern and the western regions. While the value of HPI for the eastern region was 41.05 in 2004, the matched figure for the western region was 39.03. This indicates that in 2004, human poverty situation was worse in the eastern region compared to that of the western region. However, as observed from Table 2.1, both the regions have achieved substantial progress in reducing human poverty during 2004-2011. In the eastern region, the value of HPI has declined from 41.05 in 2004 to 28.45 in 2011, and in the western region, the value of HPI has dropped from 39.03 in 2004 to 28.05 in 2011. Clearly, the pace of progress in reduction of human poverty has not been the same between the two regions—the eastern region has been able to make faster progress than that of the western region (12.6 points reduction of HPI in the East against 10.98 in the West). As a result, the values of HPI for both the regions are now (according to 2001 estimate) quite close to each other (28.45 for the East and 28.05 for the West). Three points are noteworthy from the above results: (i) There were differences in human development situation between the eastern and the western regions in the past, and the eastern region was lagging behind the western in this respect; (ii) Both the regions have made notable progress in improving human development situation over the past decade or so, but the lagging region has made faster progress that that of the other region; and (iii) The sign of convergence has now been observed between the two regions in respect of human poverty situation in the country.

Exclusive focus on the aggregate index alone is, however, inadequate for at least two reasons. *First*, an aggregate index may not be a reliable guide to judge the change in the individual constituents of the index. For instance, there may be considerable improvements in the aggregate human poverty index while registering little progress in the educational indicators which is but only one of the variables that enter HPI. *Second*, some dimensions of the well-being may not be reflected in the aggregate index because of their non-inclusion in the index itself (either because they are perceived as less important than the competing others, or simply because there is not adequate quantitative data on that particular indicator). Thus, some of the important social indicators of human poverty such as TFR, U5MR and net attendance at secondary are not directly included in the HPI, though they clearly deserve separate attention.

Analysis of the aggregate measures, therefore, needs to supplement an approach that takes a more disaggregated look at the individual human poverty and social indicators. These are discussed below in some details.

2.2 Variation in Human Poverty and Social Indicators

Tables 2.2 and 2.3 present the disaggregated profile of human poverty and other social indicators by regions (East and West). Table 2.2 presents only a few indicators (female literacy, literacy both sex, under-five mortality and child malnutrition), but over a long period of time (1993/94 through 2011), while Table 2.3 presents almost an exhaustive set of indicators (TFR, IMR, U5MR, child malnutrition, rates of immunisation, deliveries in the institutions, literacy and schooling indicators, and access to sanitary toilet and electricity) over the period of 2004 through 2011.

Evidence presented in Table 2.2 confirms considerable differentiation between the eastern and the western regions whereby East is lagging behind the West in respect of literacy (female as well as overall) and under-five mortality during 1993/94 through 2004. Subsequent to this, “signs of convergence” have been noted. However, with regard to child malnutrition, significant differences are observed between the two regions throughout the period, and the eastern region is still lagging behind the western in this respect. Pace of progress between the two regions in respect of the selected indicators is also presented in Table 2.2 (through presenting average annual changes over 1993/94 through 2000 and 2004 through 2011). The results show that, for the period from 2004 onward, the eastern region has made faster progress than the western region, and hence, the initial differences in literacy and under-five mortality between the two regions have narrowed down considerably during 2004 through 2011.

In Table 2.3, human development situation between the East and the West is presented with a larger set of indicators. It also presents the pace of progress in respect of these indicators between 2004 and 2011 for both the regions. Several points emerge from the results presented in Table 2.3: (i) There were significant differences between the East and the West in respect of most of the indicators in 2004 with East lagging behind the West in almost all of the indicators except access to electricity (where East region is well

ahead of West); (ii) Both the regions have made notable progress during 2004-2011 in respect of most of the indicators (in varying degrees though) except literacy and schooling indicators (in fact, the progress for net attendance at primary has been rather negative, and literacy and net attendance at secondary have remained more or less at the same level); (iii) Pace of progress has been faster in the eastern region in seven (TFR, IMR, U5MR, immunisation, literacy, and access to sanitary toilet and electricity) out of eleven indicators compared to that of the West (among the rest four, pace of progress for the deliveries in the institutions has been rather faster in the West than the East, and progress in child malnutrition and school attendance at both primary and secondary remained at the same level); and (iv) As the lagging region has made faster progress in respect of seven out of eleven human development indicators, we observe signs of convergence between the two regions in respect of those indicators, and for the rest (especially in respect of child malnutrition and deliveries in the institutions) the East is still lagging behind the West except with respect to access to electricity.

2.3 Conclusions

Several key observations follow from the above exercise.

First, there were differences in human development situation between the eastern and the western regions of the country in the past decades, hence the presence of East-West divide in the country.

Second, comparatively, the eastern regions were lagging behind the western regions in respect of most of the human development indicators—clearly one was lagging behind the other.

Third, both the regions have made notable progress in improving human development situation over the past decades.

Fourth, the pace of social progress has not been the same—the lagging region has made faster progress in respect of majority of the indicators.

Fifth, consequently, signs of convergence are observed between the two regions in respect of majority of the human development indicators.

Sixth, the eastern region is still significantly lagging behind the western region in respect of child malnutrition and deliveries in the institutions.

Finally, situation in respect of literacy and schooling indicators needs further careful scrutiny as the progress on these is rather negligible or negative in both the regions.

Table 2.1

Human Poverty Index in Eastern and Western Regions

Regions	Human Poverty Index (HPI)		
	2004	2011	Changes over 2004-2011
Eastern Region	41.05	28.45	-12.6
Western Region	39.03	28.05	-10.98
Total	39.83	28.11	-11.72

Sources: Author's calculation based on (i) Bangladesh Demographic and Health Survey, various years; (ii) Multiple Indicator Cluster Survey, various years; and (iii) Population Census 2001 and 2011.

Table 2.2

Changes in Human Development Situation in Eastern and Western Regions over 1993/94-2011

Indicators	1993/94	2000	2004	2011	Average annual changes over 1993/94-2000	Average annual changes over 2004-2011
Literacy (Female)						
Eastern Region	49.9	61.6	63.4	70.6	3.9	1.6
Western Region	54.5	62.9	70.1	70.8	2.6	0.2
Literacy (Both Sex)						
Eastern Region	57.4	66.7	68.0	72.9	2.7	1.0
Western Region	60.3	67.5	73.3	73.2	2.0	0.0
Under-Five Mortality						
Eastern Region	161.5	118.5	111.4	54.6	-4.4	-7.3
Western Region	130.3	96.1	86.1	51.0	-4.4	-5.8
Child Malnutrition (U)						
Eastern Region	-	48.0	49.1	37.8	0.6	-3.3
Western Region	-	47.0	45.1	33.7	-1.0	-3.6

Source: Author's calculation based on Bangladesh Demographic and Health Survey, various years.

Note: For child malnutrition, changes over 1993/94-2000 are actually changes over 2000-2004.

Table 2.3

Human Development Profile in Eastern and Western Regions

Indicators	Eastern Region			Western Region			Total		
	2004	2011	Improve-ments over 2004-11	2004	2011	Improve-ments over 2004-11	2004	2011	Improve-ments over 2004-11
Total fertility rate	3.6	2.7	-0.9	2.7	2.1	-0.6	3.1	2.4	-0.7
Infant mortality rate	80.0	46.0	-34.0	66.8	43.0	-23.8	71.9	44.1	-27.8
Under-five mortality rate	111.4	54.6	-56.8	86.1	51.0	-35.1	94.8	54.4	-40.4
Child malnutrition (underweight)	49.1	37.8	-11.3	45.1	33.7	-11.4	47.2	36.6	-10.6
Rates of immunization (full)	68.5	82.3	13.8	77.0	89.7	12.7	73.3	86.5	13.1
Deliveries in the institutions	8.3	25.2	16.9	9.0	31.4	22.4	8.8	28.8	20.0
Literacy rate (7+)	68.0	72.9	4.9	73.3	73.2	-0.1	69.8	73.0	3.2
Net attendance at primary	81.6	74.3	-7.3	83.6	78.3	-5.4	82.6	76.3	-6.2
Net attendance at secondary	35.0	35.5	0.6	42.4	41.2	-1.1	39.2	38.7	-0.5
Access to sanitary toilet	42.3	63.4	21.1	48.1	59.5	11.4	45.4	61.5	16.1
Access to electricity	28.6	60.2	31.6	21.2	44.5	23.3	25.3	51.9	26.6

Sources: Author's calculation based on (i) Bangladesh Demographic and Health Survey, various years; (ii) Multiple Indicator Cluster Survey, various years; and (iii) Population Census 2001 and 2011.

Notes: (i) Enrolment figures for 2004 and 2011 represent figures for 2006 and 2009 respectively; and (ii) Access to sanitary toilet and access to electricity figures for 2004 represent figures for 2000 and 2001 respectively.

CHAPTER 3

WHAT EXPLAINS THE GRADUAL DECLINE OF THE EAST-WEST DIVIDE?

3.1 Introduction

The objective of this chapter is to analyse the factor contributing to declining East-West divide in the Bangladesh economy. Understanding the welfare gap between the lagging and leading regions is important for several reasons. First, detecting the presence of forces of convergence would further confirm the favourable poverty outcome of accelerated economic growth. Second, if the forces of convergence are associated with greater internal factor mobility, this would gradually eliminate interregional expenditure per capita differentials, and help overcome geographic dualism or, worse still, tendencies towards spatial polarisation.[1] Finally, persistent regional welfare gap has political implications in the context of democracy, as both the East and West are well-represented politically in the national parliament. If such persistence is perceived as unfair consequence of economic development policy, it may be democratically unsustainable, especially given the narrow margin in the vote share among the two major contending parties. A more informed policy would be needed to address the regional gaps in development.

3.1.1 Data and Methodology

The paper contributes to the economic literature on the development process of Bangladesh, as studies examining regional disparity are relatively scarce. In this back drop, we attempt to look for explanations and causes underlying the significant moderation of the East-West divide. We examine the relevance of the potential factors of labour immobility─education, connectivity, urbanisation and migration─in explaining dynamics of regional welfare gap in Bangladesh. This is done by *deploying a quantile regression decomposition of the regional welfare gap* in Bangladesh.[2]

We focus on the difference in the distributions of welfare between the eastern and western regions of Bangladesh. Following the approach adopted in Nguyen *et al.* (2007), we use average monthly real per capita expenditure (RPCE), computed on the basis of total household food and non-food consumption over the past 12 months as measure of welfare. We adopt Machado-Mata decomposition method that uses quantile regression framework to decompose the gap between the distributions of log RPCE of two regions. This allows covariates to have marginal effects that vary with household's position in the welfare distribution. To examine and decompose the regional welfare gap at the mean, in addition to Machado-Mata method, we also employ the Oaxaca-Blinder decomposition

[1]For a survey of literature and an application of similar approach in the case of Sri Lanka, see Sen (2010).

[2]The terms spatial inequality, spatial gap, regional gap, regional disparity and West divide are often used interchangeably in this study. All these terms refer to the difference in the welfare gap—as measured by the per capita real consumption expenditure──between the western and the eastern regions of Bangladesh.

method. We decompose the welfare gap into two parts: first part is "endowment effects" that is explained by the difference in the observed household characteristics between the two regions; and second part is "return effects" that is explained by the difference of returns to the observed household characteristics between the two regions. The analysis is done for a period covering the decade of the 2000s. To this end we shall use primary HIES data for 2000 (HIES 2000), 2005 (HIES 2005) and 2010 (HIES 2010).

The rest of the chapter is organised as follows. Section 3.2 detects the presence of regional welfare gap across quintiles. Section 3.3 describes the analytical framework we employ to decompose the regional welfare gap. Section 3.4 explains the data and summary statistics of the variables. Section 3.5 discusses the sources of regional welfare gap based on the OLS and quantile regression results, and section 3.6 presents and discusses the decomposition results.

3.2 The Regional Welfare Gap across Quintiles

The regional welfare gap can easily be discerned in the plot of difference in log of real per capita consumption expenditure (RPCE) against the distribution of households based on log RPCE (Figure 3.1). The figure shows the actual household expenditure gap between the East and the West by percentile ranking for the three survey periods. Three points are noteworthy. First, for the year 2000, the line representing welfare gap between the East and West was increasing monotonically, implying a larger welfare gap at the top percentiles. The eastern households (irrespective of their poverty status) were not only better off than their western counterparts, but the comparative regional edge was also higher for the eastern rich compared to the eastern poor. Second, the regional gap in household welfare has widened considerably among households up to the 80^{th} percentiles over the period between 2000 and 2005. Third, the welfare gap between the regions has narrowed down significantly over the period between 2005 and 2010 for almost all the percentiles of the distribution, and the quantile differences in the magnitude of these regional gaps also diminished.

The above conclusion is also supported by kernel density estimation. Figure 3.2 presents the kernel density estimates for log of RPCE of households for both regions based on HIES 2000, HIES 2005 and HIES 2010. The kernel densities for the East are clearly to the right of the densities for the West, implying regional welfare gap between the regions throughout the distributions of log RPCE. However, this welfare gap in the kernel densities, based on HIES the 2010, is narrowed down significantly and implies some sort of spatial convergence in living standards. We also carry out the Kolmogorov–Smirnov (K-S) tests to examine the equality of distribution functions of welfare between the regions, for each survey round, and from the test, it is apparent that the log of per capita real monthly expenditure does not have the same distribution function across regions (Table 3.1).

