196

RESEARCH REPORT

Aspirational Momentum: The Development Story of Bangladesh

Tawfiq-e-Elahi Chowdhury
Mahir A. Rahman

Bangladesh Institute of Development Studies (BIDS)

RESEARCH REPORT

ASPIRATIONAL MOMENTUM: THE DEVELOPMENT STORY OF BANGLADESH

Tawfiq-e-Elahi Chowdhury
Mahir A. Rahman

October 2023

BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES

Research Report No. 196

Tawfiq-e-Elahi Chowdhury, BB, PhD
Adviser (Minister) to the Prime Minister
Energy, Power & Mineral Resources Affairs
Government of Bangladesh

Mahir A. Rahman
Research Associate
Bangladesh Institute of Development Studies (BIDS)
Dhaka, Bangladesh

Published by

Bangladesh Institute of Development Studies
E-17, Agargaon, Sher-e-Bangla Nagar
G.P.O. Box No. 3854, Dhaka-1207, Bangladesh
Phone: 880-2-58160430-37
FAX: 880-2-58160410
Website: www.bids.org.bd
E-mail: publication@bids.org.bd

Price: Inland Tk. 100.00 Foreign US$ 10.00

Printed in Bangladesh at DOT Printing & Packaging, 164 Shaheed Sayed Nazrul Islam Sarani (Old 3/2), Purana Paltan, Dhaka-1000.

Contents

List of Tables iv
List of Figures iv
Abstract v
CHAPTER 1 1
INTRODUCTION 1
CHAPTER 2 5
GOING BEYOND CONVENTIONAL EXPLANATIONS 5
CHAPTER 3 7
ASPIRATION AND ECONOMIC TRANSFORMATION: LITERATURE REVIEW 7
CHAPTER 4 11
FROM ASPIRATION TO ASPIRATIONAL MOMENTUM: CONCEPTUAL FRAMEWORK FOR THE PRESENT STUDY 11
CHAPTER 5 15
ASPIRATIONAL MOMENTUM AND THE CASE OF BANGLADESH 15
5.1 Improvement in Child and Maternal Health 15
5.2 Increasing Female Education and Participation 16
5.3 Improvement in Technology, Infrastructure and Diffusion 17
5.4 Fostering Aspirational Momentum: Density as a Potential Facilitator 19
5.5 The Postulates of the Study 20
CHAPTER 6 21
SPECIFICATION OF THE MODEL AND DATA 21
CHAPTER 7 25
RESULTS 25
CHAPTER 8 29
CONCLUDING REMARKS 29
REFERENCES 30
Appendix 34

List of Tables

Table 7.1: Regression Results 25

List of Figures

Figure 1.1: GDP Per Capita (1971-2020) 1
Figure 4.1: Time path of Income Per Capita Across Countries with Different Levels of Aspirational Momentum 13
Figure 5.1: Child (aged under-5) Mortality Rate (per 1000 live births) (1971-2019) 16
Figure 5.2: Gross Secondary Enrolment Rate for Females (2000-2020) 17
Figure 5.3: Access to Electricity (% of total population) 18
Figure 7.1: Predicted Values vs Actual Values of Natural Log of GDP Per Capita (constant 2017 international dollar) for Bangladesh (Specification 1) 26
Figure 7.2: Predicted Values vs Actual Values of Natural Log of GDP Per Ccapita (constant 2017 international dollar) for Bangladesh (Specification 2) 27

Abstract

Background: This report argues that the exemplary development path of Bangladesh can be explained by focusing on family at the core of decision-making.

Conceptual Framework: Families decide on future goals (aspirations) determined by their collective resources, tangible and intangible. Once family-level resource endowments increase, new opportunities open up that would enhance the life-cycle-intergenerational income and welfare of the family. Measures that reduce uncertainties (subjective or objective) and increase future payoffs will reinforce the process of change. The payoffs are also enhanced by access to information on peer-level success, reducing information asymmetry and thus motivating the family towards the new set of goals, and momentum in aspiration builds up recursively. The sequence of change is like an algorithmic process, which is termed "Aspirational Momentum."

Methods: We conduct a fixed-effect estimation of a dataset consisting of 26 countries (middle-income and low-income) for the years 1996 to 2020. We also conduct the Clemente-Montenes-Reyes double Additive Outlier test for unit roots to test for the presence of any structural breaks in the indicators.

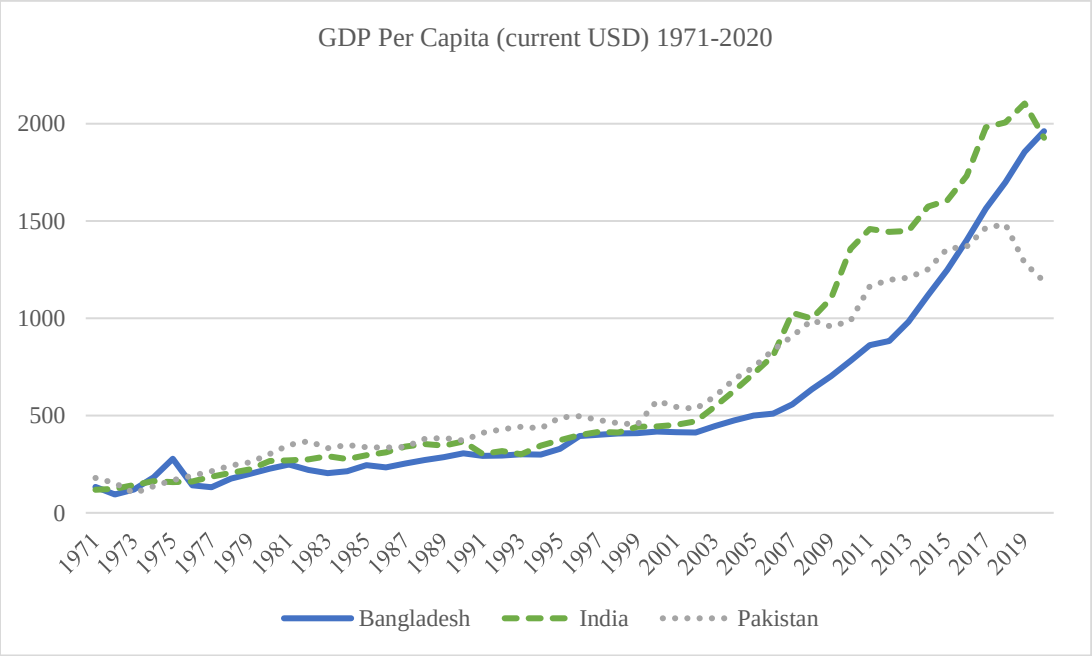
Results: The coefficients show expected signs. We find a negative but not statistically significant impact of child mortality on GDP per capita. The secondary enrolment rate for females and access to electricity have a positive and statistically significant impact on GDP per capita. Population density has a positive impact on GDP per capita, and the result is statistically significant in one specification. Finally, gross fixed capital formation has a statistically significant and positive impact on GDP per capita. We also see some preliminary indications of the presence of structural breaks across these indicators.

Conclusion: The findings of the study affirm that simultaneous and reinforcing interplay of changes at the family level in health, and education, particularly of women, diffusion of technology, and aggregate investment (at the national level) together created a momentum that codetermined income and welfare outcomes over time in Bangladesh.

CHAPTER 1
INTRODUCTION

Development practitioners in the 1970s had pessimistically characterised Bangladesh, with its meagre resource endowments and a large dense population, as a "test case," an experiment that, if successful, could be reassuring for all other developing countries (Faaland & Parkinson, 1976). On the other hand, in recent years, Bangladesh has been quoted as an exemplary success story of development, examined as a case study in rapid economic development (Basu, 2021). It has made a commendable increase in per capita income in a short period of time despite many limitations in other aspects commonly viewed as preconditions for development, leading many to consider the development trajectory of Bangladesh as surprising and an outlier (Figure 1.1) (Asadullah, Savoia, & Mahmud, 2014; Devarajan, 2005, 2008). From being one of the poorest nations at birth in 1971 with a per capita GDP one of the lowest in the world, the country has now graduated to lower-middle-income status in the World Bank ranking.

Figure 1.1: GDP Per Capita (1971-2020)



Source: World Development Indicators, World Bank.

Studies have highlighted the trends of the economic and social indicators of Bangladesh in attempting to explain this unique development story. Asadullah et al. (2014) used aggregate indices of education, health, demographic, and gender equality outcomes to empirically investigate the hypothesis that Bangladesh achieved a higher level of social development compared with countries having a similar level of per capita income. However, the study stops short of explaining the dynamic pathway of development over time.

Alamgir (2021) focused on aspiration as the fifth factor of production beyond land, labour, capital, and technology and argued for the significance of independence of countries in fostering a new set of aspirations. While agreeing with this generality, one could raise the question of the differential developments of such countries across time. For example, India and Pakistan achieved independence in 1947, two and half decades before Bangladesh did, and their incomes per capita were higher than that of Bangladesh in 1971. With much less initial endowments exacerbated by war, Bangladesh caught up with and even overtook them (Figure 1.1).

Sen, Mujeri, and Shahabuddin, (2007) discussed the role of a favourable macro-policy environment, improvement in social sectors, and "social entrepreneurialism" in fostering a pro-poor (even with rising inequality) growth trajectory in the 1990s. First, in terms of macro-policies, trade openness resulted in decent export performance, a large inflow of remittances and the creation of fiscal space for pro-poor public expenditures with an emphasis on the development of rural physical infrastructures. Second, higher allocation for social sectors such as basic education and health with explicit poverty and gender targeting was an important aspect of the social policy during the 1990s. Thirdly, "social entrepreneurialism" through catalysing the developmental roles of community-based organisations (CBOs), non-governmental organisations (NGOs) and civil society organisations (CSOs) have been seen as an important element in the poverty reduction strategy.

Iqbal and Pabon (2018) examine the quality of economic growth of Bangladesh over time. They find that while inequality in income has been increasing, the elasticity of inequality with respect to national income has been declining. It indicates that economic growth has been associated with lesser inequality. Moreover, their findings indicate that income-elasticity of employment has been increasing over time, which questions the phenomenon of "jobless growth" in Bangladesh.

These studies are useful in capturing the whole gamut of changes that have taken place. The changes were associated with fast economic growth, macroeconomic stability, and investment, both public and private. NGOs complemented public policies by designing programs for hard-to-reach people and places. Amartya Sen (2013) commented that

Bangladesh's progress can be understood as a result of state initiatives supplemented by efforts of NGOs and private enterprises. The resilience[1] of people is often mentioned, although it is hard to quantify and investigate empirically (Mujeri & Mujeri, 2020).

