BANGLADESH

Photo: Tara Simpson

Inclusive Growth Diagnostic

June 2014

BANGLADESH
Inclusive Growth Diagnostic

USAID and DFID Inclusive Growth Diagnostic Team – Bangladesh
Euan Davidson, DFID
Anastasia de Santos, USAID
Yoon Lee, USAID
Nathan Martinez, USAID
Caroline Smith, USAID
Takele Tassew, USAID

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BBL/D – Barrels per day
BDBP – Bangladesh Power Development Board
BGD – Bangladesh
BIDS – Bangladesh Institute of Development Studies
BNPI – Basic Needs Price Index
BOP – Balance of payments
CPI – Consumer Price Index
CPIA – Country Policy and Institutional Assessment
DFIs – Development finance institutions
DPDT – Department of Patents, Designs, and Trade Marks
ECI – Export Complexity Index
EPI – Environmental Performance Index
EPZ – Export processing zone
EU – European Union
FCBs – Foreign commercial banks
FDI – Foreign Direct Investment
FSAP – Financial Sector Assessment Program
FY – Fiscal Year
GCI – Global Competitiveness Index
GDP – Gross Domestic Product
GNI – Gross national income
GOB – Government of Bangladesh
HDI – Human Development Index
HIES – Bangladesh's Household Income and Expenditures Survey
HRV – Hausmann, Rodrik, Velasco
IC – Investment Climate
ICT – Information and Telecommunication
IEPL – International extreme poverty line
IGD – Inclusive growth diagnostic
IMF – International Monetary Fund
IND – India
IOM - International Organization for Migration

IP – Intellectual property
IPP – Independent power plants
KHM – Cambodia
LDCs – Least Developed Countries
LFS – Labor Force Survey
LKA – Sri Lanka
LPI – Logistics Performance Index
MCC – Millennium Challenge Corporation
NBR – National Board of Revenue
NGO – Non-governmental organization
NPL – Nepal
NPLs – Non-performing loans
PAK – Pakistan
PCBs – Private commercial banks
PHL – Philippines
PPP – Purchasing power parity
QRPPs – Quick rental power plants
RCA – Revealed comparative advantage
RMG – Ready-made garments
SAM – Social accounting matrix
SCBs - State-owned commercial banks
SITC - Standard International Trade Classification
SMEs – Small and medium enterprises
SOEs – State Owned Enterprises
TCI – Transportation Cost Index
TFP – Total factor productivity
TI – Transparency International
TIB – Transparency International Bangladesh
Tk – Taka (Bangladesh currency)
UNDP – United Nations Development Programme
VAT – Value-added tax
WDI – World Development Indicators
WEF – World Economic Forum
WGI – World Governance Indicators
WIPO – World Intellectual Property Organization

WRI – World Risk Index

EXECUTIVE SUMMARY

This section summarizes the main conclusions of the Bangladesh IGD and provides a brief preview of the principal arguments set forth in the subsequent chapters of this analysis. The present discussion focuses primarily on the binding constraints at the aggregate level, the Sector Diagnostic, and the Women's Entrepreneurship Diagnostic.

Aggregate Findings

First, electricity is the most binding constraint to economic growth in Bangladesh. The shadow price of electricity is extremely high, as evidenced by unserved energy costs many times higher than that of paid bulk tariff rates for electricity. Additionally, firms and the government itself attempt to bypass the difficulties caused by lack of electricity access by using private generators and building export processing zones (EPZs) with reliable electricity infrastructure that will attract both foreign and domestic investment. Additionally, analysis has shown that increasing power generation and consumption has in turn increased Bangladesh's investment levels and economic growth rates, another important test for bindingness. These findings are further supported by most indices, firm surveys, as well as numerous in-country experts interviewed during a field visit. Unless strides can be made in bridging the current electricity supply gap, Bangladesh's economic growth rate will continue to underperform relative to its potential.

Second, education is not currently a binding constraint to greater economic growth in Bangladesh. Returns to education are low relative to those found in other countries. Any causal relationship between improved tertiary education and GDP growth is not clear. There is some evidence of employers importing middle management and skilled workers staying in Bangladesh, but there is no clear relationship between labor intensity and growth by industry that would suggest firms that require fewer skilled workers are outperforming those that do. Hence, increasing or improving the supply of education alone will not boost economic growth while more binding constrains such as electricity are not resolved. This conclusion is not to say that education will never matter to overall growth. In the long term and as binding constraints are relaxed, Bangladesh will need to focus on improving the quality and relevance of education to increase the supply of skilled workers, and thus productivity and economic diversification.

Third, governance issues pose a most binding constraint to economic growth. The costly, cumbersome and uncertain process in contract and property rights enforcement combined with an inefficient and ineffective land tenure system constrains private sector investment and growth. The Bangladeshi business environment is one in which Bangladesh firms face high temporal and administrative costs in doing business. The combination of inefficient land administration and management system, and poor contract and property right enforcement combined with persistent corruption is increasingly impeding growth in Bangladesh. Analysis to date suggests that contract enforcement and access to land are the two most binding microeconomic failures in Bangladesh. In addition these microeconomic level distortions are likely to be interrelated, making it very difficult to separate their individual effects on economic growth. Corruption seems to underpin all microeconomic risks in Bangladesh by acting as a risk multiplier for other distortions. Thus long-term growth prospects for Bangladesh depend heavily on its ability to

overcome a series of interrelated micro-level distortions, particularly poor contract enforcement and corrupt, costly and ambiguous land tenure system.

Sector Diagnostic Findings

Results from applying the Growth Diagnostic framework to the garment sector show that energy is the most binding constraint to growth. There is substantial evidence indicating that the shadow price for electricity is high and that a large number of firms are attempting to bypass this constraint through the use of electric generators. Additionally, exposure to power outages is a key contributor to firm productivity, suggesting that removal of this constraint would have a positive impact on growth. Finally, firms selected electricity as the second biggest constraint to their firms in the 2013 Enterprise Survey. **At the same time, there is evidence that human capital is a binding constraint to the garment sector.** The average educational level of a firm's workforce provides a significant contribution to productivity and it has been identified as one of the most binding constraints for the sector by the World Bank and IMF. It has also been identified a major obstacle to doing business by Bangladeshi firms.

In regards to textiles, application of the Diagnostic tests provides additional evidence as to electricity being the most binding constraint to growth. The shadow price of electricity is high and there are a number of firms attempting to bypass the constraint. Nonetheless, results from the tests for electricity were not as conclusive as the garment sector. This may be due to the energy intensity of the textile sector, as firms do not appear to have the same demand as the garment firms. **Upon review of other constraints, there is evidence suggesting that finance is a most binding constraint for investment in the textile sector.** Finance variables provide a large contribution to firm productivity and there are a large percentage of firms using internal finance for their investments. In addition, a large number of textile firms identified finance as being a major obstacle to their businesses in the 2013 Enterprise Survey.

Women's Entrepreneurship Diagnostic Findings

The gender-specific constraints to entrepreneurship in Bangladesh are: **weak property tenure for women, especially in land and buildings and enforcement of family law; market failure in norms around women's roles as professional service-providers and managers able to move around at different times and in public spaces, and in women's weaker business networks and access to information; and women's education, especially at the tertiary level and in business, agriculture, science and engineering.** Other issues such as the cost of capital, corruption and taxation, and childcare, while important, were not found to be gender-specific binding constraints for entrepreneurship. This conclusion is based on limited data, and examination of new data, whether qualitative and quantitative, might yield a different and stronger conclusion. Further analysis is needed to rank these constraints in order of "bindingness" for women's entrepreneurship.

ACKNOWLEDGEMENTS

The Bangladesh Growth Diagnostics Team
>   Euan Davidson
>   Anastasia de Santos
>   Yoon Lee
>   Nathan Martinez
>   Caroline Smith
>   Takele Tassew

1. OVERVIEW

1.1 Introduction

Bangladesh has made remarkable progress over the past two decades, lifting millions out of poverty and sustaining expanding levels of economic growth. These achievements have been realized despite major internal and external challenges, including global economic downturns, natural disasters, and periods of political uncertainty. Reaching the Government of Bangladesh's ambitious goal of becoming a middle income country by 2021 – the country's 50th year anniversary – will require annual growth rates of between 7.5 and 8% (World Bank 2012). This growth must be inclusive of poor households and women if Bangladesh hopes to raise income levels and end extreme poverty.

Expanding levels of economic growth has led to a rise in Bangladesh's gross national income (GNI) at 2005 Purchasing Power Parity (PPP), increasing by 79% from $985 GNI per capita in 2000 to $1,768 in 2010. Nonetheless, Bangladesh remains a low-income country, with millions still living below the international poverty line of $1.25 per day and millions more living on less than $2.00 per day. By 2010, over 43% of the population lived below the International Extreme Poverty Line of $1.25 per person per day at 2005 PPP, compared to a poverty headcount of 58% in 2000. To put this in perspective, in 2010 there were around 65 million Bangladeshis living in extreme poverty – roughly the same population as the United Kingdom. Bangladesh also has a large share of its population remaining just above the extreme poverty line and thus remains vulnerable to external shocks and any adverse fluctuations in income or required spending. For example, in 2010 some 50 million Bangladeshis were above the $1.25/day extreme poverty line yet lived on less than $2.00 per day.

The governments of the United States, the United Kingdom, and other countries, as well as international organizations like the World Bank have committed themselves to help eradicate extreme poverty by 2030. Assuming no major shocks, continued economic growth at rates similar to that recorded since 2000 could permit Bangladesh to reduce the prevalence of extreme poverty to 2.4% by 2030. At the same time, one should bear in mind that in the current international context, "extreme poverty" is defined relative to an extremely low poverty line – the average of the poverty lines of the poorest countries in the world. This means that rising above the $1.25/day line by no means entails escaping "poverty," but simply becoming a bit less poor than previously. Although reducing $1.25/day poverty to 2.4% by 2030 would represent an historic achievement for Bangladesh, reaching the consumption level needed to do that would still leave more than half the population living on less than $4 per day. In short, for Bangladeshis to escape from "poverty" as viewed by the citizens of the donor countries will require sustained and inclusive growth for decades – a marathon, rather than just a sprint to 2030. As a result, policies and programs should keep both the long-term as well as medium-term goals in mind.

The purpose of this analysis is to identify the binding constraints that deter households and firms from making investments and taking risks that would significantly increase their incomes. The analysis is not intended to dictate specific interventions, but rather to provide a framework that will focus attention on the most pressing obstacles to development. Using this analysis as a point

of departure, policy makers may identify appropriate reforms and projects that will ease those binding constraints, thereby stimulating economic growth.

1.2 Methodology of Growth Diagnostics

This study uses the Growth Diagnostic framework (Hausmann, Rodrik, Velasco 2005, "HRV"), to uncover the underlying issues most adversely impacting the prospects for sustainable economic growth in Bangladesh. The framework, assuming the widely accepted linkage between private investment and economic growth, aims at identifying the areas of the socio-economic landscape that are currently the largest deterrents to private investment -- the "most binding" constraints to growth.

Figure 1.1: Growth Diagnostic Analytical Framework
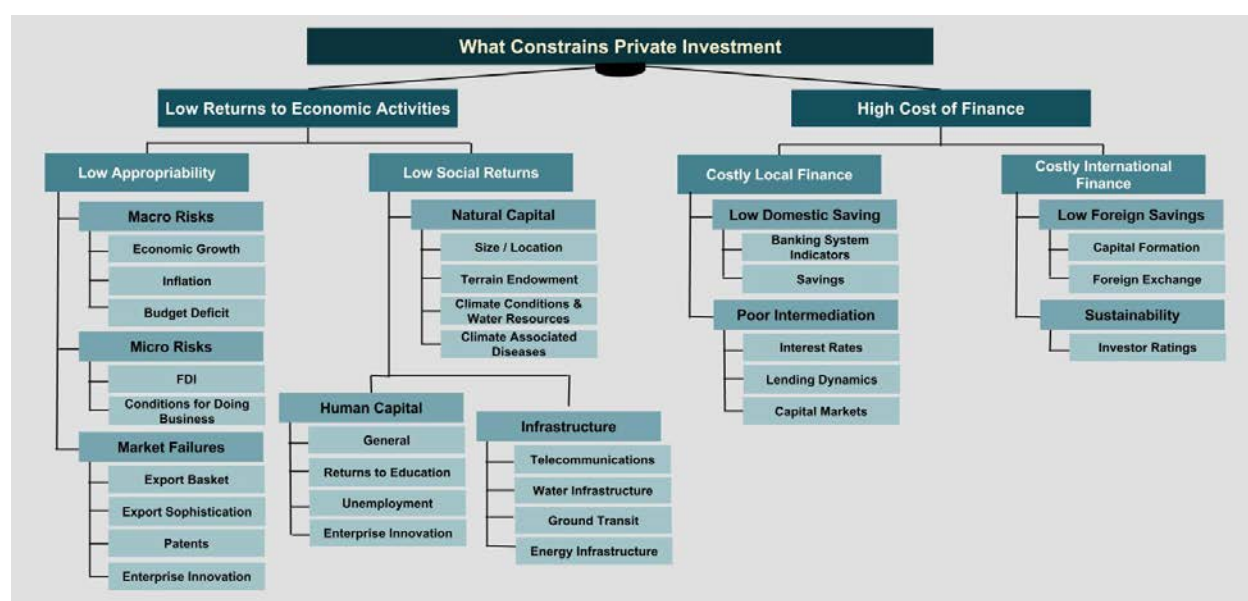
Source: Adapted from Hausmann, Rodrick and Velasco (2005)

Figure 1.1 illustrates the theoretical foundation of the approach used in this analysis, in practice a chain of questions to guide quantitative exploration of the reasons for sub-optimal rates of investment. Private investment is seen as constrained by either a lack of supply (or access) to finance or a lack of demand for finance. In the case of the latter, potential investors are holding back on projects because they perceive the returns to investment to be low. Returns are perceived to be low either due to a weak base of key factors of production ("low social returns") or due to factors in the regulatory environment that prevent the investor from fully capturing the returns ("low appropriability"). The basic factors of production considered are natural capital, human capital, and infrastructure. Appropriability is reduced by either market failures, which are not properly addressed by a regulator, or by a structure of governance that distorts the efficient outcome of a free market system. These governance issues can be described as either political or economic, with the latter set divided into questions on macro-economic stability and micro-economic policy.

To help make the diagnostic framework of Figure 1.1 operational, Hausmann, Klinger, and Wagner (2008) offer four "principles of differential diagnosis" or tests which are helpful in identifying constraints to growth. Below is a summary of these four tests:

Test 1: *The shadow price (the marginal value to the economy of an additional unit of the factor) of the constraint should be high.*

Test 2: *Movements in the constraint should produce significant movements in the objective function (i.e. investment and growth).*

Test 3: *Agents in the economy should be attempting to overcome or bypass the constraint.*

Test 4: *Agents less intensive in that constraint should be more likely to survive and thrive, and vice versa.*

A selection of comparator countries is useful when applying the tests used for a growth diagnostic in order to benchmark the growth path of a country relative to countries with similar socioeconomic characteristics, including geography, income per capita, and trade. The team decided to use a cluster analysis approach to provide a short-list of potential comparator countries (discussed in detail in Annex 1 of this report). These results were then juxtaposed to comparator countries used in previous economic reports by the IMF and World Bank. A proposed list of comparator countries was selected by considering poverty data for each of the countries identified in the cluster analysis and similar economic reports. As a result of these efforts, as well as consultations with in-country experts, the following comparator countries were selected for the Bangladesh growth diagnostic: Cambodia, India, Nepal, Pakistan, the Philippines, and Sri Lanka.

While it is generally agreed that economic growth is necessary for sustained poverty reduction, a particular interest in the latter calls for an extension of the core Growth Diagnostic methodology to explicitly account for the linkages between the two. Each particular pattern of growth will indeed determine a corresponding pattern of income distribution. The Bangladesh Inclusive Growth Diagnostic (IGD) attempts to address this linkage by widening the focus of economic growth in the aggregate to economic growth in two production sectors that data indicates are (or would be) strongly linked to poorer households if the constraints to growth in these sectors were loosened. Moreover, a Women's Entrepreneurship Diagnostic is performed in order to identify the constraints to women's participation in the formal sector. In principle, lifting the constraints to growth in these areas would facilitate inclusive growth in the economy as a whole. Where possible, the analysis confirms the extent to which a given constraint at the aggregate level is relevant to and impacts growth in these two sectors.

1.3 Organization of the Bangladesh Inclusive Growth Diagnostic

The remainder of the report applies the Growth Diagnostic framework to the Bangladesh economy, thus providing the underlying evidence for the methodology summarized in this chapter. Chapter two, Poverty and Economic Growth – the Bangladesh Experience, describes the scale and depth of poverty and recent economic trends, including the principal sources of economic growth. Chapters three through nine present the results under each topic illustrated in

Figure 1.1.   Finally, chapters 10 and 11 include the "inclusive" aspects of the analysis – the Women's Entrepreneurship Diagnostic and the Sector Diagnostic.

2 POVERTY AND ECONOMIC GROWTH – THE BANGLADESH EXPERIENCE

This chapter begins with an assessment of poverty trends – a major focus area for the Government of Bangladesh and donors – to provide a broad measurement of the inclusiveness of economic growth and to assess progress towards ending extreme poverty. Focus will then shift to an overview of Bangladesh's economic performance since the nation gained independence in 1972. This will be followed by growth decomposition and growth accounting exercises, as well as a brief overview of private investment trends to help identify the primary sources of recent economic progress. The final section will review the dynamics of the Bangladeshi labor markets to identify major sources of income generation. Subsequent chapters examine the economic policies, institutions, and other forces that have shaped these outcomes.

2.1 Extreme Poverty

Although extreme poverty in Bangladesh has fallen considerably since 1991, it remains high, reflecting in part the country's low per capita income – a primary determinant of the level of poverty.[1] Comparing poverty in Bangladesh with comparators countries is blurred by the use of different statistical approaches. The most easily accessible and usually most comparable statistics – those published in the World Bank's PovCalNet database (2013a) – suggest that in 2010 Bangladesh had the highest rate of extreme poverty among comparators, with 43% of the population living below the International Extreme Poverty Line of $1.25 per person per day at 2005 Purchasing Power Parity (PPP) (Figure 2.1).[2,3] Moreover, by this measure progress in reducing extreme poverty appears to have been slower than in most of the comparators since the mid-1990s – fifth out of seven in terms of percentage point reductions, and in last place in terms of proportional reductions relative to where each country stood at the beginning of that period.[4]

---

[1] Bangladesh had the second lowest GNI per capita, PPP (constant 2005 $) among comparators at $1,768 in 2012.

[2] Equivalent to 59 taka per day at 2010 prices, adjusted for changes in the BNPI (see text). Adjusted for changes in the CPI, the $1.25/day line is equivalent to 46.08 taka at 2010 prices, or 61.32 taka at January 2014 prices.

[3] All references to "extreme poverty" in this section are based on the International Extreme Poverty line of $1.25/day at 2005 PPP. This approach is adopted so that Bangladesh's experience can be compared directly with that of the comparator countries. An alternative approach would have been to measure extreme poverty against Bangladesh's own "Lower Poverty Line," which is treated as the threshold of extreme poverty in Bangladesh. The Lower Poverty Line is assigned 18 different taka values to reflect differences in the cost of living in different regions and in rural vs. urban areas in each region. The Lower Poverty Line represents a far lower threshold of extreme poverty than the $1.25/day line, as shown by the fact that the prevalence of extreme poverty measured against the former was less than half that measured against the latter in 2010: 17.6% based on the Lower Poverty Line, versus 43.25% based on the $1.25/day line. A rough calculation suggests that the Lower Poverty Line is equivalent to about 87 cents per person per day in terms of 2005 Purchasing Power parity. Bangladesh's Upper Poverty Line is equivalent to about $1.06 per person per day at 2005 PPP.

[4] World Bank country codes are used in this section, corresponding to the following classifications: Bangladesh (BGD), Cambodia (KHM), India (IND), Nepal (NPL), Pakistan (PAK), Philippines (PHL), Sri Lanka (LKA)

Figure 2.1: Poverty Headcount Ratios
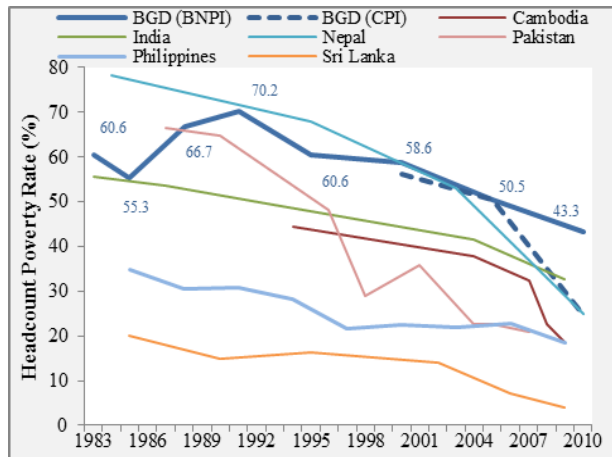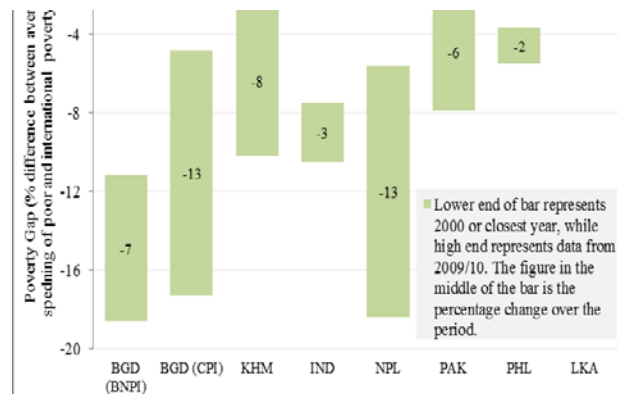
Source: World Bank WDI   Source: World Bank via PovCalNet

However, closer examination reveals a more favorable picture of Bangladesh's relative performance in reducing extreme poverty. Whereas the poverty estimates in all the comparator countries are based on household consumption deflated by each country's Consumer Price Index (CPI), those in Bangladesh are deflated by the country's Basic Needs Price Index (BNPI), which measures changes in the cost of the goods and services consumed by the poor. That difference matters because between 2005 and 2010, the BNPI rose much more rapidly than the CPI, mainly reflecting the global rise in food prices in the late 2000s. If Bangladesh's survey data had instead been deflated by the CPI, the headcount poverty rate in 2010 would have been 24.6% (dashed line in Figure 2.1). Conversely, if the comparator countries had followed Bangladesh's more accurate method of measuring the living standards of the poor, their recent progress in reducing extreme poverty would look much more modest.

Although Bangladesh has seen a decline in the rate of extreme poverty, a large share of its population remains just above the extreme poverty line and thus remains vulnerable to external shocks and any adverse fluctuations in income or required spending. For example, in 2010 some 50 million Bangladeshis (33 percent) were above the $1.25/day extreme poverty line yet lived on less than $2.00 per day (World Bank via PovCalNet; both poverty lines based on BNPI).

Finally, although the headcount poverty ratio is a straightforward and easily understood metric, it fails to take into account the severity of poverty. This makes it useful to also examine the poverty gap, which measures how far on average spending among the poor falls short of the poverty line, expressed as a percent of the poverty line.[5]   Figure 2.2 shows poverty gaps for Bangladesh and select comparator countries, based on household surveys in 2009 and 2010. On average, Bangladeshis currently below the $1.25/day extreme poverty line in 2010 would have required additional consumption spending of 14 cents per day (11.2% of $1.25) in order to just reach the threshold of extreme poverty.