Figure 3.1: **Difference in Log of Real Monthly Per-capita Expenditure against Percentile Ranks**

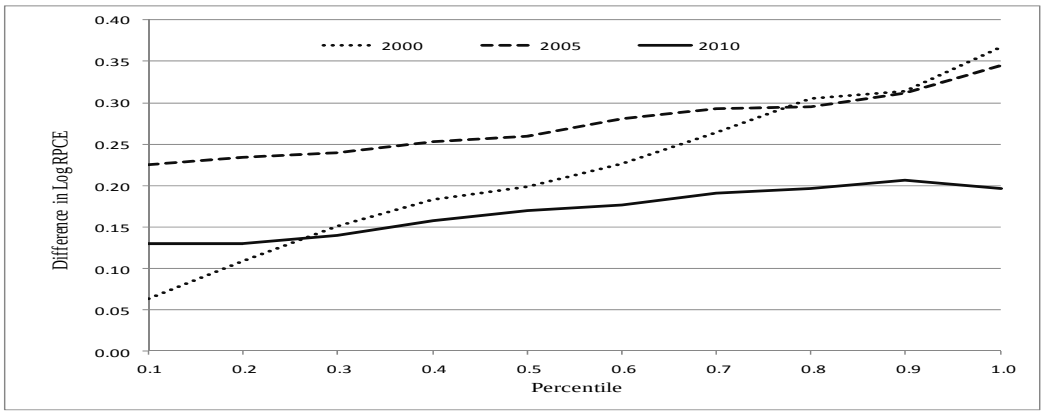


Figure 3.2: Kernel Density Distribution of Log of Real Per-capita Consumption Expenditure (RPCE)

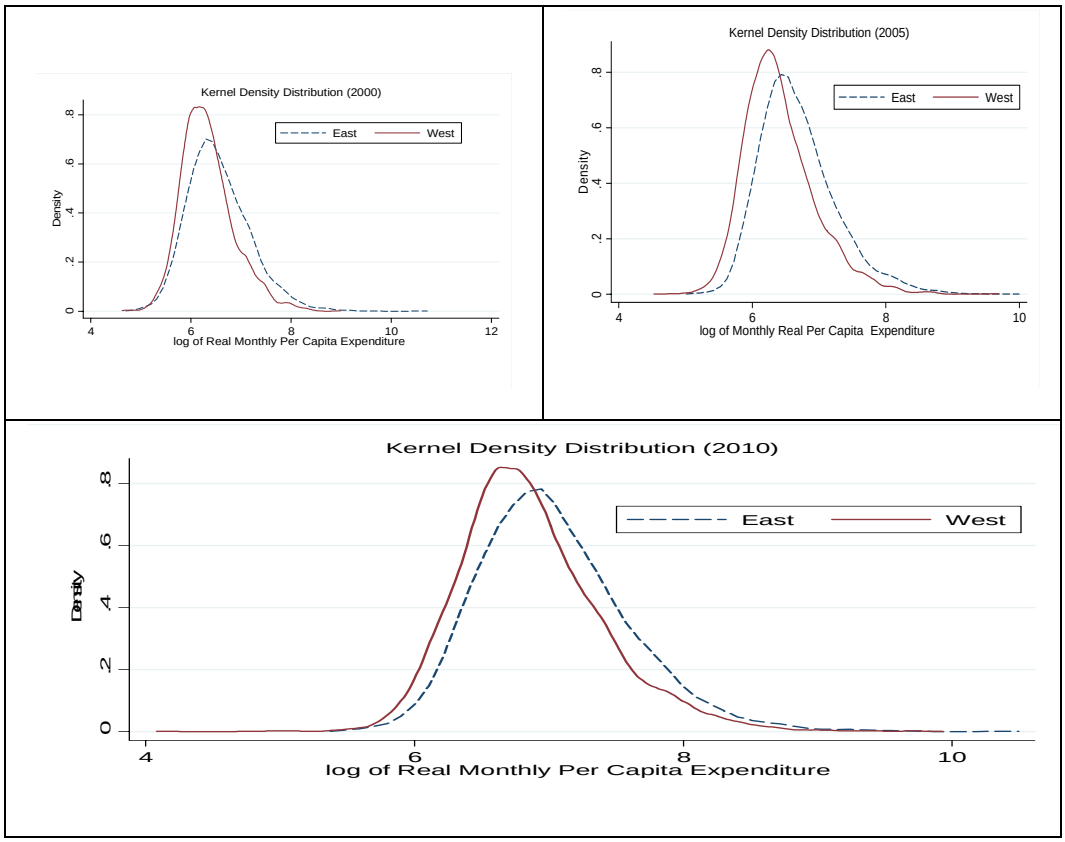


Table 3.1

Kolmogorov-Smirnov Test for Equality of Distribution Functions between East and West

Year	D (Combined K-S)	P-Value
2000	0.1678	0.000
2005	0.2294	0.000
2010	0.1459	0.000

The narrowing of the welfare gaps in real per capita expenditure between the East and the West suggests reduced spatial consumption inequality (the so-called "between-region component" of inequality). This should have moderating effects on the overall trends of consumption inequality during this period. In remaining parts of the chapter, we shall try to explain this trend reversal in the dynamics of regional welfare gap.

3.3 Analytical Framework

We employ both the Blinder-Oaxaca (Blinder 1973, Oaxaca 1973) and the Machado-Mata (2005) techniques to decompose the East-West welfare gap across the entire distribution. The Machado-Mata (2005) technique was first introduced in this sort of economic analysis by Nguyen *et al.* (2007). They used this technique to examine the rural-urban welfare gap for Vietnam. In Machado-Mata technique, first quantile regressions of log RPCE on its covariates for both East and West households are estimated; and then it constructs counterfactual distributions of log RPCE for both East and West households using western covariates for East and eastern covariates for West. This counterfactual distribution estimates the distribution of log RPCE of the East that would have prevailed if the eastern households were endowed with the western distribution of household characteristics but received the returns that pertained to the western area. By comparing the counterfactual and empirical distributions, we estimate the contribution of the differences in distributions of covariates to the East-West welfare gap. The remainder of the gap is attributed to the combined differences in the returns to the covariates.

We estimate the following form of equation to apply the Blinder-Oaxaca and the Machado-Mata decompositions to isolate the endowment and return effects on the regional welfare gap.

$$Y_{iR} = \alpha_R + \beta_R X_{iR} + \varepsilon_{iR} \quad (1)$$

where R is the region subscript (R=East or West) and Y_i is the natural log of monthly real per-capita household expenditure for region R. X_i is a covariate matrix that include households' demographic, human development, geographic and economic variables. ε_i is a vector of random error. The Blinder-Oaxaca decomposition could be expressed as the mean difference of log of RPCE between East and West as following:

$$\left(\overline{Y}_{East} - \overline{Y}_{West}\right) = \left(\overline{X}_{East} - \overline{X}_{West}\right)\widehat{\beta}_{East} + \overline{X}'_{West}\left(\widehat{\beta}_{East} - \widehat{\beta}_{West}\right) \quad (2)$$

where $\overline{Y}$ *and* $\overline{X}$ denote mean values, $\widehat{\beta}$ denotes coefficient estimates and $(.)'$ denotes transpose of the matrix or vector. This expression decompose the mean difference in log of RPCE between East and West into two parts: first part represents the difference due to endowment/characteristics effects and the second part represents the return effects.

As Blinder-Oaxaca decompositions are estimated based on ordinary least square (OLS) regression framework, which provides a general picture of the regional disparity in welfare gap. So we also use the Machado-Mata (2005) technique which works under conditional quantile regressions framework, which allows for a more detailed analysis of distributional aspects of welfare gap between the regions. We decompose East-West welfare gap of Bangladesh following the framework suggested by Machado-Mata by estimating series of quantile regressions of the following form:

$$Q_\theta\left(\frac{Y}{X}, ewd, u\right) = a_\theta + X\beta_\theta + ewd\ y_\theta + u\ \delta_\theta + ewd * u\ \mu_\theta + \varepsilon \tag{3}$$

where Y is log of RPCE, $Q_\theta\left(\frac{Y}{X}, ewd, u\right)$ is the θ^{th} conditional quantile of Y, and X is covariate matrix that include household's demographic, human development and economic characteristics. ewd is the East-West dummy (ewd=1 if households from the East) and u is the urban dummy (urban=1), and ε represents the error term.

3.4 Summary Statistics of the Regression Variables

To examine the regional inequality in living standards, we use individual and household level data from three Household Income and Expenditure Surveys of 2000, 2005 and 2010.[3] Table 3.A10 in Appendix gives summary statistic for the variables that we use in decomposition analysis for eastern and western households. Our dependent variable is log real per capita monthly expenditure (log RPCE) over the 12 months preceding the survey interview, measured in 1995/96 Bangladeshi Taka. Household size, dependency ratio, age and age squared of household head, gender and religion of household heads enter as demographic characteristics of household in our analysis. Following Nguyen *et al.* (2007), we choose highest years of schooling achieved either household head or spouse as household's human capital measure. We chose this measure as member with higher education has more influence in household decision making and it is not rare in Bangladesh that spouse with higher education is not household head but influence household decision making significantly.

[3]Each survey was conducted in a complete year to capture the seasonal variations in a cycle of one year in income, expenditure and consumption pattern. A two stage stratified random sampling technique was followed in drawing samples of the surveys. HIES 2000 includes 7,440 households, of which 4,139 households, from eastern region and 3,301 households from western region. HIES 2005 contains 1,080 households, 5,160 from the East and 4,920 from the west. HIES 2010 includes 12,240 households, of which 6,600 households from the East and 5,640 households from the West. Each survey provides valuable data on household income, expenditure, consumption, credit and savings, housing condition, education, employment, health and sanitation, water supply and electricity, etc.

To control accessibility to the centres of economic density, we use urban dummy as urban areas are the major growth centres. Because remittances are important to a large number of Bangladeshi households, we use two dummy variables to indicate whether a household received remittances in the past year from domestic sources or from foreign sources. We were intended to include measure for occupation of household heads, however, inclusion of such measure reduced sample size significantly which oblige us not to include occupation of the household head. Finally, dummy variables indicate whether a household is located in the East or West (ewd = 1 for East) or in an urban or rural area (u = 1 for urban). We do not examine more detailed urban-rural differences because our main interest is in analysing the regional gap, controlling for urban-rural differences; these dichotomies seem to capture the most important variations.

Several variables exhibit interesting patterns. The average per-capita monthly expenditure increases monotonically across the quantiles in all three survey years and are higher for each quantile of East than corresponding quantile of the West. One interesting pattern of schooling appeared in the East-West divide study. Average years of schooling is higher for the lowest 2 quantiles in the West, while is higher for top three quantiles in the East. Wider availability of work opportunity for the children in the eastern region and fee primary education may explain partially this disparity. However, as educational expenses rises significantly after primary education, we find higher average schooling years in the East for the top three quantiles.

Gender of the household head shows positive association with the quantiles of households; the frequency of female-headed households is higher among eastern households than among western ones. Female-headed households have been increased from 11 per cent to 17 per cent in eastern region over the period between 2000 and 2010; and from 7 per cent to 12 per cent over the same period in western region. These surveys revealed one interesting demographic fact. In general, it is believed high population growth and household size is associated with low income group. However, both average household size and dependency ratio are higher in the East compared to the West (Table 3.A10).

Growth of domestic remittance recipient households is also higher in the West (lagging region) compared to the East (leading region). Only one percentage point increase has been observed in eastern region, while 8 percentage points have been observed in the East. This increased labour mobility may play crucial role in reducing regional disparity between the East and the West in recent years. As major two cities are located in the East, proportion of urban household in the East is higher than that of the West. Average level of operating land is higher in the West, as estate is the dominant sector in the West and population density in the East is higher compared to the West.

3.5 Sources of Welfare Gap between the East and West

To examine the welfare gap between the East and the West, we first estimate a restricted version of equation (3) that includes the intercept term, East-West dummy,

(East=1, West=0), urban dummy (urban=1, rural=0) and an interaction dummy for eastern urban households. The urban dummy and the interaction dummy control for the variations in real per-capita consumption expenditure. We estimate this restricted model both at the mean and at the various quantiles and results are reported in Table 3.2. Estimates at the mean depict the general picture of regional welfare gap, while estimates from the quantile regressions reveal distributional aspects of welfare gap across the quantiles between the regions. The coefficient labeled as "base" stands for the log of RPCE for a rural household from the West. It is attributable from the base coefficients that there are considerable variations in log RPCE even among the households living in rural areas of the West. However, their real expenditure has increased around 55 per cent over the time of 2000 and 2010. As a result, at the mean, the East-West welfare gap, which is captured by the coefficient of East dummy, widened from 13 per cent in 2000 to 23 per cent in 2005, but narrowed to 8 per cent in 2010. The welfare gap between urban and rural households (captured by the urban dummy) was 37 per cent in 2000, which got reduced to 25 per cent in 2005 and remained at that level till 2010. However, the interaction of East dummy and urban dummy remained unchanged between the two end periods. This suggests that urbanisation continued to have higher effects when it takes place in the eastern region.

The coefficients in the quantile regressions represent the difference in log RPCE between the θ^{th} percentile of households from the East and the corresponding θ^{th} percentile of households from the West. East dummy is the variable of our interest and it depicts that the welfare gap was increasing as one moved up along the distributional ladder in 2000. While there was no significant regional difference in log RPCE among the households of 5th percentile, there was 23 per cent difference among the households of 95th percentile. Welfare gaps were accelerated across all quantiles over the period of 2000 and 2005 and this acceleration was sharper for the households belonging to the lower quantiles. However, welfare gaps declined considerably in the second half of the last decade and the reduction of welfare gap was more prominent for the households belong to the higher stratum.

The urban dummy and the interaction dummy appear significantly at the mean and at the quantiles. Like in the case of East dummy, rural-urban welfare gap was much more prominent in 2000, but declined considerably in the first half of the last decade both at the mean and at the quantiles of households. However, rural-urban gap remained stagnant at a high rate of 25 per cent throughout the second half of the last decade for all level of households. The coefficients of interaction dummy actually increased in the second half. We will discuss the role of urbanisation as source of welfare gap between the East and the West in details in the following sub-section.

Table 3.2

Estimates of the East-West Welfare Gap at the Mean and at the Various Quantiles

Dependent Variable: Log of RPCE	OLS	Quantiles				
		5th	25th	50th	75th	95th
			HIES 2000			
base	6.23***	5.57***	5.92***	6.19***	6.50***	7.05***
(std. err.)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
east	0.13***	0.01	0.09***	0.13***	0.17***	0.23***
(std. err.)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.04)
urban	0.37***	0.16***	0.24***	0.32***	0.52***	0.64***
(std. err.)	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.06)
urban*east	0.17***	0.21***	0.21***	0.23***	0.08**	0.06
(std. err.)	(0.03)	(0.05)	(0.03)	(0.05)	(0.04)	(0.08)
			HIES 2005			
base	6.32***	5.66***	5.99***	6.27***	6.58***	7.18***
(std. err.)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.03)
east	0.23***	0.21***	0.22***	0.22***	0.24***	0.27***
(std. err.)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.04)
urban	0.25***	0.11***	0.17***	0.20***	0.33***	0.49***
(std. err.)	(0.02)	(0.03)	(0.02)	(0.03)	(0.04)	(0.4)
urban*east	0.10***	0.04	0.08**	0.15***	0.13***	0.12*
(std. err.)	(0.02)	(0.04)	(0.02)	(0.03)	(0.04)	(0.06)
			HIES 2010			
base	6.78***	6.07***	6.46***	6.74***	7.06***	7.64***
(std. err.)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
east	0.08***	0.09***	0.06***	0.08***	0.07***	0.06**
(std. err.)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.03)
urban	0.25***	0.1***	0.16***	0.21***	0.32***	0.45***
(std. err.)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)
urban*east	0.17***	0.13***	0.21***	0.19***	0.17***	0.11**
(std. err.)	(0.02)	0.04	(0.02)	(0.02)	(0.03)	(0.05)

Note: Household real per capita expenditure at constant 1995/96 prices.

*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

3.5.1 Urban Proximity and Welfare Gap

Many economists use urbanisation as an alternative indicator of development process and there is consensus—with little disagreement—that the level of urbanisation is positively related to the level of household welfare. The global evidence on the enhanced welfare effects of living in the proximity to urban is also borne out by the Bangladesh data. The evidence suggests the importance of economic density (spatial concentration of economic activities), as typified by urbanisation. Workers and businesses migrate closer to higher economic densities, as seen in the growth of cities (World Bank 2009). Many others can benefit from urban agglomeration economies by at least temporarily migrating to cities for economic livelihoods—often on a daily basis—even if they do not reside directly in these areas. Deichmann *et al.* (2008) additionally report significant effect of proximity to cities on rural diversification and specialisation along with the presence of some agglomeration economies around the cities. For instance, the study found that the

return to rural non-farm sector (productivity of rural non-farm activities) is higher in the closer proximity to large metropolis. The underlying driver is the enhanced market access for products and services that comes with proximity to large cities.