However, if an explanatory hierarchical reductionist approach is adopted in understanding the development path of Bangladesh, then the question is raised of how the proximate causes (i.e., the policy-level changes) led to the ultimate cause: how these changes affected people's expectations and aspirations dynamically to propel economic development.[2] Specifically, the studies discussed above have not looked deeper at the interplay of policy interventions, family-level decision-making, and expectations and aspirations driving aggregate development and economic growth.

In this study, we pose the following questions and try to find answers:

- What explains the development story of Bangladesh, which has been termed an outlier in the sense that it challenges the conventional analytical framework and reasoning?
- What is the process that explains differential pathways of development, and how has Bangladesh attained momentum compared to its peers?

The study is organised as follows. Chapter 2 discusses the need to go beyond conventional explanations to understand Bangladesh's development story. Chapter 3 summarises the literature on the interplay of aspiration and economic transformation. Chaper 4 and Chapter 5 describe the conceptual framework and the postulates of the study in the context of Bangladesh, respectively. Chapter 6 describes the specification of the models and the data used for the empirical analysis. Chapter 7 elaborates on the results. Chapter 8 concludes the study.

[1]Taleb (2012) defines resilience as the capacity to resist shocks. Resilient people are neither harmed nor benefitted by shocks. On the other hand, Taleb distinguishes between 'resilience' and 'anti-fragility' to note that anti-fragile people or systems resist as well as benefit from experiencing adverse shocks.

[2]The explanatory hierarchical reductionist approach holds that complex entities and concepts are best explained in terms of entities and concepts only one level down the hierarchy; these in turn may be explained in terms related to one level further down, and so on. This approach involves making distinctions between proximate (or immediate) causes and ultimate causes (Wilkinson & Klaes, 2012). For example, in explaining the economic development of Bangladesh, we may conclude that policies conducive to increasing remittances, earnings from RMG export, etc. were significant factors. These would be the proximate causes at the economic level of hierarchy. We can then ask how these policies interacted to bring about a change in people's behaviour, expectations and aspirations. Seeking answers to these questions would require the analysis to adopt an ethno-economic approach at another level down the hierarchy.

CHAPTER 2

GOING BEYOND CONVENTIONAL EXPLANATIONS

An oft-quoted criticism of the focus on economic growth in terms of per capita GDP is that the indicator measures only one dimension of economic well-being, namely income. However, the impressive aspect of Bangladesh's growth path is that there has been considerable progress simultaneously in terms of other dimensions of economic development, such as poverty reduction, life expectancy, child mortality, access to basic drinking water services, secondary enrolment rate for females, etc. Bangladesh has improved faster along the human development indices compared to its peers (Figures 5.1–5.3). These are testimonies of a broad-based inclusive development in Bangladesh. Such pathways of income growth, along with gains in broad measures of human welfare, have not been investigated holistically in the historic accounts of modern economic development.

Most macroeconomic analyses trying to unravel the development process start with aggregates. For example, macroeconomic studies emphasise the significance of investment in economic growth (Khan & Reinhart, 1990). There are two important shortfalls in such an approach. First, there is an upper limit to such an estimate, as a very high investment may squeeze out current disposable income and, consequently, consumption, which is an important driver of economic growth. Second, the inter-country variations in investment GDP ratios are inadequate to explain the significant differences among countries in achieving economic growth and improvements in human welfare. These statistical numbers are artificial constructs and sacrifice the richness embedded in individual bits of information crucial for understanding the process of decision-making at the family level. Such approaches based on faceless aggregation are inherently "condescending" and do not have built-in empathy. In the words of Kenneth Arrow- "Any society, democratic or not, must have as a root element degree of mutual obligation and some sense of respect for every individual, however low he may wind up in the hierarchy" (Arrow, 1985). It is in this spirit that this study designs its postulates and conceptual framework centering around family-level gains and the recursive process resulting in what has been termed aspirational momentum.

CHAPTER 3

ASPIRATION AND ECONOMIC TRANSFORMATION: LITERATURE REVIEW

The role of aspiration in the economic transformation of nations has been studied at various levels in the literature. An early proponent of the economic significance of the "aspiration effect" was Sir James Steuart, who argued that an increase in the level of aspiration has an aspiration effect stimulating the supply of effort. Eagly (1961) defined the “aspiration effect” as an increase in the average product of labour resulting from an increase in the population's level of aspiration for material goods. He argues that as the economists increasingly focused on capital stock, capital-output ratio, and capital accumulation in explaining economic development, discussions on the effects of aspiration were relegated from the central focus of the literature.

Recently, however, there has been a resurgence of focus on the important role of aspiration in the process of development. Appadurai (2004) examined the “complex relationship” of the poor and the marginalised people to the cultural regime within which they function through the lens of “capacity to aspire.” While aspiration is partially determined by individual preferences and choices, Appadurai argues that it is primarily determined by the broader interactions occurring within a societal context and cultural norms. The capacity to aspire is thus navigational in the sense that those belonging to the higher echelons of society can utilise the map of its norms to explore the future more frequently and more realistically and share this knowledge with one another more routinely. On the other hand, the poorer people in society have a narrower horizon of aspirations because they lack the opportunities to utilise this navigational capacity. Appadurai’s arguments thus illustrate the importance of expanding the information set for the poor and fostering connectivity among them so that they can acquire knowledge about the success of their peers.

Unlike Appadurai (2004), Ambrose (2003) analyses aspiration from an individual’s perspective. He defines aspirations as strong desires for the achievement of ideals that hold great value for an individual. Ambrose also defines aspirational momentum as the accelerating growth of aspirations over time. This momentum emerges from a track record of early success experiences that convinces individuals of the strength and worthiness of their abilities. Aspirational momentum subsequently promotes further capacity development and substantially improves the chances for propulsion through the barriers toward higher levels of self-fulfilment.

Barriers, as well as catalysts to aspiration development, have also been explored in the literature. Some categorisations of the barriers include (a) segregation, stigmatisation, and material deprivation in racist and classist societies; (b) intellectual and opportunity deprivation stemming from unequal access to quality education; and (c) lack of career opportunity deriving from gender discrimination in patriarchal societies or families. On the other hand, Douglass (2010) argues the catalyst role of higher education in building a culture of aspiration (the freedom and the means to better themselves, to advance their knowledge, skills, and position in society) and, in turn, the formation of human capital, the promotion of social, economic mobility, and for determining national economic competitiveness.

The importance of aspiration in explaining uneven growth has been emphasised in the works of Ray and Genicot (Ray, 2016; Genicot & Ray, 2020). Genicot and Ray (2020) note two features of aspiration in relation to individual preferences. First, the distribution of characteristics in the "cognitive neighbourhood" of an individual shapes their ambitions and goals, which in turn affects the evaluation of their investment choices. Second, these goals are summarised in the form of a reference point or aspiration anchoring individual utility functions, but that reference point changes as societal distributions change. In Appadurai (2004), we see the reflection of this in the discussion of aspiration as a navigational capacity, as we pointed out above. Similar to the 'cognitive window' or Appadurai's ''navigational capacity to aspire,'' the idea of ''aspirational window'' denotes the relevant group that shapes members' aspirations. In other words, in forming their own aspirations, people tend to look at the experiences of individuals who are connected to them through similar occupational categories, backgrounds, or demographic categories (Genicot & Ray, 2017).

From the above discussion, some overarching features of aspiration emerge as defined by previous works. The ideas of an aspiration window, a threshold of equilibrium aspiration value, and access to information on success stories are common among most discussions on aspiration.[3] Moreover, related concepts have also been discussed in other areas, especially the importance of networks and social ties. For example, Kim and Bearman (1997) developed a model of Critical Mass Theory of occurrence of collective actions based on the assumption

[3]The notion that individuals utilise information about others' experiences is not a novel concept in economics. For example, related ideas can be found in the form of "conspicuous consumption," "animal spirit," "keeping up with the Joneses", etc. (Veblen, 1899; Keynes, 1937). However, the concept of aspiration discussed in this report is different in that we do not focus on envy or status-seeking, nor do we view aspiration as 'a spontaneous urge to action rather than inaction' (Keynes, 1937). Our view is that aspiration is a result of a conscious decision-making process followed by the individual who uses others' experiences to inform his own aspirations centering around his family.

that people respond to the decisions of their peers with whom they have a network tie. Collective actions occur if there is a strong enough network between participants with a high interest in the occurrence of that action. Gould (1993) argues along similar lines to assert that the greater the network density (i.e., the greater the number of ties between individuals), the greater the total contribution to the public good. Ohlemacher (1996) focuses on networks and develops the concept of mobilisation-mediating social networks called "relays." He invokes the concept of ''Social relays,'' which connect previously unconnected networks, acting as brokers or transmitters of contacts between strangers or groups of strangers, form the immediate environment, organisational background, or institutional grounding of several face-to-face networks, and in some cases, generate new networks by charging preexisting contacts in a new way. Social relays thus spread mobilisation to networks outside themselves.

Finally, discussions centering around momentum or acceleration have also been evoked in other disciplines, termed variably as critical mass, tipping points, etc. (Gladwell, 2012). In nuclear physics, for example, critical mass is defined as the minimum amount of fissile material required to create a self-sustaining fission reaction. Oliver and Marwell (2001) note the assumption of an accelerative dynamic where cooperation fosters more cooperation. This assumption is utilised in influence models. The cross-disciplinary uses of such concepts hold our contemplations on aspirational momentum in good stead.

In the next chapter, we develop the conceptual framework of aspirational momentum, which shares some of the features discussed in this chapter.

CHAPTER 4

FROM ASPIRATION TO ASPIRATIONAL MOMENTUM: CONCEPTUAL FRAMEWORK FOR THE PRESENT STUDY

Focusing on changes at the family level, we argue that at any given time, a family decides on future goals (aspirations) determined by its available resources, tangible and intangible. Once family-level resource endowments increase, new opportunities open up that would enhance the life-cycle and intergenerational income and welfare of the family. Stagnant family-level resource endowments would have the opposite effects.