---

[5] For example, if average daily consumption among all those below a $1.25/day poverty line were found to equal $1.00 per day, the poverty gap would be 20% (= $0.25/$1.25).

Here again, comparisons with the comparator countries depend on the choice of price deflator. Bangladesh appears to have by far the largest poverty gap in the group when its BNPI-deflated household survey data are compared with CPI-deflated data from the other countries. In contrast, if Bangladesh had instead used the CPI like the other countries, its 2010 poverty gap would instead have been 4.8% (6 cents per day), closer to the middle of the pack. Moreover, Bangladesh's poverty gap fell 7.4 percentage points between 2000 and 2010, based on the official BNPI-deflated data; deflating the same household data by the CPI would have produced a much larger decline of 12.5 percentage points, rivaling the drop recorded in Nepal.

Has Bangladesh's Recent Growth Been Inclusive In terms of Poverty Reduction?: The growth elasticity of poverty, a calculation that measures the percent change in poverty with respect to a one percent change in mean income per capita, shows that for every one percentage increase in Bangladesh's GDP per capita there was a 1.59% reduction in poverty between 2002 and 2010.[6] Comparator countries with a similar elasticity of poverty during this period include India (1.47%), Cambodia (1.55%), Nepal (1.66%) and Pakistan (1.82%). Sri Lanka (4%) and the Philippines (8.5%) had much greater growth elasticity of poverty (PovCalNet 2013a). Growth that significantly reduces poverty is considered to be inclusive. In this regard, the rate of poverty reduction between 2000 and 2010 would cumulate to a reduction of 53% if maintained over 25 years, thus slightly exceeding the Millennium Development Goal of reducing poverty by 50% over 25 years.

Trends in income distribution enhanced the impacts of growth on poverty. The income share of the lowest 40%, for instance, increased from 20.7% in 2000 to 21.3% in 2010. Moreover, based on recent changes in the distribution of consumption as measured by the Household Income and Expenditure Surveys (HIES), the benefits of Bangladesh's growth since 2000 have been quite inclusive. The Gini coefficient, which measures deviations from perfect equality, fell from 33.46 in 2000 to 33.22 in 2005, and fell further to 32.12 in 2010. The latter decline was notable in that it took place alongside the sharp rise in food prices between 2005 and 2010, which in itself tended to worsen inequality by cutting into the living standards of the poor, who must spend the highest share of overall consumption on food. With the exception of Pakistan, which has a Gini coefficient of 30, Bangladesh has the lowest inequality among each of the comparator countries.

Geographical Poverty Trends: It is also useful to examine regional patterns of extreme poverty within Bangladesh. Although poverty has declined markedly at the national level, these declines have not been evenly shared among Bangladesh's seven divisions. Analysis of Bangladesh's HIES shows that between 2005 and 2010, the largest reductions in poverty headcount ratios occurred in the western Barisal, Khulna, and Rajshahi/Rangpur divisions (over 12-percentage points in each case) while the headcount ratio fell only 1.5 percentage points in the Dhaka division. These trends were the reverse of what was seen between 2000 and 2005 (IMF 2013, Gimenez et al. 2013). The IMF suggests a number of explanations for this switch, including migration from the poorer and more rural Barisal and Rajshahi divisions to the urban Dhaka division, as well as increased private investment in areas with improved infrastructure, both of which supported rapid reductions in poverty. Table 2.2 provides additional information regarding Bangladesh's poverty headcount ratios by division, the percentage of the poor population by division, and the population density of the poor.

---

[6] The elasticity of poverty is calculated using discrete periods of time, in particular 2002 and 2010.

Despite impressive declines between 2005 and 2010, the Rangpur, Barisal, and Khulna divisions still had the three highest poverty headcount ratios, respectively, of Bangladesh's seven divisions. Chittagong had the lowest, followed by Sylhet. Meanwhile, the Dhaka division houses by far the largest percentage of Bangladesh's extreme poor, over 32% of the total. Additionally, though Barisal and Rangpur have similar poverty headcount rates, Barisal is home to only 8% of Bangladesh's extreme poor, while Rangpur contains nearly twice as many.

It's helpful to keep in mind that economic growth and poverty reduction is typically uneven from a geographic standpoint, as resources flow to the most productive and dynamic places (World Bank 2008). Therefore, it is not the purpose of this analysis to suggest that growth is expected to be broad-based in a geographic sense.

Urban/Rural Poverty: In discussing geographic aspects of extreme poverty in Bangladesh, the above section touched on the issue of urban versus rural poverty while comparing headcount ratio trends in Dhaka versus other districts. Because economic growth can affect urban and rural poverty differently, it will be helpful to examine trends in this area further. According to the World Bank, the share of the poor living in urban areas has increased from 10.1% (6.2 million) in 1992 to 17.8% (9.7 million) in 2010. At the same time, the number of rural poor declined from 89.9% (55.5 million) in 1992 to 82.2% (38.5 million) in 2010 (2012).

Table 2.1: Poverty Statistics by Bangladeshi Division, 2010

Division	Poverty Headcount Ratio (%)	Distribution of the Poor (%)	Distribution of Population (%)	Population Density of Poor (per sq. km)
Barisal	51.4	7.9	6.3	323
Chittagong	30.1	15.8	19.1	252
Dhaka	38.6	31.7	32.8	588
Khulna	50.4	12.1	11.9	355
Rajshahi	47.7	11.8	12.5	485
Rangpur	58.8	15.1	11.3	574
Sylhet	52.3	5.5	6.2	411
Bangladesh	43.5	100	100	441

Source: 2010 HIES via IMF 2013

Table 2.2: Poverty Headcount Ratio by Characteristics of the Household Head, 2010*

Population Sub-group	Poverty Headcount Rate	Distribution of the Poor	Distribution of Population
Sex of the household head			
Male	44.2	90.9	89.5
Female	37.6	9.1	10.5
...among urban households			
Male	21.2	92.7	91
Female	16.9	7.3	9
...among rural households			
Male	52.5	90.7	89
Female	43.6	9.3	11
Education of the household head			
No schooling	57.5	69.6	52.6
Primary (1-6 years)	40.9	16.9	18
Secondary (7-9 years)	30	9	13.1
Upper secondary (10-11 years)	14.9	3.6	10.6
Tertiary (12 or more years)	6.5	0.9	5.8
Total	43.5	100	100

*Measured at the $38/month ($1.25 per day) at 2005 PPP

Gender Dimensions of Poverty: Analysis of data from the 2010 HIES shows that the prevalence of extreme poverty is significantly lower for female households than for male households, both nationally and in both urban and rural areas (Table 2.2). Female-headed households make up less than 10 percent of all households in each case. Further analysis is required to judge whether having a female head itself helps households avoid extreme poverty, or alternatively whether such households are unusual in some other way that directly accounts for their lower prevalence of poverty.

Extreme Poverty and Education: Table 2.2 shows the strong correlation between the educational attainment of the household head and the likelihood that the household will be extremely poor. In particular, nearly 58% of households whose head failed to complete even a single year of school live in extreme poverty; such households include more than half (53%) of the total population and nearly 70% of the total number of extreme poor. Even a single year of primary schooling provides substantial insulation from extreme poverty, and the prevalence of extreme poverty continues to drop substantially with each rung on the educational ladder. Here again, it is premature to conclude that this correlation is due entirely to the benefits of greater education; richer households are more willing and able to ensure that their children remain in school longer, so at least part of the causation is running from household economic status to schooling. Nevertheless, the correlation is highly suggestive, so that further investigation of the causal links between education, economic inclusion, and extreme poverty could be helpful.

Meanwhile, preliminary inspection of patterns of schooling among male and female household heads suggests that the lower prevalence of poverty among female-headed households is not a result of higher educational attainment among those female household heads. On the contrary, a much larger share of female household heads have completed no years of schooling than among male household heads (70% versus 50%); conversely, a much larger share of male than female household heads have attained each subsequent rung on the educational ladder. As a result, the explanation for the lower prevalence of extreme poverty among female-headed households probably lies elsewhere.

Can Bangladesh Eradicate Extreme Poverty by 2030?: In 2013, the governments of the United States, the United Kingdom, and other countries, as well as international organizations like the World Bank committed themselves to help eradicate extreme poverty by 2030.[7] Subsequent analysis has suggested that reaching this target globally will be very difficult, mainly because many countries are starting too far from the target to reach it by 2030, with large shares of their population far below the International Extreme Poverty Line and with levels of per capita income far below those at which the prevalence of poverty typically falls to single digits. For those countries, reaching the target would require unprecedented accelerations in economic growth (Chandy et al. 2013, Yoshida et al. 2014). These facts raise the question of the feasibility of ending extreme poverty in Bangladesh by 2030. For the sake of concreteness, the discussion will examine this question in terms of the international target – reducing the prevalence of $1.25/day extreme poverty to zero – or very close to zero – by 2030. To anticipate the conclusion of this analysis, continued growth at rates similar to that recorded since 2000 could permit Bangladesh to reduce the prevalence of extreme poverty to less than 3% by 2030, while providing the

---

[7] In the context of this discussion, people are counted as living in "extreme poverty" if they live in households with per capita consumption of less than $1.25 per day, measured at 2005 Purchasing Power Parity (PPP) exchange rates. The $1.25/day International Extreme Poverty Line (IEPL) is due to be replaced by a new version in 2014 or early 2015, based on the 2011 Purchasing Power Parity exchange rates released by the International Comparison Programme in May 2014. At this point, the value of the new IEPL can only be guessed at – the final version will only be set after careful review of the price surveys underpinning the new PPPs, followed by discussions on the appropriate method for setting the new line. Until the new line is set, it would be premature to try to base poverty projections on some assumed value of the new line. Nevertheless, the draft PPPs suggest that living standards in Bangladesh are higher than previously estimated relative both to the United States and relative to most other developing countries. In turn, these facts suggest that Bangladesh will look closer to the goal of eradicating extreme poverty under the new International Extreme Poverty Line than under the current $1.25/day line.

13

additional budgetary resources needed to lift any remaining very poor households out of extreme poverty via transfers.

In developing countries, essentially all the information used to measure the "income" dimension of poverty comes from household surveys – in the case of Bangladesh, the Household Income and Expenditure Survey administered every five years, the last time in 2010.[8] Those data provide estimates of both mean consumption per person (the "survey mean") as well as the distribution of consumption among households; together those two pieces of information suffice to measure the share of the population living below any particular poverty line. Because future changes in distribution tend to be very hard to forecast, most poverty projections – including this one – assume that distribution will remain unchanged, and instead focus on the growth in the survey mean needed to reach a particular poverty target.[9] Perhaps the biggest problem with this approach is that the growth of survey mean consumption often differs considerably from other measures of growth, notably real per capita GDP. Errors arise on the household survey side, especially because better-off households tend to understate their resources or refuse to participate in the survey at all, and because many respondents have difficulty remembering everything they consumed over a particular time period. But errors arise with national income and accounts data as well, where consumption is measured as a residual and is thus vulnerable to errors in all other components of national income (Deaton 2010). The bottom line here is that poverty estimates, and especially poverty forecasts, should be viewed with a healthy degree of skepticism.

One way to avoid at least some of these problems is to focus on the survey data only, while bearing in mind that they may have been measured with error. As shown in Table 2.3, mean consumption in 2010 was $51.67 per person in U.S. dollars at 2005 PPP.[10] The central question is, how much would household consumption need to increase to lift all – or almost all – Bangladeshis out of extreme poverty? Using the information contained in PovCalNet, an approximate answer is raising mean consumption to $108.50 would eradicate all extreme poverty. To reach this level of consumption would require average growth in real consumption per capita of 3.72% per year between 2010 and 2030. A more precise estimate can be obtained through direct analysis of the HIES household data, which indicates that raising mean consumption to $108.50 would leave about 2.4% of the population in extreme poverty; reducing that share to below 1% would require raising mean consumption to $121.60, requiring in turn average growth in real consumption of at least 4.28% per year between 2010 and 2030.

---

[8] "Income" is placed in quotes here, because Bangladesh, like most developing countries, follows best practice by measuring poverty based on survey data on household *consumption* rather than income.

[9] It should be noted carefully that the assumption that future growth will be distribution-neutral is not a forecast, but rather a reflection of the difficulty of forecasting future changes in distribution. As memorably stated by the Brookings Institution's Laurence Chandy, Natasha Ledlie and Veronika Penciakova, "Changes in distribution over time follow no discernible trend and have no established correlates …" (*The Final Countdown: Prospects for Ending Extreme Poverty by 2030*, 2013). Of course, if future growth in Bangladesh is accompanied by a continued shift in distribution toward the poor, the pace of poverty reduction would be faster than it would be with distribution-neutral growth, and conversely would be slower if distribution were to shift against the poor.

[10] This figure is obtained by first deflating survey data measured in 2010 taka to 2005 prices using the Basic Needs Price Index (BNPI), and then converting to U.S. dollars at the 2005 PPP exchange rate for household consumption, 24.494 taka per dollar.

How achievable are these growth rates? At first glance, they might appear completely unreachable in light of recent performance. As measured in the HIES and as recorded in PovCalNet, mean consumption has increased at a much slower pace in recent years – 1.77% per year from 2000 to 2010, and 1.36% per year between 2005 and 2010. However, as emphasized above, the slow pace of progress in reducing extreme poverty in recent years has strongly reflected the jump in world food prices in 2008, which hit poor households especially hard.

If it can be assumed that no further jump in relative food prices will occur before 2030, it then becomes reasonable to consider how fast mean consumption would have risen if the jump in food prices had not occurred in the first place – deflating nominal consumption by the overall CPI rather than by the BNPI. This counterfactual calculation raises the growth rate of mean consumption dramatically – to 3.95% per year between 2000 and 2010 and to 6.39% per year between 2005 and 2010. By that standard of comparison, the 3.72% growth rate in mean consumption needed to reduce extreme poverty to 2.4% by 2030 is seen as well within the range of recent experience; achieving the 4.28% growth needed to bring extreme poverty below 1% would certainly be more challenging, but still well below the rate of progress that would have been achieved between 2005 and 2010 if world food prices had not increased.

Table 2.3: Alternative Projections of Extreme Poverty[11]

Poverty Indicator		Year or Growth Interval	Official -- deflated by Basic Needs Price Index (BNPI)	Counterfactual -- deflated by Consumer Price Index (CPI)
Survey mean consumption		2000	$43.27	$44.77
		2005	$48.27	$48.27
		2010	$51.67	$66.43
Growth rate of mean consumption		2000-2005	2.19%	1.51%
		2005-2010	1.36%	6.39%
		2000-2010	1.77%	3.95%
Projected mean consumption in 2030 if mean grows at the above rate between 2010 and 2030		2005-2010	$67.84	$238.29
		2000-2010	$73.68	$146.26
Implied prevalence of extreme poverty in 2030, at projected mean consumption above and assuming no change in distribution	Projections based on PovCalNet	2005-2010	8.20%	0.00%
		2000-2010	7.20%	0.00%
	Analysis of HIES household data via ADePT	2005-2010	22.30%	0.00%
		2000-2010	16.80%	1.60%

Source: PovCalNet, BBS (HIES)

In either case, continued overall growth at the pace seen in recent years would provide Bangladesh with a substantially larger tax base, making it much easier for the nation to address the remaining problem of extreme poverty through targeted transfers. This latter point is important because as countries become richer overall, extreme poverty tends to become increasingly concentrated among households that face particular disadvantages in gaining access to the market opportunities that growth creates – e.g. those with physical disabilities or elderly people without children or education.

---

[11] All poverty headcount figures in this table are stated relative to the current International Extreme Poverty Line of $1.25 per person per day at 2005 PPP.

At the same time, one should bear in mind that in the current international context, "extreme poverty" is defined relative to an extremely low poverty line – the average of the poverty lines of the poorest countries in the world. This means that rising above the $1.25/day line by no means entails escaping "poverty," but simply becoming a bit less poor than previously. Although reducing $1.25/day poverty to 2.4% by 2030 would represent an historic achievement for Bangladesh, reaching the consumption level needed to do that would still leave more than half the population living on less than $4 per day. In short, for Bangladeshis to escape from "poverty" as viewed by the citizens of the donor countries will require sustained and inclusive growth for decades – a marathon, rather than just a sprint to 2030. As a result, policies and programs should keep both the long-term as well as the medium-term goals in mind.

2.2 Bangladesh's Economic Growth 1970-2012

Prior to 1989, Bangladesh's economy was characterized by volatility and anemic growth with annual changes in real Gross Domestic Product (GDP) per capita averaging -0.7% in the 1970s and 0.5% in the 1980s (Figure 2.3). However, by building on previous market reforms to further strengthen market deregulation and privatization measures and combining them with movements towards political democratization, Bangladesh saw an average GDP per capita growth of 2.6% in the 1990s. Positive economic growth was maintained throughout the 2000s, despite two periods of slowed growth mainly due to global economic downturns.

Sustained economic growth has led to a rise in Bangladesh's per capita income. Since 1990, real income per capita has increased by 122%, although admittedly from a very low base. More recently, per capita income has risen by 71% and 42% since 2000 and 2005 respectively. However, internal unrest and political uncertainty have recently had a negative impact on economic growth, which declined from 6.7% in FY 2011 to 6% in FY 2013. Growth in the services sector fell to 6.06% in FY 2013 from 6.3% in FY 2012 as safety concerns caused markets to close and limited customer movement. Insufficient improvements to power and gas supplies and general infrastructure also contributed to declining economic growth in FY 2013 (World Bank 2013b).

Figure 2.3: Bangladesh GDP per Capita
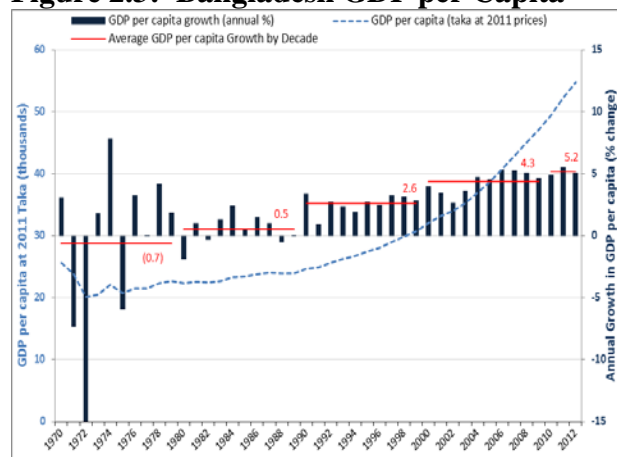
Figure 2.4: GDP Growth & GDP per Capita

Source: World Bank WDI

16
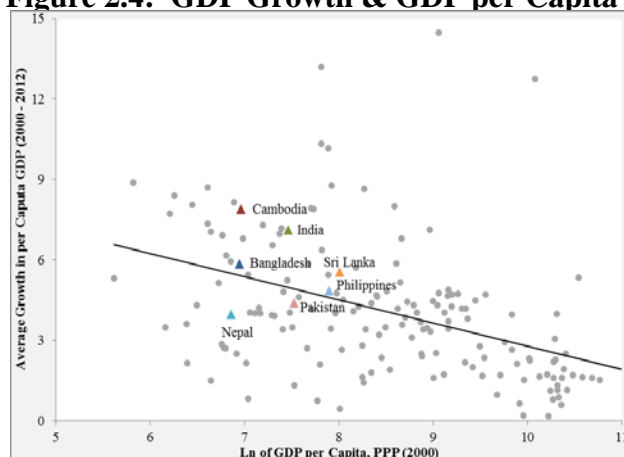
Bangladesh's growth record over the past decade has remained slightly above average when compared with other regional economies. Figure 2.4, a representation of average growth in per capita GDP from 2000 to 2012 against the level of per capita GDP in 2000, provides an overview of recent economic performance in 165 countries. As expected, economies with higher levels of per capita GDP in 2000 have generally experienced slower growth than countries with lower per capita GDP in the base year. Bangladesh's growth is slightly above the downward sloping regression line, representing greater than average GDP growth, which clearly demonstrates that its per capita income growth has been in line with expectation based on its 2000 income level.

Similarly, a comparison between growth trends in Bangladesh and the comparator countries chosen for this analysis shows that the country has experienced robust and relatively stable economic growth over the past 19 years. Using an index set to 100 in 1993 – the first year for which estimates are available – Figure 2.5 provides a brief history of growth rates for each country.[12] Bangladesh's per capita GDP growth expanded at relatively slow rates in the mid-nineties, increasing in the 2000s and continuing this trend up until 2012.

Figure 2.5: GDP Growth (1993 = 100)   **Figure 2.6: 2013 Human Development Index**
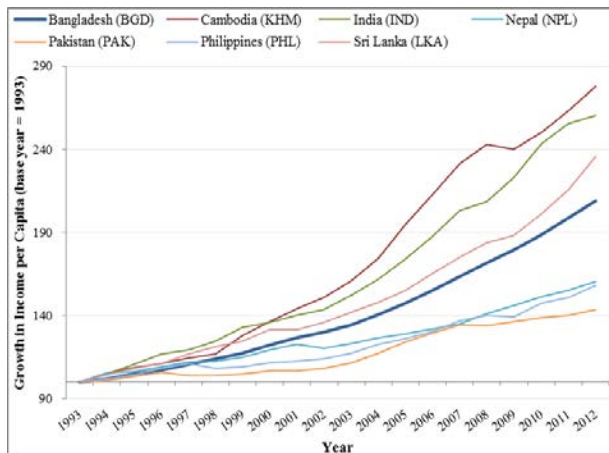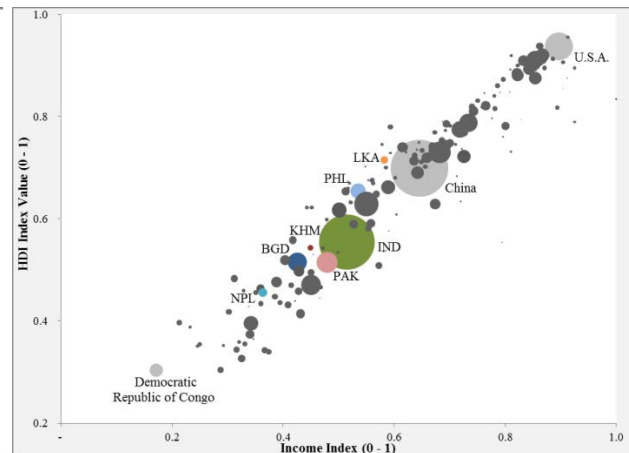
Source: World Bank WDI   *Source: UNDP 2013*

Unlike other economies in the region, Bangladesh did not experience substantial slowdowns in growth due to external shocks. During the 1997 Asian financial crisis, Bangladesh's per capita GDP growth was unaffected while other comparator countries saw negative or static growth. Furthermore, global economic downturns in 2002 and 2008 had limited impact on Bangladeshi per capita income growth, as opposed to the slowdowns seen in most other comparators. Despite resilient growth, Bangladesh's income level remains low. In 2001, Bangladesh had GNI per capita (at 2005 PPP) of $1,017, similar to per capita levels in Nepal ($979) and Cambodia ($1,078).[13] In 2011, while Bangladeshi GNI per capita at 2005 PPP increased to $1,676, it was substantially lower than Cambodia ($1,918) although much higher than Nepal ($1,288).

---

[12] In, Figure 2.5 the slope of each line is proportional to the growth rate.
[13] GNI per capita for Pakistan is from 1999.