With increased economic distance from growth centres welfare of people residing in lagging areas can drop considerably. After allowing for the usual individual/household level controls, we find that returns to urbanisation are higher for households in the East (Tables 3.A1 to 3.A9 in Appendix).[4] The urbanisation dummy shows the positive *additional* impact of urbanisation relates to the welfare effects associated with the eastern residence. In 2000, the additional welfare gains of an average urban resident in the East was about 17 per cent higher after allowing for usual controls (Table 3.A1). Tables 3.A4 to 3.A9 in appendix further present the results from quantile regressions estimations for both regions. The results confirm that the *additional* benefits derived from urbanisation by the households from the East were considerably higher compared to the households from the West in all the survey rounds; and this conclusion is valid for households at all levels of quantiles. This is not surprising due to the presence of two major growth centres, namely Dhaka and Chittagong, in the East.

One interesting feature, however, is that the additional effects for residing in urban areas between the two regions *decreased* to only 2 per cent in 2005 down from 17 per cent in 2000; in 2010, the urban effects became prominent again, but the matched difference was still 11 per cent (Tables 3.A1-3.A3). What accounts for this declining marginal effect (coefficient effect) of the urban factor deemed so crucial to explaining the persistence of regional inequality in the economic geography literature cited earlier (as in Krguman 1991, 1999). One possibility is whether the disadvantage of the "congestion diseconomies" is now eroding some of the earlier advantages of the "agglomeration economies" associated with large cities such as Metropolitan Dhaka.[5] With or without such congestion diseconomies, the marginal effects of the urban factor while still large can drop over time simply because of diminishing marginal returns to urban assets.[6] For example, while urbanisation has accelerated at a remarkably faster pace in the decade of the 2000s at the aggregate level, it has contrasting regional dynamics. The rapid growth in urban population—as per the HIES—encompassed not just the eastern (leading) region, but also the western (lagging region). Thus, the proportion of population residing in urban areas has increased from 35 per cent to 37 per cent in the East, but rose sharply from 28 per cent to 35 per cent in the West. Clearly, the initial urban edge historically enjoyed by the eastern region has declined remarkably in the decade of the 2000s.

3.5.2 Human Capital and Welfare Gap

Bangladesh has attained well-known initial success in achieving high primary and secondary enrollment rates, and gender parity in primary and secondary education. This

[4]We also used "distance from Dhaka city" as one of urbanisation covariates and found inversely correlated with the welfare gains. However, we did not report results due to high correlation with urban dummy.

[5]Henderson (2000) makes the point that once the "urban primacy" (the proportion of urban population living in the largest city) crosses 50 per cent, the congestion diseconomies start to kick in. Something similar happening in the context of Metropolitan Dhaka cannot be ruled out.

[6]The declining marginal factor returns are expected in course of time, and could be explained in the light of the "law of diminishing marginal returns" to a factor.

cuts across the East-West divide (though pockets of underdevelopment in this respect can be found in both the regions). As a result of this, the initial differentials in educational access have declined considerably between the leading and lagging regions. This was not unexpected—as outlined in Chapter 2—the western region actually had more favourable initial human development conditions even at the outset of the 1990s. The HIES data also show that the average years of education was higher among the rural households in the West compared to their counterparts in the East throughout the last decade.

For the urban area, the corresponding gap has been negligible throughout, suggesting regional convergence in human capital. The average years of education were almost the same across the regions in all the survey rounds in the decade of the 2000s (Table 3.A12). This convergence in human capital, in sheer quantitative terms, indicates a positive policy response to the problem of illiteracy across the country. At the national level, the average years of schooling have increased by about one year between 2000 and 2010.

Tables 3.A1 to 3.A9 suggest that although the access to human capital (endowment) is similar across regions, the returns to human capital are higher in the eastern (leading) region in all survey rounds. This is one of the key reasons for the persistence of East-West divide. Household human capital has been measured by the maximum number of years of schooling attained by either household head or his spouse. Returns to education for each extra year of schooling have actually increased for the entire sample over the 10-year period covered by these surveys. The incremental gains are higher in the East─earning an *additional* 1.8 per cent return compared to the average pay-off in the West in 2010 (Table 3.A3). The corresponding figure for the additional return to schooling in the East was about 1 per cent. This suggests that the extra pay-off to human capital in the leading region has almost doubled during the 2000s. This is consistent with the prediction of increasing return economics of human capital in the more urbanised setting. We interpret this as being related to the higher income earning opportunities of educated individuals living in a more urbanised and globalised setting. This may also capture the effects of residing in the close proximity to the state (as well as private corporate agencies) in terms of getting improved access to information and jobs in the formal sector.

Unequal returns to human capital are one of the main sources of welfare gap across quantiles in the eastern region. The contrasting regional pattern is revealed clearly once the returns to human capital by quantiles are calculated separately by leading and lagging regions (Tables 3.A8-3.A9). Three points are noteworthy. First, the higher returns to human capital for the eastern (leading) region are noticeable for all the quantiles and valid for all the three survey periods. For example, in 2010, for the 5th percentile the return to education was about 2.7 per cent compared with 1 per cent in the western (lagging) region; for the 75th percentile, the corresponding figures are 3.1 per cent and 1.5 per cent; and for the 95th percentile, they are 4.8 per cent and 1.73 per cent, respectively (Tables 3.A8 and 3.A9). Second, the pattern of increasing returns to human capital at the upper quantiles is found valid only for the East. In contrast, the returns to education are similar across quantiles in the West. This suggests that unequal effects of

human capital are likely to be an important source of within-sector inequality in the case of the East, but not in the West. Third, similarity of educational returns across quantiles in the West and rising educational returns for the upper quantiles in the East also indicate the potential welfare gains for the more educated workers in migrating out of the West. This may create constraints to sustaining accelerated regional growth in the West as the latter looses more educated workers in the process of national growth. Of course, one could imagine a scenario whereby the out-migration of more educated workers from the West would be compensated by increased flow of domestic remittances from the East. This is, however, not borne out by the HIES data. The share of households receiving domestic remittance while sizable at 13 per cent in 2005, dropped further to 12 per cent in 2010. However, potentials for the equalising role of domestic migration/remittance can be further increased through greater inter-regional and inter-city connectivity and rapid mass transit system facilitating temporary (daily) commuting from the West to the East.

3.5.3 Migration and Welfare Gap

Migration can play a key role in equalising inter-regional welfare gap and dualism through higher labour mobility. As the level of income is higher in the East, workers at all quantile levels migrate from the West and enjoy higher returns on their labour and human capital endowment. If there is no structural constraints to labour mobility between regions, high labour mobility to the East may help to reduce regional dualism through the channel of domestic remittance. This process is aptly captured by the epithet of "unbalanced growth, balanced development" regionally (World Bank 2009).

The evidence from Bangladesh suggests that migration to the main growth centres can be an important channel for addressing the challenges of inclusive development for the lagging region. First, the returns to domestic migration are important for almost all the quantiles in both lagging and leading regions in 2010 (Tables 3.A8 and 3.A9).[7] Second, in 2010, the return to domestic migration is higher for the 25th, the 50th and the 75th percentiles in the both regions compared to the extreme quantiles (Tables 3.A8 and 3.A9). However, in the middle class segment–from 25th to 50th percentiles—the matched returns are higher for the East. This shows the incentives for the moderate poor (falling between the 25th and 50th percentiles) to migrate out of the West. Interestingly, the return to domestic migration for the poorest 5 per cent is also higher in the East, suggesting the benefits to the extreme poor in migrating from the West to the East. The latter may take part in the relatively high growth urban construction and transport activities in the East fueled, in turn, by remittance flows and general linkage effects due to higher growth (Hossain *et al.* 2012).

Third, as expected, the return to international migration is consistently higher for the upper quantiles. This is consistent with the findings that, by the end of the 2000s,

[7]We do not have isolated data for remittance from the domestic sources and remittance from the foreign sources in 2000. Remittance data in HIES 2000 includes remittance from both sources and thus we should take the coefficient of this variable with caution.

international migration has become an increasingly disequalising source of rural income inequality (Osmani and Sen 2011). Fourth, the returns to international migration for each quantile are similar across regions. This is because the pattern of international migration is not dictated by the internal growth dynamics alone; many from the lagging districts have been able to migrate abroad and in increasing numbers. This also indicates the potential for international migration to reduce further the East-West divide. There is a case for potential policy support here to extend financing facility to the poor residing in the lagging regions to enable them to undertake such initiative requiring considerable initial private investment.

The other noteworthy aspect is that returns to international migration are relatively stable way up the distribution ladder (up to the 75th percentile), rising only sharply for the top-most 95th percentile. As would be discussed shortly, increasing access to international migration on the part of the western region has been an important cause for reducing interregional gap in welfare.

3.5.4 Return Effects vs. Endowment Effects

The welfare gap between the eastern and western regions has been declining, but still remains considerable. How much of this observed difference is attributable to just factor accumulation (the so-called endowment effects) and how much is accounted for by the factor returns (the so-called return effects)?

The results show that in all survey rounds, the regional welfare gap is mostly the result of higher returns to the covariates in the East. In fact, some of the endowment (or characteristics) effects were favouring the lagging region (see, Table 3.A10). But the high difference in returns to the covariates in the leading region outweighed this endowment edge of the West. For example, the average years of schooling as well as the level of operating land was higher among the western households in 2000; this edge was maintained for the upper quantiles residing in the West in 2010. The average household size—a major determinant of schooling and investment decisions—was consistently lower in the West compared to that in the West in both 2000 and 2010. The consequences of this sort of difference are summarised in Figures 3.3 through 3.5, and in Table 3.3 and Table 3.A11.

Using Blinder-Oaxaca technique and Machado-Mata technique, we decompose the inter-regional gap between the East and the West of Bangladesh into returns effect and endowment effect. We present the results of Blinder-Oaxaca decomposition of return effects and endowment effects of welfare gap in Table A.11. Our results for Machado-Mata decomposition are presented in Table 3.3 and in Figure 3.3 to Figure 3.5. Both types of decompositions are about disaggregating the regional welfare gaps (or, for that matter, any welfare gaps observed between the two groups) into endowment and return effects. However, there is an important difference between the two. The Blinder-Oaxaca decomposition is done to analyse the aggregate gap in welfare between the regions (groups), but does not provide decomposition estimates for such gaps at each quantile level. In contrast, the Machado-Mata decomposition is done to capture such

decomposition estimates at each quantile level. The limitation of the latter, however, lies in its inability to distinguish separately the *individual* contribution of explanatory factors to total return and endowment differences.

A few comments on the results of Blinder-Oaxaca decomposition would be in order.[8] First, the return effects dominate over endowment effects in all three rounds. To illustrate the nature of such predominance, let us focus on the HIES 2005. Out of 28.4 per cent difference in real per capita consumption expenditure between the two regions, 26.2 per cent is attributable to the return effects, and only 2 per cent is attributable to endowment effects. Second, given this predominance of return effects, the next issue is which of the listed factors stand out prominently within the set of return effects? Two factors stand out from the policy point of view. In 2010, human capital accounts for 52 per cent of the total effects accruing to the return dimension (coefficient effects); in 2000, such factor was negligible statistically. The other factor is urbanisation, which accounted for 25 per cent of the total return effects in 2000 and 23 per cent in 2010. Together human capital and urbanisation accounted for three-forth of the total return effects in 2010. This is consistent with the prominent role attributed in the present study to human capital and urbanisation, as discussed earlier. Third, among the endowment effects, the unequal access to foreign remittance stands out. Fourth, interestingly, the factor of land availability is an equalising factor working in the direction of reducing regional gap in welfare. This is statistically evidenced by the significant "negative" sign of the land coefficient in Blinder-Oaxaca decomposition.

Turning now to Machado-Mata decomposition results the following may be noted. The welfare gap between the East and the West is increasing monotonically across the household quantiles in 2000. For example, the difference in log RPCE between the two regions was about 7 per cent for the 5th percentile of households ranked by real per capita consumption expenditure; this figure was about 36 per cent for the 95th percentile of households in 2000. The first half of the 2000s shows a further rise in the regional welfare gap among the households in the lower stratum, while the welfare gap in the top quantiles remained stable at the same time. However, a rapid convergence of welfare gap appears over the period between 2005 and 2010. This fact is clearly attributable from the Figures 3.3 to 3.5, as they are drawn with the same scale. In 2010, the regional welfare gap still remains in the band of 10 to 16 per cent across the quantiles.

In summary, an increasing share of the overall gap in log RPCE that still remains between the leading and lagging regions in Bangladesh is attributable to higher returns to endowments. High "economic density" of activities in the East tends to enhance the productivity of the available resource endowments; as a result, the return effects have become increasingly important source of regional divergences in welfare. The consistent

[8]It may be mentioned that the sum total of endowment and return effects do not neatly match with the total observed differences in the welfare between the regions (see, Table 3.A11). This is because there is a third term of "interaction effects" between endowment and return variables.

negative sign on endowment effects at the lower end of the distribution (up to the 50th percentiles) in all three survey rounds indicates that the endowment access was not a binding constraint for the poor's economic mobility. While asset endowments were higher for the poorer classes in the West vis-á-vis their counterparts, the East, the returns to these endowments were lower in comparison. It is because of the differential returns to assets, the East-West divide while declining continues to persist.