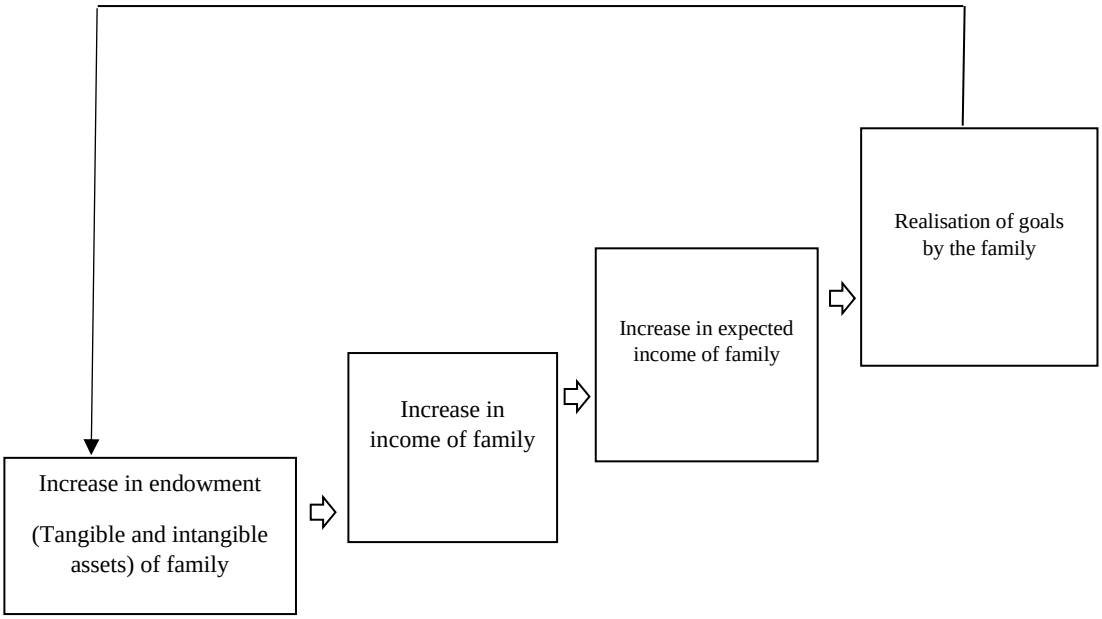
Even with an increase in family resources, sustainability would require other changes to take place concurrently. Uncertainties about the future may hold back further progress. Thus, measures that reduce uncertainties (subjective or objective) and increase future payoffs will reinforce the process of change. For example, access to information on peer-level success would motivate families toward a new set of goals. If supportive changes take place in the known environment, uncertainty is further reduced, payoff is increased, and the domain of decision-making is extended in time across generations. In the absence of such measures, the process of change will not be sustained, may slow down, or even stall.

Success in achieving proximate new goals feeds into the decision-making process and increases the confidence of the family in the new pathway. If the course is not disrupted (sudden death, health expenses, income loss, or other shocks can slow down or even roll back the process), momentum in aspiration builds up recursively, and goals are reset in the ongoing process. This can also be influenced and strengthened by changes in exogenous income or other resources (for instance, remittance from abroad, land distribution) or expectations thereof. The sequence of change is like an algorithmic process, which we have termed as Aspirational Momentum.[4]

In this study, we focus on the endogenous process at the family level, which is initiated and strengthened over time through the lens of aspirational momentum. A schematic presentation of the workings of aspirational momentum is given below:

[4] In Physics, momentum is defined as the vector sum of the products of mass and velocity of each particle in the system.

Schematic Presentation of Aspirational Momentum: A Recursive Process



National-level income and welfare are mere aggregations of those of the families. Thus, interventions designed and focused on enhancing family welfare and income can unleash a sustained process of positive changes, which would show up in aggregate statistics at the national level. From this perspective, income and welfare are co-determined (Genicot & Ray, 2017).

To explain the inter-country differences in growth trajectories and transformational processes, we assume that the time path of income per capita varies with aspirational momentum. Typically, the higher the aspirational momentum, the faster will be the growth path. However, momentum becomes a less significant determinant at high levels of income per capita. Thus, we assume that income per capita follows an S-shaped path over time, which implies that countries with higher momentum will reach their inflex ion point in terms of income per capita faster than countries with lower levels of momentum.

Figure 4.1: Time-path of Income Per Capita Across Countries with Different Levels of Aspirational Momentum

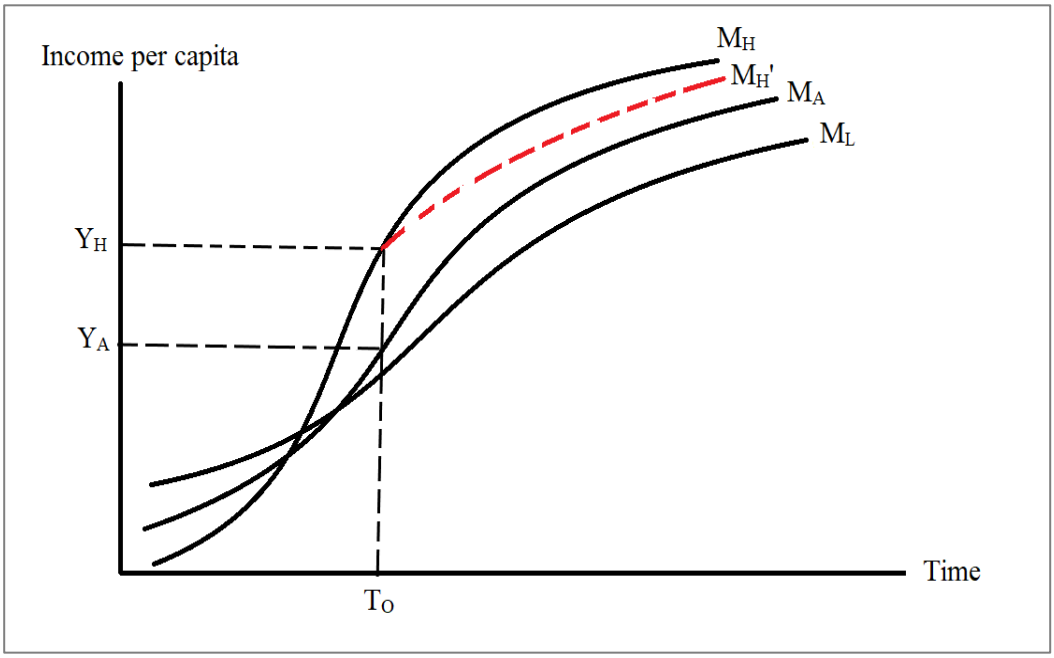


Figure 4.1 illustrates the growth path of income per capita over time across countries with different levels of aspirational momentum. For each point in a given curve, the level of momentum is the same. Different curves are associated with different levels of momentum. For example, the curves labelled M_H, M_A, and M_L show a high momentum path, an average momentum path, and a low momentum path, respectively. We postulate that countries that can attain higher momentum achieve both faster and higher growth in income per capita compared to countries where aspirational momentum is low. Thus, even countries starting with a relatively lower income per capita but leveraged by higher momentum can eventually cross countries with higher income per capita with a lower-level momentum. The push in income per capita provided by aspirational momentum is likely to taper off in the longer term as the process will be held back by technological, environmental, and other resource constraints. Lastly, any shock, either external or internal, can cause the income path to be derailed temporarily or permanently such that a high-momentum country can experience slower growth in income per capita, as illustrated by the curve labelled $M_{H'}$.

CHAPTER 5

ASPIRATIONAL MOMENTUM AND THE CASE OF BANGLADESH

The present empirical study argues that a sequence of reinforcing changes is at the heart of the development of Bangladesh.[5] These changes worked through a nexus at the family level of better health outcomes (child and maternal mortalities besides other public health benefits), opportunities for education (females in particular) and women empowerment, social mobility, enhanced scope for employment and technological changes, as outlined by the postulates in the previous Chapter. Together, they brought about aspirational momentum.

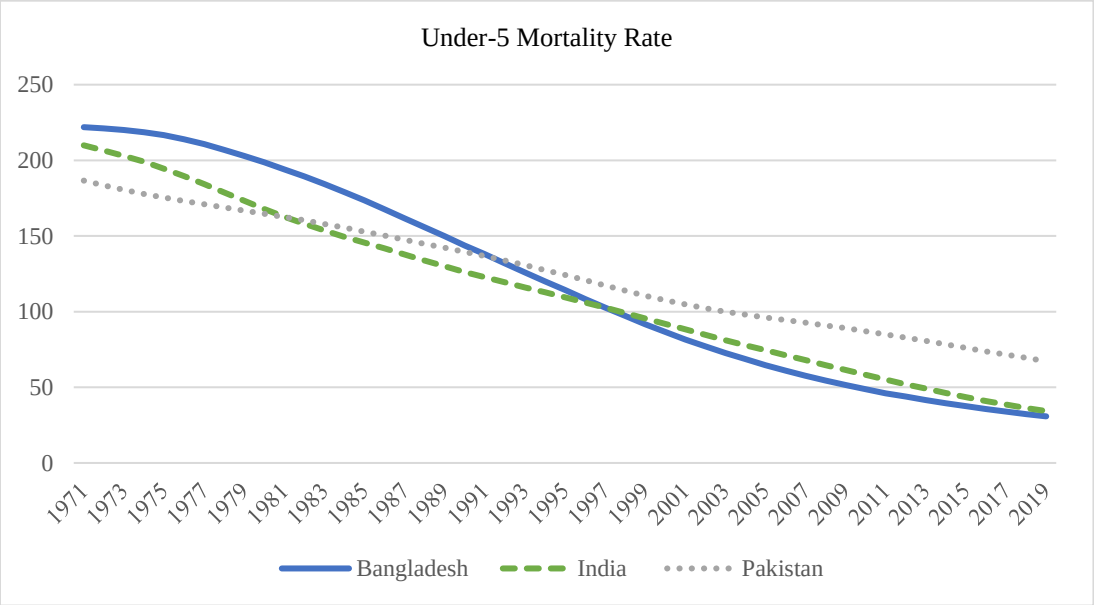
5.1 Improvement in Child and Maternal Health

A fast reduction in child mortality (Figure 5.1) impacted family-level welfare and income in distinct and significant ways: fewer births were needed to reach the expected family size; mothers were relieved of unwanted pregnancies, thereby reducing both material and emotional costs of achieving the desired family size; choices beyond the reach of such families were opened up by opportunities for education, mobility and expected higher income when they turn adult.

The postulated changes are reflected in the relevant statistics: child mortality rate (per 1000 live births) in Bangladesh has declined from 140 in 1990 to 31 in 2019. Unwanted pregnancies (wanted later or unwanted) declined from about 33 percent in 1993-94 to 21 per cent in 2017-18. At the same time, the mean ideal number of children among ever-married women has remained almost unchanged, from 2.5 in 1993-94 to 2.3 in 2017-18. Importantly, the mean ideal family size is somewhat higher among women with no education (2.5 children) than among women with secondary education or higher (2.1 children).