In regards to the Human Development Index (HDI), a composite index of development indicators, Bangladesh's score has improved from 0.433 in 2000 to 0.515 in 2012 (Figure 2.6).[14] Out of a total of 187 countries measured in the 2012 HDI, Bangladesh had a country rank of 146 – lower than all of the comparator countries with the exception of Pakistan (146) and Nepal (157). In regards to the HDI income indicator, which is based on the World Bank's GNI per capita PPP (constant 2005 international), Bangladesh had a country rank of 155 in 2012.

2.3 Growth Decomposition

Decomposing Bangladesh's growth over time by expenditure components and sectoral origins allows us to see what types of spending and which economic sectors are driving growth, as well as whether or not the relative share of components is changing over time. This knowledge can yield clues regarding potential constraints to growth in the Bangladeshi economy.

Figure 2.7 decomposes GDP growth per capita into its expenditure components. Private household consumption has made up the majority share of GDP growth for every year since 2002. On average, it accounts for approximately 65% of Bangladesh's GDP growth each year. Investment, both private and public, makes up the second largest component of GDP growth, on average a substantial 33% each year. The two remaining expenditure components, government consumption and net exports of goods and services, are generally a smaller portion of overall growth, on average 7% and -6% respectively.

Figure 2.7: GDP Expenditure Components   **Table 2.4: GDP Growth by Sector**
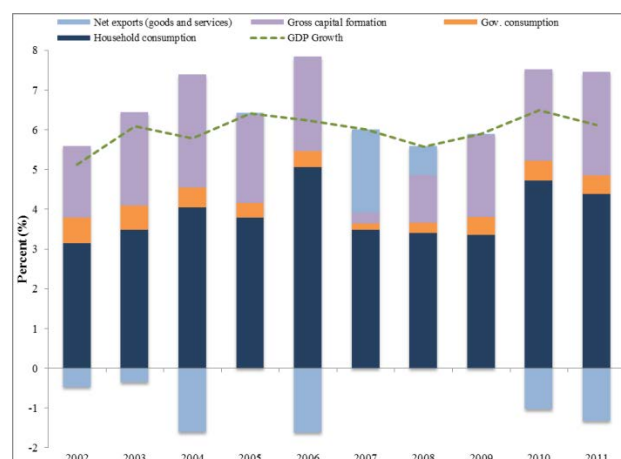
Source: World Bank WDI

Sector	2008-2009	2009-2010	2010-2011	2011-2012
Agriculture and Forestry	0.83	0.80	0.36	0.17
Fishing	0.18	0.23	0.23	0.23
Mining and Quarrying	0.11	0.06	0.09	0.14
Manufacturing	1.10	1.66	1.66	1.71
Electricity, Gas and Water Supply	0.11	0.10	0.19	0.14
Construction	0.52	0.58	0.66	0.72
Wholesale and Retail Trade	0.80	0.89	0.78	0.65
Hotel and Restaurants	0.05	0.05	0.05	0.05
Transport, Storage, and Communication	0.78	0.61	0.68	0.70
Financial Intermediations	0.21	0.18	0.21	0.18
Real Estate, Renting, and Busn. Activities	0.27	0.28	0.27	0.27
Public Administration and Defense	0.22	0.27	0.16	0.14
Education	0.23	0.25	0.19	0.26
Health and Social Works	0.18	0.20	0.18	0.18
Community, Social, and Personal Services	0.31	0.32	0.31	0.31
Total	**5.89**	**6.49**	**6.05**	**5.86**

Source: Bangladesh Bureau of Statistics (BBS)

Decomposing GDP growth by sector of origin is also instructive, as shown in Table 2.4. Over the past four years, the agriculture and forestry sector has seen a substantial decline in its share of GDP growth. This is particularly noteworthy because the agriculture sector employs 47.5% of the country's entire workforce and accounts for 19.3% of total GDP (Bangladesh Ministry of Agriculture 2013). While a large portion of Bangladesh's workforce is engaged in the agriculture sector, its contributions to GDP growth have dropped from 14% of total GDP growth in 2008-2009 to only 3% in 2011-2012. This shift away from agriculture is expected and occurs

---

[14] The Human Development Index is based on a scale from 0 to 1, with 1 representing the highest score. In 2012, the average HDI score for South Asia was 0.558.

as agricultural productivity increases, allowing former agricultural workers move to other, more productive sectors.

Bangladesh's manufacturing sector has steadily increased its share of yearly GDP growth, from 19% of growth in 2008-2009 to 29% in 2011-2012, which complements the relative decline in agricultural share. Construction, though still a relatively small contributor to GDP growth, is another sector which has seen gains over the past four years, its share of GDP growth jumping almost 40% between 2008-2009 and 2011-2012.   The increasing contributions of the construction sector to GDP growth is a positive sign in a country in need of infrastructure improvements, as will be discussed in a Chapter 8. In addition, construction is among the sectors that contribute to the labor intensive pattern of growth.

2.4 Growth Accounting

Growth accounting provides insight on what portion of GDP growth is derived from capital stock, labor, human capital per worker, and total factor productivity (TFP). One caveat to growth accounting analysis is that the results of such an exercise are heavily dependent upon the assumptions about income shares made when conducting the analysis (which are outlined fully in Annex 2). However, two major trends in Bangladesh's growth accounting over time (Figure 2.8) were robust to a variety of capital and labor income shares.

First, the portion of growth due to TFP steadily increased from 1980 to 2012. In the decade from 1980 to 1990, total factor productivity contributions to GDP growth were negative every year. These negative contributions have a number of possible explanations, including the overestimation of factor inputs and distortions in the economy that result in a misallocation of inputs (World Bank 2012).

However, over the next two decades, TFP contributions to growth steadily increased, with TFP making up approximately 20% of total GDP growth between 2002 and 2012. These findings are supported by a previous World Bank growth accounting exercise (World Bank 2012). Second, particularly between 2002 and 2012, labor contributions to growth have declined. While all other factors have seen increases in percentage point contributions to growth, ranging from TFP's significant increase to capital stock and human capital per labor's more modest gains, labor's percentage point contributions to growth declined from 1.9 percentage points in 1980-1991 to 1.2 in 2002-2012. It should be noted that labor productivity has also increased over this same period, which is a step in the right direction.

Figure 2.8: Contributions to Growth, Bangladesh, 1980-2012
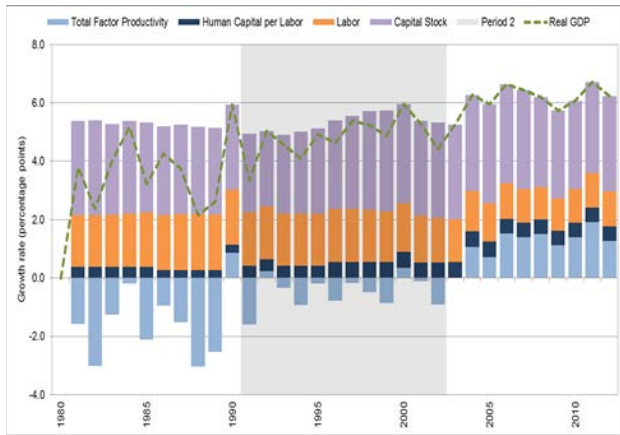
Figure 2.9: Contributions to Growth, Bangladesh and Comparators, 2000-2012
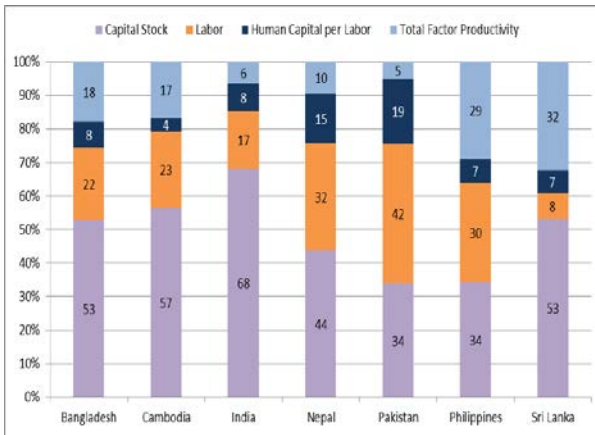
Source: World Bank

Source: World Bank

Figure 2.9 shows growth accounting from 2000 to 2012 for Bangladesh and its six comparator countries, again with assumptions and additional detail provided in Annex 1. A majority of these countries have capital stock contribute the majority of their GDP growth, with labor contributions smaller but still generally larger than the contributions made by human capital and TFP. These growth accounting results imply that Bangladesh is well within the range of similar countries with respect to its relative contributions of factor inputs to GDP growth over the past twelve years.

2.5 Private Investment

The growth diagnostic methodology is predicated upon the idea that private investment drives economic growth. Thus, examining private investment levels in Bangladesh is crucial. Figure 2.10 compares average private investment as a percentage of GDP from 2005 to 2012 to GDP per capita levels in 2011. As expected, a positive relationship exists between private investment and GDP per capita. Bangladesh is positioned above the regression line, meaning that, on average, it derives a larger share of its GDP from private investment than do other countries with similar GDP per capita levels. That is, approximately 19% of Bangladesh's GDP comes from private investment, versus an expected average of 14% for countries with similar GDP per capita levels. Of Bangladesh's six comparator countries, only Cambodia and Pakistan are below the average regression line, and only India and Sri Lanka derive a greater proportion of their GDP from private investment than Bangladesh, at 21% and 20% respectively.

Figure 2.10: Private Gross Capital Formation in Relation to GDP per Capita

Figure 2.11: Private Investment as a Share of Total Investment
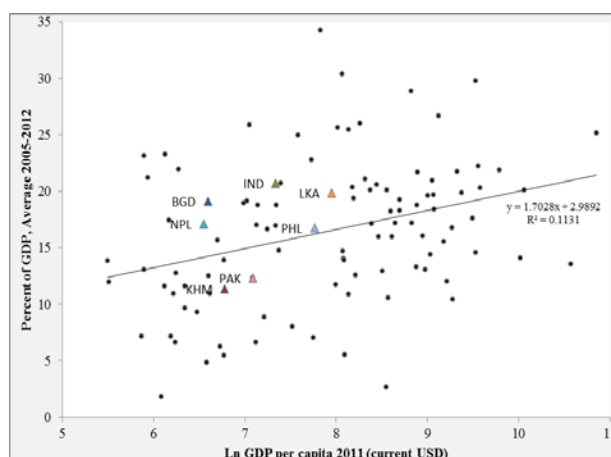
Source: World Bank WDI
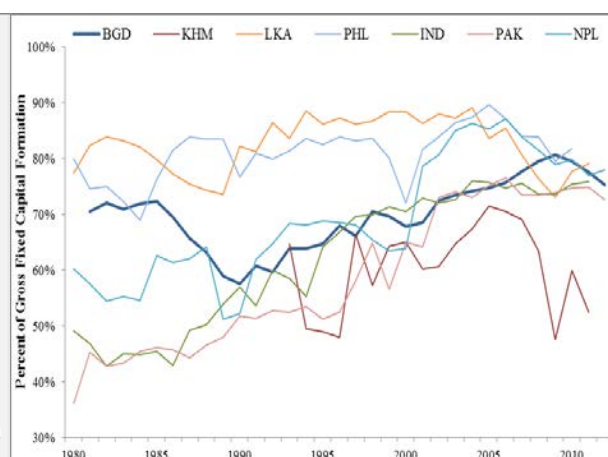
Figure 2.11 shows the share of private investment as a portion of total investment for Bangladesh and comparator countries from 1980 to 2012. Private investment increased as a share of total investment beginning in the early 1990s, peaking at 81% in 2009 and declining thereafter to 75% in 2012. Over this time frame, an average of 70% of Bangladesh's total investment has come from private sources, below Sri Lanka and the Philippines with averages above 80%, above Cambodia, India, and Pakistan which are all around 60%, and roughly similar to Nepal.

Investment has been a significant driver of Bangladesh's economic growth, though private investment has stagnated at roughly 19.5% of GDP for the past several years and saw a 1.2% level decrease in 2013 (Hussain and Rizwan 2013). This decline in private investment, though offset by increases in public investment, also accompanied a deceleration in GDP growth (World Bank 2013c). Moreover, Bangladesh's Country Policy and Institutional Assessment (CPIA), a composite index measuring a country's trade, financial sector, and business regulatory environment, has declined from 3.5 in 2009 to 3.3 in 2012. Nevertheless, private investment in Bangladesh has been accompanied by sustained GDP growth, is high relative to its income level, and similar to those found in aspirational comparator countries such as Sri Lanka.

Foreign Direct Investment (FDI) is another important driver of GDP growth contributing to an influx of capital. Since the 1980s, Bangladesh's FDI relative to GDP has risen steadily, albeit at a slowing pace. Due to its low labor costs and large capacity, Bangladesh has been particularly successful in attracting investment into the ready-made garment (RMG) sector. However, the country has been unable to expand FDI into other sectors and suffers from a relatively low overall investment rate. In 2012, FDI inflows grew by 6.3%, but the country received only US$990 million in FDI – a small sum relative to the US$39 billion in foreign investment that the entire South Asia region attracted in 2011. In 2012, FDI inflows to Bangladesh accounted for 1% of GDP – higher than Pakistan (0.5%) and Nepal (0.4%) yet slightly lower than the Philippines (1.1%), India (1.3%), and Sri Lanka (1.5%), and much lower than Cambodia (11.1%)

2.6 Trade

Bangladesh's overall trade position (total imports and exports as a percentage of GDP) has trended upward, growing by an average of 5 percentage points between 2000 and 2012 to 55% of GDP. The size of Bangladesh's trade is similar to India (55% of GDP), while slightly lower than the Philippines (65%) and Sri Lanka (59%) and greater than Nepal (43%) and Pakistan (32%). However, a large portion of trade growth has occurred in imports, resulting in a trade deficit of US$7 billion in FY 2013.

The country's import payment was about US$33 billion in the last fiscal year, up 0.8% while earnings from exports stood at about US$26 billion, up 10.7% (Bangladesh Bureau of Statistics). In 2012, Bangladesh's imports/GDP ratio (32%) was lower than LDCs (38%) and low-income countries (41%), although similar to import levels for India (32%) and Nepal (33%). In the same year, Bangladesh's exports/GDP ratio (23%) was lower than the ratio for low-income countries (26%), LDCs (30%), and the world (31%). Nonetheless, Bangladesh's export/GDP ratio was greater than each of the comparators with the exception of the Philippines (30%) and Cambodia (54%).[15] Bangladesh's exports are highly concentrated in a limited number of sectors, including ready-made garments (66.96% of total export value) and goods emanating from export processing zones (22.51%).

2.7 Labor Markets Dynamics

Employment arising from labor, the most abundant productive resource of the poor, is the primary source of income for Bangladeshi households. Expanding employment opportunities and increasing returns to labor will be vital to poverty reduction, especially when taking into consideration the rapidly expanding supply of labor. The total labor force has grown by 46%, from 43.7 million in 2000 to 63.8 million in 2010, while the labor force participation rate increased to 59.3% from 54.9%.

In 2010, the proportion of the labor force employed in rural areas was 76% (43.2 million) compared to 24% (13.2 million) in urban areas. The urban labor force, however, is growing at a much faster pace, expanding by 49.5% between 2000 and 2010, compared to 15.5% in rural areas. The urbanization of the Bangladeshi labor force is typical among developing counties. Women made up only 40% of the total labor force in 2010, although this is a slight improvement from a 36.9% share in 2000. In addition, women account for a larger share of the labor force than in India (25%), Sri Lanka (32%), Pakistan (22%), and the Philippines (39%). Similar to other developing countries, Bangladeshis between the ages of 20 and 44 years make up a majority (64.3%) of the labor force (ADB 2010).

Most Bangladeshis are employed in the informal sector where wages and benefits are typically lower than in the formal sector (ILO 2013). Using data from the 2010 HIES, the World Bank estimates that 87% of the labor force is employed in the informal sector, including 92% of total female labor and 85% of total male labor. Unemployment is relatively low at 4.6%, and while underemployment decreased from 24.5% in 2006 to 20.3% in 2010, this figure is still quite high and typically has a greater impact on female and youth employment (World Bank 2012). In

---

[15] Data for Cambodia are from 2011.

addition to the unemployed (2.7 million) and underemployed (11 million), there are an additional 2.1 million Bangladeshis entering the labor force every year. Estimating job growth for both the formal and informal sector is complicated by the use of different statistical approaches employed in the 2000, 2005/06 and 2010 Labor Force Surveys (LFS). In the 2005/06 LFS, informal employment accounted for a much smaller portion of total employment at 78.5%, while formal sector employment made up for a larger share at 21.5%.

The employment elasticity of growth measures the change of employment associated with movements in economic growth. Countries with positive GDP growth and employment elasticities between 0 and 1 have both positive employment and productivity growth. Furthermore, employment elasticities closer to 1 are indicative of more employment intensive economic growth, as opposed to lower figures which are representative of higher productivity growth (ILO).[16] Between 2003 and 2006, the employment elasticity was 0.3, corresponding into employment-intensive growth of 7% and productivity-intensive growth of 13.1%. Meanwhile, between 2006 and 2010, the employment elasticity was 0.4, resulting in employment- and productivity-intensive growth of 14.1% and 21.1%, respectively. While there are different lines of thought as to whether employment-intensive or productivity-intensive growth is more desirable for poverty reduction, the World Bank (2012) and ILO (2005) recommend that both must be jointly pursued.

According to the World Bank, sustained annual GDP growth of 7% would add only 1.5 million formal jobs (assuming employment elasticity of growth does not decline). Meanwhile, creating productive employment opportunities for 25% of the 11 million underemployed would add an additional 2.75 million formal sector jobs. In 2005, 10.2 million laborers (22% of the total) were employed in the formal sector compared to 36.1 million informal workers (78% of the total). As mentioned in the previous paragraph, part of the solution lies in both employment-intensive and productivity intensive employment growth in sectors outside of agriculture. Overseas migration and remittance inflows provide another short- to medium-term solution.

Remittances have had a significant impact on economic growth, increasing from $1.8 billion in FY 2001 to $14.4 billion in FY 2013. Remittances have also increased to around 11% of GDP in 2011 compared to 4.2% in 2000. With the exception of Nepal (22% of GDP), Bangladesh has a greater percentage of remittances as a share of GDP than any of its comparator countries. Data provided by a number of sources also shows that remittances have a significant impact on household incomes. The World Bank reports that income was on average 82% higher than households who did not receive remittances, while consumption and savings were 37.7% and 107% higher, respectively (2012). According to the International Organization for Migration (IOM), over 63% of Bangladeshi remittances were directed towards household expenses in 2009. Additionally, the IOM found that the most households used remittances for expenditures related to education and health, school supplies, fees and transportation costs, and medicinal purposes.

According to the 2010 Household Income and Expenditure Survey, poverty headcount rates of households receiving remittances were 13.1% compared to 33.6% for non-recipients. The

---

[16] Changes in GDP growth are measured by using changes in employment growth as well as changes in labor productivity growth. As a result, employment elasticities can be used to estimate the percentage contributions to GDP growth.

World Bank claims this is due to the fact that access to migration opportunities increases significantly for Bangladeshis in upper income groups. With the exception of the eighth income decile, the percentage of migrants in each income group rises continuously from 0.5% in the lowest decile to 6.8% in the 9th and 10th deciles (2012).

The discrepancy between migration opportunities among different income groups is due to the high fees associated with migration and the lack of access to finance for poorer households. In 2009, migration payments cost an average of $3,250, of which two-thirds were directed towards intermediaries (IOM). A Bangladeshi construction worker in the Middle East has an average recruitment cost of $2,891 – a figure that is 14.5 months of the average wage in a construction position ($200 per month) – compared to an average cost of $1,200 for a worker from Nepal. Female migrants also face significant constraints. In 2009, females accounted for 4.7% of total Bangladeshi migrants, compared to 63% in Nepal and 50% in Sri Lanka (UN). [17]

2.8 Conclusion

Bangladesh has made remarkable progress towards reducing poverty, especially when factoring in the different measurements applied to estimating the poverty headcount in comparator countries. Nonetheless, Bangladesh remains a low-income country, with millions of Bangladeshis still living below the international poverty line of $1.25 per day and millions more living on less than $2.00 per day. Economic growth has been quite remarkable, expanding in each of previous three decades. This growth has been driven by private investment and consumption. Results from a growth accounting exercises demonstrate that total factor productivity and capital have also been important factors. With a GNI per capita of $840 in 2012, however, Bangladesh has lower average income than each of the comparator countries with the exception of Nepal ($700). Additionally, economic growth has not materialized into an adequate supply of job opportunities, particularly in the formal sector, resulting in a shortage in employment opportunities for the 2.1 million Bangladeshi entering the labor force every year. In addition, women are excluded from economic opportunities, thus limiting the growth potential of the country. The chapters that follow build on these findings and examine the evidence to identify priorities for Bangladesh to achieve and sustain faster and more inclusive growth.

---

[17] The statistics used for Nepal and Sri Lank are from 2010. BMET is the source for the 2009 data for Bangladesh but the Government Website is not currently accessible. The IOM reported that 1.9% of migrants are female.

3 FINANCE

3.1 Introduction

This section of the diagnostic makes an assessment of whether access to finance is a constraint to growth. This can arise either through inadequate access to savings (both domestic and foreign) or inefficient financial intermediation.

In order to test whether access to finance is a constraint to growth several tests are carried out. If access to finance is a binding constraint we expect i) the real rate of interest (the shadow price) to be comparatively high; ii) reductions in real interest rates to be correlate with investment growth, or vice versa; iii) that firms will try to bypass the constraint and iv) firms/industries less intensive in the finance constraint to thrive relative to firms more intensive. Data will be analyzed to test the extent to which these occur.

These tests will be supplemented by wider analysis of the supply and demand for finance, including interest rate spreads, size of market capitalization and some analysis of different firm sizes.

Several studies have been carried out in recent years to examine the health of the Bangladesh financial sector, most notably the International Monetary Fund (IMF) Financial Sector Stability Assessment (FSAP) in 2010. This, and other previous studies, have been drawn on and updated for this chapter. Data have been taken from four main sources: the World Bank World Development Indicators (WDI), the IMF Financial Development and Structure Dataset; the Bangladesh Bank Annual Report; and the World Bank Enterprise Survey.

The financial sector of Bangladesh has been improving in recent years, with a shift away from Government interference and towards financial sector deepening. That being said, the financial sector remains fairly shallow and certain challenges remain.

3.2 Diagnostic Tests

3.2.1   Test 1: If access to finance is a constraint then the real interest rate should be comparatively high.

One of the fundamental tests of whether access to finance is a binding constraint is to look at the cost of finance (the real interest rate). The real interest rate[18] has been falling over recent years but is still slightly higher than in comparator countries (other than Pakistan which has shown erratic trends over the period). This reduction is positive, and suggests that the supply for money/credit is aligning with the demand for money/credit.

---

[18] The real interest rate is calculated as the nominal lending rate minus the inflation rate (based on the GDP deflator).