Table 3.3

Machado-Mata Decomposition Results

Component	HIES 2000		HIES 2005		HIES 2010	
	Effects	Std. Err.	Effects	Std. Err.	Effects	Std. Err.
			5th Percentile			
Total Difference	0.0704***	0.0150	0.2276***	0.0094	0.1063***	0.0085
Endowments Effects	-0.0458***	0.0146	-0.0416***	0.0117	-0.0661***	0.0125
Return Effects	0.1162***	0.0115	0.2692***	0.0087	0.1724***	0.0085
			25th Percentile			
Total Difference	0.1435***	0.0102	0.2444***	0.0066	0.1161***	0.0066
Endowments Effects	-0.0270***	0.0105	-0.0157***	0.0082	-0.0400***	0.0088
Return Effects	0.1705***	0.0091	0.2601***	0.0061	0.1560***	0.0063
			50th Percentile			
Total Difference	0.2138***	0.0111	0.2767***	0.0073	0.1312***	0.0062
Endowments Effects	-0.0177*	0.0112	0.0094	0.0090	-0.0211***	0.0096
Return Effects	0.2316***	0.0100	0.2673***	0.0069	0.1523***	0.0067
			75th Percentile			
Total Difference	0.2883***	0.0149	0.3204***	0.0110	0.1513***	0.0096
Endowments Effects	-0.0121	0.0137	0.0469***	0.0152	0.0011***	0.0127
Return Effects	0.3004***	0.0119	0.2735***	0.0098	0.1502***	0.0089
			95th Percentile			
Total Difference	0.3644***	0.0250	0.3632***	0.0234	0.1593***	0.0192
Endowments Effects	-0.0032	0.0218	0.1346***	0.0381	0.0167	0.0226
Return Effects	0.3676***	0.0193	0.2285***	0.0216	0.1427***	0.0198
Number of Observation	7,367		9,212		11,233	

Figure 3.3 Returns and Endowments Effects for Welfare Gaps in Bangladesh (2000)

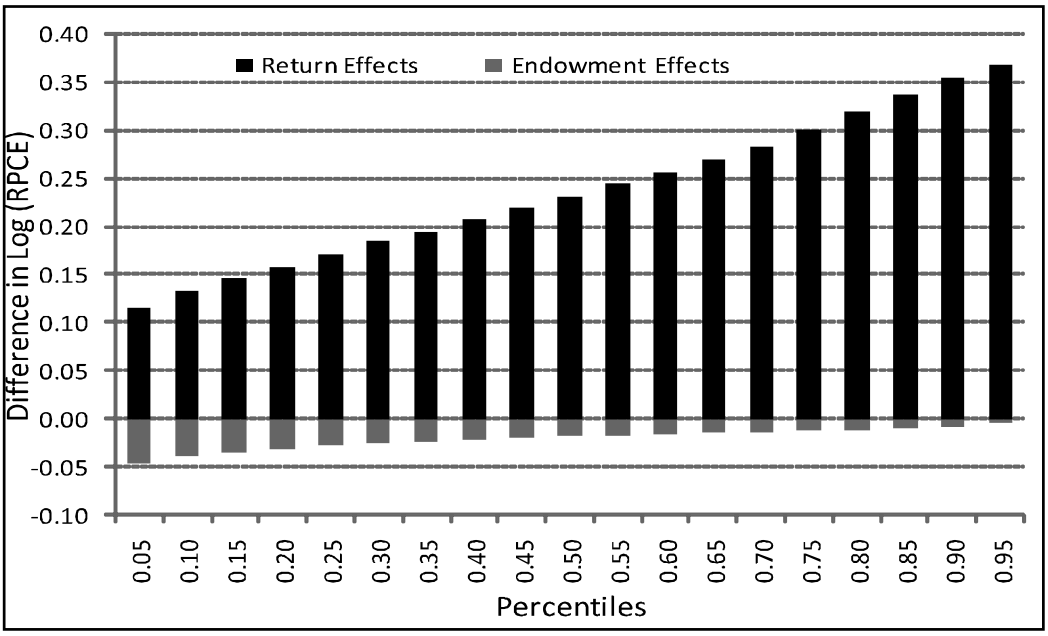


Figure 3.4: Returns and Endowments Effects for Welfare Gaps in Bangladesh (2005)

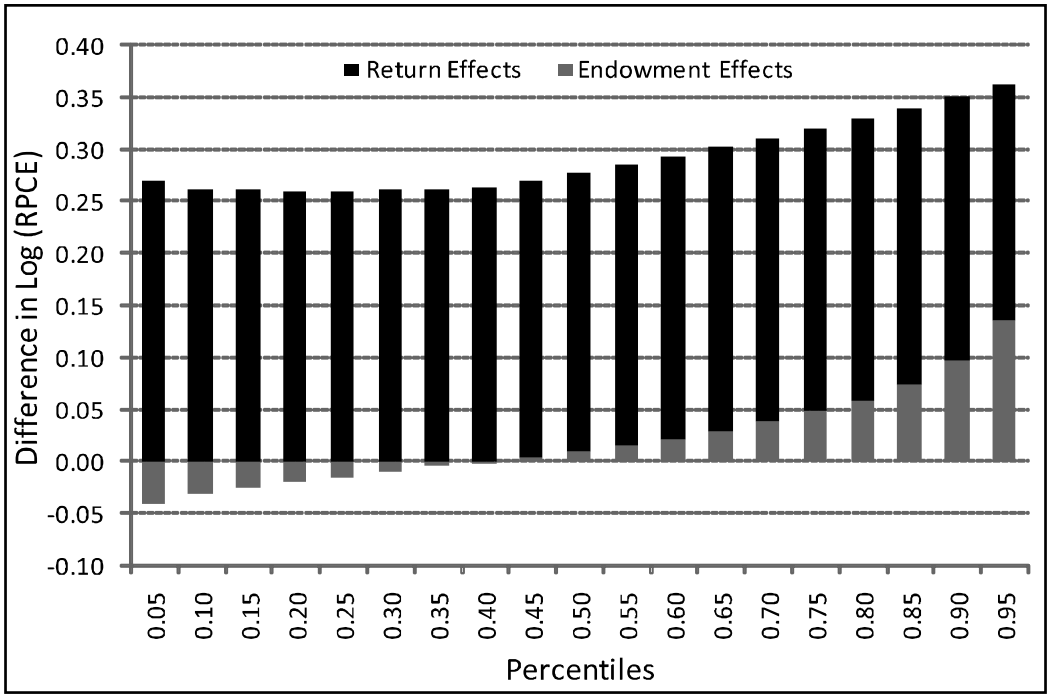
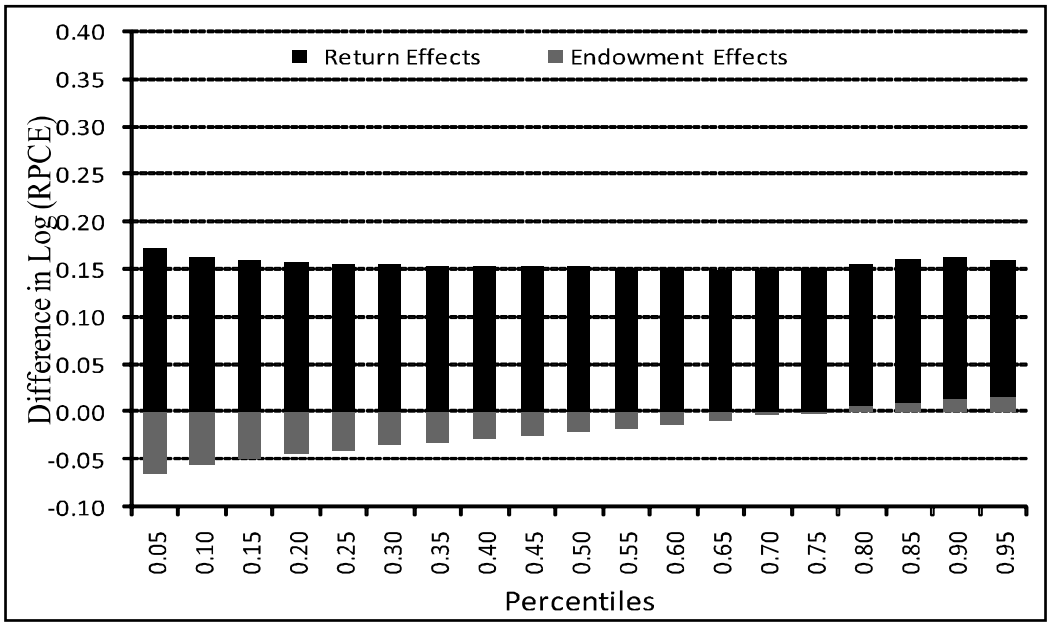


Figure 3.5: Returns and Endowments Effects for Welfare Gaps in Bangladesh (2010)



Appendix Tables

Table 3.A1

OLS Regression of Household Real Per Capita Expenditure (HIES2000)

Dependent Variable: Log of RPCE	Eastern Region		Western Region	
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
urban dummy	0.2998***	0.0227	0.1317***	0.0238
age	-0.0015	0.0035	0.0074**	0.0031
age^2	0.0001*	0.0000	0.0000	0.0000
gender dummy	-0.1011***	0.0291	-0.0744**	0.0344
religion dummy	-0.0132	0.0212	-0.0152	0.0233
household size	-0.0330***	0.0044	-0.0251***	0.0042
dependency ratio	-0.0016***	0.0001	-0.0017***	0.0001
received remittance dummy	0.3178***	0.0258	0.2528***	0.0402
education (schooling years)	0.0249***	0.0048	0.0146***	0.0053
education squared	0.0019***	0.0004	0.0022***	0.0005
urban*education	0.0247***	0.0036	0.0284***	0.0038
operating land (log)	0.0240***	0.0036	0.0425***	0.0034
constant	6.5283***	0.0895	6.1087***	0.0858
Number of Observation	4,099		3,268	
Adjusted-R Square	0.4765		0.4688	

Note: Household real per capita expenditure at constant 1995/96 prices.

*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Table 3.A2

OLS Regression of Household Real Per Capita Expenditure (HIES 2005)

Dependent Variable: Log of RPCE	Eastern Region		Western Region	
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
urban dummy	0.1241***	0.0199	0.1014***	0.0193
age	0.0094***	0.0031	0.0088***	0.0027
age^2	0.0000	0.0000	0.0000	0.0000
gender dummy	-0.0794***	0.0235	0.0278	0.0256
religion dummy	0.1307***	0.0159	0.0291	0.0221
household size	-0.0488***	0.0038	-0.0472***	0.0037
dependency ratio	-0.0013***	0.0001	-0.0015***	0.0001
received domestic remittance dummy	0.0525***	0.0179	0.1984**	0.0178
received foreign remittance dummy	0.3293***	0.0251	0.4608*	0.0676
education (schooling years)	0.0496***	0.0045	0.0452***	0.0045
education squared	0.0009***	0.0003	0.0010***	0.0003
urban*education	-0.0166***	0.0027	-0.0232***	0.0028
operating land (log)	0.0405***	0.0042	0.0680***	0.0040
constant	6.3472***	0.0784	6.0186***	0.0717
Number of Observation	4,821		4,391	
Adjusted-R Square	0.4664		0.4377	

Note: Household real per capita expenditure at constant 1995/96 prices.

*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Table 3.A3

OLS Regression of Household Real Per Capita Expenditure (HIES 2010)

Dependent Variable: Log of RPCE	Eastern Region		Western Region	
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
urban dummy	0.2374***	0.0190	0.1305***	0.0180
age	0.0146***	0.0025	0.0166***	0.0028
age^2	-0.0001***	0.0000	-0.0001***	0.0000
gender dummy	-0.0775***	0.0152	-0.0366*	0.0206
religion dummy	0.0247	0.0170	0.0721***	0.0181
household size	-0.0561***	0.0031	-0.0665***	0.0043
dependency ratio	-0.0010***	0.0001	-0.0014***	0.0001
received domestic remittance dummy	0.1081***	0.0161	0.1065***	0.0206
received foreign remittance dummy	0.3217***	0.0182	0.3418***	0.0388
education (schooling years)	0.0313***	0.0029	0.0133***	0.0031
education squared	0.0003	0.0002	0.0013***	0.0003
urban*education	0.0169***	0.0024	0.0221***	0.0026
operating land (log)	0.0463***	0.0037	0.0704***	0.0033
constant	6.4774***	0.0657	6.2773***	0.0675
Number of Observation	5,975		5,258	
Adjusted-R Square	0.4413		0.4065	

Note: Household real per capita expenditure at constant 1995/96 prices.

*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Table 3.A4

Quantile Regression of Household Real Per Capita Expenditure: Eastern Region (HIES 2000)

Dependent Variable: Log of RPCE	5th Percentile		25th Percentile		50th Percentile		75th Percentile		95th Percentile	
	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.
urban dummy	0.2868***	0.0545	0.2954***	0.0219	0.2750***	0.0249	0.2853***	0.0343	0.3431***	0.0816
Age	0.0042	0.0065	0.0029	0.0036	-0.0013	0.0043	-0.0041	0.0048	-0.0143	0.0117
age^2	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0001*	0.0001	0.0002*	0.0001
gender dummy	-0.0286	0.0540	-0.0415	0.0354	-0.0964***	0.0274	-0.1411***	0.0371	-0.1839***	0.0566
religion dummy	-0.0335	0.0488	-0.0696**	0.0276	-0.0856***	0.0234	0.0078	0.0270	0.0861**	0.0406
household size	-0.0220***	0.0066	-0.0332***	0.0045	-0.0368***	0.0045	-0.0321***	0.0046	-0.0294***	0.0114
dependency ratio	-0.0016***	0.0003	-0.0015***	0.0001	-0.0014***	0.0001	-0.0017***	0.0002	-0.0016***	0.0003
received remittance dummy	0.2461***	0.0596	0.3017***	0.0406	0.3521***	0.0262	0.3563***	0.0316	0.3462***	0.0914
education (schooling years)	0.0200**	0.0111	0.0145*	0.0075	0.0262***	0.0081	0.0329***	0.0059	0.0336***	0.0089
education squared	0.0011	0.0010	0.0021***	0.0007	0.0015**	0.0007	0.0015**	0.0006	0.0024***	0.0008
urban*education	0.0268***	0.0087	0.0271***	0.0042	0.0282***	0.0041	0.0249***	0.0051	0.0180	0.0114
operating land (log)	0.0313***	0.0068	0.0200***	0.0050	0.0201***	0.0051	0.0188***	0.0041	0.0337***	0.0095
Constant	5.7703***	0.1595	6.1928***	0.0866	6.5933***	0.0996	6.8467***	0.1237	7.3503***	0.2316
Pseudo R^2	0.2019		0.2540		0.2859		0.3099		0.3197	
Observation	4,099									

Source: Author's own calculation based on HIES 2000.

Note: Household real per capita expenditure at constant 1995/96 prices.
*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Table 3.A5

Quantile Regression of Household Real Per Capita Expenditure: Western Region (HIES 2000)

Dependent Variable: Log of RPCE	5th Percentile		25th Percentile		50th Percentile		75th Percentile		95th Percentile	
	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.
urban dummy	0.1318***	0.0453	0.1277***	0.0214	0.1409***	0.0264	0.1336***	0.0339	0.1785**	0.0826
Age	-0.0043	0.0054	0.0049	0.0046	0.0086	0.0057	0.0112**	0.0048	0.0079	0.0088
age^2	0.0001	0.0001	0.0000	0.0000	0.0000	0.0001	-0.0001	0.0001	0.0000	0.0001
gender dummy	0.1273	0.0810	0.0459	0.0378	-0.0469	0.0434	-0.1212***	0.0318	-0.2636	0.1663
religion dummy	0.0575	0.0482	-0.0349	0.0356	-0.0434	0.0300	-0.0345	0.0252	0.0067	0.0842
household size	-0.0140**	0.0069	-0.0239***	0.0053	-0.0281***	0.0057	-0.0274***	0.0047	-0.0217***	0.0077
dependency ratio	-0.0016***	0.0002	-0.0017***	0.0001	-0.0017***	0.0001	-0.0018***	0.0001	-0.0018***	0.0003
received remittance dummy	0.1246	0.1938	0.2701***	0.0501	0.3006***	0.0353	0.2518***	0.0516	0.2081	0.1316
education (schooling years)	0.0001	0.0100	0.0054	0.0086	0.0098*	0.0053	0.0194***	0.0065	0.0381**	0.0152
education squared	0.0023**	0.0009	0.0024***	0.0009	0.0026***	0.0006	0.0022***	0.0008	0.0015	0.0015
urban*education	0.0203***	0.0068	0.0226***	0.0044	0.0243***	0.0044	0.0318***	0.0065	0.0394***	0.0133
operating land (log)	0.0483***	0.0052	0.0395***	0.0033	0.0391***	0.0041	0.0436***	0.0049	0.0461***	0.0080
Constant	5.5828***	0.1797	5.8649***	0.1286	6.0911***	0.1489	6.2832***	0.1052	6.7852***	0.3619
Pseudo R^2	0.1934		0.2283		0.2745		0.3192		0.3307	
Observation	3,268									

Source: Author's own calculation based on HIES 2000.

Note: Household real per capita expenditure at constant 1995/96 prices.