[5]A personal experience of the first author can set the tone for the analysis that follows in this chapter: "Sometime back, I visited a burnt-out shanty in Dhaka to try to help the residents. They were in dire straits with no place for shelter and hardly anything to eat. Improvised plastic roofs were put up as temporary shelters and a few gruel kitchens to feed the residents. Interestingly, the next help they were asking for was books for their children that had been burnt. Incidentally, all the residents were sending their kids to school, irrespective of sex. The family size was small too. The preference of these poor people on the margin speaks of a powerful process that had been unleashed. Their aspirations around their children had undergone a transformation, which would impact their family size and expected life cycle income (Cain, 1982; Nugent, 1985). The process is likely to be passed on to the next generation, thus building a momentum for change. I had a similar experience during my visits to other shanties."

Figure 5.1: Child (aged under-5) Mortality Rate (per 1000 live births) (1971-2019)

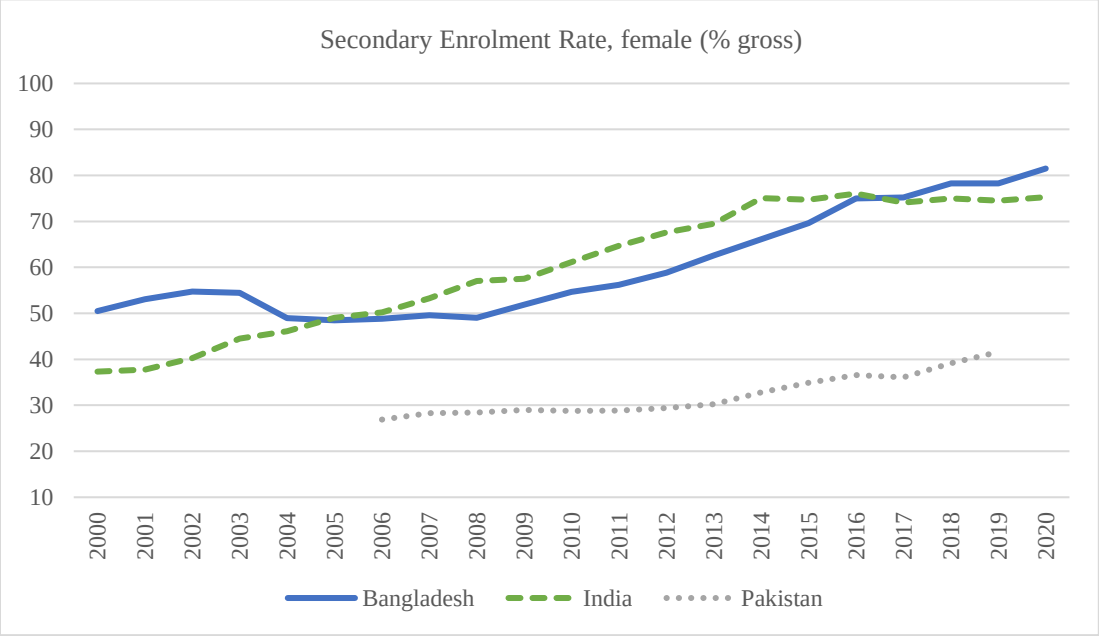


Source: World Development Indicators, World Bank.

5.2 Increasing Female Education and Participation

Attitudinal change towards education is evidenced in enrolment in primary school and, more importantly, in girls' secondary enrolment (Figure 5.2). The steady increase in the enrolment of girls in secondary school reflects a transformational change in attitude towards the status of girls in the family (sex preference) and as future bread earners. The increase in participation of women in the labour force in general and their dominance in the garment industry in particular generated cash income for the family and reinforced future expectations. This process also ushered in social mobility (Copestake & Camfield, 2010), which was aided by the absence of structural impediments, such as classism, racism, etc. Given the ethnic homogeneity and a compact society, these attitudinal changes were quickly adopted by communities (Amin, 2022; BDHS Reports).

Figure 5.2: Gross Secondary Enrolment Rate for Females (2000-2020)

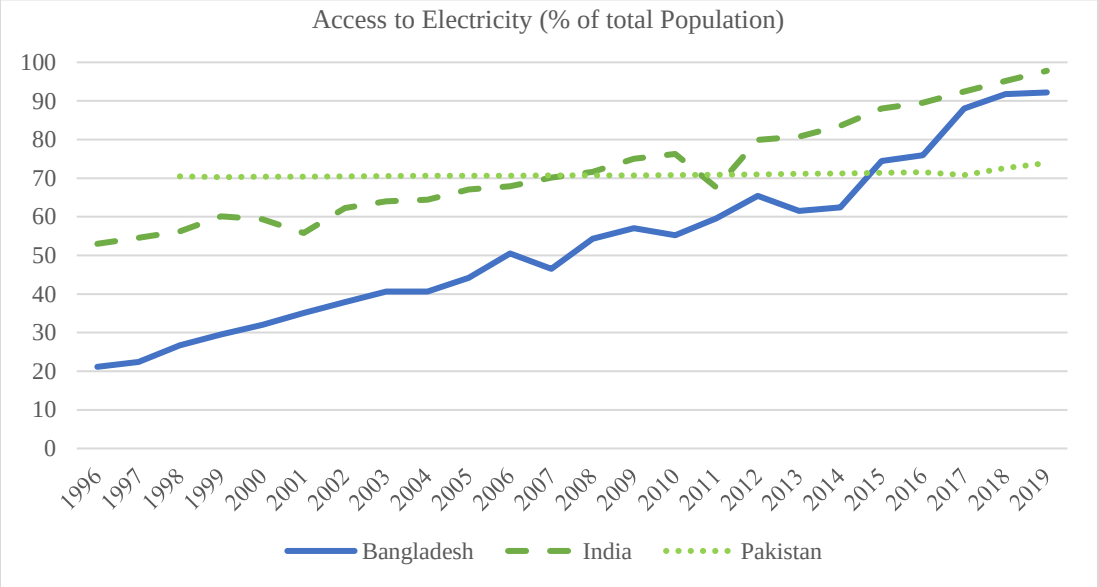


Source: World Development Indicators, World Bank.

5.3 Improvement in Technology, Infrastructure, and Diffusion

In parallel, new and diverse opportunities for earning income were leveraged by infrastructure developments and other macro interventions (power, transport, communication), technological changes, and adoption of best practices. Access to electricity has increased rapidly in the 2010s (Figure 5.3). At the same time, the number of active mobile subscribers has increased from about 87 million in 2012 to approximately 181 million in 2021 (BTRC). These increases fostered connection and communication among community members, enhancing livelihood and income (Copestake & Camfield, 2010). Sharing information about higher income (both current and expected) changes the risk profile and reduces risk perception, both subjective and objective, in input and output markets. In addition, the expansion of safety net programs provided additional income and a degree of security for the most vulnerable population.

Figure 5.3: Access to Electricity (% of total population)



Source: Data collected from various national sources.

This, in turn, facilitates the transition to new choices through technology diffusion and adoption. For instance, agricultural innovations are facilitated, as communities start sharing experiences, which reduces the learning cost of and asymmetry of information regarding new technologies and best practices; market information of both inputs and outputs are quickly shared, which leads to a snowball process; social capital is enhanced due to interdependence among actors; information on employment of girls in the garment sector is quickly passed on to peers raising expectation about increased cash income and mobility. Access to digital technology builds further aspirational momentum.

These hypothesised changes are supported by previous studies. Assessing the effects of explosive growth in the Bangladeshi readymade garments industry on the lives of Bangladeshi women, Heath and Mobarak (2015) find that girls exposed to the garment sector delay marriage and childbirth. They attribute this development to two factors. Firstly, young girls become more likely to be enrolled in school after employment opportunities in garment factories are created, and secondly, older girls become more likely to be employed outside the home in garment-proximate villages. In another study, David and Foray (2020) discuss the role of knowledge-sharing in driving innovations and economic changes. They identify knowledge-based communities as agents of economic change: “Knowledge-based activities emerge when people, supported by information and communication technologies, interact in concerted efforts to co-produce (i.e., create and exchange) new knowledge.” (p.5). The process of diffusion of technology and innovation has three main components: i) a significant number

of a community's members combine to produce and reproduce new knowledge (diffuse sources of innovation); ii) the community creates a "public" space for exchanging and circulating the knowledge; and iii) new information and communication technologies are intensively used to codify and transmit the new knowledge.

5.4 Fostering Aspirational Momentum: Density as a Potential Facilitator

The changes discussed above led to a new set of ASPIRATIONS entering the family calculus of decision-making. These benefits can be summarised as "income" and "aspiration" effects. The first order changes that increase the direct and indirect incomes of the family are "income effects." Once the changes are set in motion, the aspirations of families undergo transformation based on optimism about family size and future benefits that could be harnessed across generations. We term them "aspiration effects". The relative strength of the two determines the pathway. Even with a small income effect but a strong aspiration effect, the process of change can be sustained. The contrary is also true.

The process of transformation is strengthened and facilitated and gains momentum in a compact population. Population density is an endowment that is determined by the size of a country and its population. While population growth is seen as a drag on infrastructural developments, density may have the opposite effect. In other words, for the same amount of investment in infrastructure, higher population density may amplify benefits by reducing cost per person and expediting other spin-off benefits like information sharing, technology diffusion, and leveraging social capital. Klasen and Nestmann (2006) argue that higher population density raises the returns to innovation and compensates for the disadvantage of having fewer inventors in absolute terms. In addition, it leads to a higher speed of communication, which fosters the creation and diffusion of new knowledge. A larger market size also facilitates a finer division of labour and, thus, greater internal trade in goods and ideas and lowers the per capita fixed costs for the creation of infrastructure necessary for technological progress. The importance of social capital in engendering economic change has also been noted in the literature. Fukuyama (1996) has argued that the absence of social capital[6] inhibits people's ability to exploit economic opportunities. Besides the demographic dividends, Bangladesh, the most densely populated large country in the world, can harness the benefits of density. Thus, it is argued that density is a dividend[7] for enhancing income and social prosperity, thereby building aspirational momentum.

[6] Social capital is defined as the ability of people to work together for common purposes in groups and organisations (Fukuyama, 1996; Coleman, 1988; Putnam, 1993, 2001).

[7] Arguably, there is a flip side of this dividend. A dense community fosters communicable diseases, stress, information sharing of harmful ideas and practices, crime and social violence. It is assumed that at the initial phase of development, the adverse consequences of population density are outweighed by the benefits.