Figure 3.1: Real Interest Rate
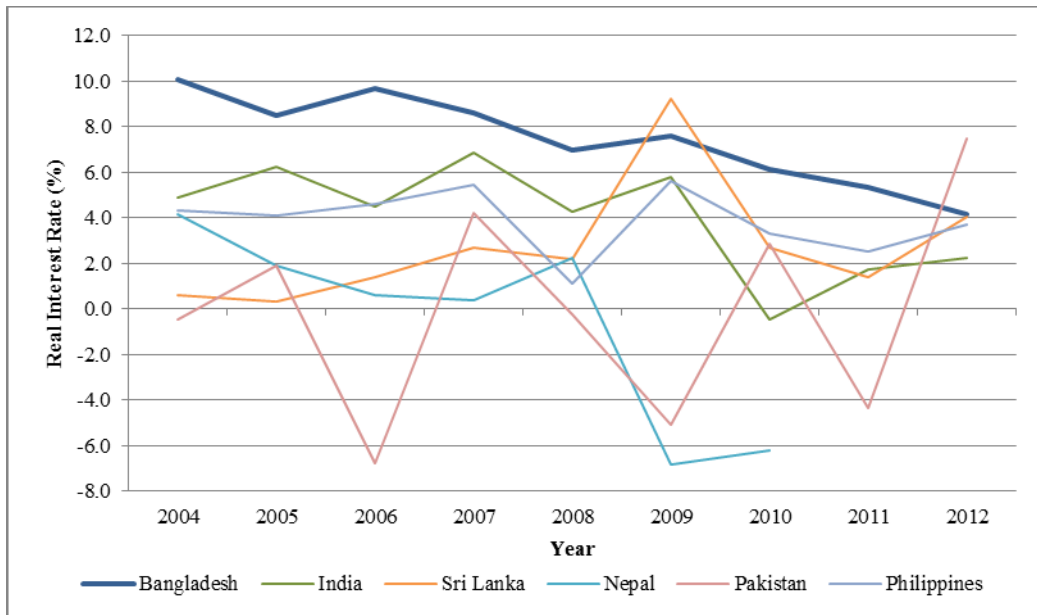
Source: WDI 2013

The real interest rate has also shown far less volatility than the comparator countries (other than Philippines). This is also positive, as lower volatility generally reduces uncertainty for investment.

More broadly, compared to other low/lower middle income countries (for which the data were available) the real interest rate in Bangladesh is relatively low (see Figure 3.2)

Figure 3.2: Real Interest Rates and per capita GDP - Low and Lower Middle Income Countries - 2012

Source: WDI 2013

26
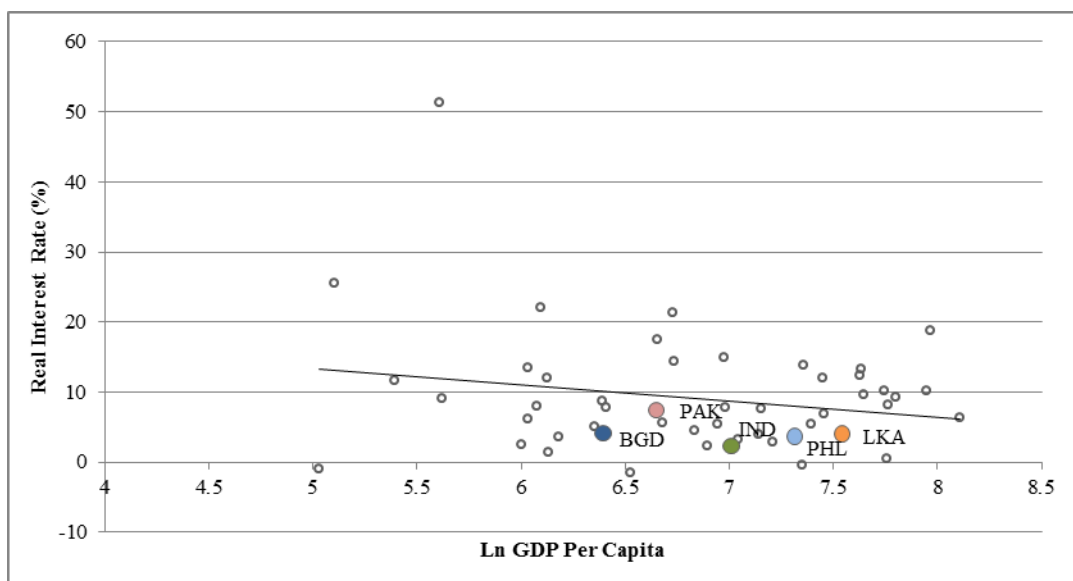
The above test assumes that the real interest rate represents the shadow price of finance; however, this assumption only holds if there are no market distortions. In this regard, the picture has also been improving, with market-based reforms being implemented such as the lifting of the interest rate ceiling in 2012[19]. State-owned bank's share of total banking sector assets has also been declining over the last decade. However, some market distortions remain, and Bangladesh has been given a low score in the financial freedom index[20] (and lowest out of the comparison countries). This index measures overall banking efficiency as well as independence from government control and interference in the financial sector. The score for Bangladesh of 30 (out of 100) suggests "extensive government interference." Hence, the real interest rate will not be a completely accurate representation of the shadow price (and so the results from the test must be taken with caution).

An important determinant of the price of finance is the supply of finance (savings). Figure 3.3 shows that gross savings have been rising rapidly since the early 90s and hence the supply of loanable funds appears to be healthy. Domestic savings have also been growing in Bangladesh, although at a slower rate than gross savings (the difference is likely due to growth in remittances).

Figure 3.3: Gross Savings (% of GDP)
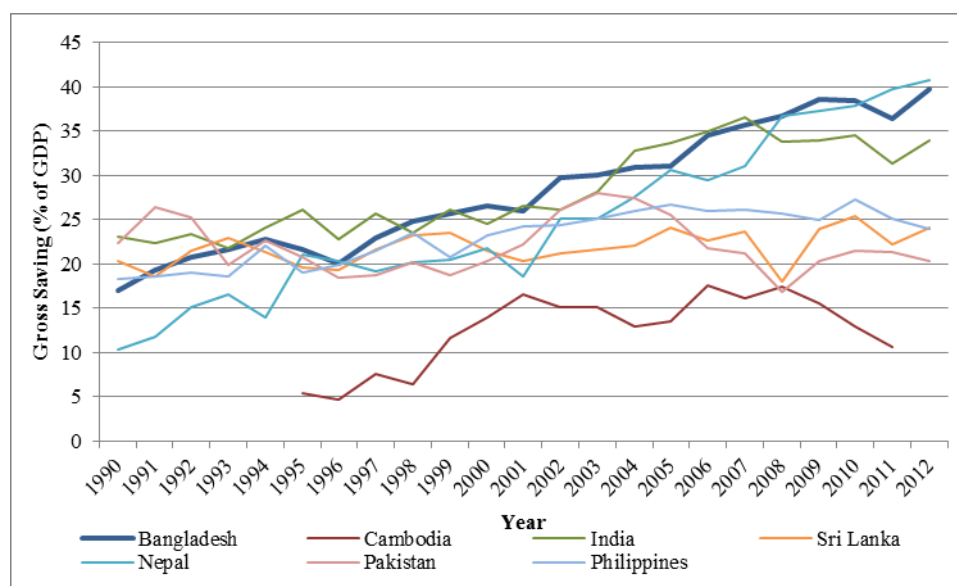
Source: WDI 2013

Another potential supply of loanable funds is from foreign sources. Analyzing the cost and restrictions associated with foreign borrowing is therefore also important. In Bangladesh there are certain restrictions imposed on foreign borrowing (the borrower must obtain approve from the Bangladesh Board of Investment and the interest rate on the loan must not exceed LIBOR +

---

[19] The interest rate ceiling was lifted in all sectors other than pre-shipment export credit (7 percent ceiling) and agriculture (13 percent ceiling).
[20] 2014 index of Economic Freedom, Heritage Foundation, http://www.heritage.org/index/

4%). Furthermore, foreign borrowing is effectively not permitted for banks,[21] and hence private banks rely on domestic deposit growth. In terms of the cost of foreign borrowing, a country's sovereign risk or credit rating can reflect the likely cost and level of access that large firms have to foreign saving[22]. Bangladesh's credit rating (Standard and Poor) is higher than most of the comparator countries (with only India and Philippines rated higher) suggesting that cost/access should be reasonable.

3.2.2 Test 2: If access to finance is a constraint then changes to the interest rate constraint should lead to significant movements in investment.

There appears to be a strong link between the real interest rate and the rate investment[23] (gross fixed capital formation as a % of GDP). Interpreting this test as a constraint to growth, however, should be taken with caution as access to finance is not always exogenous from the growth process.

Figure 3.4: Investment vs. Interest Rates in Bangladesh, 2000-2012
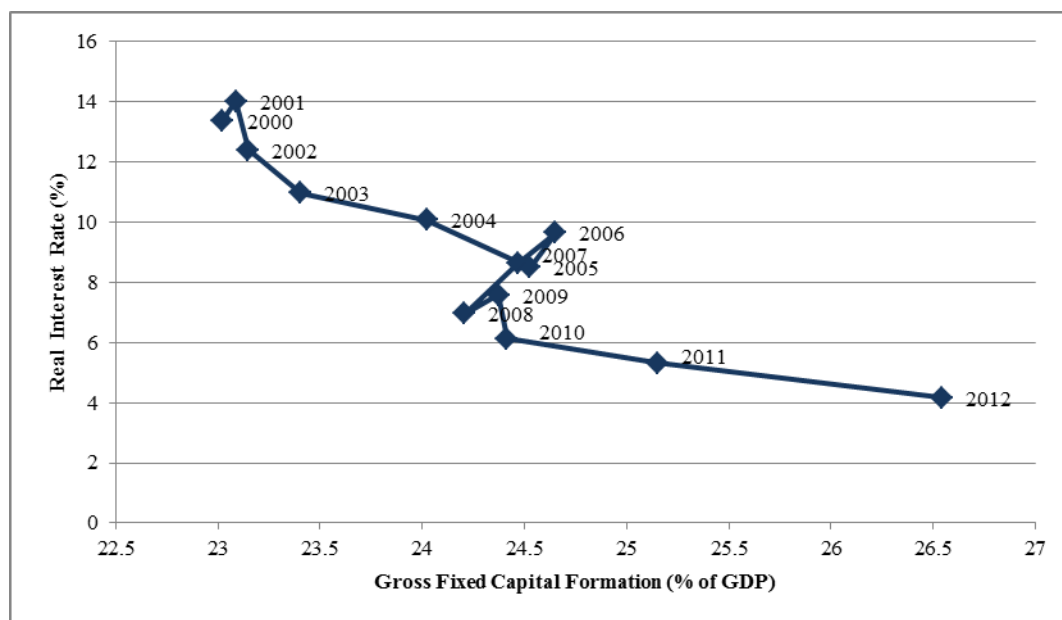
Source: WDI 2013

As shown in Figure 3.4, over the last twelve years, a reduction in the real interest rate has generally been accompanied by an increase in investment. The correlation between the real interest rate and domestic credit to the private sector yields a similar result (with a negative correlation of 0.95). These tests lend support to the idea that finance could be a constraint to growth; however, further investigation is needed.

---

[21] It is allowed, but only at a 0% interest rate.
[22] Hausmann et al, 2008, 'Doing Growth Diagnostics In Practice: A Mindbook', CID Working Paper No. 177, September 2008.
[23] Correlation of -0.89

Investigating savings rates, there has been a relatively strong correlation between the rate of savings and the rate of investment over the last 20 years (correlation of 0.9), suggesting that the supply of loanable funds is potentially a constraint to growth. However, a closer inspection reveals that the correlation is strong between 1990-2000 (correlation of 0.9) but very weak between 2001-2012 (correlation of -0.1). This suggests that the supply of finance may have been a constraint during the 1990s, but over the last 10 years this is no longer the case.

3.2.3 Test 3: If access to finance is a constraint to growth, then agents would try to find alternative financing.

According to the 2013 World Bank Enterprise Survey, around 14% of firms identified access to finance as the main obstacle to their business (this represents a decline from 35% in 2007)[24]. The picture varies depending on the size of firm. Only 7% of large firms and 12% of medium firms identified access to finance as the main obstacle, compared to 20% of small firms. Again, this represents a vast improvement since the 2007 survey (in which access to finance was the main obstacle for 23% of large firms, 24% of medium firms and 52% of small firms).

The 2013 Enterprise Survey also includes data on companies' main sources of finance for investment. As can be seen in Figure 3.5, the vast proportion of investment is financed by firms own internal sources in Bangladesh (only Pakistan has a higher rate[25]). Perhaps surprisingly, this story seems common across all firm sizes (with large, medium and small enterprises all reporting similar proportions of investment financed by internal sources). Efficient financial markets should reduce the reliance on internal sources for investment, and hence the data suggests that financial markets may not be operating efficiently.

---

[24] It is important to remember that there is an inherent bias with this type of analysis – the Enterprise Survey can only cover the firms that survived; hence it is possible that finance may be a constraint but the firms in the market survived precisely because they don't require as much financing as the firms that failed.

[25] There are also limitations to this type of analysis. Different industries have different risk structures and some types of industries/sectors may inherently have to rely more on internal financing (not because there isn't external financing available). Given that the industrial composition of the comparator countries will be different, this means that an equal comparison cannot be made.

Figure 3.5: Financing of Firm Investment
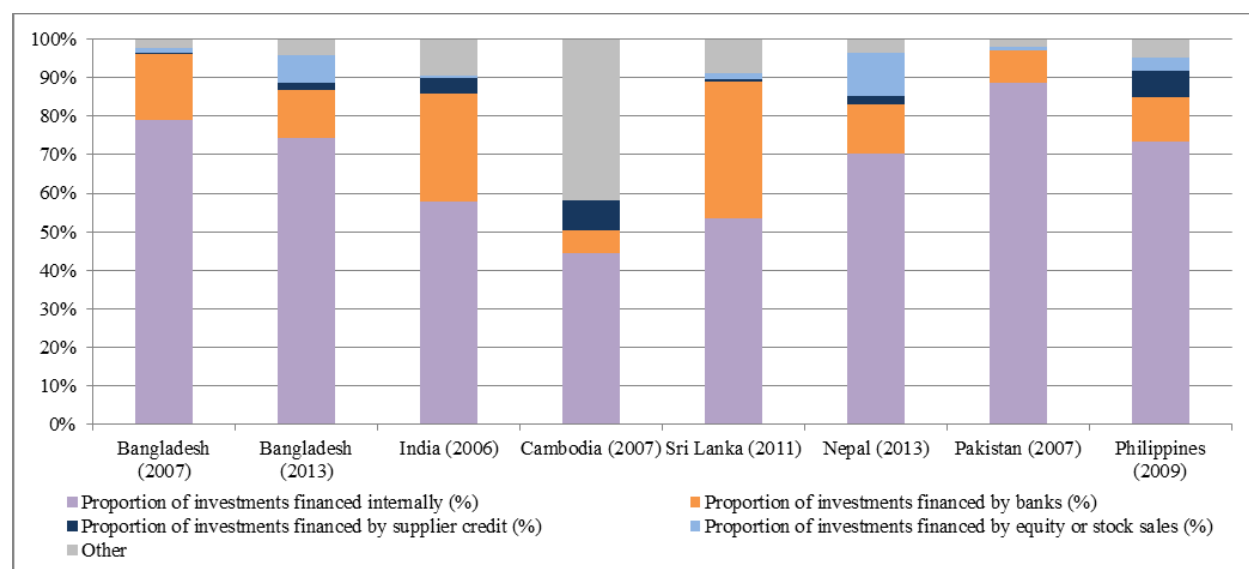
Source: 2013 Enterprise Survey

Small and medium enterprises (SMEs) in developing countries often rely on internal finance. The above analysis looks at the economy as a whole, and does account for the fact that the share of GDP from SMEs may be higher or lower in Bangladesh than the comparator countries. In order to account for this, the analysis was broken down by firm size. For small businesses in Bangladesh, 76% of investment was financed internally and 10% by banks. There is a fairly mixed picture across comparator countries for small businesses, with internal finance ranging from 60% to 92% and finance from banks ranging from 5% to 30% (and hence Bangladesh was somewhere in the middle). For larger firms, Bangladesh had one of the highest rates of internal financing for investment at 74% (only Pakistan was higher with 78%). Furthermore, large businesses in Bangladesh had the lowest proportion of investment from banks, at just 15% (with the comparator countries ranging from 18% to 41%).

The 2013 Enterprise Survey also reveals the percentage of firms who had a loan rejected. In the case of large firms the rate was only 4%, suggesting that there is not a high unmet demand for bank loans (despite the high rate proportion of investment funded from internal sources). The same cannot be said for small firms, 29% of which had a loan application rejected (16% for medium firms).

3.2.4 Test 4: If access to finance is a constraint then firms or sectors less intensive in the finance constraint are expected to thrive relative to firms that are more intensive.

Lack of comprehensive data makes this test difficult to carry out with a high degree of rigor. The analysis above under test three suggests that firms that are not reliant on external financing survive. Further analysis of the Enterprise Survey shows that sales growth of firms with a loan/line of credit has been roughly the same as the sales growth of firms without a loan/line of

credit. However, strong conclusions cannot be drawn from this evidence given the myriad of other factors that influence firm sales.

A broad look at the data available on bank advances by economic purpose shows that agriculture and transport/communications receive a small proportion of finance from banks relative to their contribution to overall GDP. If finance is a constraint to growth then these sectors that appear to be less burdened by the finance constraint may be expected to thrive relative to other firms[26]. However, this has not been the case, with growth rates in these two sectors generally below headline GDP in recent years. Nevertheless, as above, it is difficult to draw conclusions with confidence based on these high level tests.

Table 3.1: Bank Advances vs. Economic Performance

Sector	Proportion of bank advances (FY 2013)	Proportion of GDP (FY 2013)	GDP growth (FY 2013)
Ag, forestry and fishing	5.4%	18.7%	2.2%
Industry	21.1%	22.6%	9.0%
Working capital financing	13.4%	-	
Construction	9.1%	9.4%	8.1%
Transport and Communications	2.1%	10.8%	6.7%
Trade	37.5%	14.1%	4.7%
Others	11.4%	-	-

Source: Bangladesh Bank Annual Report

3.3 Functioning of the Financial System

To supplement the tests above a more in-depth analysis of the financial sector was carried out. Efforts have been to improve the banking sector in recent years and this is reflected in the data.

At a broad level, the interest rate spread provides useful insight into the function of the financial system. According to the latest Annual Report from the Bangladesh Bank, the interest rate spread has remained at around 5% for the last 6 years. In practice, comparing interest rate spreads between countries is difficult due to differences in terms and conditions attaches to rates, and differences in aggregation methods. However, while 5% is high, it is not dissimilar from the comparator countries for which data is available.

The level of competition in the sector can be an important determinant of interest rate spreads. Competition in Bangladesh continues to improve, with asset share of the three largest banks (as a percentage of total bank assets) halving between 2001 and 2011 (from 61% to 32%). This places Bangladesh amongst the lowest of the countries analyzed, suggesting that the financial sector reforms continue to have a positive impact. The role of state banks also continues to decline.

---

[26] This analysis assumes that all industries require the same amount of external financing. However, as highlighted above, this is not the case and a low proportion of bank advances may not be due to any sort of financing constraint, but rather the characteristics of the industry. Therefore the analysis should be taken with caution.

Operating costs (another determinant of interest rate spreads) also appear reasonable for Bangladesh. Bank overheads as a share of total assets are 2.4%, which is mid-way between the top performing and worst performing comparator countries (India with 1.7% and Sri Lanka with 3.3%).

Figure 3.6 shows that deposit money bank assets continue to rise, placing Bangladesh among the top comparator countries. This is healthy and suggests trust in the banking system.

Figure 3.6: Deposit Money Bank Assets to GDP (%)
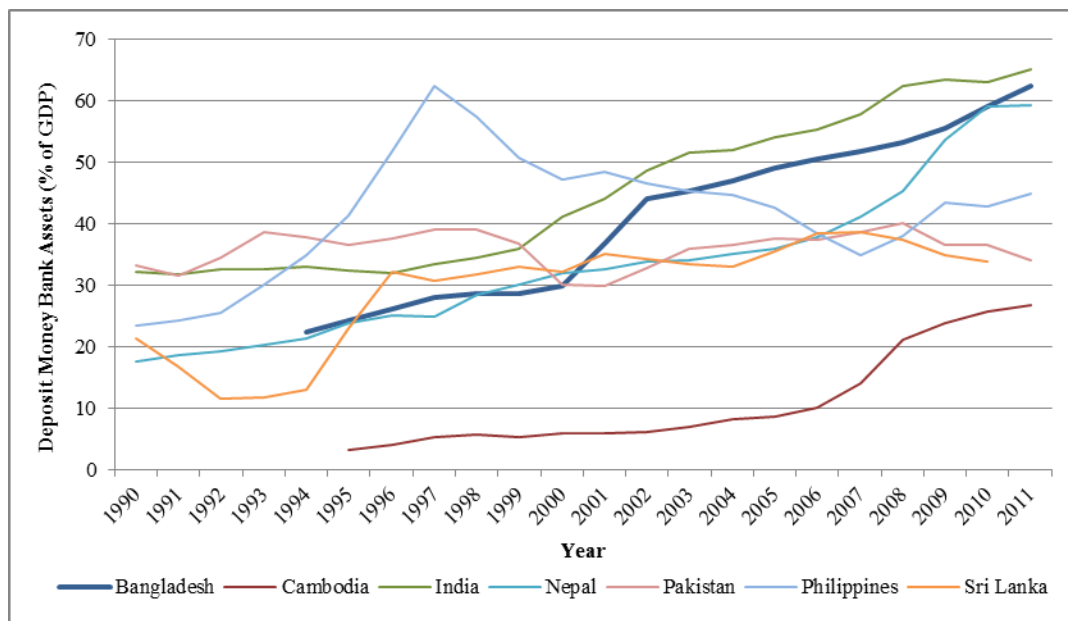
Source: IMF: Financial Development and Structure Statistics 2013

The analysis below further investigates the functioning of financial intermediation. As shown by Figure 3.7, rates of bank non-performing loans (NPLs) has dropped dramatically in the last 10 years, backing up the assertion that financial intermediation has been improving. However, Bangladesh's non-performing loan rate is higher than those of other comparator countries where data is available (again, cross country comparisons can be difficult due to differences in measurement). The IMF's 2010 FSAP recommended that stricter enforcement of regulations was needed to ensure full and accurate disclosure of NPLs. The latest Bangladesh Bank Annual Report (2012/13) highlights that new stricter loan classifications have been put in place to ensure more accurate NPL reporting. However, several interview respondents noted concern that the official rate of NPLs still misrepresents the true picture, with debt being re-scheduled and rolled over.

Figure 3.7: Bank non-performing loans (% of gross loans)
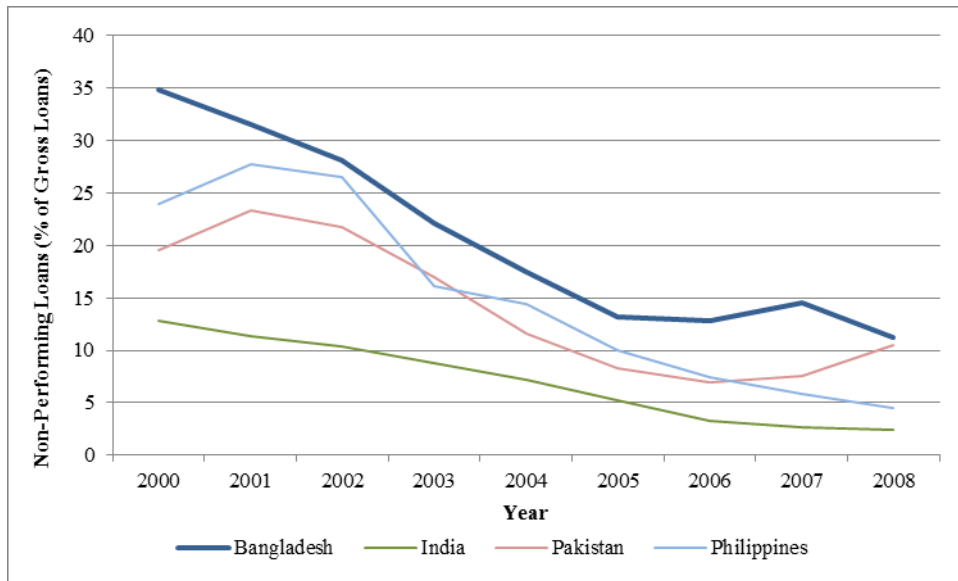
The rate of non-performing loans is largely driven by SCBs (state-owned commercial banks) and DFIs (Development Finance Institutions), who have loan default rates of 24% and 27% respectively[27], compared to the much lower rates of 5% for private commercial banks (PCBs) and 4% for foreign commercial banks (FCBs). DFIs only account for around 6% of banking system assets; SCBs, on the other hand, account for roughly a quarter, and therefore the poor performance of this bank type is having a fairly large impact on the market as a whole.