*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Table 3.A6

Quantile Regression of Household Real Per Capita Expenditure: Eastern Region (HIES 2005)

Dependent Variable: Log of RPCE	5th Percentile		25th Percentile		50th Percentile		75th Percentile		95th Percentile	
	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.
urban dummy	0.0742**	0.0366	0.1062***	0.0200	0.1254***	0.0211	0.1459***	0.0307	0.2498***	0.0609
Age	0.0170***	0.0060	0.0109***	0.0030	0.0045	0.0031	0.0036	0.0030	0.0170**	0.0083
age^2	-0.0001**	0.0001	-0.0001**	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0001
gender dummy	0.0720	0.0503	-0.0310	0.0260	-0.0702***	0.0238	-0.1000**	0.0480	-0.2759***	0.0920
religion dummy	0.0084	0.0244	0.0624***	0.0166	0.1222***	0.0158	0.1968***	0.0185	0.2162***	0.0455
household size	-0.0452***	0.0055	-0.0487***	0.0023	-0.0437***	0.0019	-0.0450***	0.0039	-0.0441***	0.0069
dependency ratio	-0.0012***	0.0002	-0.0013***	0.0001	-0.0013***	0.0001	-0.0013***	0.0001	-0.0017***	0.0004
received domestic remittance dummy	0.0797	0.0514	0.0962***	0.0168	0.0637***	0.0160	0.0440*	0.0239	0.0374	0.0556
received foreign remittance dummy	0.3133***	0.0315	0.2835***	0.0271	0.2967***	0.0237	0.3091***	0.0316	0.4465***	0.1116
education (schooling years)	0.0334***	0.0081	0.0354***	0.0062	0.0467***	0.0058	0.0554***	0.0077	0.0710***	0.0129
education squared	0.0007*	0.0004	0.0012***	0.0003	0.0011***	0.0003	0.0011**	0.0004	0.0002	0.0007
urban*education	-0.0158***	0.0046	-0.0154***	0.0035	-0.0165***	0.0030	-0.0163***	0.0051	-0.0062	0.0068
operating land (log)	0.0402***	0.0061	0.0325***	0.0049	0.0381***	0.0034	0.0365***	0.0049	0.0599***	0.0103
Constant	5.6133***	0.1607	6.1511***	0.0756	6.4047***	0.0846	6.6316***	0.0846	6.9081***	0.2558
Pseudo R^2	0.2142		0.2569		0.2878		0.3094		0.3094	
Observation	4,821									

Source: Author's own calculation based on HIES 2005.

Note: Household real per capita expenditure at constant 1995/96 prices.
*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Table 3.A7

Quantile Regression of Household Real Per Capita Expenditure: Western Region (HIES 2005)

Dependent Variable: Log of RPCE	5th Percentile		25th Percentile		50th Percentile		75th Percentile		95th Percentile	
	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.
urban dummy	0.0926***	0.0353	0.0769***	0.0177	0.0956***	0.0176	0.1300***	0.0177	0.1502**	0.0674
Age	0.0090	0.0068	0.0059*	0.0033	0.0087**	0.0038	0.0088**	0.0035	0.0195*	0.0121
age^2	-0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0001
gender dummy	0.1129***	0.0312	0.0708**	0.0358	0.0346	0.0366	0.0337	0.0364	0.0349	0.0461
religion dummy	0.0525	0.0448	0.0190	0.0144	0.0032	0.0164	0.0675**	0.0269	-0.0370	0.0477
household size	-0.0414***	0.0065	-0.0474***	0.0033	-0.0457***	0.0041	-0.0483***	0.0033	-0.0549***	0.0096
dependency ratio	-0.0018***	0.0001	-0.0016***	0.0001	-0.0016***	0.0001	-0.0014***	0.0001	-0.0015***	0.0003
received domestic remittance dummy	0.0832***	0.0303	0.1844***	0.0251	0.2246***	0.0164	0.2342***	0.0203	0.2352***	0.0506
received foreign remittance dummy	0.2468*	0.1315	0.3255***	0.0552	0.3696***	0.0463	0.4739***	0.0565	0.9828***	0.1531
education (schooling years)	0.0205**	0.0094	0.0299***	0.0052	0.0372***	0.0054	0.0444***	0.0062	0.0806***	0.0125
education squared	0.0009	0.0006	0.0013***	0.0003	0.0015***	0.0003	0.0016***	0.0004	0.0003	0.0009
urban*education	-0.0105*	0.0057	-0.0220***	0.0037	-0.0236***	0.0032	-0.0223***	0.0045	-0.0335***	0.0091
operating land (log)	0.0519***	0.0066	0.0620***	0.0039	0.0606***	0.0048	0.0729***	0.0046	0.0894***	0.0134
Constant	5.5301***	0.1893	5.8803***	0.1046	6.0282***	0.1025	6.1552***	0.0949	6.3071***	0.3118
Pseudo R^2	0.1963		0.2263		0.2572		0.2936		0.3045	
Observation	4,391									

Source: Author's own calculation based on HIES 2005.

Note: Household real per capita expenditure at constant 1995/96 prices.
*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Table 3.A8

Quantile Regression of Household Real Per Capita Expenditure: Eastern Region (HIES 2010)

Dependent Variable: Log of RPCE	5th Percentile Coef.	Bootstrap Std. Err.	25th Percentile Coef.	Bootstrap Std. Err.	50th Percentile Coef.	Bootstrap Std. Err.	75th Percentile Coef.	Bootstrap Std. Err.	95th Percentile Coef.	Bootstrap Std. Err.
urban dummy	0.1731***	0.0407	0.2279***	0.0212	0.2494***	0.0183	0.2421***	0.0207	0.2265***	0.0630
Age	0.0128***	0.0050	0.0148***	0.0022	0.0130***	0.0028	0.0150***	0.0031	0.0113	0.0079
age^2	-0.0001**	0.0000	-0.0001***	0.0000	-0.0001***	0.0000	-0.0001**	0.0000	0.0000	0.0001
gender dummy	-0.0516**	0.0224	-0.0514***	0.0195	-0.0761***	0.0262	-0.0902***	0.0310	-0.1444*	0.0796
religion dummy	-0.0570*	0.0328	-0.0015	0.0208	0.0302	0.0205	0.0410***	0.0139	0.1391**	0.0580
household size	-0.0451***	0.0048	-0.0519***	0.0028	-0.0521***	0.0027	-0.0582***	0.0053	-0.0600***	0.0107
dependency ratio	-0.0009***	0.0002	-0.0009***	0.0001	-0.0009***	0.0001	-0.0011***	0.0001	-0.0011***	0.0002
received domestic remittance dummy	0.0626*	0.0335	0.0928***	0.0292	0.1119***	0.0206	0.1052***	0.0191	0.0677	0.0546
received foreign remittance dummy	0.2911***	0.0194	0.2898***	0.0163	0.2856***	0.0221	0.3065***	0.0256	0.3572***	0.0841
education (schooling years)	0.0269***	0.0051	0.0251***	0.0028	0.0242***	0.0044	0.0313***	0.0041	0.0481***	0.0101
education squared	0.0002	0.0004	0.0005	0.0003	0.0007**	0.0003	0.0006**	0.0003	-0.0002	0.0009
urban*education	0.0159***	0.0045	0.0153***	0.0035	0.0171***	0.0025	0.0147***	0.0029	0.0250***	0.0092
operating land (log)	0.0461***	0.0081	0.0401***	0.0046	0.0441***	0.0039	0.0445***	0.0042	0.0463***	0.0111
constant	6.0160***	0.1239	6.2664***	0.0581	6.4939***	0.0630	6.6801***	0.0800	7.0374***	0.2069
Pseudo R^2	0.2021		0.2418		0.2619		0.2810		0.2780	
Observation	5,975									

Source: Author's own calculation based on HIES 2010.

Note: Household real per capita expenditure at constant 1995/96 prices.

*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Table 3.A9

Quantile Regression of Household Real Per Capita Expenditure: Western Region (HIES 2010)

Dependent Variable: Log of RPCE	5th Percentile		25th Percentile		50th Percentile		75th Percentile		95th Percentile	
	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.	Coef.	Bootstrap Std. Err.
urban dummy	0.1247***	0.0282	0.1249***	0.0269	0.1243***	0.0157	0.1430***	0.0279	0.1414***	0.0460
age	0.0167***	0.0055	0.0196***	0.0044	0.0153***	0.0036	0.0131***	0.0041	0.0151**	0.0071
age^2	-0.0001**	0.0001	-0.0002***	0.0000	-0.0001***	0.0000	-0.0001*	0.0000	0.0000	0.0001
gender dummy	0.1195***	0.0413	-0.0125	0.0274	-0.0295	0.0269	-0.0768**	0.0377	-0.1695**	0.0691
religion dummy	0.0005	0.0228	0.0429*	0.0244	0.0685***	0.0258	0.0695***	0.0270	0.1283***	0.0412
household size	-0.0631***	0.0104	-0.0653***	0.0054	-0.0635***	0.0051	-0.0670***	0.0064	-0.0713***	0.0113
dependency ratio	-0.0012***	0.0002	-0.0011***	0.0001	-0.0013***	0.0001	-0.0016***	0.0001	-0.0014***	0.0003
received domestic remittance dummy	0.0121	0.0408	0.0469**	0.0188	0.0880***	0.0258	0.1128***	0.0264	0.0595*	0.0310
received foreign remittance dummy	0.2463***	0.0373	0.2776***	0.0460	0.3449***	0.0375	0.3642***	0.0398	0.4756***	0.1138
education (schooling years)	0.0106*	0.0064	0.0084*	0.0045	0.0112**	0.0045	0.0145***	0.0041	0.0173*	0.0095
education squared	0.0004	0.0006	0.0013***	0.0003	0.0013***	0.0004	0.0015***	0.0004	0.0019*	0.0010
urban*education	0.0214***	0.0046	0.0204***	0.0025	0.0251***	0.0029	0.0235***	0.0048	0.0271***	0.0087
operating land (log)	0.0590***	0.0065	0.0620***	0.0046	0.0651***	0.0031	0.0762***	0.0053	0.1001***	0.0140
constant	5.7199***	0.1298	5.9967***	0.1153	6.3009***	0.0926	6.5958***	0.1081	6.8314***	0.1898
Pseudo R2	0.1698		0.1993		0.2291		0.2671		0.2821	
Observation	5,258									

Source: Author's own calculation based on HIES 2010.

Note: Household real per capita expenditure at constant 1995/96 prices.

*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Table 3.A10

Summary of the Key Variables across the Quantiles of the East and the West

	HIES 2000											
Region	Eastern Region						Western Region					
Quantiles	First	Second	Third	Fourth	Fifth	Total	First	Second	Third	Fourth	Fifth	Total
Monthly Per Capita Expenditure	395.57	578.59	758.56	1046.71	2284.17	1098.28	362.81	495.40	620.56	801.38	1573.72	823.36
Proportion of Urban Households	0.11	0.20	0.28	0.39	0.66	0.35	0.14	0.19	0.21	0.32	0.49	0.28
Age of the Household Head	43.08	44.34	44.02	45.11	46.13	44.65	41.42	42.32	43.68	45.74	46.83	44.24
Gender of the Household Head	0.90	0.90	0.90	0.90	0.88	0.89	0.91	0.93	0.95	0.95	0.92	0.93
Religion of the Household	0.95	0.92	0.89	0.90	0.91	0.91	0.91	0.92	0.90	0.91	0.88	0.91
Household Size	5.75	5.64	5.35	5.22	4.91	5.34	5.15	5.13	4.90	4.99	4.79	4.98
Dependency Ratio	136.18	112.03	95.52	85.07	62.63	95.41	123.27	99.34	84.22	69.94	57.01	84.16
Received Remittances	0.05	0.08	0.10	0.17	0.19	0.13	0.01	0.02	0.03	0.04	0.09	0.04
Highest Schooling Years	1.18	1.84	2.46	4.19	7.16	3.64	1.43	2.24	3.06	4.25	7.72	4.01
Log of Distance from Capital	4.77	4.52	4.19	4.11	3.25	4.10	5.47	5.40	5.40	5.37	5.33	5.39
Log of total Operating Land	1.53	1.98	1.95	2.04	1.45	1.77	1.38	2.00	2.45	2.81	2.95	2.42
	HIES 2005											
Monthly Per Capita Expenditure	629.66	880.41	1133.2	1540.29	3290.97	1494.90	500.72	688.08	864.75	1149.09	2355.95	1111.7
Proportion of Urban Households	0.22	0.27	0.35	0.44	0.64	0.38	0.23	0.27	0.33	0.37	0.52	0.35
Age of the Household Head	43.51	45.91	46.28	46.92	47.18	45.96	42.30	43.15	45.28	46.15	47.27	44.83
Gender of the Household Head	0.91	0.89	0.88	0.84	0.84	0.87	0.90	0.93	0.92	0.93	0.92	0.92
Religion of the Household	0.86	0.85	0.87	0.87	0.88	0.86	0.89	0.89	0.87	0.91	0.90	0.89
Household Size	5.60	5.16	5.03	4.86	4.56	5.04	5.07	4.72	4.56	4.52	4.47	4.67
Dependency Ratio	127.60	98.69	83.05	71.44	57.83	87.75	110.28	85.07	70.54	61.98	54.92	76.60
Received Domestic Remittances	0.09	0.15	0.17	0.17	0.15	0.15	0.06	0.09	0.13	0.16	0.23	0.13
Received Foreign Remittances	0.03	0.07	0.12	0.17	0.20	0.12	0.004	0.006	0.01	0.03	0.06	0.02
Highest Schooling Years	1.75	2.65	3.99	6.18	9.57	4.83	2.06	2.89	3.89	5.45	8.77	4.61
Log of Distance from Capital	4.86	4.64	4.53	4.38	3.93	4.47	5.43	5.40	5.41	5.39	5.36	5.40
Log of total Operating Land	2.50	2.81	2.85	2.81	2.74	2.74	2.42	2.87	3.06	3.44	3.47	3.05

Table 3.A10

Summary of the Key Variables across the Quantiles of the East and the West (Contd.)

HIES 2010												
Region	Eastern Region						Western Region					
Quantiles	First	Second	Third	Fourth	Fifth	Total	First	Second	Third	Fourth	Fifth	Total
Monthly Per Capita Expenditure	1302.9	1886.57	2443.83	3288.83	6424.36	2985.49	1093.20	1527.22	1913.47	2481.21	4816.21	2488.19
Proportion of Urban Households	0.14	0.26	0.36	0.48	0.67	0.37	0.21	0.28	0.31	0.37	0.52	0.35
Age of the Household Head	44.69	45.62	46.16	47.83	47.52	46.30	43.06	44.86	44.83	46.41	48.67	45.74
Gender of the Household Head	0.85	0.85	0.81	0.82	0.81	0.83	0.88	0.91	0.88	0.88	0.86	0.88
Religion of the Household	0.88	0.86	0.88	0.87	0.87	0.87	0.89	0.88	0.87	0.89	0.90	0.88
Household Size	5.40	4.95	4.80	4.40	4.16	4.77	4.84	4.57	4.35	4.16	3.90	4.33
Dependency Ratio	114.84	94.28	81.18	69.23	56.90	84.34	103.85	83.95	68.98	62.32	52.22	72.81
Received Domestic Remittances	0.10	0.13	0.16	0.15	0.18	0.14	0.10	0.09	0.12	0.12	0.16	0.12
Received Foreign Remittances	0.05	0.11	0.17	0.19	0.23	0.15	0.02	0.04	0.04	0.07	0.11	0.06
Highest Schooling Years	1.79	3.02	4.21	5.51	9.07	4.59	2.54	3.22	4.10	5.15	8.10	4.80
Log of Distance from Capital	4.77	4.63	4.51	4.35	4.26	4.51	5.33	5.31	5.34	5.32	5.33	5.33
Log of total Operating Land	2.54	2.81	2.89	2.73	2.61	2.71	2.36	2.70	2.97	3.12	3.36	2.93

Source: Estimated from HIES 2000, 2005 and 2010.