5.5 The Postulates of the Study

The sequence of changes hypothesised above can be summarised into the following postulates:

i. Family-level decision-making is dominantly influenced initially by infant/child (leveraged by other public health improvements). Since the two sets of variables are closely related, the study took child mortality as the proxy.

ii. Expectation about the future is influenced by opportunities. Education is the first-order precondition for realising the opportunities that become relevant in the domain of decision-making. For the present study, secondary school enrolment of girls (% gross) has been chosen as a proxy exploratory variable for the change mechanism; participation of girls in education and consequent empowerment and mobility into the formal sector are also captured in the process.

iii. In the early stage of development, access to electricity (% of the population) is a transformational experience as a community moves out of darkness to light. More directly, it ushers and facilitates new opportunities for social and economic developments and other spin-off benefits through technology diffusion, particularly in the rural sector.

iv. Decision-making is also influenced by peer experiences and sharing. A dense population makes the family learning process, including technology diffusion and adoption of best practices, easier and faster. Population density (per square kilometer) has been included to capture the process.

v. Finally, aggregate investment in infrastructure at the national level impacts family-level decisions by enhancing the prospects of income and domain of expectation. Thus, investment/GDP percentage at the national level has been selected as an explanatory variable.

Variables i-v together explain income level and, through expectation, future changes in income and levels thereof.

CHAPTER 6

SPECIFICATION OF THE MODEL AND DATA

This is essentially a study influenced by an ethno-economic approach and is grounded with a granular focus on family-level income and the realisation of expected changing goals. It argues that in developing countries (in most situations, developed countries, too), family is at the core of decision-making. An attempt is made to understand Bangladesh's economic development by unravelling the determinants of family decision-making, expectations, aspirations, and the sequence of events that are unleashed once opportunities are made evident (the absence of this process would limit development). Expectations are realised, once the process is set in motion, recursively generating aspirational momentum.

It is difficult in any computable model to capture the organic process of societal changes originating from decision-making at the family level. It is further complicated in any inter-country comparison.[8] Under generalised assumptions of homogeneity in families within a country and across countries and across time, this study attempts a heuristic investigation to establish inter-country validation of family-level decision-making and changes as the primary driver of economic and social development. We conducted a panel-data regression analysis to test our hypothesis that the explanatory variables (as described in Chapters 4 and 5) affect the GDP per capita (constant 2017 international dollar). The dataset included 26 countries (middle-income and low-income as classified by the World Bank) that have grown reasonably well[9] in terms of GDP per capita in recent times (Appendix Table A2). In order to capture the dynamics of the growth process of these countries, we included data from 1996 to 2020 (a total of 25 years). The general specification for a panel data model can be expressed by the following equation:

$$y_{i,t} = \alpha_i + X'_{i,t}\beta + u_{i,t} + \varepsilon_{i,t} \quad (1)$$

with i (i=1,...,N) denoting countries, and t (t=1,...,T), denoting years, and $X'_{i,t}$ the observation of K explanatory variables in country i and year t. It should be noted that α_i is time-invariant and accounts for any country-specific effect not included in the regression equation. Two different interpretations may be given to the α_i, and consequently, two different methods may be distinguished. If the α_i's are assumed to be correlated with the explanatory variables $X'_{i,t}$, then the fixed-effects method is utilised to estimate the model expressed by

[8] For a comprehensive overview of the issues involved with measuring multidimensional aspiration, see Bernard & Taffesse (2014) and Copestake & Camfield (2010).

[9] Countries that ranked high in terms of per capita GDP (constant 2015 USD) growth rate during 2010-18.

equation (1). On the other hand, if the α_i's are assumed to be uncorrelated with the explanatory variables, then the random effects method is used.

We conducted two tests to choose between Random Effect (RE) and Fixed Effect (FE) estimates. First, the usual Hausman test is performed under the null hypothesis that there are no systematic differences between the RE and FE estimates so that the RE model is consistent. Second, another test is based on the fact that the random effects estimator uses the additional orthogonality conditions that the regressors are uncorrelated with the group-specific error α_i, i.e., E ($X_{i,t}$*α_i) = 0. These additional orthogonality conditions are overidentifying restrictions. The test is implemented using the artificial regression approach described by Arellano (1993) and Wooldridge (2010). Under conditional homoskedasticity, this test statistic is asymptotically equivalent to the usual Hausman fixed-vs-random effects test; with a balanced panel, the artificial regression and Hausman test statistics are numerically equal. Unlike the Hausman version, however, this test extends straightforwardly to heteroskedastic- and cluster-robust versions and is always guaranteed to generate a nonnegative test statistic. Both test results indicate that the fixed effect estimate is appropriate for our model. The equation then becomes:

$$y_{it} - \overline{y_i} = (x_{it} - \overline{x_i})\beta + (\varepsilon_{it} - \overline{\varepsilon_i})$$

where y_{it} = natural logarithm of GDP per capita (constant 2017 international dollar) for country i at year t. The explanatory variables are i) natural logarithm of population density, ii) gross fixed capital formation (% of GDP), iii) secondary enrolment rate for females (% gross), iv) access to electricity (% of the total population), and v) under-5 mortality rate (per 1000 live births).

Before we describe our regression results, a discussion is warranted regarding our model specification in the broader context of growth empirics. Several problems plague the literature of empirical growth analysis. First, growth theories are not explicit enough about which independent variables belong in the "true" regression (Sala-i-Martin, 1997). In a regression analysis combining various explanatory variables, a particular variable x_1 will soon be found to be significant when the regression includes variables x_2 and x_3, but it becomes statistically insignificant when x_4 is included. Since the "true" variables that should be included are not known, one is left with the question: "What are the variables that are really correlated with growth?" (Sala-i-Martin, 1997).

Durlauf (2001) argues in the same vein by noting that growth theories are fundamentally open-ended, implying that the "truth' of one theory (in the sense that the theory embodies a distinct causal explanation of growth) has no necessary bearing on the truth of another. For

example, the accuracy of the statement that trade openness bears a causal relationship to growth says nothing about the accuracy of the statement that distortionary government taxes reduce growth or the statement that democratic institutions facilitate growth. As many factors plausibly matter for growth, identification of appropriate instruments that are correlated with the explanatory variables in the regression equation explaining growth and uncorrelated with the model's residuals is difficult. Durlauf (2001) also points out other issues, such as the problem of assuming constant parameters across countries at different stages of development. Durlauf, Johnson, and Temple (2005) elaborate along similar lines.

Another problem is that there exists a strong theoretical argument that at least a subset of the explanatory variables should be expected to be endogenous. Two sources of endogeneity are important; one is unobserved heterogeneity, and the other is 'reverse causality' (the effect of Y on X). These problems can be solved by using a panel-data, general method-of-moments estimator (Caselli, Esquivel, & Lefort, 1996; Leszczensky & Wolbring, 2022; Arellano & Bond, 1991; Arellano & Bover, 1995; Blundell & Bond, 1998). Leszczensky and Wolbring (2022) summarise the limitations of the traditional estimators in the presence of unobserved heterogeneity and reverse causality quite well. Specifically, the Lagged First Difference (LFD) model accounts for both time-invariant unobserved heterogeneity and reverse causality by relaxing the strict exogeneity assumption and only requiring sequential exogeneity. As shown by Vaisey and Miles (2017), however, the LFD model only provides unbiased estimates if the effect of X on Y is indeed fully lagged, thus being prone to specification error. Finally, the Arellano-Bond (AB) and Maximum Likelihood Structural Equation Model (ML-SEM) models also perform well in case of time-invariant unobserved heterogeneity and/or reverse causality, the latter of which is achieved by assuming sequential rather than strict exogeneity. However, it is an open question whether these models are also sensitive to the specification of temporal lags, i.e., if the effect of X on Y is not fully lagged as captured by the observed data.

CHAPTER 7

RESULTS

Keeping the limitations described in the previous chapter in mind, we considered a fixed effect estimation method adjusted for heteroscedasticity. We considered two specifications: one in which the data for secondary enrolment rate for females have been interpolated for countries with a substantial number of missing values. We considered a simple linear method for interpolating the missing values. Our justification for utilising interpolated values is that since trends in aggregate indicators are interlinked with many other bits of crucial information and are relatively stable, interpolations are less likely to be random. Table 7.1 shows the regression results.

Table 7.1: Regression Results

Variables	Natural log of GDP per capita (constant 2017 international dollar)	Natural log of GDP per capita (constant 2017 international dollar)
Child (Under-5) mortality rate (per 1000 live births)	-0.000413	-9.79e-05
	(0.00121)	(0.00146)
Secondary enrolment rate for females (% gross) [10]	0.00731***	
	(0.00244)	
Secondary enrolment rate for females (% gross)		0.00583***
		(0.00125)
Access to electricity (% of total population)	0.00567**	0.00569**
	(0.00268)	(0.00246)
Natural log of population density	0.343	0.693*
	(0.356)	(0.377)
Gross fixed capital formation (% of GDP)	0.0107**	0.0101***
	(0.00404)	(0.00320)
Constant	6.071***	4.560***
	(1.426)	(1.620)
Observations	524	379
R-squared	0.753	0.847
Number of c_id	26	26

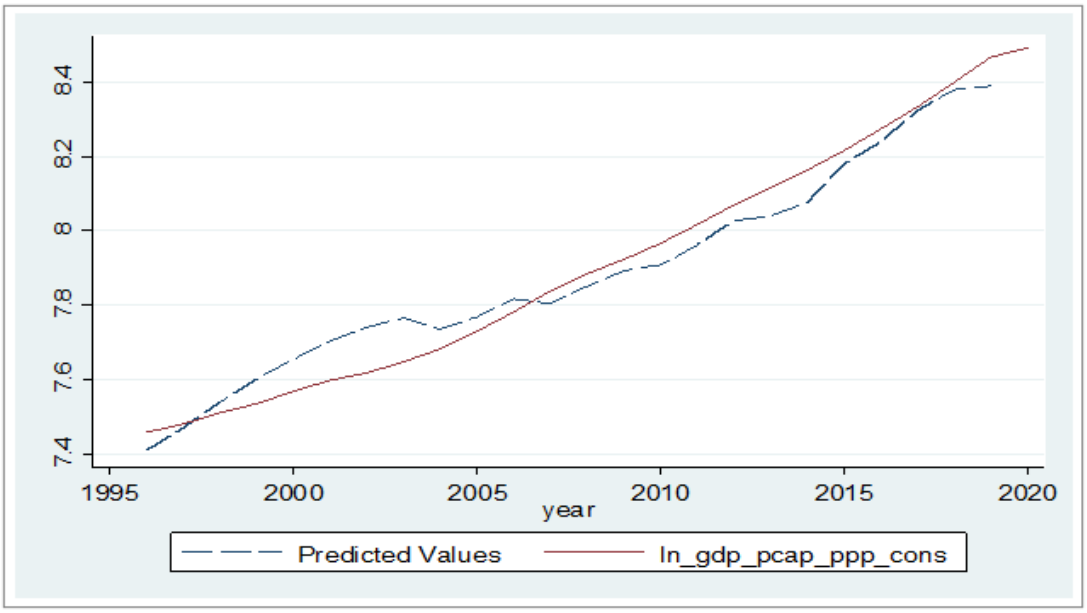
Robust standard errors are in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculations.