Another indicator of the health of the financial sector is the average return on assets. Figure 3.8 shows a volatile picture between 2003 and 2008, though with improvement over recent years. Again, the performance of SCBs and DFIs is below that of the PCBs and FCBs.

---

[27] Bangladesh Bank Annual Report 2012-2013.

Figure 3.8: Average Bank Return on Assets
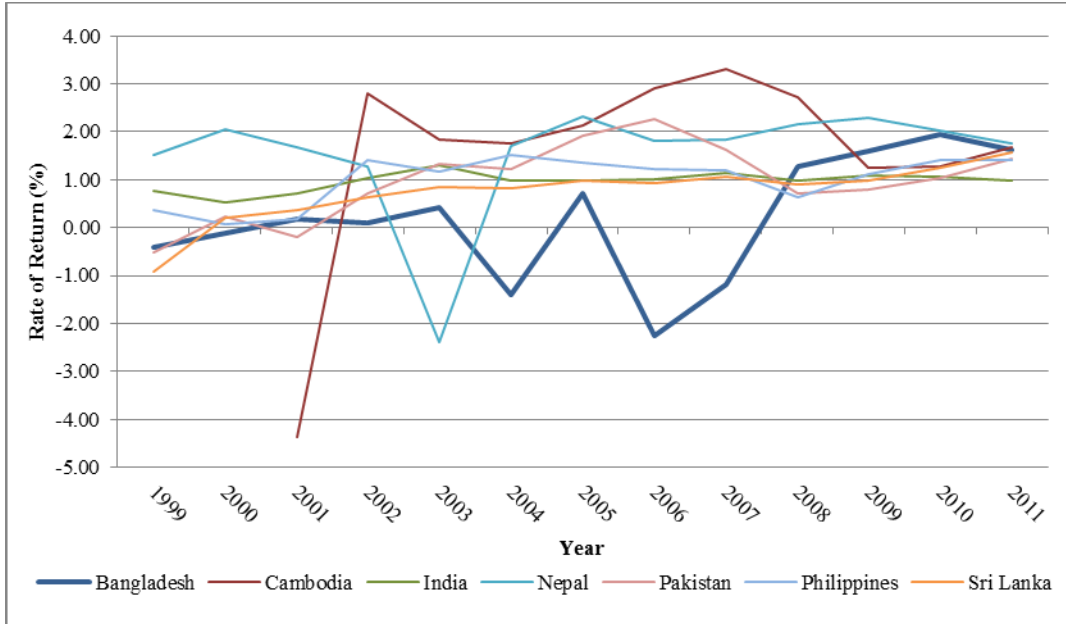
Source: Financial Development and Structure Dataset, 2013.

3.4 Other Considerations

As the 2010 FSAP highlights, long-term financing is scarce and the capital market remains shallow. Banks are engaging in long-term financing, but their deposits are largely short-term, making them ill-suited to this type of lending. The stock market remains shallow, and despite some growth in recent years Bangladesh's market capitalization is far below that of comparator countries.

Figure 3.9: Market Capitalization of Listed Companies (% of GDP)
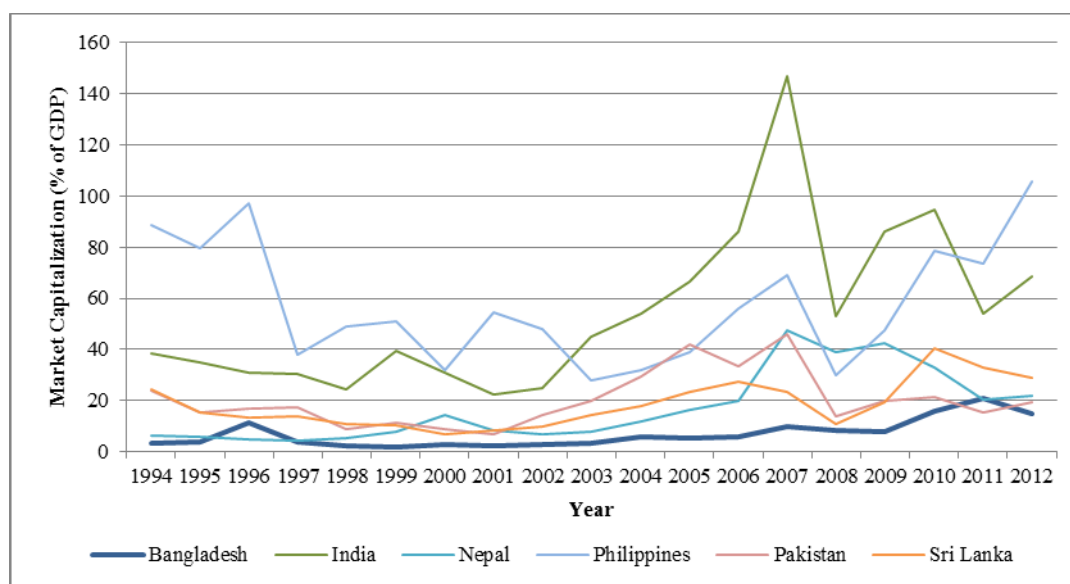
Source: WDI 2013

From an inclusivity angle, it is useful to assess the extent to which the population has access to financial markets. Figure 3.5 in the previous section shows that the vast majority of firms use internal sources of financing for investment, suggesting that access may be an issue.

The Bangladesh Microfinance and Financial Sector Diagnostic Study (2009) suggests that there is an unmet demand for SME financing. This is also reflected in the 2013 Enterprise Survey, which shows that 28.5% of small firms had a loan application rejected (compared to 15.7% of medium firms and 4.4% of larger firms).

The number of branches per 100,000 people in Bangladesh is the lowest out of the comparator countries (other than Cambodia). The average rate of growth in the number of branches per 100,000 people in Bangladesh has been slow at less than 2% per annum over the last 10 years. Over the same period, financial markets more broadly have increased in size as the share of credit extension to the private sector as % of GDP has risen rapidly. Bank branches can give a signal about efficient the financial market is in connecting savers with investors. More encouraging to note is the rise in the number of people borrowing from commercial banks, which has risen by 34% in the last 8 years to around 90 per 1000 adults (well above the rates in Nepal and Pakistan but still below India).

Figure 3.10: Commercial Bank Branches per 100,000 Adults
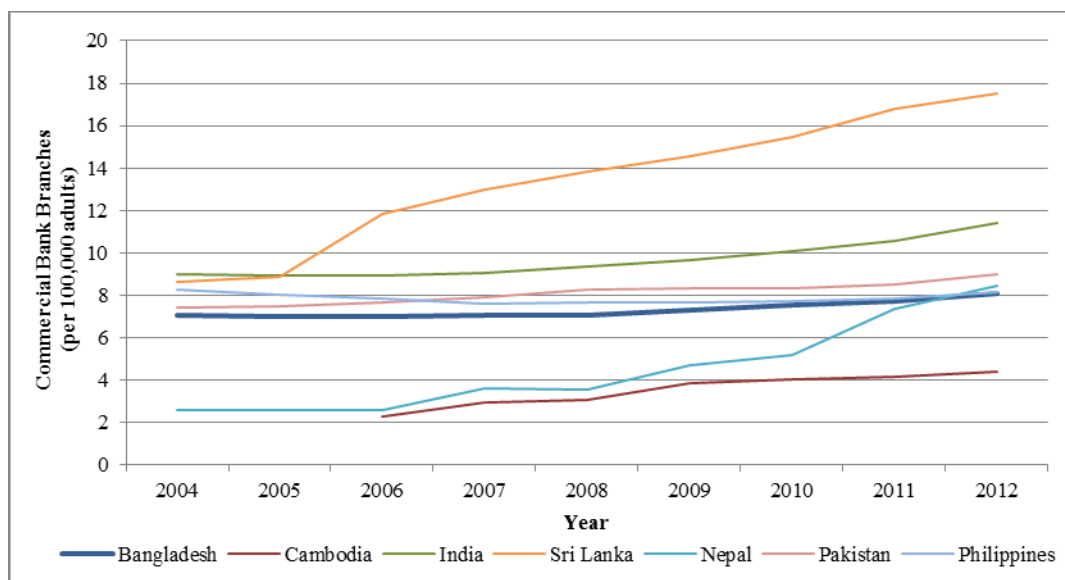
Source: WDI 2013

3.5 Conclusion

The analysis above paints a mixed picture of the financial sector in Bangladesh. In general the story is one of improvement, with falling real interest rates and a growing, more competitive banking sector. However, the 2013 Enterprise Survey reveals a high level of internal financing for investment, which suggests that further improvement is needed. Furthermore, capital markets remain shallow, raising concerns about the financing of longer term investments.

Overall, access to finance is not rated as a binding constraint. However, there are aspects of the financial system that will have an impact on medium/long-term growth prospects and should be seen as intermediate priorities (such as capital market deepening and SME financing). This conclusion is generally supported by the findings from in-country interviews.

4 MACROECONOMIC RISKS

This chapter reviews the macroeconomic conditions in Bangladesh in recent years to determine whether these conditions represent binding constraints to the country's economic growth that may thus require a change in national policy. After examining this node, it appears that Bangladesh's macroeconomic state is relatively stable and does not represent a binding constraint to economic growth. However, the macroeconomic indicators as reviewed in this chapter suggest that conditions could be improved by imposing strict policy measures in fiscal and monetary policy.

4.1 The Importance of the Macroeconomic Environment

Macroeconomic policies and development affect economic growth and the policy objective of poverty reduction in a number of ways. As noted in the Tunisia IGD[28] completed as part of the U.S. government's Partnership for Growth initiative, macroeconomic policy distortions in fiscal policy negatively affect the interest rate, inflation, and availability of government resource for critical area for growth: infrastructure, education, health, and social safety nets. Excessive budget deficits require large amounts of government borrowing, lead to increases in real interest rates, push up costs of financing, and crowd out private investment.   Macroeconomic policy distortions that cause an exchange rate overvaluation reduce profitability of exports and of domestic production of goods and services, vis-a-vis importing. Sustained inflation can increase the costs of doing business.
Macroeconomic risks arise when government policies and macroeconomic developments lead to an increased likelihood that the economy will suffer a macroeconomic crisis in the future.   If future risks are considered significant, they will discourage current private investment, as the investors are concerned with potential rapid inflation, large increases in interest rates, and sudden devaluations of currency, leading to a financial crisis. If such macroeconomic distortions and risks are serious, they can pose a binding constraint to economic growth.

4.2 Fiscal Policies and Public Debt

During the past several years (2005-2012), the Government of Bangladesh (GOB) has pursued a conservative fiscal policy and maintained modest fiscal deficits and complementary monetary and exchange rate policies. As a result, the GOB has maintained macroeconomic stability and progressively reduced the likelihood of crisis. As shown in Figure 4.1 below, the budget deficit (including grants) as a share of GDP ranged from a high of 1.7% in 2009 to 0.9% in 2011. This deficit level in 2011 and its overall range of variation over the time frame is the lowest among all of the comparator countries. For example, India's deficit was more volatile, ranging from a high of 5.4% in 2009 to 0.5% in 2007, while the same figure for Pakistan ranged from 7.2% in 2007 to 3.2% in 2005.

---

[28] Towards a New Economic Model for Tunisia: Identifying Tunisia's Binding Constraints to Broad-Based Growth, November, 2012

Figure 4.1: Budget Deficit as a Percentage of GDP
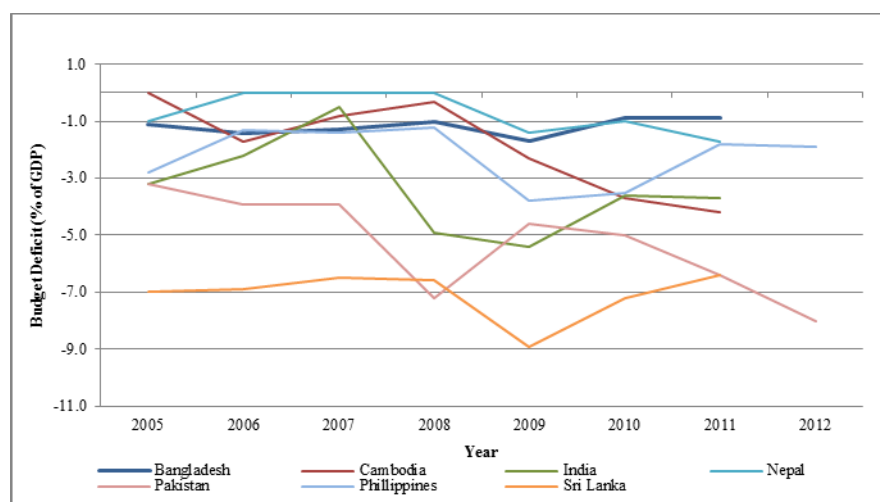
*Source: World Bank World Development Indicators (via USAID Economic
Analysis Data Service's (EADS) Economic and Social Data Base (ESDB))*

Though between 2005 and 2011 the GOB achieved a lower level of budget deficit than the comparator countries, fiscal pressure still existed, mainly due to the rising subsidies for fuel, electricity, and fertilizer. The provision of fuel and electricity at prices lower than cost combined with a rapid expansion in oil-dependent power generation placed a major burden on government budget. As a result, the GOB's fiscal deficit grew by 9.7% during FY 2011/2012.[29] To address this issue, the GOB has taken several measures, including containing subsidy related costs and reducing nonessential spending to limit the overall fiscal deficit.

The National Board of Revenue (NBR) took extensive efforts to strengthen revenue administration and broaden the tax base by automating systems, registering tax payers, and improving voluntary compliance. A new value-added tax (VAT) law was approved by the Cabinet in March 2012. As a follow up measure, a VAT implementation plan and time table was created and the organizational structure of the NBR was overhauled. A direct tax law was introduced in 2012 that included income tax code which limited exemptions and concessions and implemented rationalizing rates and thresholds. This law also resulted in the automation of tax payer identifications numbers, with links established to the national identification and business identification systems. These measures will increase the transparency of tax administration, increase the revenue base, and contribute to higher level of tax revenue.

To contain subsidy-related costs, the GOB has made concerted efforts to cut down on losses from key state-owned enterprises (SOEs) and ensure adequate budgetary resources for critical spending needs on education, health and other social safety nets.
 Despite progress on rationalizing fuel subsidies, Bangladesh will continue to record budget deficits for the next 2-3 years as the government encounters several domestic challenges, including the need to invest in power and water infrastructure and higher welfare spending. Public expenditures will continue to outpace revenue growth.

---

[29]Bangladesh Development Update, The World Bank, April, 2013, Table 3, page 30

The April 2013 World Bank "Bangladesh Development Update," notes that the GOB is committed to pursuing a moderate fiscal consolidation path by increasing revenue and containing subsidies in order to expand resources for investment spending while keeping fiscal risks in check. The government's overall fiscal stance has remained prudent, but still needs close watch as tax revenue is below target and large subsidies continue to be provided. Stricter tax enforcement, the new VAT law, and income tax reforms could result in a more effective tax regime in the medium-term. Better cost management and price adjustments will be needed to contain subsidies, along with improved targeting in safety net programs to protect Bangladesh's most vulnerable citizens. To keep fiscal risks in check, focused attention on concessional financing complemented with selective use of non-concessional borrowing will be required to keep total debt levels manageable.

Maintaining a sustainable fiscal stance is critical to ensuring sound debt management. The 2011 joint IMF-World Bank Debt Sustainability Analysis confirms that with the borrowing path currently envisaged, Bangladesh would remain at low risk of external debt stress. It also recognizes the need to continue contracting external borrowing on highly concessional terms, which is the GOB's current debt management strategy.

As shown in Table 4.1 below, Bangladesh's external debt stock increased during the past several years, from US$17.8 billion in 2005 to US$25.4 billion in 2011. However, as a portion of GDP, it steadily declined from 29.6% in 2005 to 22.7% in 2011. Additionally, Bangladesh's external debt stock as a percentage of exports of goods and services rapidly declined, from 284.6% in 2005 to 84.1% in 2011. This dramatic decline was due to the country's high growth in export earnings.

The overall relatively low levels of fiscal deficit and public debt in Bangladesh suggest that they will have a minimal impact on domestic interest rates, with little current risk of crowding out.

Table 4.1: External Debt Stock

Indicator	2005	2006	2007	2008	2009	2010	2011
External Debt Stock (US$ bil)	17.8	17.9	19.6	21.0	23.0	22.4	25.4
External Debt (% of GDP)	30%	29%	29%	26%	26%	22%	23%
Debt Stock (% of Exported Good & Services)	285%	228%	207%	152%	151%	103%	84%

Source: Bangladesh Development Series, Volume 1: Overview, World Bank (Doc No: 67991), 2012

4.3 Inflation

A country's fiscal policy, deficit, and public debt (discussed in the previous section) have significant impacts on inflation. As seen in Figure 4.2, between 2005 and 2012, Bangladesh's annual inflation ranged from 5.4% in 2009 to 10.7% in 2011. In 2012, inflation was 8.7%. With the GOB's restrained fiscal policies and its decision to borrow funds rather than engaging in expansionary monetary policy, inflation has been relatively restrained and fluctuated within a narrow band relative to comparator countries. Figure 4.2 shows the inflation rates of Cambodia,

Pakistan and Sri Lanka in 2008, the year of the global financial crisis, which spiked to 35.0%, 28.3%, and 22.6%, respectively.

A close look at the inflation rates of Bangladesh in 2012 and 2013 shows a broad-based declining trend, as noted in the April 2013 World Bank publication, "Bangladesh Development Update." The twelve-month-moving average inflation rate declined from a peak of nearly 11% in February 2012 to 8% in March 2013, reflecting declines in both food and nonfood prices. This decline in inflation also reflects favorable international commodity prices, a stable exchange rate, and monetary tightening.

Figure 4.2: Annual Inflation (Measured as Changes in the Consumer Price Index)
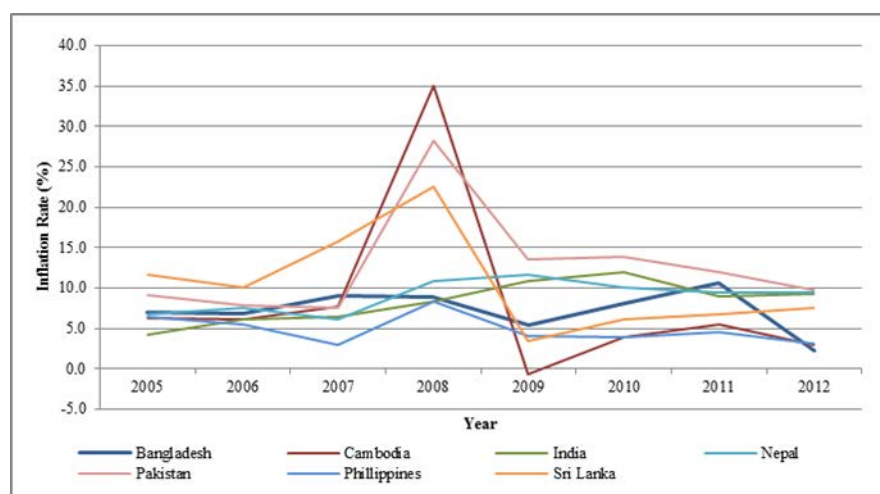
Source: World Bank World Development Indicators (via USAID Economic Analysis Data Service's Economic and Social Data Base (ESDB))

To reflect changing consumption patterns, in July 2012, the Bangladesh Bureau of Statistics introduced a new consumer price index (CPI) series using 2005/2006 as the base year. It included new consumption baskets and weights. By August 2013, the authorities had fully migrated to the new series.[30]

According to the Asian Development Bank's September 2013 "Bangladesh Quarterly Economic Update," the annual average inflation, measured by the CPI using 2005/2006 as the new base year, declined from 8.7% in FY 2012 to 6.8% in FY 2013 because of lower international food and commodity prices, and slower growth of private credit.

Year-on-year inflation slowed steadily to 5.0% in September 2012 from a peak of 12.7% in September 2011, because of the decline of food prices (ADB, 2013). Food inflation eased, reflecting the higher weight the new CPI assigns to rice, the price of which declined. Nonfood prices also declined, responding to slower growth in credit and appreciation of the Taka.

---

[30] To reflect changing consumption habits when measuring inflation, the statistical agency considers the price of 318 items in a rural basket and 422 items in an urban basket. [See Bangladesh: Quarterly Economic Update, Asia Development Bank, September 2013, PP.11-12]

The inflation rate rose slowly in subsequent months, reaching 8.1% in June 2013, reflecting an increase in food prices due to supply disruptions caused by national strikes and a rise in government-administered domestic fuel and power prices (ADB, 2013). Urban inflation was higher than rural inflation. In August 2013, urban inflation was 8.3%, compared to a rural inflation rate of 6.9%. During this same time, urban food inflation was 9.5%, and nonfood inflation was 7.1%, while rural food inflation was 7.5% and nonfood inflation was 5.8% (ADB, 2013).

The expected rise in domestic fuel and power prices, the likely supply disruptions caused by growing political unrest, and the expected rise in public and private garment sector wages may put pressure on prices in the near future. Wage increases may spill over into the rest of the economy, creating demand pressures.

While inflation in Bangladesh is lower and its band of variation narrower than in comparator countries and it does not pose high risk for doing business, the GOB should continue to carefully monitor any developments that may cause inflation to become a constraint in the future.

4.4 Exchange Rate

The monetary policy and exchange rate of a country can both have an effect on its trade performance. If problems in these areas exist, they can lead to budget deficits, inflation, and public debt. As seen in Table 4.2 the weighted average of nominal exchange (Taka/US$) has remained quite stable over the past several years, depreciating from 64.3 in 2005 to 68.9 in 2006, then remaining at roughly the same level through 2010. The exchange rate then depreciated to 74.2 in 2011 and further in 2012, to 81.9. It then appreciated from 81.7 in September 2012 to 77.8 in September 2013, an appreciation of about 5.0% (ADB, 2013). This appreciation reflects weak demand for the US dollar, as import growth was slower than export growth over this period. With a higher nominal exchange rate appreciation and a higher domestic inflation rate relative to that of its major trading partners (EU and US), Bangladesh's real effective exchange rate appreciated by 14.6% year-on-year as of end of September 2013 (ADB, 2013), implying some loss in export competitiveness.

Table 4.2: Nominal Exchange Rate

Year	2005	2006	2007	2008	2009	2010	2011	2012
Exchange Rate (Tk/US$)	64.3	68.9	68.9	68.6	69.0	69.6	74.2	81.9

Source: IMF Balance of Payments Statistics, December 2013

The Bangladesh Bank's gross foreign exchange reserves increased to US$16.2 billion (equivalent to about 5 months of imports) at the end of September 2013, from US$11.3 billion in September 2012[31] through purchases from commercial banks in order to prevent the Taka from appreciating and eroding the country's export competitiveness. In addition, an increase in oil imports-related credit and strong aid disbursements in FY 2013 contributed to further increases in the central bank's foreign exchange reserves.