Table 3.A11

Blinder-Oaxaca Decomposition Results: Endowment and Return Effects

	HIES 2000		HIES 2005		HIES 2010	
Dep.Var. Log of real per capita consumption expenditure	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Total Difference	0.2167***	0.0134	0.2842***	0.0116	0.1332***	0.0103
Endowments Effects						
urban dummy	0.0202***	0.0036	0.0052***	0.0015	0.0014	0.0021
age	-0.0006	0.0014	0.0106***	0.0041	0.0148***	0.0044
age^2	0.0031	0.0024	-0.0042	0.0031	-0.0099***	0.0034
gender dummy	0.0037***	0.0011	0.0041***	0.0012	0.0055***	0.0013
religion dummy	-0.0001	0.0002	-0.0037***	0.0010	0.0001	0.0002
household size	-0.0119***	0.0021	-0.0187***	0.0024	-0.0263***	0.0024
dependency ratio	-0.0177***	0.0028	-0.0161***	0.0022	-0.0152***	0.0017
received domestic remittance dummy*	0.0275***	0.0028	0.0008*	0.0005	0.0044***	0.0009
received foreign remittance dummy			0.0334***	0.0027	0.0330***	0.0024
education (schooling years)	-0.0094***	0.0032	0.0115**	0.0053	-0.0102***	0.0031
education squared	-0.0055***	0.0026	0.0045**	0.0019	-0.0007	0.0007
urban*education	0.0049***	0.0023	0.0047***	0.0016	0.0022	0.0015
operating land (log)	-0.0114***	0.0021	-0.0121***	0.0019	-0.0105***	0.0017
Total	0.0028	0.0103	0.0199**	0.0083	-0.0113	0.0071
Coefficients Effects						
urban dummy	0.0594***	0.0112	0.0085	0.0106	0.0367***	0.0089
age	-0.3946**	0.1984	0.0249	0.1805	-0.0932	0.1675
age^2	0.2035**	0.0974	-0.0009	0.0899	0.0552	0.0835
gender dummy	-0.0240	0.0342	-0.0940***	0.0283	-0.0340	0.0221
religion dummy	0.0018	0.0313	0.0880***	0.0234	-0.0420**	0.0216
household size	-0.0429	0.0278	-0.0085	0.0248	0.0503**	0.0236
dependency ratio	0.0141	0.0141	0.0202*	0.0122	0.0307***	0.0112
received domestic remittance dummy*	0.0082	0.0052	-0.0215***	0.0038	0.0002	0.0035
received foreign remittance dummy			-0.0162***	0.0058	-0.0029	0.0049
education (schooling years)	0.0374	0.0244	0.0216	0.0299	0.0821***	0.0204
education squared	-0.0099	0.0197	-0.0049	0.0187	-0.0470***	0.0154
urban*education	-0.0069	0.0092	0.0148*	0.0086	-0.0121	0.0081
operating land (log)	-0.0290***	0.0072	-0.0758***	0.0155	-0.0660***	0.0138
constant	0.4196***	0.1153	0.3286***	0.1048	0.2000**	0.0940
Total	0.2368***	0.0106	0.2621***	0.0099	0.1582***	0.0088
No. of Observation	7,367		9,212		11,233	

Note: * For HIES 2000, this variable includes recipients of foreign remittance as well.Household real per capita expenditure at constant 1995/96 prices.

*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Table 3.A12

Education in Eastern and Western Regions (2000-2010)

	East			West			National
	Urban	Rural	Total	Urban	Rural	Total	
HIES 2000	5.36	2.7	3.64	5.94	3.24	4.01	3.80
HIES 2005	6.97	3.49	4.83	6.29	3.72	4.61	4.72
HIES 2010	6.71	3.34	4.59	6.34	3.99	4.8	4.70

Table 3.A13

Spread of Urbanisation, Schooling and Remittance in Eastern and Western Regions

	HIES 2000	HIES 2005	HIES 2010
Share of urban population (%)			
East	35.0	38.0	37.0
West	28.0	35.0	35.0
Highest schooling years			
East	3.64	4.83	4.59
West	4.01	4.61	4.80
Household size			
East	5.34	5.04	4.77
West	4.98	4.67	4.33
Households reporting any remittance			
East	13.0	27.0	29.0
West	4.0	15.0	18.0
Household reporting domestic remittance			
East	-	15.0	14.0
West	-	13.0	12.0
Household reporting foreign remittance			
East	-	12.0	15.0
West	-	2.0	6.0

Source: Estimated from HIES data. The 2000 HIES does not show recipients of domestic and foreign remittance separately.

CHAPTER 4

SPATIAL EXTERNALITIES AND DECLINE IN THE EAST-WEST DIVIDE: TESTING THE STRENGTH OF NEIGHBOURHOOD EFFECTS

4.1 Introduction

Spatial convergence—as witnessed by the narrowing of the East-West divide—may also have been conditioned by greater spatial integration of the lagging region (West) with the leading region (East). The growth in the leading region can have positive spillover effects on the growth in the lagging regions, and vice versa. One of the mechanisms for such integration relates to the strength of social and geographic interactions across regions. The possibility of such mechanism in the Bangladesh context was indicated by the "geographic diffusion" of fertility-control technology across the East-West divide. Dev *et al.* (2002), for instance, have earlier pointed out that the spatial diffusion has been one of the key channels through which the country has achieved remarkable progress in reducing fertility. In this chapter we try to test the presence of "neighborhood effects"—as additional potential force for bringing about spatial integration--in the spread of new ideas and new technologies by taking the example of literacy and poverty measured at the upazila level.

What is the significance of testing neighbourhood effects[1] in the context of the East-West divide debate? The term has been imported from the political science literature, but found much currency in the recent economics literature. Miller (1977) formed the hypothesis that "people who talk together vote together." As applied to economics literature, two aspects of neighborhood effects can be singled out. The first line of inquiry examined the possibility as to how the similarity in economic and geographic characteristics (or population homogeneity) defines the choice of public assets as such choice invariably involves some sort of voting outcomes. The heterogeneous communities may not agree on the nature of public goods and hence these goods tend to be short in supply (or under-provisioned). This is also because the strength of bonding may differ depending on the homogeneity of the group interaction. For instance, ethnically diverse communities may have less investment in public goods than communities that are relatively homogenous. The second line of inquiry focuses on the possible impact of neighbourhood's development outcomes on own community's development outcomes. This effect can percolate through the channel of social interaction among different neighborhoods. The geographic proximity, for instance, can influence the crop choice, dissemination of new technology, migration and schooling decisions, affecting both poverty and human development outcomes. The bridging of the East-West divide will be faster if the social and geographic context of interactions encourages positive neighbourhood effects both within and between lagging and leading regions. This is especially expected in Bangladesh marked by least ethnic fragmentation, high

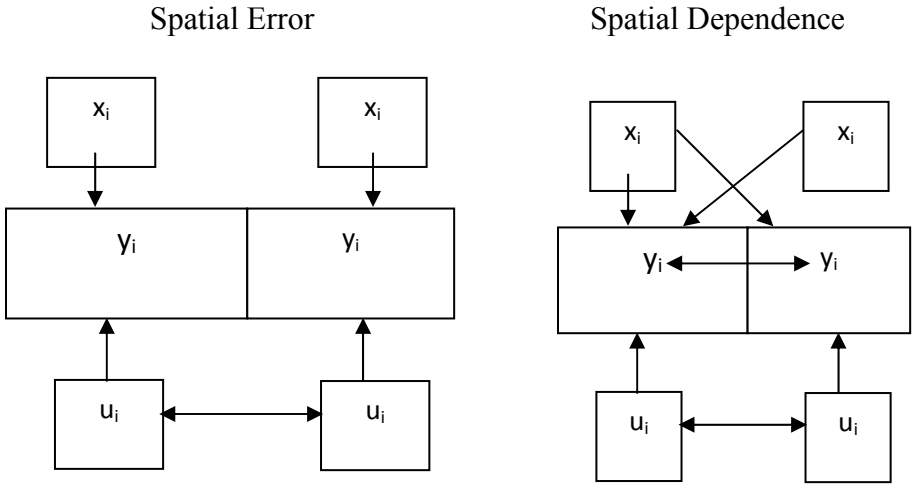
[1]The term was originally coined in the seminal works of Kevin Cox in "The Voting Decision in a Spatial Context" published in *Progress in Geography* (1969), and later popularised by Ron J. Johnston in "Political Geography" (1979) and Peter J. Taylor and G. Gudgin in "Geography of Elections" (1979).

population density and close geographic proximity (unlike Sub-Saharan Africa in all three respects) can accelerate the process of diffusion of information, ideas and technology. We define neighbouring community at the upazila level, and focus on the spatial diffusion of literacy (as a key social well-being variable) and poverty (as a key economic well-being variable) to test for the presence of "neighbourhood effects" across various upazilas.

Bangladesh has made remarkable progress in reducing poverty and increasing adult literacy. However, not all regions have made equal progress on these two counts. It has also been alleged that there is a "so-called" divide between eastern and western parts of the country. Even within each of the regions there may be sharp divides across upazilas. Given the level of developmental interventions, geography, particularly the physical environment, plays a significant role in the poverty condition and the level of education of communities and of the people living in disadvantaged regions. However, this spatial dimension of poverty has not been given much attention. In an attempt to underscore its importance, this study explores the nature and extent of spatial patterns of poverty and literacy and the possible underlying determinants affecting them in the eastern and western regions of the country.

When one upazila community attempts to imitate other successful ones, there is spatial dependence that may work through the variables in the model and the error terms. Insofar as location and distance (physical, economic or otherwise) are important forces at work, the notion of spatial interaction and diffusions effects, hierarchies of location, and spillover effects matters. Based on these issues the spatial dependence may be conceived of two different ways: (i) spatial error and (ii) spatial dependence.

Figure 4.1: Archetypes of Spatial Error and Spatial Dependence



In these archetype models realisations *i* and *j* are neighbours and their effects are transmitted concurrently, i.e., without any lags; a reasonable supposition given the cross-

section. The term neighbour as used in this context necessarily means sharing a border "geographic neighbour." However, defining neighbours has always proved to be a problem and as pointed out by Anselin (2002), Sole-Olle (2003) and others, a common procedure for specifying these interactions uses geographic proximity criteria. The fact that performance of neighbouring upazilas has an impact on the performance of upazila *i* does not imply that all neighbours have equal influence. Upazila *j*'s impact on upazila *i*'s performance depends on the complementarity of the upazilas' resource endowments.

The outcomes of 457 upazilas in Bangladesh are analysed from the viewpoint of spatial integration. The rest of the upazilas could not be included due to lack of data. Upazila poverty data were collected from the WFP's local office that were used for preparing the poverty atlas of the country based on the HIES, 2005 data. The other data were collected from the online edition of *Banglapedia*. Even though there are different indicators of the East-West divides, head count poverty and adult literacy were used as important proxy in this analysis.

4.2 Econometric Model

Following the above discussion of the possible presence of the spatial effect, we posit a general model in which upazila *i*'s performance (y_i) depends on neighbouring upazilas' performance and a set of upazila specific variables:

$$y_i = \rho y_j + \mathrm{x}_i'\beta + u_i; \quad i = 1, \ldots, N; j = 1, \ldots, N; \tag{1}$$

With multiple neighbours, y_j in equation (1) is replaced with $\sum_{j \neq i}^{N} \omega_{ij} y_j$ where ωij =1 if upazila *j* is neighbour of upazila *i* and ωij = 0 if upazila *j* is not a neighbour of upazila *i.* Besides, ωii =0 for obvious reason. Vector ωij indicates the relative importance of each of the upazilas to upazila *i*. Additionally, ρ is a scalar parameter measuring the slope of the reaction function; x_i ($k \times 1$) is a vector of upazila specific characteristics, and β is the corresponding vector of coefficients on the conditioning variables. The first element of x_i is unity to allow for the intercept. We assume that the parameters ρ, and β are constant across space. The system of equations for all upazilas is written in the following matrix form:

$$\mathrm{y} = \rho \mathrm{W}_1 \mathrm{y} + \mathrm{X}\beta + \mathrm{u}; \Rightarrow \mathrm{y} = \left(\mathrm{I}_\mathrm{N} - \rho \mathrm{W}_1\right)^{-1} \mathrm{X}\beta + \left(\mathrm{I}_\mathrm{N} - \rho \mathrm{W}_1\right)^{-1} \mathrm{u} \tag{2}$$

where $\mathbf{y}=(\mathrm{y}_1,\ldots,\mathrm{y}_N)'$ is the ($N \times 1$) vector of upazila performance; W_1 is an ($N \times N$) matrix of spatial weights, X is an $N \times K$ matrix with rows given by the set of vectors x'_1 and u is the corresponding ($N \times 1$) error term vector.

Notwithstanding of the interaction through the dependent variable, neighbours could still be subject to correlated random shocks and the presence of such shocks produces a correlation between upazilas' levels of performance that could result in the presence of causal influences that are actually not there. To correct for this potential correlation among the upazilas, errors of neighbours are allowed in the following way:

$$u_i = \lambda \sum_{j \neq i}^{N} \omega_{ij} u_j + \varepsilon_i \; ; => u = (I - \lambda W_2)\varepsilon \;\; i = 1, \ldots, N; j = 1, \ldots, N \qquad (3)$$

where ε is an idiosyncratic error that is uncorrelated between upazilas: $E(\varepsilon_i \varepsilon_j) = 0$ for $i \neq j$. In this study there is potential for dependence on neighbours through performance (y), as well as through errors (u), to mimic each other. If spatial correlation in the error terms is not corrected for, it would not affect the consistency of the β parameters, but it would reduce its efficiency. However, ignoring the spatial lag term, when ρ is non-zero, would be more serious, as it will yield inconsistent estimates of the β parameters. With the errors in equation (2) are correlated with the right-hand-side variables, ordinary least squares (OLS) will lead to inconsistent estimates. To remove the dependent variable from the right hand side, we can invert it to the following reduced form:

$$y = (I_N - \rho W_1)^{-1} \beta X + (I_N - \rho W_1)^{-1} (I_N - \lambda W_2)^{-1} u \qquad (4)$$

where I_N is the identity matrix of size N and it gives the solution of the Nash equilibrium of the game. Given that the error term is $u = \lambda W_2 u + \varepsilon$, equation (4) now incorporates the potential correlation between errors of neighbours and performance and is now written as a non-linear function of exogenous variables, X. With this correlation, it means that estimating using OLS will lead to inconsistent parameters. Maximum likelihood estimation is complicated when one accounts for spatial correlation in the error term by possible identification problems (Anselin 1988).