[10] This variable contains interpolated data for missing values

The coefficients show the expected signs, i.e., the effects of the explanatory variables on the dependent variable (GDP per capita) are in line with our hypotheses. Child mortality has an expected negative impact on GDP per capita. However, this finding is not statistically significant. Next, we find a statistically significant and positive impact of the secondary enrolment rate for females on GDP per capita. Access to electricity also has the hypothesised positive and statistically significant impact on GDP per capita. Interestingly, we find a positive impact of population density on GDP per capita, and the result is statistically significant in the case of specification 2 (without interpolated values for female education). Finally, gross fixed capital formation (% of GDP) has a positive effect, and the coefficients are statistically significant.

Figure 7.1: Predicted Values vs Actual Values of Natural Log of GDP Per Capita (constant 2017 international dollar) for Bangladesh (Specification 1)

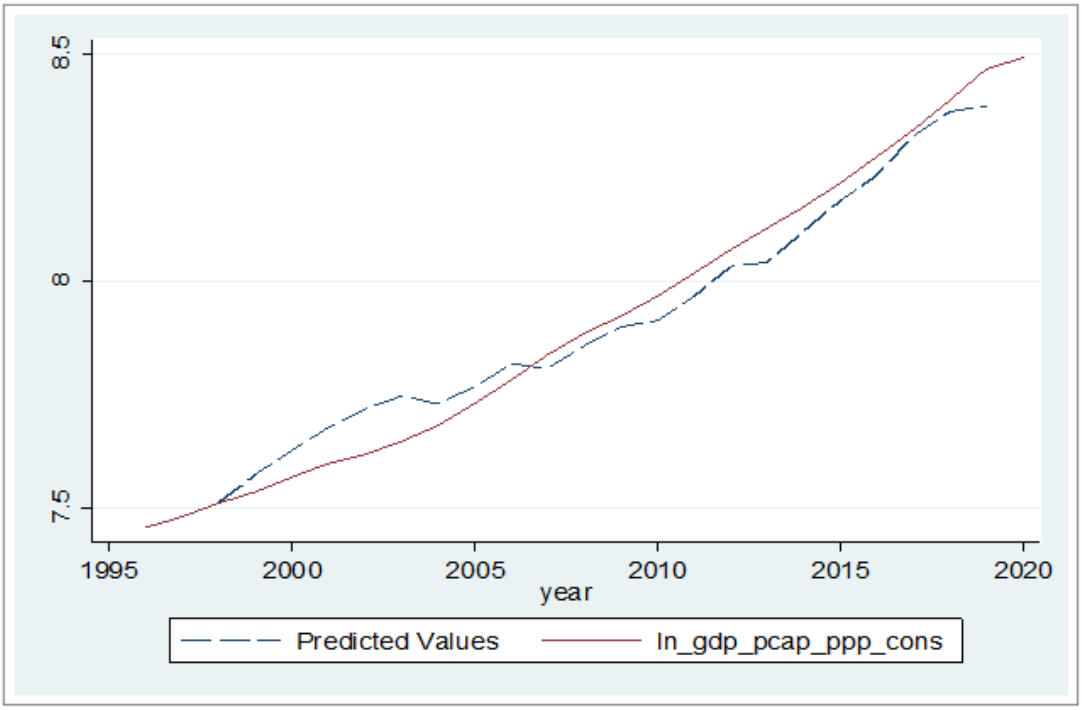


Source: Authors' calculations.

In the second step of our analysis, we computed the predicted values of the natural logarithm of GDP per capita (constant 2017 international dollar) for Bangladesh from the two sets of regression equations and compared them with the actual values (Figure 7.1 and Figure 7.2). As we can note, the predicted values of the log of GDP per capita are higher than actual values until around 2007, and then actual GDP values start getting higher than predicted values. This income path establishes two points. First, compared to the average experience of the group of countries under study, Bangladesh started from a low level of income and crossed the predicted income at some point by a process of momentum. Secondly, the overall convex

shape of the graph of actual GDP per capita values implies that Bangladesh is still at an upward trajectory of aspirational momentum and has yet to reach the inflexion point, lending plausibility to the hypothesised relationship between aspirational momentum and an S-curve-shaped time path of income per capita as delineated in Chapter 4.

Figure 7.2: Predicted Values vs Actual Values of Natural Log of GDP Per Ccapita (constant 2017 international dollar) for Bangladesh (Specification 2)



Source: Authors' calculations.

Finally, in order to explore whether the trend in the indicators of economic development under consideration experienced any changes in patterns, we conduct the Clemente-Montenes-Reyes (CMR) double Additive Outlier test for unit roots to test for the presence of any structural breaks in the series on an exploratory basis (Clemente, Montañés, & Reyes, 1998). We see some preliminary indications of the presence of such breaks, which require further analysis. The figures are provided in the Appendix.

CHAPTER 8

CONCLUDING REMARKS

The study is an attempt to unravel the development process in general and, in particular, the remarkable development story of Bangladesh. We argue that it has been marked by aspirational momentum, driven by measures that increased current income and payoffs in the future and mitigated uncertainties and risks at the family level; the changes in "income" and "aspiration" were transmitted across generations. The findings affirm that simultaneous and reinforcing interplay of changes at the family level in health and education, particularly of women, their empowerment, diffusion of technology, and aggregate investment (at the national level) together create a momentum that codetermined income and welfare outcomes over time in Bangladesh.

It is relevant to map back to policies and programs that made the difference and Bangladesh an outlier. A quick review reveals unique and innovative public policies that can be attributed to changes in family choices in an algorithmic sequence with realised goals building aspirational momentum. The process was possibly leveraged by what we have termed "density dividend." Follow-up research on the details of the policies adopted during this period that influenced family-level decision-making to build the aspirational momentum, evaluated in a micro ethno-economic framework, may help understand the process in greater depth.

REFERENCES

Alamgir, M. (2021). Aspiration, freedom and growth [Keynote Speech]. Annual BIDS Conference on Development 2021.

Amin, S. (2022). How have women contributed to Bangladesh's Development?

Ambrose, D. (2003). Barriers to aspiration development and self-fulfillment: Interdisciplinary insights for talent discovery. *Gifted Child Quarterly*, *47*(4), 282-294. DOI: https://doi.org/10.1177%2F0016986203047004 05

Appadurai, A. (2004). The capacity to aspire: Culture and the terms of recognition. In: *Culture and public action*, edited by V. Rao and M. Walton. World Bank, pp. 59–84.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2), 277-297. DOI: https://doi.org/10.2307/2297968

Arellano, M. (1993). On the testing of correlated effects with panel data. *Journal of Econometrics*, *59*(1-2), 87-97. DOI: https://doi.org/10.1016/0304-4076(93)90040-C

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, *68*(1), 29-51. DOI: https://doi.org/10.1016/0304-4076(94)01642-D

Arrow, K. J. (1985). Distributive justice and desirable ends of economic activity. In *Issues in Contemporary Macroeconomics and Distribution* (pp. 134-156). London: Palgrave Macmillan UK. DOI: https://doi.org/10.1007/978-1-349-06879-1_3

Asadullah, M. N., Savoia, A., & Mahmud, W. (2014). Paths to development: Is there a Bangladesh surprise? *World Development*, *62*, 138-154. DOI: http://dx.doi.org/10.1016/j.worlddev.2014.05.013

Basu, K. (2021). The Bangladesh Economy: Navigating the Turning Point. *Innovations: Technology, Governance, Globalization*, *13*(1-2), 28-40. DOI: https://doi.org/10.1162/inov_a_00281

BBS. (2018). *Labour Force Survey 2016-17*. Dhaka: Bangladesh Bureau of Statistics (BBS). Accessed from:http://www.bbs.gov.bd/site/page/111d09ce-718a-4ae6-8188-f7d938ada348/%E0%A6%B2%E0%A7%87%E0%A6%AC%E0%A6%BE%E0%A6%B0-%E0%A6%8F%E0%A6%A8%E0%A7%8D%E0%A6%A1-%E0%A6%87%E0%A6%AE%E0%A6%AA%E0%A7%8D%E0%A6%B2%E0%A7%9F%E0%A6%AE%E0%A7%87%E0%A6%A8%E0%A7%8D%E0%A6%9F

Bernard, T., & Taffesse, A. S. (2014). Aspirations: An approach to measurement with validation using Ethiopian data. *Journal of African Economies*, *23*(2), 189-224. DOI: https://doi.org/10.1093/jae/ejt030

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115-143. DOI: https://doi.org/10.1016/S0304-4076(98)00009-8

Cain, M. (1982). Perspectives on family and fertility in developing countries. *Population Studies*, *36*(2), 159-175. DOI: 10.1080/00324728.1982.10409026

Caselli, F., Esquivel, G., & Lefort, F. (1996). Reopening the convergence debate: A new look at cross-country growth empirics. *Journal of Economic Growth*, *1*, 363-389. DOI: https://doi.org/10.1007/BF00141044

Clemente, J., Montañés, A., & Reyes, M. (1998). Testing for a unit root in variables with a double change in the mean. *Economics Letters*, *59*(2), 175-182. DOI: https://doi.org/10.1016/S0165-1765(98)00052-4

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, *94*, S95-S120. DOI: https://doi.org/10.1086/228943

Copestake, J., & Camfield, L. (2010). Measuring multidimensional aspiration gaps: A means to understanding cultural aspects of poverty. *Development Policy Review*, *28*(5), 617-633. DOI: https://doi.org/10.1111/j.1467-7679.2010.00501.x

Durlauf, S. N. (2001). Manifesto for a growth econometrics. *Journal of Econometrics*, *100*(1), 65-69. Accessed from: home.uchicago.edu/sdurlauf/includes/pdf/Durlauf%20-%20Manifesto%20for%20Growth%20Econometrics.pdf

Durlauf, S. N., Johnson, P. A., & Temple, J. R. (2005). Growth econometrics. *Handbook of Economic Growth*, *1*, 555-677. DOI: https://doi.org/10.1016/S1574-0684(05)01008-7

David, P., & Foray, D. (2020). *An introduction to the economy of the knowledge society*. University of Oxford. Available from: https://ora.ox.ac.uk/objects/uuid:e710170f-46d4-4af2-bbf3-542f14777450

Devarajan, S. (2005). South Asian surprises. *Economic and Political Weekly*, 4013-4015. Accessed from: https://www.jstor.org/stable/4417133?seq=1

Devarajan, S. (2008). Two comments on "governance indicators: where are we, where should we be going?" by Daniel Kaufmann and Aart Kraay. *The World Bank Research Observer*, *23*(1), 31-36. DOI: https://doi.org/10.1093/wbro/lkn001

Douglass, J. A. (2010). Creating a culture of aspiration: Higher education, human capital and social change. *Procedia-Social and Behavioral Sciences*, *2*(5), 6981-6995. DOI: https://doi.org/10.1016/j.sbspro.2010.05.050

Eagly, R. V. (1961). Sir James Steuart and the "Aspiration Effect." *Economica*, *28*(109), 53-61. DOI: https://doi.org/10.2307/2550453

Faaland, J., & Parkinson, J. R. (1976). A development perspective for Bangladesh. *The Bangladesh Development Studies*, *4*(1), 49-66. Accessed from: https://www.jstor.org/stable/40794118?seq=1

Fukuyama, F. (1996). *Trust: The social virtues and the creation of prosperity*. Simon and Schuster.