---

[31] Bangladesh Quarterly Economic Update, Asian Development Bank, September 2013.

Based on this evidence, Bangladesh's exchange rate and foreign exchange reserves are not a cause for concern and are unlikely to cause macroeconomic distress in the near future. They are not macroeconomic risks that are constraining economic growth.

4.5 Balance of Payments

A country's balance of payments (BOP) influences both its debt stock and inflation. As shown in Figure 4.3 below, Bangladesh's current account balance during 2005-2012 was positive in all years, except for 2005 and 2011. The current account deficit as a percentage of GDP in these two years was very low, at 0.3% and 0.1%, respectively. Overall, the fluctuation of Bangladesh's current account balance was very low relative to its comparator countries, especially Cambodia, Pakistan, and Sri Lanka.

Figure 4.3: Current Account Balance as a Percentage of GDP[32]
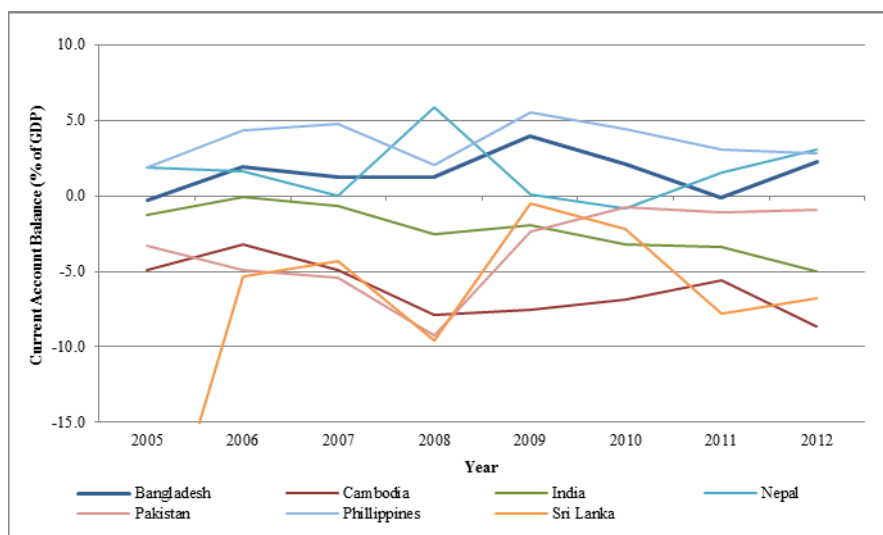
Source: IMF Balance of Payments Statistics, December 2013

Bangladesh's current account BOP slipped into deficit in FY 2011 (July 2010-June 2011) for the first time since 2005 as shown in Figure 1.3 above. An increase in exports of ready-made garments, partly from the capture of new market share, contributed to an overall higher export figure. However, this increase in exports was more than offset by record levels of imports, largely due to surging demand for oil, food grains, and consumer goods. Flows in remittances increased as the number of workers going abroad increased in 2011, but foreign aid disbursements slowed as a result of slow project loans.

As shown in Table 4.3 below, both exports and imports of goods and services have grown rapidly in recent years. Exports grew from US$10.4 billion in 2005 to US$27.6 billion in 2012, while imports grew from US$14.6 to US$37.7 billion over the same time period. Bangladesh's trade deficit of goods and services increased from US$3.9 billion in 2006 to US$10.1 billion in

---

[32] Sri Lanka's 2006 current account balance as a percentage of GDP was -26.6, though it is not displayed in the figure.

42

2012. During this period, the country's capital account registered a positive balance consistently, ranging from US$261.7 million in 2004 to US$420.2 million 2012. As a result, Bangladesh's overall balance of payments, including both the current and capital accounts, was positive over the entire observed period, ranging from US$85.5 million in 2005 to US$3.1 billion in 2012.

Table 4.3: Bangladesh Balance of Payments, 2005-2012

Indicators (millions US$)	2005	2006	2007	2008	2009	2010	2011	2012
A. Current Account	-176.2	1,196.1	856.8	985.6	3,556.1	2,105.9	-164.9	2647.7
Exports	10,420.2	12,744.5	13,906.3	17,402.0	17,047.4	21,654.5	26,990.1	27,592.8
Imports	14,576.9	16,640.9	19,369.2	25,074.7	23,072.7	29,470.8	37,878.1	37,660.2
Balance	-4,156.8	-3,896.3	-5,462.9	-7,672.6	-6,025.3	-7,816.3	-10,888.0	-10,067.5
B. Capital Account	261.7	152.5	715.4	490.5	474.9	603.4	512.4	420.2
Credit	261.7	152.5	715.4	490.5	474.9	603.4	512.4	420.2
Debit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Balance: Current and Capital Accounts	85.5	1348.6	1572.2	1476.1	4031.1	2709.3	347.5	3067.9
Balance: Current, Capital, and Financial Accounts	227.9	1468.8	2252.3	1207.8	6100.9	1071.3	-631.7	3955.1

Source: USAID Economic Analysis Data Service's Economic and Social Data Base (ESDB), IMF Balance of Payment Statistics

According to the Asian Development Bank's September 2013 "Bangladesh Quarterly Economic Update," Bangladesh's export performance has been quite strong since July 2013 (the beginning of FY 2014). Export earnings grew by 24.0% between July 2012 and July 2013. Strong growth in the ready-made garment (RMG) sector contributed to this good performance. RMG exports from July to August 2013, accounting for about 82.6% of total export earnings over the period, grew by 17.1%. Garment exports to the European Union (EU) increased by 15.5% and to the U.S. by 14.1% (ADB, 2013).

The same Asian Development Bank report referenced above finds that export earnings from the EU, the main source of Bangladesh's export earnings, grew by 19.0% from July to August 2013, to US$2.7 billion, which is 54.3% of total export earnings over the same period. Bangladesh's export earnings from the U.S. between July and August 2013 went up by 10.1% to US$977.6 million, equivalent to 19.4% of total earnings over the same period (ADB, 2013). Export earnings from newly-entered markets also increased significantly: from July to August 2013, export earnings from these markets increased by 10.9% to US$967.2 million, about 19.2% of total export earnings, while garment export earnings rose by 15.1% to US$651.7 million (ADB, 2013).

Bangladeshi imports increased by 8.0% between July 2012 and July 2013. Among the import categories, import of food grains increased by 93.7%, textile and articles by 14.2%, and iron, steel and other base metals by 20.7% over the same period (ADB, 2013).

The trade deficit declined to US$129.0 million in July 2013, down from US$476.0 million in July 2012 because of lower growth of imports compared to exports. This lower trade deficit raised the current account surplus to US$754.0 million in July 2013, up from US$284 million in July 2012 (ADB, 2013).

Bangladesh's net FDI increased to US$144 million in July 2013, up from US$133 million in July 2012, while net foreign assistance fell to US$41.8 million in July 2013, a dramatic decrease from US$156.8 million in July 2012 (ADB, 2013).

The country's combined capital and financial accounts recorded a deficit of US$394.0 million in July 2013, a large decline from the surplus of US$224.0 million in July 2012 that reflects a large deficit in short-term loans and a net trade deficit. As a result, the overall balance of payments showed a lower surplus of US$369.0 million in July 2013, compared to a July 2012 surplus of US$553.0 million (ADB, 2013).

4.6 Remittances

Remittances play an important role in Bangladesh's economy, as is the case in many developing countries. According to the World Bank, Bangladesh is one of the top 10 remittance countries in the world. As seen in Table 4.4, total remittance inflows grew faster than GDP growth, from US$3.85 billion in 2005 to US$11.65 billion in 2011. Remittances as a percentage of GDP also grew, from 6.4% in 2005 to 10.5% in 2011. They also grew faster than exports of goods and services, increasing from 37.0% in 2005 to 50.6% in 2010, though later declining to 43.1% in 2011. This decline is due to the fact that exports of goods and services in 2011 experienced a sudden 24.4% jump, rather than a decline in remittances. Remittances increased by a modest 6.0% in that year as shown in the table below.

Table 4.4: Bangladesh Remittances

	2005	2006	2007	2008	2009	2010	2011
Remittances (billion US$)	3.85	4.80	5.98	7.92	9.69	10.99	11.65
Remittances (% of GDP)	6.4	7.8	8.7	9.9	10.8	11.0	10.5
Exports (% of GDP)	14.2	16.6	17.6	17.7	17.4	16.2	20.8
Remittances (% of exports)	37.0	37.8	43.0	45.5	57.0	50.6	43.1

Source: USAID Economic Analysis Data Service's Economic and Social Data Base (ESDB), IMF Balance of Payment Statistics

Saudi Arabia, the United Arab Emirates, Kuwait, the United States, and the United Kingdom are the top five country sources (in descending order) of Bangladeshi remittances; 78.2% of total remittances in 2011 originated from these countries. Bangladesh migrants to these countries account for more than 73% of the total migrants.[33] Remittance inflows totaled US$3.3 billion, a decline of 8.1% in the first three months of FY 2014 over the corresponding period of FY 2013, when they totaled US$3.6 billion. [34] Remittance inflows declined due to a large drop in out-of-

---

[33] Bangladesh: Towards accelerated, Inclusive and Sustainable Growth- Opportunities and Challenges, Vol II: Main report, The World Bank, June 2012, P51.
[34] Bangladesh Quarterly Economic Update, Asian Development Bank, September 2013.

country employment, especially in Middle Eastern countries. The Asian Development Bank (see footnote 7) notes that out-of-country jobs for Bangladesh workers fell by 38.9% over the two month period between July and August of 2013, indicating a likely slowdown in remittance inflows in the remaining months of FY 2014. It should be noted, however, that the large and generally increasing level of personal remittances during 2005-2011 as shown in Table 4.4, emanating from Bangladeshi workers who have migrated abroad looking for work, serves as a red flag indicating a significant failure of the domestic economy to generate good jobs at home to employ Bangladesh's steadily growing labor force.

4.7 Conclusion

As observed in the previous sections, the GOB has achieved a relatively stable macroeconomic environment, due to a number of factors: the GOB's commitment to sound macroeconomic policies and discipline, a favorable flow of remittances and donor grants, and continued success in exports of goods and services. Based on this analysis, the macroeconomic environment in Bangladesh does not pose a binding constraint to private investment, its overall economic growth, or efforts at poverty reduction. However, the fiscal deficit is still a concern in Bangladesh, as it is in many developing countries. With the continued commitment of the GOB to sound fiscal policy, the fiscal deficit is not expected to grow large or crowd-out private investment by forcing increases in interest rates and inflation. The current account balance has been positive during the past seven years, with the exception of a small deficit in two of the years. With a relatively stable and low level of external debt stock and its size relative to GDP and exports declining steadily during the past several years, the threat of a public debt-related crisis is unlikely. While a high level of remittances from migrant workers abroad helps to maintain a stable macroeconomic environment, it provides strong evidence that the Bangladesh economy is failing to generate enough productive employment for its growing labor force. Other areas of this growth diagnostic analysis must identify the binding constraints contributing to this critical failure.

5 MICROECONOMIC RISKS

5.1 Introduction

Government plays a significant role in carrying out economic development activities through regulations, infrastructure investments, tax incentives, and the creation of expectations and rules that govern economic transactions. Thus, the growth and development of a country's economy relies heavily on the behavior of government officials in the country. This is particularly true in Bangladesh, where there appears to be a symbiotic relationship between businessmen and political elites. While transparency, promotion of property rights, and a strong institutional environment can spur growth, corruption, high taxes, and a lack of property rights can be a threat to private appropriability of return to investment, and hence to growth and development. In other words, a private entrepreneurs' ability to appropriate economic returns may be constrained by these microeconomic level risks and distortions.

While the international and local business environment surveys cannot on their own constitute definitive evidence of the existence and severity of a particular microeconomic level constraint to investment, several indicators have shown that Bangladesh's institutional quality and business environment are a major concern for private investment growth. According to the World Bank's 2012 World Governance Indicators (WGI), Bangladesh's performance is weak in all six governance quality indicators (Kaufmann, and Mastruzzi, 2013). In 2013, the World Bank Doing Business data ranks Bangladesh 132th among 189 countries assessed worldwide in overall ease of doing business (see Table 5.1). Of its comparator countries, only Cambodia and Philippines score worse. The 2013-14 World Economic Forum (WEF) Global Competitiveness Index (GCI) ranks Bangladesh 110th among 148 countries assessed worldwide in overall global competiveness. The Fraser Institute's Economic Freedom Index ranks the country 114th out of 152 countries.

Table 5.1: Bangladesh's Performance in the 2013 Doing Business Indicators

Indicator	Bangladesh's Rank (out of 189)
Overall	132
Starting a Business	83
Dealing with Construction Permits	80
Getting Electricity	189
Registering Property	177
Getting Credit	82
Protecting Investors	21
Paying Taxes	98
Trading Across Borders	126
Enforcing Contracts	185
Resolving Insolvency	121

Source: World Bank Doing Business, 2013

In this section, we will demonstrate why certain microeconomic distortions significantly constrain private investment growth in Bangladesh. The analysis of available surveys indicates

that four areas of microeconomic distortion are of particular concern and worth examining as potential most binding constraints to private investment growth in Bangladesh. These areas are: (1) corruption, which seems to pose a major obstacle to economic growth by increasing the cost of doing business in terms of time and money in Bangladesh; (2) lack of contract enforcement, where Bangladesh is ranked near the bottom on many international lists and is particularly poor relative to comparator countries; (3) taxation, seen in Bangladesh having the high profit tax rate among its six comparator countries; and (4) access to land, demonstrated by widespread, insecure land tenure and exacerbated by a corrupt, costly and ambiguous land titling and registration system. Each section that follows will examine one of these microeconomic distortions to ascertain if it is a binding constraint to economic growth in Bangladesh.

5.2 Corruption

There is a negative relationship between corruption and economic growth and development.[35] Corruption discourages private entrepreneurs, provides incentives for workers to engage in nonproductive activities, hinders private foreign investment, increases the size of government, and decreases the quality of existing infrastructure. Using the estimated bribe payments from Ugandan firms, Fisman and Svensson (2007) found that corruption is one of the most common binding constraints to growth, with a one-percentage point increase in the bribery rate resulting in a three percentage point decline in firm growth, "an effect that is about three times greater than that of taxation."

Corruption was cited by the largest percentage (22.2%) of World Economic Forum (WEF) Global Competitiveness Index (GCI) respondents as the most problematic factor for doing business in Bangladesh in its 2013-2014 report; inadequate supply of infrastructure comes second, followed by inefficient government bureaucracy and access to financing. Within the corruption sub-section, Bangladesh's worst showing was in the area of irregular payments and bribes and in ethical behavior of firms, both ranking 146 out of 148. The country also scored very poorly in favoritism in decisions of government officials, intellectual property protection, protection of minority shareholders' interests, and several other institutional categories (See Table 5.2 for ranks of problematic factors; for scores and additional details see Table 5.10 and Table 5.11 in the chapter annex).

---

[35] See Murphy, Shleifer and Vishny (1993), Mauro (1995, 1996), Keefer and Knack (1995), Triesman (2000), Tanzi and Davoddi (1997), Gupta, et al. (1998), Elliott (1997), Wei (1997a), Brunetti, et al. (1997), Lambsdorff (1999), Rose-Ackerman (1997) and Bardhan (1997).

Table 5.2: Most Problematic Factors for Doing Business in Bangladesh, 2011-2013

	2011	2012	2013
Corruption	2	2	1
Inadequate supply of infrastructure	1	1	2
Inefficient government bureaucracy	3	4	3
Access to financing	5	3	4
Government instability/coups	12	7	5
Inadequately educated workforce	6	9	6
Foreign currency regulations	8	8	7
Policy instability	4	6	8
Tax regulations	9	11	9
Poor work ethic in national labor force	13	13	10
Inflation	5	5	11
Tax rates	11	10	12
Insufficient capacity to innovate	--	14	13
Crime and theft	10	12	14
Restrictive labor regulations	14	15	15
Poor public health	15	16	16

Note: (Ranking: 1 most problematic, 16 least problematic)
Source: WEF 2011, 2012, 2013

In its 2012 Corruption Perception Index, Transparency International (TI) ranked Bangladesh 144th out of the 174 countries assessed worldwide. According to the Transparency International Bangladesh (TIB) 2012 household survey, most households in Bangladesh (63.7%) think that they are the victims of corruption, with officials in law enforcement, land administration, justice, health, education, and local government being cited as most corrupt. This finding is significant as the household survey measures individuals' views of corruption. The World Bank's 2012 World Governance Indicators (WGI) ranked Bangladesh poorly in institutional quality and business environment. The WGI gave Bangladesh a score of 21 in control of corruption on a 0 to 100 scale (with one hundred being "very clean"). According to the 2013 World Bank Enterprise Survey, 48.5% of firms in Bangladesh are expected to give gifts to public officials "to get things done," compared to 29.3% in South Asia. In the same report, it is estimated that 58% of firms indicated that bribes are required to obtain operating licenses from the government, which is a larger portion than in any of Bangladesh's comparator countries (See Table 5.3).

Table 5.3: Corruption in Bangladesh

	Percentage of firms expected to give a gift:				
	To "get things done" with public officials	In meetings with tax officials	To secure a gov't contract	To get an operating license	Value of expected gift to get gov't contract (% of contract)
Bangladesh (2013)	48.5	41.0	35.5	58.0	2.9
Cambodia (2007)	61.2	60.3	76.8	...	14.9
India (2006)	47.5	52.3	23.8	52.5	1.0
Nepal (2013)	14.3	10.4	51.3	18.9	4.3
Pakistan (2007)	48.0	58.8	14.1	12.7	0.3
Philippines (2009)	18.6	21.8	58.5	10.6	16.4
Sri Lanka (2011)	13.7	7.7	18.2	12.0	0.4

Source: World Bank Enterprise Survey

Corruption remains a significant concern for firms carrying out their business operations in Bangladesh. According to Wu, in Bangladesh, 94% of firms reported that they regularly bribe public officials, which is higher than the proportions of firms in any of the comparator countries (Xun Wu, 2005). However, it should be noted that although a higher percentage of firms (94%) report some level of bribery activity in Bangladesh, the "majority of the firms make small payouts," suggesting that petty corruption is more institutionalized and widespread (Xun Wu, 2005).

As shown in Figure 5.1, in general, medium size firms (56%) perceive corruption as more of a major constraint than small and large firms; large firms (49%) come second, followed by small firms (43%). The proportion of small firms in Bangladesh that identify corruption as a constraint is higher than in any of the comparator countries except Cambodia and Pakistan. While the corruption perceptions of medium and large firms vary among comparator countries, it is consistently higher in Bangladesh than India, the Philippines, and Sri Lanka.

Figure 5.1: Percent of Firms Identifying Corruption as a Major Constraint
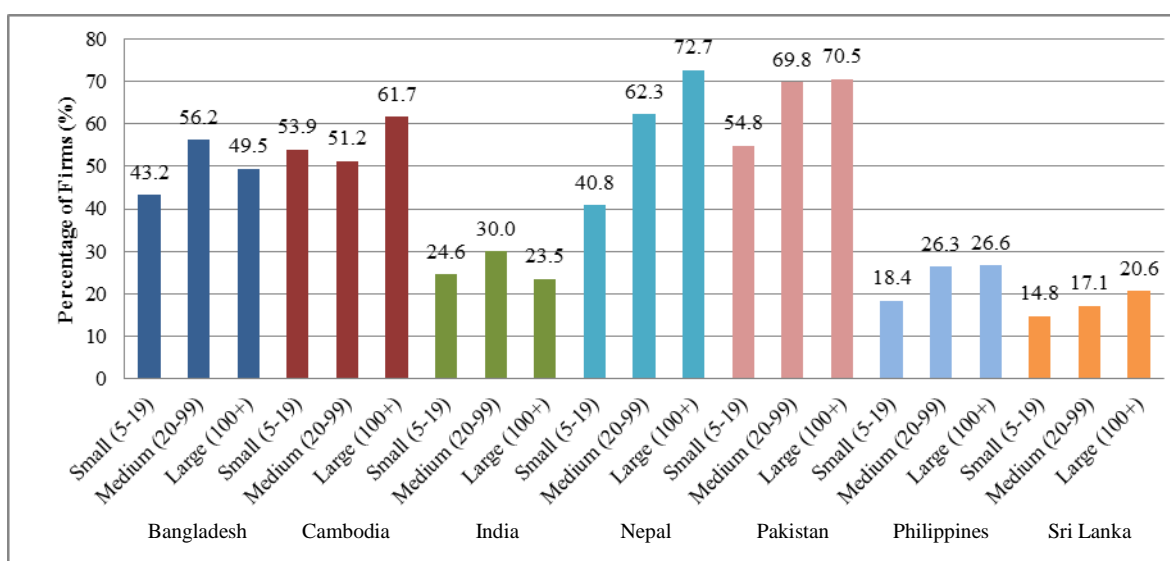
Source: World Bank Enterprise Surveys, 2013

Although the size of the "gift" to secure the contract varies among comparator countries, Bangladeshi firms seem to pay significantly higher prices in the area of import licensing and operating licenses (see Figure 5.2). In Bangladesh, 77% of firms expect to give gifts to public officials to get import licenses, compared to an average of 25% in comparator countries. Overall, 47.8% of small firms are expected to give gifts to get operating licenses, and 30.1% are expected to give gifts in meetings with tax officials-which are higher rates than those seen by firms in Nepal, the Philippines, and Sri Lanka (see the World Bank Enterprise Survey, 2013).

Figure 5.2: Percent of Firms Expected to Give Gifts to Get Import and Operating Licenses
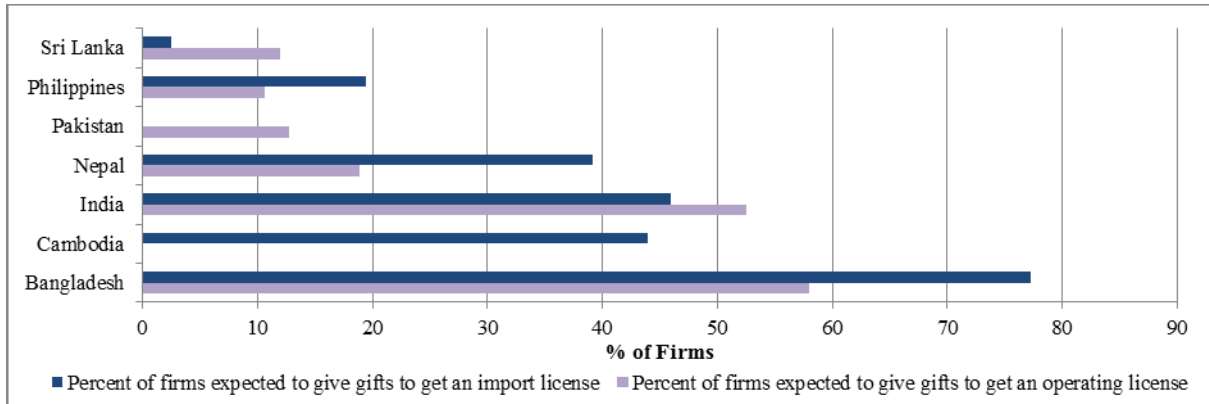
Source: World Bank Enterprise Survey, 2013

With a lot of space for discretion in the Bangladeshi public sector, small firms must negotiate the price they pay to establish or operate a business. The price small firms pay to secure a contract or do business coupled with the time it requires unnecessarily increases the cost of doing business. Taken together, this pattern suggests that corruption is an underlying issue in Bangladesh, and disproportionately penalizes the small firms in the country.