4.3 Empirical Analyses

4.3.1 Extent of the East-West Divide

Quite a number of control variables were included in the regression to explain the variations in poverty and adult literacy, the outcome variables. These include population density, share of urban area, occupations, concentration of manufacturing industries. It was found that population density is an important factor for reducing poverty. This may imply that high density of population creates economic opportunities thus helps reduce poverty. Occupation as agriculture as helps reduce poverty maybe through positive endowment effect. The unexpected relationship is the concentration of manufacturing industries which appears to increase poverty. Regression for educational development evident through adult literacy points at similar influences. It was found that occupation as agriculture as helps increase adult literacy through the positive endowment effect. Following the same line of argument, occupation as agricultural wage labour as reduces adult literacy through the lack of endowment.

If the focus is shifted to the dichotomous dummy of the East-West divide, twin interesting phenomenon arises. It was found that poverty is higher by about 11.48 percentage points in the western region. Interestingly, adult literacy is also about 1 percentage point higher. It may also be noted that there is hardly any difference among the influencing variables between the eastern and western regions except for population density and agricultural wage labours (see Annex Table 4.1A). This apparent paradox may imply lack of economic opportunities in the western region compared with the eastern region, even though the two regions are otherwise similar.

Table 4.1

Results of East-West Divide in Poverty and Adult Literacy

	Head Count Poverty	Adult Literacy
Population Density	-0.004**	0.000
	(0.001)	(0.001)
Share of Urban Area	19.210	8.601
	(12.566)	(7.886)
Occupation as Agriculture (%)	-0.312*	0.783***
	(0.171)	(0.041)
Occupation as Agricultural Wage Labour (%)	0.070	-0.057***
	(0.068)	(0.021)
Concentration of Industries	1.481***	-0.061
	(0.548)	(0.203)
Dummy for East-West Divide (East=1, West=0)	11.482***	0.875**
	(1.251)	(0.382)
Adult Literacy	-0.176	-
	(0.194)	-
Head Count Poverty	-	-0.015
	-	(0.017)
Constant	51.106***	8.226***
	(5.148)	(2.153)
Number of Observations	457	457
R-Squared	0.260	0.790
F-statistic (7. 449)	26.94***	148.83***

Note: Figures in the parentheses are robust standard errors.
*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

4.3.2 Diagnostics of Spatial Dependence

As a first step toward spatial analysis, global spatial autocorrelation was estimate for both poverty and adult literacy splicing the data between East and West based on spatial contiguity weight matrices. Three alternative measures viz. Moran's I (Cliff and Ord 1981), Geary's C (Geary 1954), and Getis and Ord's G (Getis and Ord 1992) statistics were used to assess the global spatial correlation of both the variables. The results are presented in Table 4.2. Both the head count poverty and adult literacy show certain degree of spatial correlation, except in the case of poverty in the West. In this case the Getis and Ord's statistics shows hardly any spatiality. Insofar as the other two statistics hint at the presence of spatial dependence, one can safely conclude in favour of it. As the outcomes of poverty and literacy are affected by both spatial factors (neighbours) and upazila specific factors, it is expedient to explore the presence or absence of such as association from regression perspective.

Table 4.2

Global Spatial Autocorrelation Statistics of Poverty and Adult Literacy

	Poverty		Literacy	
Regions =>	East	West	East	West
Moran's I statistic	0.552***	0.528***	0.470***	0.749***
	(12.997)	(13.447)	(11.087)	(19.032)
Geary's C statistic	0.357***	0.488***	0.466***	0.319***
	(-12.882)	(-9.934)	(-10.734)	(-13.730)
Getis and Ord's G statistic	0.025***	0.021	0.025***	0.023***
	(4.887)	(1.099)	(4.271)	(8.768)

Note: Figures in the parentheses are 'z' statistics. East and West are binary weight matrices involving the geographical neighbours of the upazila.
*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

Accordingly, separate OLS regressions were estimated for both head count poverty rate and adult literacy rate.[2] Residuals from OLS regressions were used with the weight matrices for diagnostic analyses. Five diagnostics tests are performed to assess for missing spatially lagged dependent variable and the error terms. The results are presented in Table 4.3. The regression diagnostics also corroborates presence of spatiality, albeit the evidences are tenuous in the case of adult literacy. It may be noted that these statistics are sensitive to the selection of weight matrix. As the true weight matrix is not known in the absence of strong theoretical underpinnings, these evidence should not be taken too seriously. However, one should proceed to spatial dependence through both the dependent variable and the error term before making any final judgment. This is accomplished in the spatial regression analysis that follows. The regression models for both poverty and literacy implicitly assume that these rates are driven by upazila characteristics. Accordingly, poverty posits to dependent on the population density, per cent of urban area, per cent of population reporting agriculture as their main occupation, per cent population reporting agricultural wage labour as their main occupation, concentration of manufacturing industries per square kilometer of the area, and adult literacy. Similar model was assumed for adult literacy where poverty was used as one of the explanatory variables. However, it may be noted that the choice of explanatory variables was dictated by the availability of data.

Table 4.3

Tests for Spatial Dependence in the OLS Residuals of Poverty and Adult Literacy

	Poverty		Literacy	
Regions =>	East	West	East	West
Spatial Lag				
Lagrange Multiplier statistic	135.572***	171.205***	29.134***	27.928***
	[0.000]	[0.000]	[0.000]	[0.000]
Robust Lagrange Multiplier statistic	17.452***	0.132	7.045***	26.721***
	[0.000]	[0.716]	[0.008]	[0.000]
Spatial Error				
Moran's I statistic	11.705***	13.689***	5.664***	1.682*
	[0.000]	[0.000]	[0.000]	[0.093]
Lagrange Multiplier statistic	122.874***	172.456***	26.915***	1.769
	[0.000]	[0.000]	[0.000]	[0.184]
Robust Lagrange Multiplier statistic	4.754**	1.384	4.825**	0.563
	[0.029]	[0.239]	[0.028]	[0.453]

Note: Figures in the brackets are p-values. East and West are binary weight matrices involving the geographical neighbours of the upazila.
*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

4.3.3 Regression Results of Spatial Dependence in Outcomes

The spatial dependence regression results are given in Table 4.4. First, let us focus on the spatial coefficients. It was found that spatial integration of upazilas both in the case of poverty and adult literacy was evident. This was true of the eastern and western upazilas. Thus, an upazila located within the eastern or western region is positively

[2]The results of the OLS regression are not reported for brevity of the analysis. Besides, these estimates are biased and inconsistent.

affected by the poverty and literacy outcomes of other upazilas. The positive coefficients imply that a 10 per cent increase in the poverty of the other upazilas leads to 7.3-7.4 per cent increase in the poverty of the upazila. In contrast, a 10 per cent increase in the literacy of the other upazilas leads to 2.1-3.4 per cent increase in the literacy of the upazila.

Table 4.4

Results of Spatial Dependence Model of Poverty and Adult Literacy

	Poverty		Literacy	
	East	West	East	West
Population Density	-0.001	-0.006**	0.000	-0.000
	(0.001)	(0.003)	(0.000)	(0.001)
Share of Urban Area	-3.844	10.865	10.749**	-1.085
	(8.422)	(15.744)	(4.519)	(3.787)
Occupation as Agriculture (%)	-0.232**	-0.179	0.499***	0.760***
	(0.102)	(0.236)	(0.045)	(0.030)
Occupation as Agricultural Wage Labour (%)	0.039	-0.125	-0.067***	-0.060***
	(0.048)	(0.076)	(0.026)	(0.018)
Concentration of Industries	0.622	1.646	-0.081	0.064
	(0.524)	(1.503)	(0.287)	(0.365)
Adult Literacy	-0.266**	0.116	-	-
	(0.114)	(0.249)	-	-
Head Count Poverty	-	-	-0.044*	0.003
	-	-	(0.025)	(0.011)
Constant	23.930***	24.670***	7.815***	3.373**
	(4.411)	(6.386)	(2.782)	(1.618)
Spatial Lag (ρ)	0.736***	0.730***	0.344***	0.207***
	(0.046)	(0.047)	(0.600)	(0.036)

Note: Figures in the parentheses are robust standard errors.
*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

4.3.4 Regression Results of Spatial Dependence in Errors

It may be noted that spatial dependence also permeates through the error term. Table 4.5 presents the results of the spatial error dependence model for poverty and literacy. Spatial integration of upazilas was evident through the errors in poverty and literacy both in the eastern and western regions. Thus, an upazila located within the same region is affected by the random shocks to other upazilas. The positive coefficients imply that a 10 per cent increase in the shocks to other upazilas leads to 7.4–8.2 per cent increase in the poverty of the upazila. Similarly, a 10 per cent increase in the shocks to other upazilas leads to 5 per cent increase in the poverty of the eastern upazila. The estimated coefficient was not found precise in the case of western upazilas.

Table 4.5

Results for Spatial Error Model of Poverty and Adult Literacy

	Poverty		Literacy	
	East	West	East	West
Population Density	-0.001	-0.010***	0.000	-0.001*
	(0.001)	(0.004)	(0.000)	(0.001)
Share of Urban Area	-2.839	16.130	7.721	-0.758
	(9.238)	(15.387)	(4.926)	(4.068)
Occupation as Agriculture (%)	-0.234**	-0.112	0.489***	0.882***
	(0.100)	(0.218)	(0.051)	(0.026)
Occupation as Agricultural Wage Labour (%)	0.042	-0.171*	-0.108***	-0.068***
	(0.065)	(0.103)	(0.032)	(0.022)
Concentration of Industries	0.212	1.856	-0.003	0.350
	(0.465)	(1.415)	(0.268)	(0.384)
Adult Literacy	-0.444***	0.148	-	-
	(0.125)	(0.251)	-	-
Head Count Poverty	-	-	-0.110***	-0.002
	-	-	(0.032)	(0.013)
Constant	55.785***	62.789***	22.414***	7.512***
	(5.689)	(8.578)	(2.913)	(1.901)
Spatial Error (λ)	0.819***	0.740***	0.501***	0.143
	(0.044)	(0.046)	(0.083)	(0.104)

Note: Figures in the parentheses are robust standard errors.
*** Significant at 1% level, ** Significant at 5% level, * significant at 10% level.

To conclude, the following key result of this exercise may be highlighted. The eastern and western regions of Bangladesh were found divided both in terms of human sufferings (poverty) and human development (literacy). Within each divides, areas were found to be spatially integrated both through the outcomes and the errors. However, the results of the spatial regressions would have been more appealing should the cases of spatial dependence and spatial errors be treated simultaneously.

Appendix Table

Table 4.1A

Descriptive Statistics of the Key Variables in the Eastern and Western Regions (2001)

	Poverty			Literacy
	All	East	West	Difference
Poverty (2005)	43.686	37.491	49.094	-11.604***
Adult Literacy	29.457	28.916	29.929	-1.013
Population Density	940.052	1047.104	846.600	200.504***
Share of Urban Area	0.048	0.053	0.044	0.009
Occupation as Agriculture (%)	29.760	29.384	30.088	-0.704
Occupation as Agricultural Wage Labour (%)	41.887	40.510	43.089	-2.579**
Concentration of Industries	0.278	0.353	0.212	0.140

Note: *** Significant at 1% level, ** Significant at 5% level.

CHAPTER 5

SUMMARY MESSAGES AND POLICY RECOMMENDATIONS

The East-West divide continues to persist in welfare, but the gap is declining rapidly. The present study attempts to quantitatively capture the persistence of regional welfare gaps, the recent trends of decline in these gaps, and analyse the factors that may have contributed to the reduction of these gaps. The study deploys a range of statistical and econometric techniques to achieve these objectives. In this chapter we present the summary messages of the study as well as a few key policy recommendations that are directly related to the study's findings.

5.1 Summary Messages

5.1.1 Role of Contextual Factors

The study begins by noting several contextual factors that foregrounded the narrowing of the East-West divide in the second half of the 2000s. First, theoretical approaches in the literature on the regional differences in development highlight the role of adverse geography, non-inclusive institutions and lack of policy responses. In the Bangladesh case, we have argued that the assumed presence of such adverse geography and non-inclusive institutions is only partly applicable with respect to the western region, while the role of policies has been most important in reducing regional divide.

Second, the situation in the dimension of adverse geography was already moderated by the dynamics of the last two decades that not only encouraged agricultural growth and specialisation in the West, but also resulted in pro-poor agrarian institutions such as favourable changes in the land-tenure. The economic density factor also increased in the West with the growth of medium and small sized cities, resulting in more diversified economic activities.

Third, adverse geography did not discourage human capital accumulation or human development in broad range of indicators. Remarkably, the West also had the advantage of relatively high initial human development status that compared favourably even with the East—a unique feature not found elsewhere in South Asian lagging-leading region debate.

Fourth, the West also responded very well to the placement of innovative modern institution such as MFI. The concentration of MFIs was actually higher in the West, having further positive influence on human development indicators, especially empowerment of women, and creating the base of small entrepreneurship.

Fifth, the policy responses to the East-West divide were very important factor in reducing the welfare gap between the two regions. Several dimensions of the policy response may be highlighted here. The construction of the *Jamuna Bridge* in 1998 requiring massive public investment is a case in point: the bridge literally connected the West with the East and helped its integration with national and global economic opportunities. There has been an impressive change in within and between region road

connectivity. The inhabitants of the West had increasingly better access to domestic and international economic migration with the improvement in connectivity and information flows. A national labour market has formed in the process of economic growth with migration playing an important role in reducing further the welfare gap between the two regions. The expansion of schooling in the West was also an important policy component, though the quality divide in human capital still persists between the two regions. This is indirectly suggested by the continued higher concentration of the centres of excellence at all levels of education in the East. Given the higher exposure to ecological risks in the West, the public policy of flood protection, disaster mitigation and social protection was also helpful to reduce the environmental vulnerability of the West, thus creating more investment opportunities in the lagging region. All these contextual factors need to be kept in view in interpreting the results of the quantitative exercise. The latter highlights three sets of factors—urbanisation, human capital and migration—as being crucial to understanding the contrasting dynamics of the East-West Divide in welfare.

5.1.2 Role of Urbanisation

With increased economic distance from growth centres welfare of people residing in lagging areas can drop considerably. The quantile regressions results confirm that the *additional* benefits derived from urbanisation by the households from the East were considerably higher compared to the households from the West in all the survey rounds; and this conclusion is valid for households at all quantile levels. This is not surprising due to the presence of two major growth centres, namely Dhaka and Chittagong, in the East. One interesting feature, however, is that the additional effects for residing in urban areas between the two regions *decreased* to only 11 per cent in 2010 down from 17 per cent in 2000. This may be due to increasing congestion diseconomies of urbanisation in the East. For instance, the disadvantage of the "congestion diseconomies" may now erode some of the earlier advantages of the "agglomeration economies" associated with large cities such as Metropolitan Dhaka.

The other possibility is that urbanisation has also become more visible in the West. For example, while urbanisation has accelerated at a remarkably faster pace in the decade of the 2000s at the aggregate level, it has contrasting regional dynamics. The rapid growth in urban population—as per the HIE—Sencompassed not just the eastern (leading) region but also the western (lagging region). Thus, the proportion of population residing in urban areas has increased from 35 per cent to 37 per cent in the East, but rose sharply from 28 per cent to 35 per cent in the West. Clearly, the initial urban edge historically enjoyed by the eastern region has declined remarkably in the decade of the 2000s.