Genicot, G., & Ray, D. (2017). Aspirations and inequality. *Econometrica*, *85*(2), 489-519. DOI: https://doi.org/10.3982/ECTA13865

Genicot, G., & Ray, D. (2020). Aspirations and economic behavior. *Annual Review of Economics*, *12*, 715-746. DOI: https://doi.org/10.1146/annurev-economics-080217-053245

Gladwell, M. (2012). *The tipping point: How little things can make a big difference*. Little, Brown.

Gould, R. V. (1993). Collective action and network structure. *American Sociological Review*, 182-196. DOI: https://doi.org/10.2307/2095965

Heath, R., & Mobarak, A. M. (2015). Manufacturing growth and the lives of Bangladeshi women. *Journal of Development Economics*, *115*, 1-15. DOI: http://dx.doi.org/10.1016/j.jdeveco.2015.01.006

Iqbal, K., & Pabon, M. N. F. (2018). Quality of growth in Bangladesh. *The Bangladesh Development Studies*, *41*(2), 43-64. https://www.jstor.org/stable/27031075

Keynes, J. M. (1937). The general theory of employment. *The Quarterly Journal of Economics*, *51*(2), 209-223.

Khan, M. S., & Reinhart, C. M. (1990). Private investment and economic growth in developing countries. *World Development*, *18*(1), 19-27. DOI: https://doi.org/10.1016/0305-750X(90)90100-C

Kim, H., & Bearman, P. S. (1997). The structure and dynamics of movement participation. *American Sociological Review*, 70-93. DOI: https://doi.org/10.2307/2657453

Klasen, S., & Nestmann, T. (2006). Population, population density and technological change. *Journal of Population Economics*, *19*(3), 611-626. DOI: https://doi.org/10.1007/s00148-005-0031-1

Leszczensky, L., & Wolbring, T. (2022). How to deal with reverse causality using panel data? Recommendations for researchers based on a simulation study. *Sociological Methods & Research*, *51*(2), 837-865. DOI: https://doi.org/10.1177%2F0049124119882473

Mitra, S. N., Nawab Ali, M., Islam, S., Cross, A. R., & Saha. T. (1994). *Bangladesh demographic and health survey, 1993-1994*. Calverton, Maryland: National Institute of Population Research and Training (NIPORT), Mitra and Associates, and Macro International Inc.

Mujeri, M. K., & Mujeri, N. (2020). *Bangladesh at fifty: Moving beyond development traps*. Springer International Publishing. DOI: https://doi.org/10.1007/978-3-030-56791-0

National Institute of Population Research and Training (NIPORT), Mitra and Associates, & ORC Macro. (2005). *Bangladesh demographic and health survey 2004*. Dhaka, Bangladesh and Calverton, Maryland [USA]: National Institute of Population Research and Training, Mitra and Associates, and ORC Macro.

National Institute of Population Research and Training (NIPORT), Mitra and Associates, & Macro International. (2009). *Bangladesh demographic and health survey 2007*. Dhaka, Bangladesh and Calverton, Maryland, USA: National Institute of Population Research and Training, Mitra and Associates, and Macro International.

National Institute of Population Research and Training (NIPORT), Mitra and Associates, & ICF International. (2013). *Bangladesh demographic and health survey 2011*. Dhaka, Bangladesh and Calverton, Maryland, USA: NIPORT, Mitra and Associates, and ICF International.

National Institute of Population Research and Training (NIPORT), & ICF. (2020). *Bangladesh demographic and health survey 2017-18*. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT and ICF.

Nugent, J. B. (1985). The old-age security motive for fertility. *Population and Development Review*, 75-97. DOI: https://doi.org/10.2307/1973379

Ohlemacher, T. (1996). Bridging people and protest: Social relays of protest groups against low-flying military jets in West Germany. *Social Problems*, *43*(2), 197-218. DOI: https://doi.org/10.2307/3096998

Oliver, P. E., & Marwell, G. (2001). Whatever happened to critical mass theory? A retrospective and assessment. *Sociological Theory*, *19*(3), 292-311. DOI: https://doi.org/10.1111/0735-2751.00142

Putnam, R. (1993). The prosperous community: Social capital and public life. *The American Prospect*, *13*(Spring), Vol. 4. Available online: https://prospect.org/infrastructure/ prosperous-community-social-capital-public-life/

Putnam, R. (2001). Social capital: Measurement and consequences. *Canadian Journal of Policy Research*, *2*(1), 41-51. Accessed from: https://www.alnap.org/system/files/ content/ resource/files/main/1825848.pdf

Rahman, R. I., & Islam, R. (2013). *Female labour force participation in Bangladesh: trends, drivers and barriers*. New Delhi, India: International Labour Organization, DWT for South Asia and Country Office for India.

Ray, D. (2016). Aspirations and the development treadmill. *Journal of Human Development and Capabilities*, *17*(3), 309-323.

Sala-i-Martin, X.. (1997). I just ran two million regressions. *The American Economic Review*, *87*(2), 178-183. DOI: 10.3386/w6252

Sen, A. (2013). What's happening in Bangladesh? *The Lancet*, *382*(9909), 1966-1968. DOI: https://doi.org/10.1016/S0140-6736(13)62162-5

Sen, B., Mujeri, M. K., & Shahabuddin, Q. (2007). Explaining pro-poor growth in Bangladesh: Puzzles, evidence, and implications. *Delivering on the Promise of Pro-Poor Growth*, 79.

Taleb, N. N. (2012). *Antifragile: Things that gain from disorder* (Vol. 3). Random House Trade Paperbacks.

Vaisey, S., & Miles, A. (2017). What you can—and can't—do with three-wave panel data. *Sociological Methods & Research*, *46*(1), 44-67. DOI: https://doi.org/10.1177%2F0049124114547769

Veblen, T. (1899). *The theory of the leisure class: An economic study in the evolution of institutions*. New York: Macmillan.

Wilkinson, N., & Klaes, M. (2012). *An introduction to behavioral economics*. 2nd edition.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT Press.

Appendix

Table A1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Natural log of GDP per capita (2017 international dollar)	750	8.738	0.901	6.573	10.356
Natural log of population density	750	4.112	1.338	0.976	7.143
GFCF (% of GDP)	680	23.333	6.848	2.1	44.519
Female secondary enrolment rate (% gross)	522	69.028	25.971	7.455	148.034
AE	670	68.238	30.463	1.028	100
Child (Under-5) mortality rate per 1000	750	50.507	39.709	6.2	224.5

Hausman (1978) specification test

	Coef.
Chi-square test value	28.327
P-value	0

Test of overidentifying restrictions: fixed vs random effects

Cross-section time-series model: xtreg re robust cluster(c_id)

Sargan-Hansen statistic 10.037 Chi-sq(5) P-value = 0.0742

Table A2: List of 30 Countries Used in Regression Analysis

Sl.	Country	Income Status (World Bank Classification)
1.	China	UMIC
2.	Myanmar	LMIC
3.	India	LMIC
4.	Bangladesh	LMIC
5.	Rwanda	LIC
6.	Ghana	LMIC
7.	Turkey	UMIC
8.	Philippines	LMIC
9.	Dominican Republic	UMIC
10.	Indonesia	LMIC
11.	Nicaragua	LMIC
12.	Cote d'Ivoire	LMIC
13.	Nepal	LMIC
14.	Guyana	UMIC
15.	Bolivia	LMIC
16.	Congo, Dem. Rep.	LIC

(Contd. Table A2)

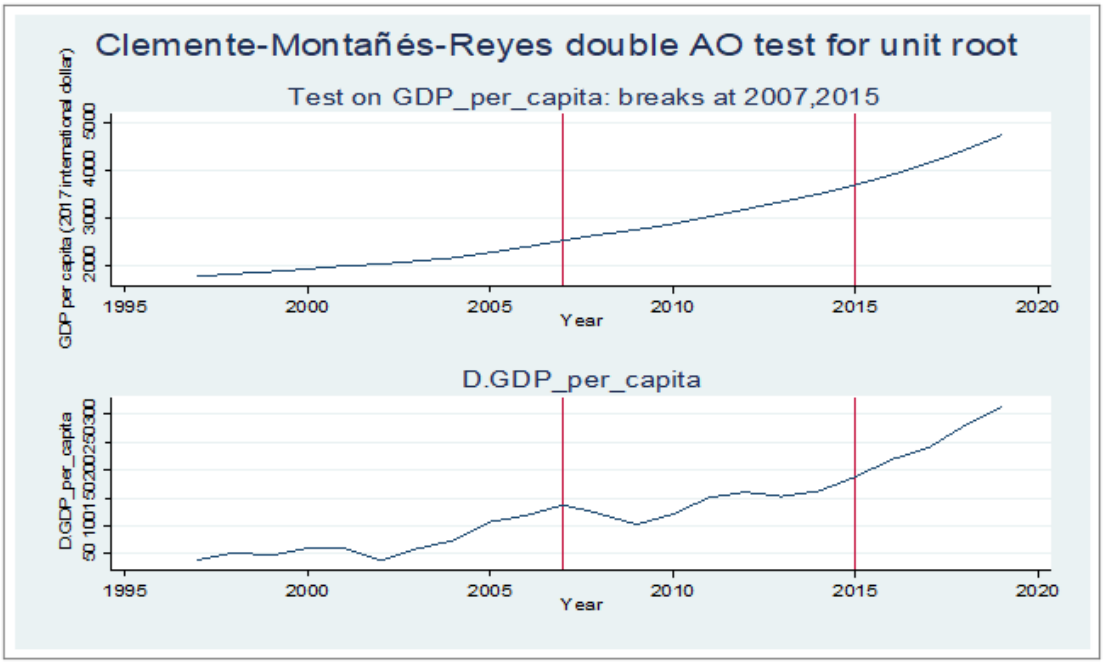
Sl.	Country	Income Status (World Bank Classification)
17.	Malaysia	UMIC
18.	Papua New Guinea	LMIC
19.	Peru	UMIC
20.	Colombia	UMIC
21.	Costa Rica	UMIC
22.	Thailand	UMIC
23.	Kenya	LMIC
24.	Botswana	UMIC
25.	Paraguay	UMIC
26.	Burkina Faso	LIC