5.2.1   Test 1: Is the shadow cost of corruption high in Bangladesh?

Firms in Bangladesh appear to pay "gifts" that have a higher percentage of their contract value than firms in India, Pakistan, and Sir Lanka, indicating a higher price of corruption. However, this average shadow price of corruption is seen to be significantly below Cambodia and the Philippines, and slightly below the average in Nepal (see Figure 5.3).

Figure 5.3: Value of Gift Expected to Secure a Government Contract
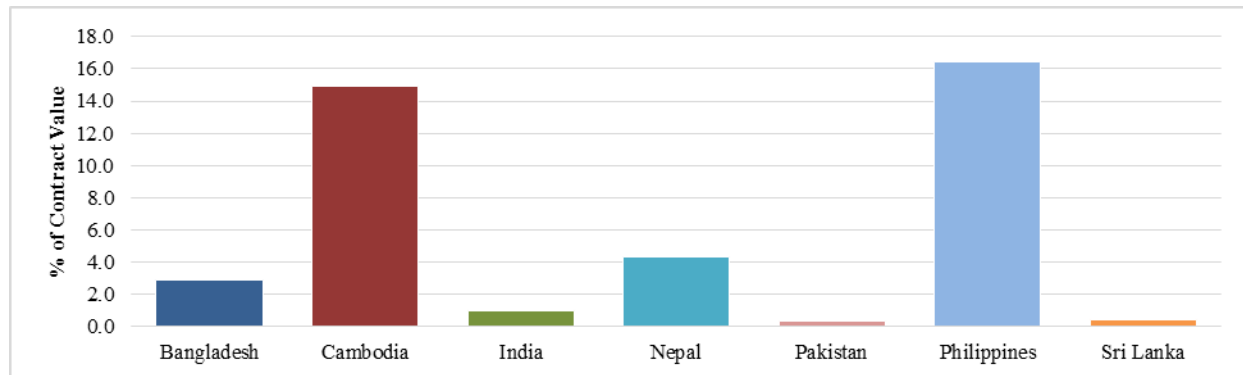
Source: World Bank Enterprise Survey, Bangladesh (2013); Cambodia (2007); India (2006); Nepal (2013); Pakistan (2007); Philippines (2009); Sri Lanka (2011).

Corruption is perhaps more of a bottleneck for small firms than medium and large firm in Bangladesh because, as Aterido et. al (2009) argues, small firms pay more in bribes as a percentage of sales than medium and large firms. Although we do not have relevant data to test the above claim, one might think that small firms have to pay bribes that represent a higher share

of their income than their counterpart large and medium firms. Figure 5.4 presents some evidence that small firms pay a higher price (3.3%) to secure government contracts than small firms in any of the comparator countries except Cambodia and Philippines. It is also of interest that small firms in Bangladesh pay a higher price to secure government contracts than medium size firms (1.3%), and a similar price to large firms (4.4%).

Figure 5.4: Value of Gift Expected to Secure a Government Contract by Firm Size
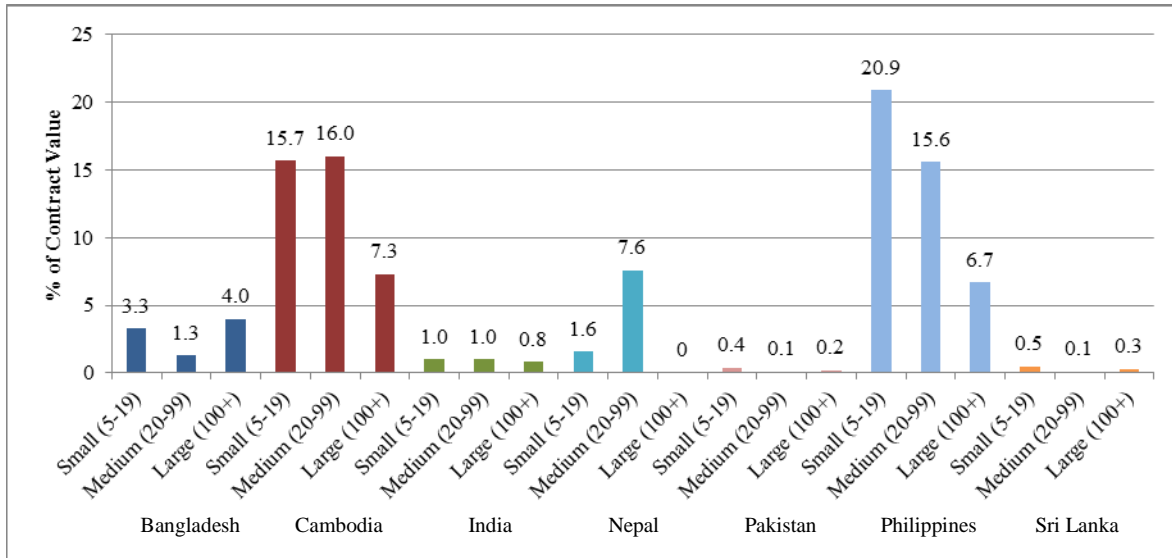
Source: World Bank Enterprise Survey, Bangladesh (2013); Cambodia (2007); India (2006); Nepal (2013); Pakistan (2007); Philippines (2009); Sri Lanka (2011).

5.2.2   Test 2: Do improvements in corruption correlate with investment growth?

Bangladesh has the lowest level of control over corruption of all other comparator countries except for Cambodia (see Figure 5.5). However, it should be noted that with the adoption of an Anti-Corruption Commission Act in 2004, the government of Bangladesh has attempted to improve the country's business environment and strengthen institutional and legal procedures. Scores on the control of corruption indicator seem to have improved since 2004, although Bangladesh still lags behind comparator countries and its overall score remains low. Nevertheless, the question of whether improvements in corruption correlate with investment growth remains.

Figure 5.5: Comparison of Control of Corruption Estimate, 1996-2012
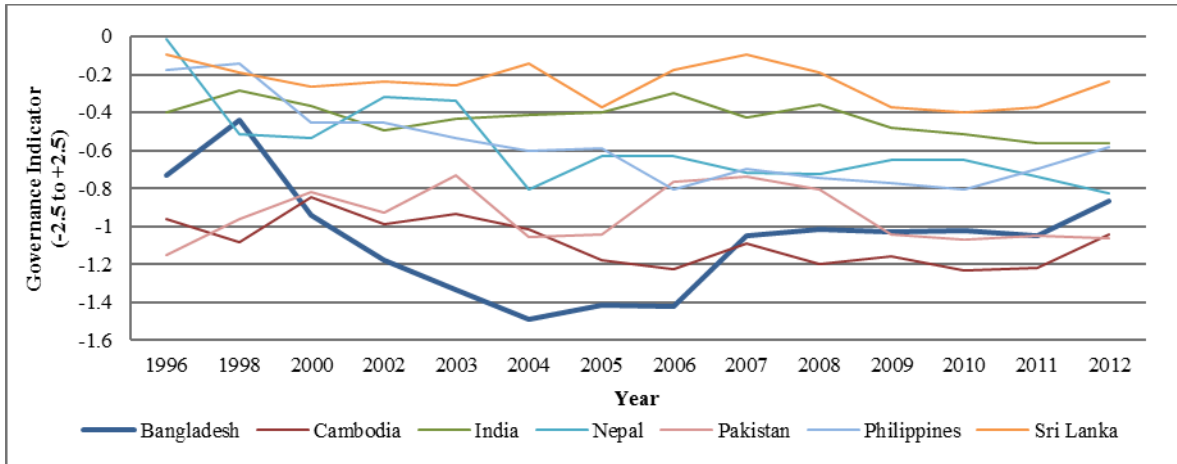
Source: World Bank Governance Indicators, 2013

Following Mauro (1995), we examine whether a change in corruption level affects investment. First, following the Millennium Challenge Corporation (MCC) constraint analysis procedures, we use a simple correlation regression between gross capital formation as percentage of GDP (a proxy for private investment) and the level of corruption (MCC, 2013). The result indicates no statistically significant relationship between corruption and private investment, and shows a weak and mixed correlation between investment and improvements in the control of corruption in Bangladesh (see Figure 5.6).

Figure 5.6: Correlation of Bangladesh's Investment Growth and Control of Corruption Indicator
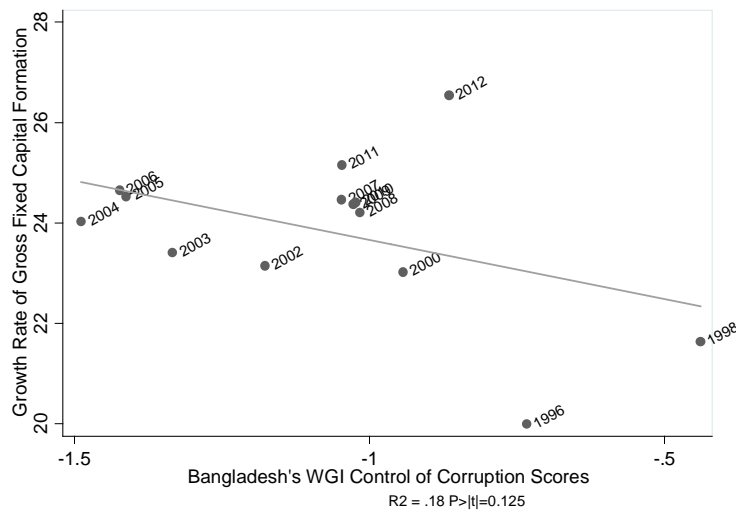
Source: WDI 2013, WGI 2013

Secondly, following Mauro we employ a model that controls for key determinants of investment to rule out whether corruption affects private investment beyond the typical determinants. However, the result again indicates no statistically significant relationship between corruption

and private investment. This confirms Rahman (2009) in finding that corruption is not a binding constraint on investment in Bangladesh. Still, it should also be noted that corruption is hard to quantify due to its illegal and hidden nature (Coolidge and Rose-Ackerman, 1997), and, moreover, what is perceived as corruption in one country is considered normal in another (Lindgreen, 2004). Therefore, analysis based on this particular correlation regression should be interpreted as only a partial explanation of the relationship rather than a comprehensive one.

5.2.3   Other Considerations

A lack of relevant data prevented us from completing diagnostic tests 3 and 4 of the growth diagnostic methodology. However, in the case of Bangladesh, one may argue that firms able to circumvent corruption could include established, local businesses that are highly diversified to avoid risk and able to get around bureaucratic requirements through engaging in rent-seeking behavior themselves. In this situation, new firms, particularly small firms, may face significant barriers to entry.

As noted in the overview section, Bangladesh's economy has been growing on average by 5.2% for the last 10 years, despite rampant corruption. In fact, the country's relatively impressive growth rate has persuaded some analysts to argue that corruption may not have a significant effect on private investment in Bangladesh. For example, Rahman states that "to the extent that Bangladesh has experienced steady economic growth despite all-pervasive corruption, it is far from self-evident that corruption is a binding constraint on investment" (Rahman, 2009). One explanation for the above argument is that so far, Bangladesh's economy (both private and public) has always been able to find a way around the problems caused by corruption. As one local expert during our round table discussion put it, "Bangladesh is a development paradox." In a 2007 report, the World Bank made a similar observation, noting that Bangladesh is "an outlier in cross-country studies which relate governance to economic growth" (World Bank, 2007).

However, it is complacent to assume that Bangladesh will be able to sustain its impressive growth of the last ten years for the next decade without an improvement in governance and the business environment. Also, it would be difficult to effectively address other constraints to Bangladesh's growth without improving governance and corruption, particularly because the latter seems to underpin all microeconomic risks in Bangladesh by acting as a risk multiplier for other distortions. Taken together, the analysis suggests that while corruption in Bangladesh is problematic and seems to act as a risk multiplier for other distortions, it does not, in its own, rise to the level of a binding constraint.

5.3 Contract Enforcement and Property Rights

In nations with secure contract law and well-defined and strongly protected property rights, "people are most likely be prosperous" (Knack and Keefer, 1995; Miller and Benjamin 2010). Efficient and transparent courts are essential to enforce contracts and interpret market rules, thus protecting both property and contract rights. The ability of courts to enforce the numerous contracts firms and individuals enter into in a business environment depends on a well-functioning and independent judiciary system.

However, Bangladesh has weak institutions, and endemic corruption plagues the performance of the judiciary system. As a result, courts are both time inefficient and costly. According to the TIB survey, more than half of households (57%) perceive the judiciary system in Bangladesh to be corrupt; nearly 7 out of 10 surveyed believe they were the victims of corruption (TIB, 2012). If firms perceive similar levels of corruption in the judicial system, they will be less likely to enter into and honor business contracts because of doubt over their enforceability. In addition, if firms cannot plan for the future because they do not know what the rules of the game will be (due to uncertainty regarding legal institutions), they will be far less likely to make productive long-term investments, as evidenced by Bangladesh's current inability to attract long-term FDI in the areas such as electricity generation. Therefore, it is possible that Bangladesh is being held back by weak contract enforcement.

Although the changes are marginal, the 2013-2014 WEF data suggest that investor confidence that contracts and property rights will be upheld may have decreased. Over that period, Bangladesh was given an average score of 3.4 for property rights, ranking 122th out of 148 countries. In the preceding year (2012-2013), Bangladesh was given an average score of 3.6 for property rights, ranking 104th out of 144 countries. Relative to comparator countries, Bangladesh has the lowest level of property rights protection with the exception of Pakistan, as highlighted by the WEF indicators in 2013 (see Table 5.4).

Table 5.4: The Global Competitiveness Index Property Rights Rankings, 2013-2014

	Rank	Score
Bangladesh	122	3.4
Cambodia	108	3.6
India	71	3.7
Nepal	114	3.5
Pakistan	123	3.3
Philippines	61	4.3
Sri Lanka	59	4.4

Source: WEF 2013

In the World Bank Doing Business 2013-2014 report, Bangladesh fares worst among all comparator countries in terms of contract enforcement with the exception of India. The report ranks Bangladesh 185th followed by India at 186th in enforcing contracts among 189 countries assessed worldwide. This ranking for Bangladesh seems to be consistent with the findings of the same report, which compared the shadow cost of contract enforcement across countries (see Table 5.5).

5.3.1   Test 1: Is the shadow cost of contract enforcement high in Bangladesh?

In 2013, Bangladesh required 41 procedures to undertake enforcement of a contract, at a cost of 66.8% of the claim; the number of days required to enforce a contract in Bangladesh averaged 1,442, which was higher than in Cambodia (483), India (1,420), Nepal (910), Pakistan (976), the Philippines (842), and Sri Lanka (1,318). As shown in Table 5.5 below, Bangladesh's cost of contract enforcement as a percentage of claims is also higher than most comparator countries,

with the exception of Cambodia (103.4%) and Sri Lanka (103.4%). Thus, the shadow price of contract enforcement in terms of time is high in Bangladesh, meaning that poor contract enforcement appears to pose some extra barriers to firms doing business in the country.

Table 5.5: Comparison of Rank and Shadow Cost of Contract Enforcement

	Rank (189)	Procedures (number)	Time (days)	Cost (% of property value)
Bangladesh	185	41	1,442	66.8
Cambodia	163	44	483	103.4
India	186	46	1,420	39.6
Nepal	137	39	910	26.8
Pakistan	159	46	976	23.8
Philippines	112	41	842	66.8
Sri Lanka	136	44	1,318	103.4

Source: World Bank, Doing Business Surveys, 2013

Bangladesh lags behind the comparator countries in terms of rule of law except for Cambodia (see Figure 5.7). Scores on the rule of law indicator have improved since 2006, although its score has declined since 2011 and remains relatively low.

Figure 5.7: Comparison of Rule of Law Estimate, 1996-2012
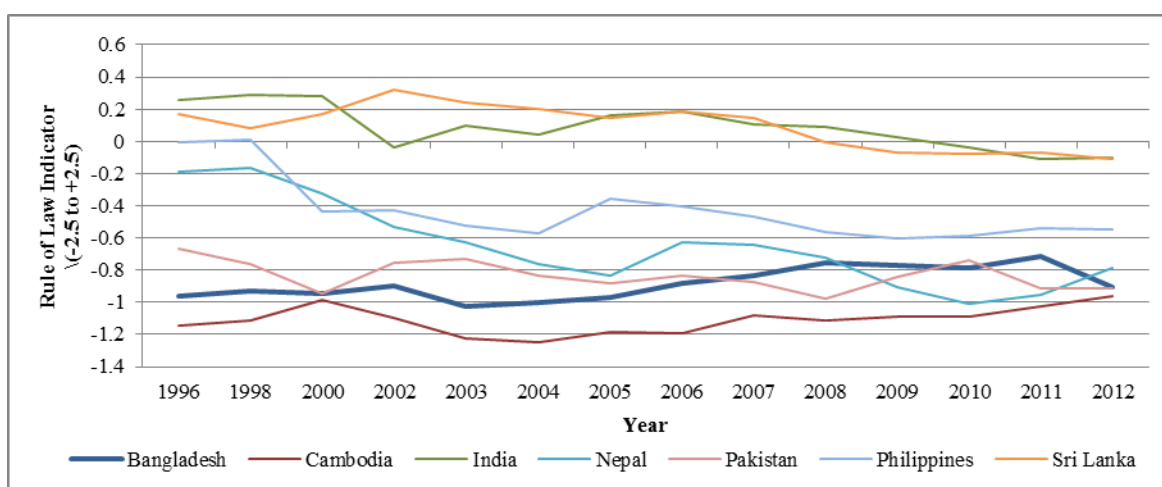
Source: World Bank Governance Indicators, 2013

5.3.2   Test 2: Do improvements in contract enforcement correlate with an increase in investment growth?

The World Bank's "Rule of Law" indicator captures "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (World Bank). In order to explore the effect of contract enforcement on private investment growth, we use this rule of law indicator as a proxy for contract enforcement. Following the MCC's guidance on conducting constraint analysis, we use a simple correlation regression between gross capital formation as a percentage of GDP (a proxy for private investment) and the

rule of law indicator as a proxy for contract enforcement (MCC, 2013). The result indicates no statistically significant relationship between contract enforcement and private investment, though the correlation between investment and improvements in the rule of law in Bangladesh are somewhat strong (see Figure 5.8).

Figure 5.8: Correlation of Bangladesh's Investment Growth and Rule of Law Indicator
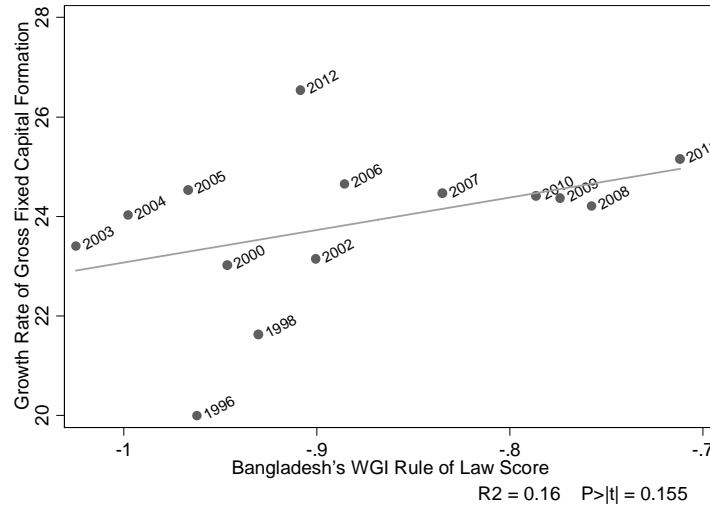
Source: WDI 2013, WGI 2013

Although, it is far from certain whether contract enforcement and property rights are constraining growth, this analysis indicates that contracts and property rights are both uncertain and costly to enforce in Bangladesh. Contract enforcement appears to be a constraint to growth, but doesn't rise to the level of the most binding constraint. The opportunity cost of contract enforcement, in terms of litigation time, is high in Bangladesh relative to comparators and improvements in rule of law appear to correlate with investment growth. Again, a lack of relevant data prevented us from completing tests 3 and 4 of the growth diagnostic methodology in the areas of contract enforcement and property rights.

5.4 Taxation

Investment can be restricted by high corporate taxes because entrepreneurs consider taxes an additional cost of doing business. Thus, high taxes contribute to low private appropriability of economic returns by making investments unattractive to potential investors. In an increasingly global world, high taxes on corporate profits can also discourage foreign investors from coming into a country and encourage domestic investors to move capital abroad. Among its comparator countries, Bangladesh has the highest profit tax rate, immediately followed by India (see Table 5.6). However, Bangladesh's overall tax rate, as indicated below, is lower and comparable to other comparator countries.

Table 5.6: Corporate Taxes Rates

	Profit tax (%)	Labor tax and contributions (%)	Other taxes (%)	Total tax rate (% profit)
Bangladesh	25.7	0.0	9.2	35.0
Cambodia	19.1	0.1	2.1	21.4
India	24.4	20.7	17.7	62.8
Nepal	17.2	11.3	3.0	31.5
Pakistan	18.1	15.1	1.5	34.6
Philippines	19.6	10.8	14.2	44.5
Sir Lanka	1.0	16.9	37.4	55.3

Source: World Bank Doing Business (2013)

Respondents in the 2012-2013 WEF GCI report rank tax rates and tax regulations as the least problematic factor in Bangladesh (see Table 5.1, Table 5.2 and Table 5.10 in the chapter annex for additional details). In the survey, out of the sixteen most problematic factors for doing business in Bangladesh, tax regulations are ranked 9th and tax rates are ranked 12th.
The problem in Bangladesh is not that taxes are high; rather, it is the presence of a narrow tax base with very few firms paying very high tax rates. The overall concern in Bangladesh is that poor tax administration and corruption in the tax system encourages tax evasion and promotes informality. According to the First Secretary in the National Bureau of Revenue, only 1.5% of the country's 150 million people hold a tax identification number. This partly explains the narrow tax base because without a tax ID number it is easy to avoid paying taxes.

Figure 5.9: Comparison of Tax Rates and Tax Administration as a Major Constraint
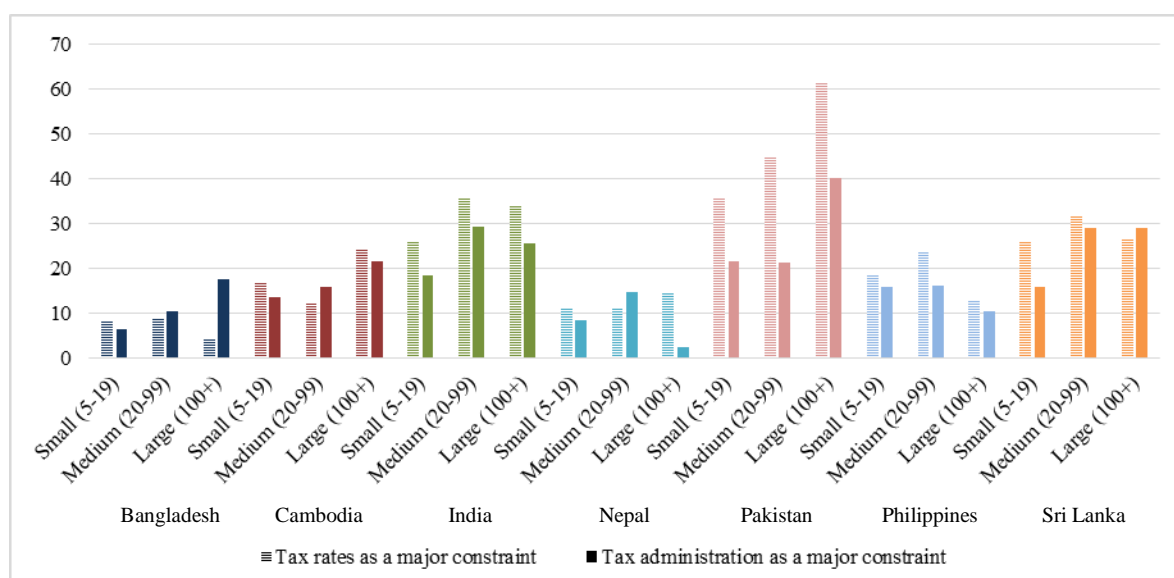
Source: World Bank, Enterprise Survey, 2013

As shown in Figure 5.9, tax rates and tax administration appear to be a low concern for firms in Bangladesh in carrying out their business operations. Across firm size, only 7.3% and 10.8% of firms view tax rates and tax administrations as a major constraint respectively, which is lower than the proportion of firms in any of the comparator countries. Moreover, Bangladesh has one

of the lowest tax-to-GDP ratios relative to those of its comparator countries (Rahman (2009). As a result, it is unlikely that Bangladesh is restricting investment through excessive taxation.