5.1.3 Role of Human Capital

Additional benefits of agglomeration economies in urban areas also create incentives for human capital accumulation. Human capital seems to be a disequalising force contributing to the persistence side of the East-West divide. Two points are noteworthy. First, although access to human capital (endowment) is similar across regions, the returns to human capital are found to be higher in the eastern (leading) region in all HIES rounds

of the 2000s. Second, returns to education for each extra year of schooling have actually increased for the entire sample over the 10-year period covered by these surveys. The incremental gains are higher in the East—earning an *additional* 1.8 per cent return compared to the average pay-off in the West in 2010. The corresponding figure for the additional return to schooling in the East was about 1 per cent. This suggests that the extra pay-off to human capital in the leading region has almost doubled during the 2000s.

This is consistent with the prediction of increasing return economics of human capital in the more urbanised setting. People with the same level of education are likely to have higher incomes in a more urbanised setting. They also have greater chances of income mobility based on human capital by taking the advantage of global economic opportunities that come almost to the urban door-step. This may also capture the effects of residing in the close proximity to the state (as well as private corporate agencies) in terms of getting improved access to information and jobs in the formal sector.

However, only the upper quantiles could reap the benefits of higher returns on human capital in the East. As a result, unequal returns to human capital are one of the main sources of welfare gap across quantiles *within* the eastern region. The contrasting regional pattern is revealed clearly once the returns to human capital by quantiles are calculated separately by leading and lagging regions. The pattern of increasing returns to human capital at the upper quantiles is found valid only for the East. In contrast, the returns to education are similar across quantiles in the West. This suggests that unequal effects of human capital are likely to be an important source of within-sector inequality in the case of the East, but not in the West.

Similarity of educational returns across quantiles in the West and rising educational returns for the upper quantiles in the East also indicate the potential welfare gains for the more educated workers in migrating out of the West. This may create constraints to sustaining accelerated regional growth in the West as the latter looses more educated workers in the process of national growth. The out-migration of more educated workers from the West could have been compensated by increased flow of domestic remittances from the East. This is, however, not borne out by the HIES data for 2005 and 2010. The share of households receiving domestic remittance while sizable at 13 per cent in 2005, dropped further to 12 per cent in 2010.

5.1.4 Role of Migration

The next issue to consider is whether migration to the main growth centres can be an important channel for addressing the challenges of inclusive development for the lagging region. This process is captured by the epithet of “unbalanced growth, balanced development” regionally (World Bank 2009).

As the level of income is higher in the East, workers at all quantile levels migrate from the West and enjoy higher returns on their labour and human capital endowment. If there is no structural constraints to labour mobility between regions, high labour mobility to the East may help to reduce regional dualism through the channel of domestic remittance. The Bangladesh experience provides some supports to this.

In the middle class segment–from 25th to 50th percentiles—the matched returns are higher for the East. This shows the incentives for the moderate poor (falling between the 25th and 50th percentiles) to migrate out of the West. Interestingly, the return to domestic migration for the poorest 5 per cent is also higher in the East, suggesting the benefits to the extreme poor in migrating from the West to the East. The latter may take part in the relatively high growth urban construction and transport activities in the East fueled, in turn, by remittance flows and general linkage effects due to higher growth.

The returns to international migration for each quantile are similar across regions. This is because the pattern of international migration is not dictated by the internal growth dynamics alone; many from the lagging districts have been able to migrate abroad and in increasing numbers. This also indicates the potential for international migration to reduce further the East-West divide.

5.1.5 Endowment vs. Return Effects

In all survey rounds, the regional welfare gap is mostly the result of higher returns to the assets in the East. The endowment differences between the regions had little influence on either the initial persistence or subsequent narrowing of the East-West divide. In fact, some of the asset endowment effects were favouring the lagging region, but the high difference in returns to the assets in the leading region outweighed this endowment edge of the West. For example, the average years of schooling as well as the level of operating land was higher among the western households in 2000; this edge was maintained for the upper quantiles residing in the West in 2010. The average household size—a major determinant of schooling and investment decisions—was consistently lower in the West compared to that in the West in both 2000 and 2010.

Among the return effects, two factors stand out from the policy point of view. In 2010, human capital accounts for 52 per cent of the total effects accruing to the return dimension (coefficient effects); in 2000, such factor was negligible statistically. The other factor is urbanisation, which accounted for 25 per cent of the total return effects in 2000 and 23 per cent in 2010. Together human capital and urbanisation accounted for three-fourth of the total return effects in 2010. This is consistent with the prominent role attributed in the present study to human capital and urbanisation, as discussed earlier.

Among the endowment effects, the unequal access to foreign remittance stands out. Interestingly, the factor of more land availability in the West is an equalising factor (with high statistical significance) working in the direction of reducing regional gap in welfare. However, its quantitative weight in explaining the regional gap is rather modest.

5.1.6 Presence of Neighbourhood Effects

The present study also examined the issue of "neighbourhood effects"—as additional potential force for fostering spatial integration—in the spread of economic development by taking the example of literacy and poverty measured at the upazila level. The results confirm the statistical presence of such effects, which indicates even stronger possibility of faster narrowing down of the regional gaps in economic and social indicators. The process of "catching up" works through the mechanism of social learning and social interaction carried over geographically proximate relatively homogenous communities.

5.2 Policy Recommendations

Several policy suggestions follow from this study. The key idea is to promote further labour and resource mobility over time between the regions. The results re-stress the point of fostering growth in the leading (eastern) region as the main centre of gravity for economic activities, while, at the same time, improving labour mobility from the lagging (western) region. We have identified four sets of policies in this regard that are connected with the results of the study.

5.2.1 Enhancing Incentives for Skill Acquisition

The first set of policies would require improving the quality of human capital to improve the employable skills of population, especially in the lagging region. This will enhance labour mobility within and migration from the lagging to the leading region as well. Broad-based access to human development as well as human capital development across leading and lagging regions in Bangladesh creates favourable economic and social initial conditions in catching up in growth on the part of laggers. However, as mentioned earlier, the returns to human capital are found to be higher in the eastern (leading) region in all HIES rounds of the 2000s, and the extra pay-off to human capital in the leading region has almost doubled during the 2000s.This may be related to the supply side of the human capital formation. One possibility is that the quality of human capital is not the same across the regions. Those in the West, who have the same level of education as the East, may have lower English language proficiency and computer literacy. The regional return differences in human capital may also convey varying demand conditions in the two regions: the lagging may lack adequate job opportunities consistent with the skill attainment. From this observation, two kinds of policy interventions may be considered.

First, the issue of varying schooling quality across the regions needs to be addressed by setting up common standard of teaching method and facilities ensuring improved English language proficiency and computer literacy This relates to technical and vocational education as well.

Second, encouraging diversified economic activities, especially modern industrial and service sector establishments in the lagging region, will generate employment that rewards higher skill attainments and human capital. This will enhance incentives for skill acquisition in the lagging region. This, of course, needs to be done in tandem with the logic of the economic growth process that takes into account the benefits of agglomeration economies, costs of congestion diseconomies, and the imperatives of regionally inclusive development. A disproportionate emphasis on infrastructure investments in the lagging region needs to weigh the potential efficiency loss associated with the neglect of modern infrastructural needs in the eastern region, which is also no less pressing.

5.2.2 Improving Connectivity: Road, Bridge, Gas and Power

The second set of policies would require subsequent improvements in the connectivity of the lagging regions both within and across regions, especially to forge closers alliance with larger urban centres and strategic growth poles.

This will also include investment in infrastructures in the lagging (western region) itself. Admittedly, this strategy needs to be calibrated by the compulsions of maintaining growth momentum at the national level without incurring significant efficiency loss that often comes with blind pursuit of regionally equitable policies. Nevertheless, it is also clear that the room for accelerated growth in the West without distorting the growth process in the East has not been exhausted as yet. The pace of economic diversification—by tapping the full potentials of industrialisation and relocation of industrial units from the East to the West—is particularly held back by the lack of investment in gas and power connectivity in the western region.

The Jamuna Bridge was possibly a prime factor behind the trends of regional growth/poverty convergence that we saw in the second half of the 2000s. A second such strategic initiative in the form of Padma Bridge would have provided further boost to the regional growth in the West. In short, improved urban infrastructure and connectivity through gas, power and bridge would have provided a significant stimulus to the growth of industrialism and service sector growth over and beyond agricultural diversification already happening in the West. Such factors would have encouraged further the growth of medium-sized cities such as Khulna and Bogra, and promoted initiatives that would have integrated the western region better with global and regional economic opportunities.

5.2.3 Promoting Gainful Economic Migration

The potentials for the equalising role of domestic migration/remittance can be further increased through greater inter-regional and inter-city connectivity and rapid mass transit system facilitating temporary (daily) commuting from the West to the East.

Role of international migration was important in reducing the East-West divide. There is a case for potential policy support here to extend financing facility to the poor residing in the lagging regions to enable them to undertake such initiative requiring considerable initial private investment.

5.2.4 Reducing Risks and Vulnerability

The third set of policies relate to undertaking measures that would further reduce risks and vulnerability that mark the West much more than the East. After all, the oft-quoted model of "unbalanced growth-balanced development," based on the model of deliberate human capital accumulation, is premised on some initial investments in reducing risk and uncertainty in the lagging region. Food security as a pre-condition for human capital, for instance, is a case in point. Ensuring food security, which, in turn, would require measures for fertility control and enhanced agricultural productivity, can pave the way for exit from traditional rural occupations and encouraged faster labour mobility in and out of the lagging region.

REFERENCES

Anselin, L. 1988. *Spatial Econometrics: Methods and Models*. Dordrecht, Netherlands: Kluwer Academic Publishers.

———2002. "Under the Hood: Issues in the Specification and Interpretation of Spatial Regression Models." *Agricultural Economics,* 27(3): 247-267.

Banerjee, A. and L. Iyer. 2005. "History, Institutions, and Economic Performance: The Legacy of Colonial Land Tenure Systems in India." *American Economic Review*, 95(4): 1190-1213.

BIDS. 2001. *Fighting Human Poverty: Bangladesh Human Development Report 2001.* Dhaka: Planning Commission/Bangladesh Institute of Development Studies.

Blinder, A. S. 1973. "Wage Discrimination: Reduced Form and Structural Variables." *Journal of Human Resources,* 8(4): 436-55.

Cliff, A. and J. K. Ord. 1981. *Spatial Process: Model and Applications.* London: Pion.

Deichmann, U., F. Shilpi and R. Vakis. 2008. "Spatial Specialization and Farm-Nonfarm Linkages." Policy Research Working Paper 4611. The World Bank, Washington, D.C.

Dev, M., K. S. James and B. Sen. 2002. "Causes of Fertility Decline in India and Bangladesh: The Role of Community." *Economic and Political Weekly*, 37 (43).

Elbers, C., P. Lanjouw, J. Mistiaen, B. Ozler and K. R. Simler. 2005. "Are Neighbors Equal? Estimating Local Inequality in Three Developing Countries." In R. Kanbur and A. J. Venables (eds.), *Spatial Inequality and Development.* Oxford: Oxford University Press, pp. 37-60.

Engerman, S. and K. Sokoloff. 2000. "History Lessons: Institutions, Factor Endowments and Paths of Development in New World." *Journal of Economic Perspectives,* 14(3): 217-232.

Henderson, V. 2000. "The Effects of Urban Concentration on Economic Growth." NBER Working Paper No. 7503.

Hossain, M., B. Sen and Y. Sawada. 2012. "Jobs, Growth and Development: Making of the "Other" Bangladesh." Background paper prepared for the World Development Report 2013: Jobs, Washington, D.C (mimeo).

Geary, R. C. 1954. "The Contiguity Ratio and Statistical Mapping." *Incorporated Statistician*, 5(3): 115–145.

Getis, A. and J. K. Ord. 1992. "The Analysis of Spatial Associations by Use of Distance Statistics." *Geographical Analysis*, 24(3): 189-206.

Kanbur, R. and A. Venables (eds.). 2005. *Spatial Inequality and Development.* World Institute for Development Economics Research, Oxford University Press.

Krugman, P. 1991. "Increasing Returns and Economic Geography." *Journal of Political Economy,* 99 (3): 483-499.

———1999. "The Role of Geography in Development." *International Regional Science Review,* 22 (2): 142-161.

Machado, J. and J. Mata. 2005. "Counterfactual Decomposition of Changes in Wage Distributions Using Quantile Regression Models." *Journal of Applied Econometrics*, 20: 445-465.

Mahmud, W. 2008. "Social Development in Bangladesh: Pathways, Surprises and Challenge." *Indian Journal of Human Development*, 2 (1): 79-91.

Miller, W.L.1977. *Electoral Dynamics in Britain since 1918*. New York: St. Martin's.

Mujeri, M. and B. Sen. 2005, "Economic Growth in Bangladesh, 1970-2000." In K. Parikh (ed.), *Explaining Growth in South Asia*. New Delhi: Oxford University Press, pp. 45-122.

Myrdal, G. 1957. "The Principle of Circular and Cumulative Causation and the Drift towards Regional Economic Inequalities in a Country." In G. Myrdal (ed.) *Economic Theory and Under-Developed Regions.* New York: Harper & Row, pp. 11-38.

Nguyen, B. T., J. W. Albrecht, S. B. Vroman and M. D. Westbrook. 2007. "A Quantile Regression Decomposition of Urban–Rural Inequality in Vietnam." *Journal of Development Economics*, 83: 466-490.

Oaxaca, R. 1973. "Male-female Wage Differentials in Urban Labour Market." *International Economic Review*, 9(3):693-709.

Osmani, S. R. and B. Sen. 2011. "Inequality in Rural Bangladesh in the 2000s: Trends and Causes." *The Bangladesh Development Studies*, 34 (4): 1-36.

Sachs, J. D., A. D. Mellinger and J. L. Gallup. 2001. "The Geography of Poverty and Wealth." *Scientific American*, March: 71-74.

Shahabuddin, Q. 2010, "Unfavourable Environment and Chronic Poverty in Bangladesh.". In Rizwanul Islam, Anirban Das and Lopamudra Banerjee *(eds)Development, Equity and Poverty: Essays in Honour of Azizur Rahman Khan*. Macmillan India, pp. 233-262.

Sen, B. and Z. Ali. 2009. "Spatial Inequality in Social Progress in Bangladesh." *The Bangladesh Development Studies*, XXXII (2).

Sen, B. 2010. "Human Capital, Urbanization, and Ethnicity: Analysis of Regional Inequality in Sri Lanka," Rizwanul Islam, Anirban Das and Lopamudra Banerjee). In *Development, Equity and Poverty: Essays in Honour of Azizur Rahman Khan*, Macmillan India, pp. 144-170.

Sole-Olle, A. 2003. "Electoral Accountability and Tax Mimicking: The Effects of Electoral Margins, Coalition Government, and Ideology," *European Journal of Political Economy*, 19(4): 685-713.

Williamson, J. G. 1965. "Regional Inequality and the Process of National Development: A Description of the Patterns." *Economic Development and Cultural Change,* 13 (4):1-84.

World Bank 2009. *Reshaping Economic Geography: World Development Report 2009.* Washington, D.C.

———2008ba. *Accelerating Growth and Development in the Lagging Regions of India* (Report No. 41101-IN. India, February 21, 2008). Poverty Reduction and Economic Management, Washington, D.C.

———2008b. Bangladesh Povert Assessment for Bangladesh: Creating Opportunities and Bridging the East-West Divide. The World Bank, South Asia Region, Report No. 44321-BD.

Yunus, M. and B. Sen. 2012, "Poverty in the Coastal Region of Bangladesh." Paper prepared for ADB/ NCEAR (mimeo).

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