Source: World Bank

*LMIC= Lower Middle Income Countries, UMIC= Upper Middle Income Countries, LIC= Low Income Countries

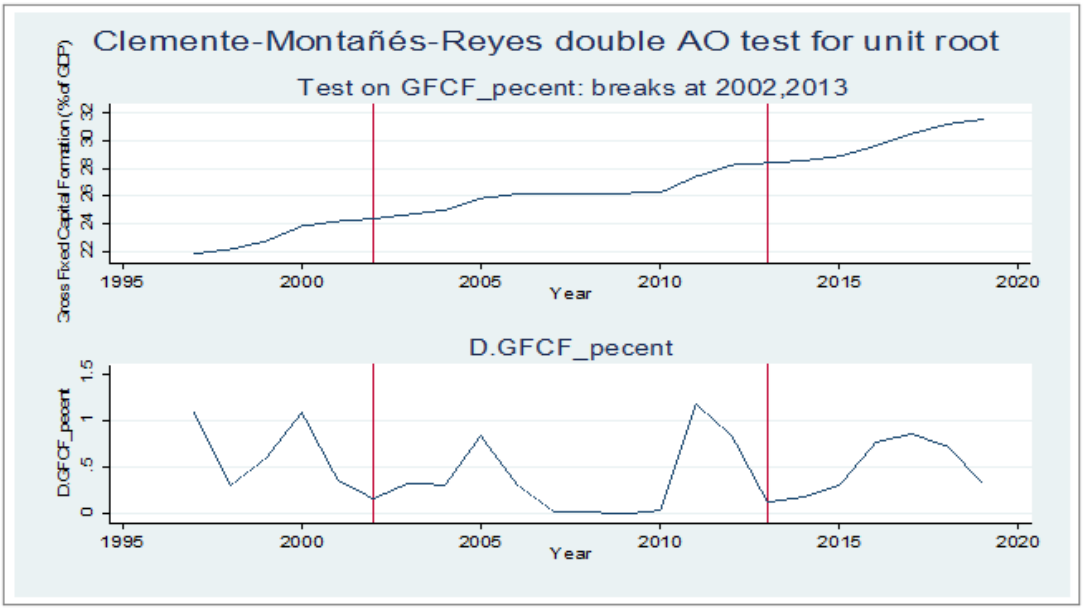
Note: These countries maintained a high per capita GDP growth (GDP per capita (constant 2015 USD) during the years 2010-18.

Figure A1: Structural Break Test for GDP Per Capita (constant 2017 international dollar) (CMR double Additive Outlier Test)



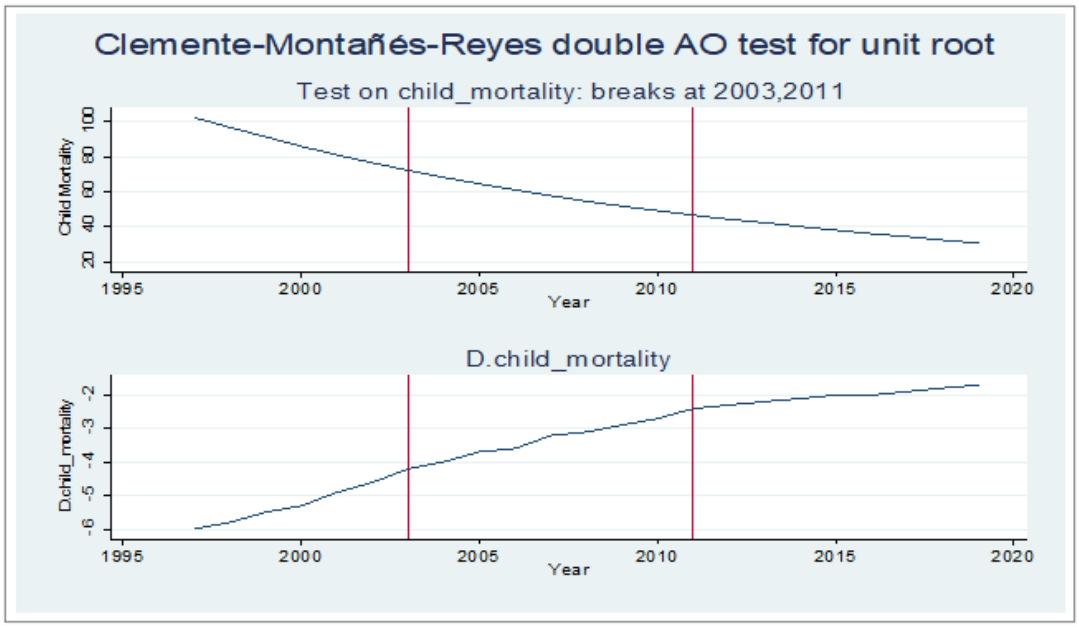
Source: Authors' calculations.

Figure A2: Structural Break Test for Gross Fixed Capital Formation (% of GDP)
(CMR double Additive Outlier Test)



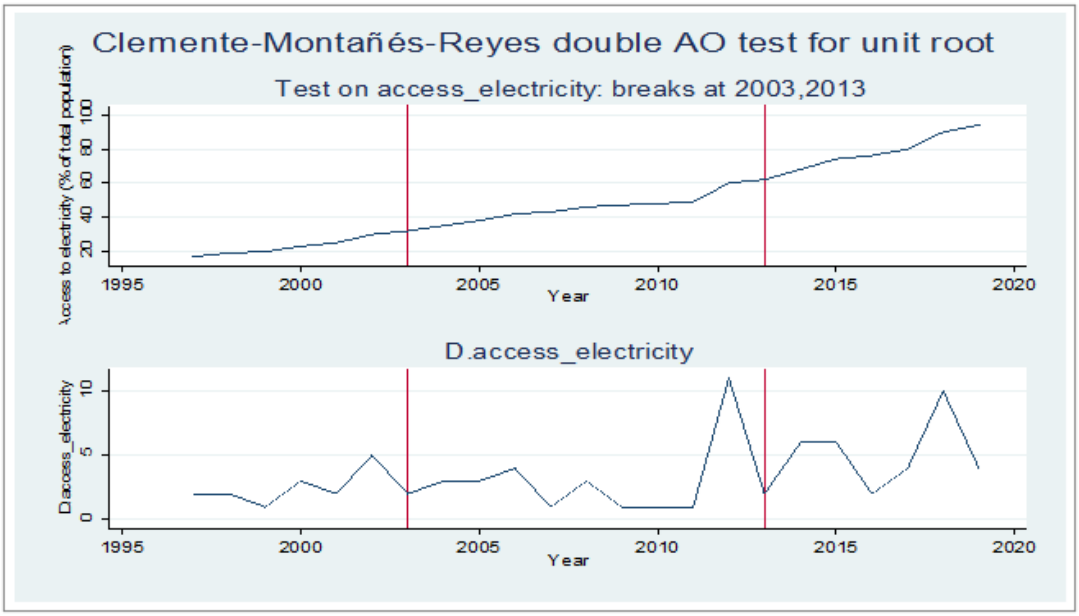
Source: Authors' calculations.

Figure A3: Structural Break Test for Child Mortality
(CMR double Additive Outlier Test)



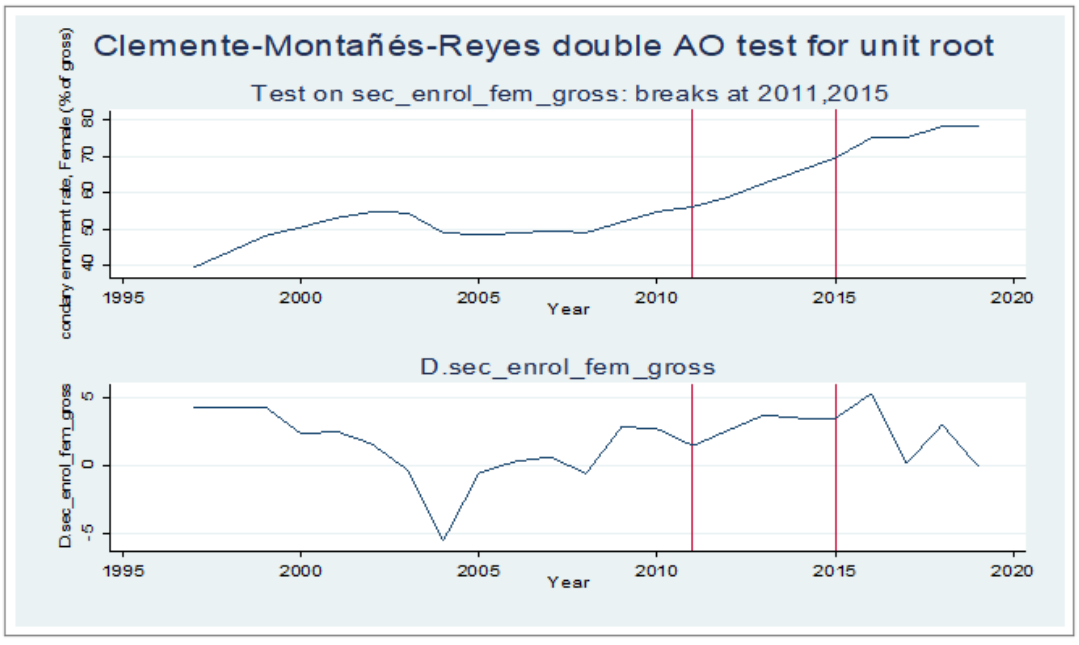
Source: Authors' calculations.

Figure A4: Structural Break Test for Access to Electricity (% of total population)
(CMR double Additive Outlier Test)



Source: Authors' calculations.

Figure A5: Structural Break Test for Secondary Enrolment Rate for Females (% gross)
(CMR double Additive Outlier Test)



Source: Authors' calculations.

Bangladesh Institute of Development Studies
E-17, Agargaon, Sher-e-Bangla Nagar, Dhaka-1207, Bangladesh
Tel: 88 02 58160430-37, Email: info@bids.org.bd, Web: www.bids.org.bd