5.5 Access to Land

Land inequality is an overriding issue in Bangladesh. According to a 2010 USAID report, in rural areas, only 1% of landowners own more than 7.5 acres, 10% of landowners own between 2.5 and 7.5 acres, and the remaining 89% of landowners own less than 2.5 acres. Additionally, 39% of landowners own less than 0.5 acres. Thirteen percent of rural households in Bangladesh own absolutely no type of land, which includes no ownership of housing, and the number of landless households is growing. Thirty-one percent of rural households rely on agricultural labor as their main source of income (USAID, 2010). Access to land is very important to the rural poor because of their dependence on agriculture for their livelihoods. Furthermore, agriculture is the primary source of funding to meet their education and health needs.

As a result of this lack of access to land, the practice of land grabbing is common throughout the country and adds to the widespread problems of landlessness and inequality in Bangladesh. The Asian NGO Coalition for Agrarian Reform and Rural Development (ANGOC) reported in 2012 that almost 27% of all agricultural lands were taken by land grabbers. Almost 10,000 acres of *khas* (state land) in Dhaka and the surrounding area is illegally occupied by real estate land grabbers. Table 5.7 summarizes land disparities in Bangladesh.

Table 5.7: Land Ownership Disparities in Bangladesh

Large Landowners	Small Landowners	Landlessness
Make up 2.1% of rural HHs, owning 17.3% 0f all agricultural land. 13% of households own 58% the land.	Majority (70%) of HHs, are landless and marginal farmers, owning 15% of total land	Landless farmers (56%) of HH owns less than ½ acre.

Source: ANGOC, 2012

Insecurity in land tenure is also widespread and is exacerbated by costly and ambiguous land titling practices that are accompanied by corruption in the registration system. Findings from the 2010 national household survey show that land administration is viewed as the second most corrupt institution in Bangladesh, with 79.8% of respondents indicating that they were victims of corruption and harassment by land administration officials (TIB, 2012). Although the rates in the most household survey seem to have improved since 2010, Bangladesh's land administration is still perceived as the third most corrupt institution by respondents, with 59% of households feeling they were victims of corruption (see Table 5.8).

Table 5.8: Percentage of Households Facing Corruption in Different Service Sectors

Service Sectors	Percentage of households (%)	
	2012	**2010**
Law-Enforcement Agency	75.8	79.7
Land Administration	59	71.2
Judiciary	57.1	88
Health	40	33.2
Local Government	30.9	43.9
Agriculture	20.4	45.3
Electricity	18.3	45.9
Tax and Customs	16.8	51.3
Education	14.5	15.3
Banking	7.1	17.4
Insurance	6	19.2
NGO	5	10.1
Others	54.9	34.1
Overall	55.8	84.2

Source: TIB, 2012

In the absence of a transparent system, large proportions of rural land are owned by absentee urban landlords (Uddin and Haque, 2009). According to a United Nations 2010 report, Bangladesh's Finance Minister A.M.A. Muhith admitted that "the land registration system is at the core of corruption. Bribes are exchanged openly in the land registration offices" (United Nations Public Administration Network, 2010). Figure 5.10 shows the percentage of households who became victims of corruption or harassment when seeking services related to land administration.

Figure 5.10: Percentage of Households Facing Corruption for Services in Bangladesh
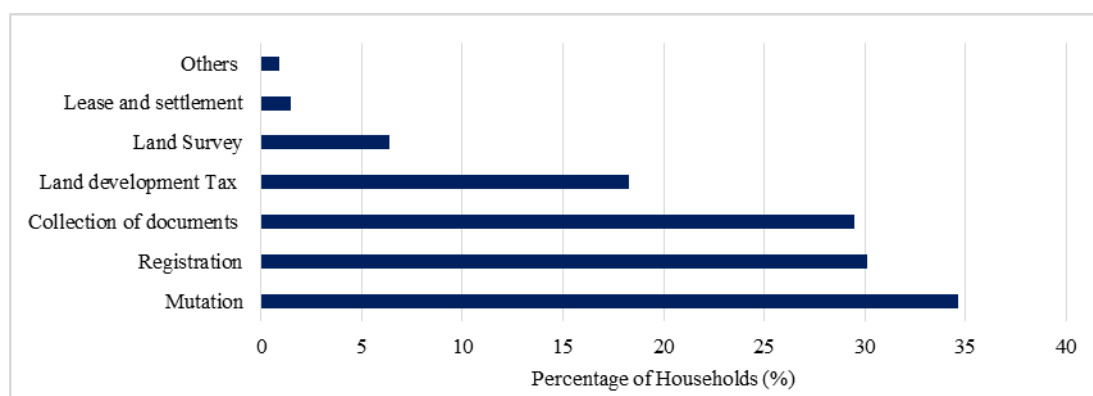
Source: TIB Household survey, 2012

Land disputes and conflicts are also common in Bangladesh and are created when the landless poor in rural areas attempt to secure control of land owned by absentee urban landowners and

elites. Khan S. et.al (2009) notes that "the number of land-related lawsuits is at about 3.2 million, with the total number of individuals accused in lawsuits listed at 150 million." This number is especially significant because the population of the country is roughly 150 million (Khan et. al, 2009). Land disputes, which are symptoms of poor governance, are widespread, costly, and cumbersome in Bangladesh. According to an ANGOC 2012 report, there are about 63,000 new land-related cases filed annually, with an estimated 5 million acres of privately owned land under litigation (ANGOC, 2012).

5.5.1 Test 1: Is the Shadow Price of Land Governance High in Bangladesh?

The below figure shows the time it takes to lease private and public lands in Bangladesh and a variety of comparator countries. Bangladeshi firms seem to pay significantly higher prices in terms of time to access public land except for India (see Figure 5.11). The number of days required to lease public land in Bangladesh averaged 240 days, which was higher than Cambodia (119); Pakistan (96); and Sir Lanka (91). Such high costs in terms of time to access public land are symptoms of dysfunctions in Bangladesh's land administration system.

Figure 5.11: Time to Lease Private and Public Lands
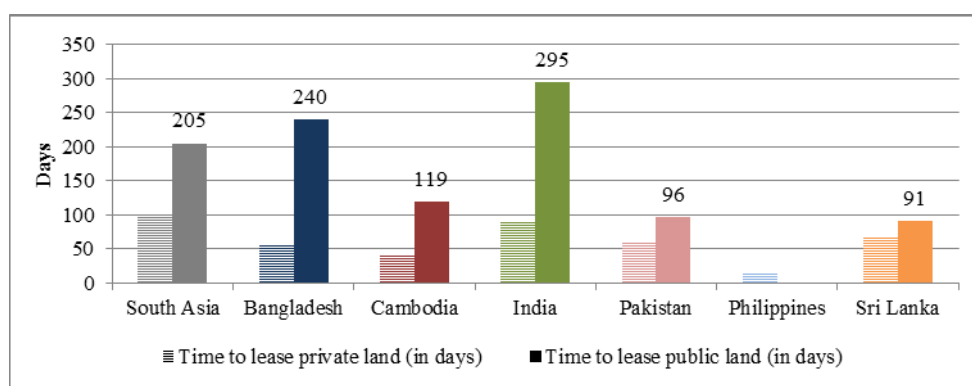
Source: World Bank Investing Across Borders

This acute inefficiency in Bangladesh's land tenure system is due to a lack of land records and the absence of a well-functioning land market. As a result, "there is little or no verification [of] whether the seller of a land is the true owner of the land" Khan S. et.al (2009). This uncertain and lengthy process in land registration promotes informal dealing, thus benefiting the few individuals who can afford to pay a bribe. This system of bribery works to the disadvantage of the poor. As shown in Table 5.9, Bangladesh ranks last (177th) in registering property among comparator countries.

Table 5.9: Comparison of Rank and Shadow Price of Registering Property

	Rank (of 189)	Procedures (number)	Time (days)	Cost (% of property value)
Bangladesh	177	8	245	6.8
Cambodia	112	7	56	4.3
India	91	5	44	7.1
Nepal	22	3	5	4.9
Pakistan	122	6	50	7.8
Philippines	119	8	39	4.8
Sri Lanka	136	8	52	5.1

Source: World Bank, Doing Business Surveys, 2013

It takes approximately 245 days to register property in Bangladesh, the longest time across comparator countries, though the number of procedures required across countries is comparable. The cost of a claim in Bangladesh is higher than in most countries with the exception of India (7.1%) and Pakistan (7.8%). It also takes about eight months to register property in Bangladesh, compared to just five days in Nepal and less than two months in any of other comparator countries, suggesting that the shadow price in terms of time is high in Bangladesh. It should be once more noted that we are constrained by inadequate data to conduct the remaining tests of the growth diagnostic methodology, and thus are unable to assess the impact of improved land governance on investment, whether firms are bypassing the constraint of weak land governance, and if firms that are least impacted by weak land governance do relatively better than firms that require strong land governance in order to be successful.

Finally, Bangladesh's increasing population exerts pressure on the availability of land. The problem of securing land ownership in Bangladesh is exacerbated by weak implementation of the rule of law, the lack of a well-functioning land market, a very poor land record system, and rampant corruption in the public sector. Thus, the evidence presented in this section appears to suggest that weak land governance is a binding constraint to growth in Bangladesh, especially for the poor.

5.6 Conclusion

One of the significant problems in Bangladesh is a lack of improvement in the business environment. The weak institutions and endemic corruption in Bangladesh undermine the public sector's ability to facilitate a good business environment. The extensive interviews and round table discussions conducted in Dhaka with both local and international experts, combined with international and local business environment surveys and indices, confirm that Bangladesh institutional quality and business environment act as constraints and are a major concern for private investment growth.

The costly, cumbersome, and uncertain processes involved in securing contract and property rights and an inefficient and ineffective land tenure system constrain private sector investment and growth.   The Bangladeshi business environment is one in which firms face higher costs to doing business both temporally and administratively. Analysis to date suggests that pervasive and petty corruption underpins most of these governance failures in Bangladesh. In addition,

these microeconomic distortions are likely to be interrelated, making it very difficult to separate their individual effects on economic growth. Though not a binding constraint to growth by itself, corruption seems to underpin these microeconomic binding constraints in Bangladesh by acting as a risk multiplier. Thus, long-term growth prospects for Bangladesh depend heavily on its ability to overcome a series of interrelated micro-level distortions, particularly poor contract enforcement and a corrupt, costly and ambiguous land tenure system.

5.7 Annex

Table 5.10: Most Problematic Factors for Doing Business in Bangladesh

Indicator	Percentage of Responses (%)
Corruption	22.2
Inadequate supply of infrastructure	17.4
Inefficient government bureaucracy	15.4
Access to financing	7.4
Government instability/coups	6.6
Inadequately educated workforce	6.1
Foreign currency regulations	3.9
Policy instability	3.5
Tax regulations	3.4
Poor work ethic in national labor force	3.1
Inflation	2.5
Tax rates	2.4
Insufficient capacity to innovate	2.0
Crime and theft	1.9
Restrictive labor regulations	1.8
Poor public health	0.3

Note: From the list of factors above, respondents were asked to select the five most problematic for doing business in their country and to rank them between 1 (most problematic) and 5. The figure show the responses weighted according to their rankings.
Source: WEF, Global Competitiveness Report 2013-2014

Table 5.11: Bangladesh Global Competitiveness Rankings and Scores

Indicator	Rank (148)	Score (1-7)
Property rights	122	3.4
Intellectual property protection	130	2.6
Diversion of public funds	107	2.7
Public trust in politicians	132	1.9
Irregular payments and bribes	146	2.2
Judicial independence	129	2.4
Favoritism in decisions of government officials	134	2.2
Wastefulness of government spending	92	2.9
Burden of government regulation	97	3.2
Efficiency of legal framework in settling disputes	114	3.1
Efficiency of legal framework in challenging regs	81	3.9
Transparency of government policymaking	95	3.9
Business costs of terrorism	118	4.6
Business costs of crime and violence	110	3.9
Organized crime	103	4.4
Reliability of police services	141	2.6
Ethical behavior of firms	146	2.8
Strength of auditing and reporting standards	133	3.6

Source: WEF, Global Competitiveness Report, 2013-2014, P. 11

6 MARKET FAILURES

6.1 Introduction

Market failure is another potential constraint to economic growth. Two types of market failures that are given particular attention in growth diagnostic methodology are information externalities and coordination externalities.

Information externalities occur in an economy when firms or entrepreneurs are unable to capture returns on innovation or the costly "self-discovery" process of what activities, products, or sectors are worth further investment and development. These externalities cause spillover whereby other actors in the economy are able to free-ride on those paying the costs of acquiring this kind of information, and are often due to a lack of intellectual property protection. In economies with significant information externalities, private sector actors have little incentive to engage in this "self-discovery" process, and as a result, there is a lack of expansion into new and viable economic activities.

Similarly, coordination externalities occur when entry into a particular activity or sector is impeded because of a lack of necessary, coordinated action by the government or other private sector actors. For example, an individual may be discouraged from entering a particular sector if there is no market for the needed inputs or technology required for production. These disincentives result in a similar outcome to that produced by information externalities: a lack of expansion into potentially lucrative economic activities. As a consequence, countries facing costly information or coordination externalities likely have lower economic growth than they would absent these market failures.

Testing whether or not market failures are a binding constraint to growth can be challenging as they are often difficult to measure directly. However, looking at a country's intellectual property environment, government policies on innovation, and export sophistication and diversity provide information on whether or not growth is inhibited by information or coordination externalities. Countries with strong intellectual property environments and policies on innovation are likely to have the necessary levels of self-discovery needed to move into new types of productive activities. Countries with growing or high levels of export sophistication also indicate that firms are able to realize returns on innovation, meaning information externalities are less likely to be of concern. In examining coordination failures, it is useful to look at product space analysis and export diversity in order to see if firms in emerging sectors are likely to have access to the requisite inputs and coordination along value chains needed for success.

6.2 "Self-Discovery" and Information Externalities in Bangladesh

Bangladesh has had a legal framework for intellectual property (IP) protection dating back to British India, including laws governing patents, designs, and trademarks. The Bangladeshi government also recognizes the importance of IP protection as a key ingredient for economic growth. Actions taken by the government to strengthen its intellectual property regime include creating the Department of Patents, Designs, and Trade Marks (DPDT) in 2003 (which was previously two separate, less powerful offices) and updating existing IP legislation to bring it in

line with international standards (Rahman, n.d.). Though positive steps, such actions are immaterial without effective enforcement.

Unfortunately, despite these policy and organizational advances, practical IP protection in Bangladesh is lacking and enforcement is a significant problem. A 2011 analysis found that enforcement is hampered by a lack of technology, capacity, and public awareness (Naznin, 2011). DPDT also notes a lack of awareness from both the public and law enforcement agencies regarding intellectual property laws (Rahman, n.d.), and the World Intellectual Property Organization (WIPO) describes national IP education as "not mentionable" (WIPO, 2009). It is this lack of enforcement of that depresses returns to innovation and suggests material information externalities in the Bangladeshi economy.

However, even in light of poor IP enforcement and awareness, indirect measurements of Bangladesh's ability to innovate place it squarely in line with what is expected for a country of its GDP per capita.

Figure 6.1: Patent Applications vs. GDP Per Capita, 2010-11 Averages
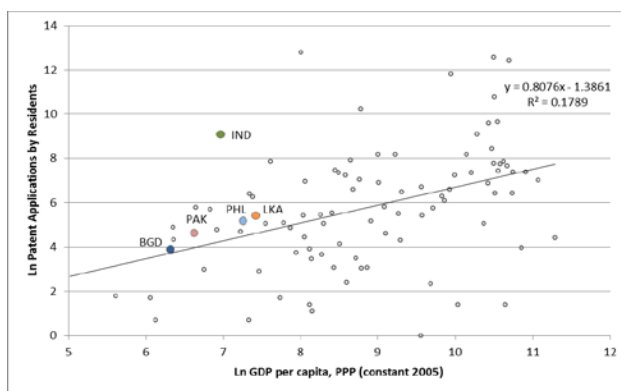
Source: WDI, World Bank

Figure 6.2: Export Sophistication vs. GDP Per Capita, 2010
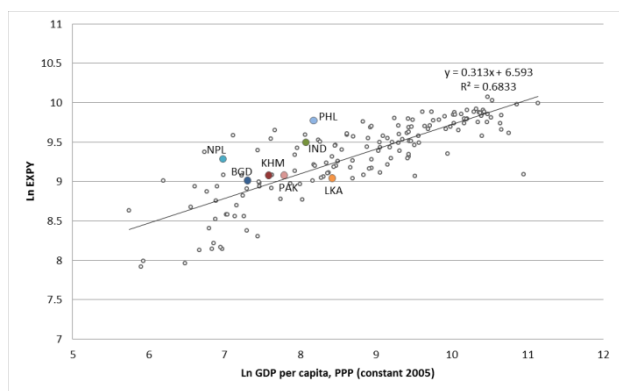
Source: WDI, World Bank

Figure 6.1 shows the relationship between a country's GDP per capita and its number of patent applications by residents. Bangladesh and all comparator countries for which there is data available lie on or above the graph's regression line, meaning that they receive more patent applications than average for countries at their development levels. Given Bangladesh's low levels of IP right awareness and enforcement, it seems likely that innovation levels are even higher than indicated by patent application numbers. This implies that adequate innovation is occurring in the economy, in spite of challenging conditions for recouping self-discovery costs.

Export sophistication can also be used to measure Bangladesh's ability to innovate. Exports of relatively high levels of complexity indicate that actors within a country have both the ability to capture returns to innovation as well as access to needed inputs and technology required to produce them. One measurement of export sophistication is the EXPY index, developed by Hausmann, Hwang, and Rodrik in 2007. Countries with high EXPY values produce

sophisticated exports, while those with low EXPYs produce more simple goods[36]. According to Figure 6.2, Bangladesh has a slightly higher EXPY than expected for its level of development; it is also roughly within the range of EXPY values of most of its comparator countries, particularly Pakistan, Cambodia, and Sri Lanka.

Though intellectual property protection in Bangladesh is minimal, the figures above provide evidence that actors in the economy continue to innovate, contributing to economic growth. Strengthening IP enforcement would decrease information externalities in the economy. Though theoretically this would increase economic growth, in practice, other issues in the Bangladesh economy, including problems with infrastructure and microeconomic distortions, are more serious binding constraints to growth and even more likely than information externalities to discourage investment and innovation in the private sector. Given this and the other evidence presented in this section, it is unlikely that information externalities are currently one of the most binding constraints to economic growth in Bangladesh.

6.3 Export Diversification and Coordination Externalities in Bangladesh

Export diversification levels can serve as a proxy for measuring coordination failures. Countries with diverse exports are likely to have the requisite technology, inputs, and institutional arrangements available to expand into other productive but unexplored sectors. This ability to expand and diversify production is necessary for successful, long-term economic growth.

Figure 6.3: Bangladesh HS-Classified Export Baskets, 1995 and 2011
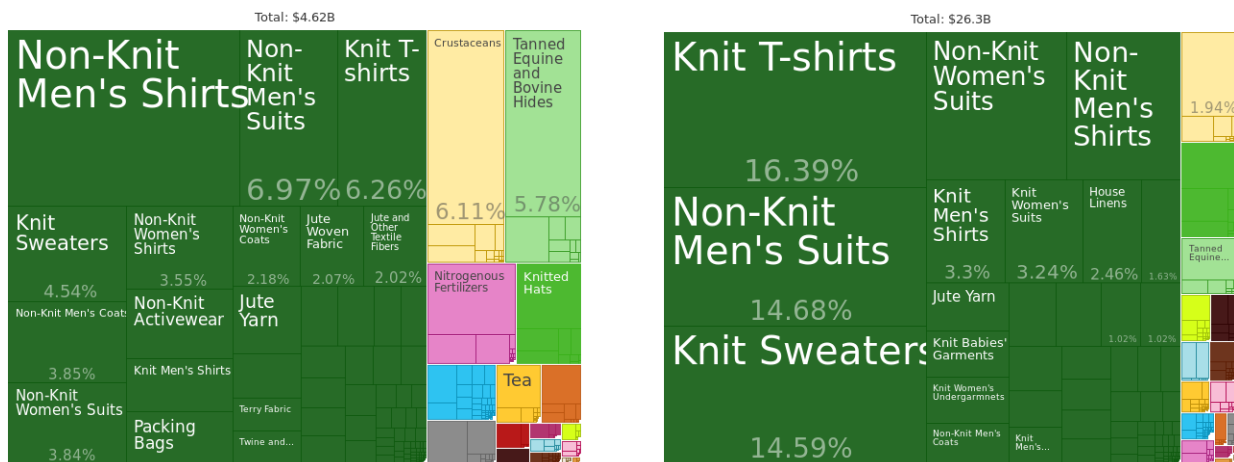
Source: Simoes and Hidalgo, Observatory of Economic Complexity, MIT Media Lab

---

[36] A more technical definition can be found in Hausmann, Hwang, and Rodrik's 2007 paper on the subject. The calculations required to produce the EXPY indicator are also explained in more detail in Annex 3 at the end of this report.

Figure 6.3 shows the 1995 and 2011 export baskets for Bangladesh. The two graphics provide a percentage breakdown of Bangladesh's exports by sector and sub-sector and give a rough sense of diversification trends over time. Exports in Bangladesh are overwhelmingly dominated by textiles and garments, which made up 90% of the country's exports in 2011, up from 73% in 1995 (Simoes and Hidalgo, 2011), and emanate largely from the ready-made garment (RMG) sector. Rather than diversifying, Bangladesh's exports are relying more and more on a single sector, which has troubling implications for long-term growth potential.

This overdependence on the RMG sector in Bangladesh is driven largely by the availability of cheap labor and is exacerbated by subsidies and tax breaks given to garment manufacturers. Such reliance makes Bangladesh highly vulnerable to external shocks, including changes in market demand, exchange rate fluctuations, and input costs. Additionally, this heavy dependence on clothing exports may indirectly signal the presence of coordination externalities by way of path dependence. With so much of the economy involved in the manufacturing and export of garments, it is possible that actors in other sectors attempting to diversify their activities don't have the inputs, technology, or complementary activities needed for success. Choices made by so many firms to enter the garment sector in the past constrain the available options of firms attempting to diversify today.

Though coordination failures are likely an issue outside of the garment sector and certainly a potential constraint to economic growth in the longer run, in the short-term there is positive evidence of an ability to diversify within the garment sector. A 2011 study on the Bangladesh RMG sector by McKinsey finds that garment manufacturers are beginning to move beyond exclusively "cut, make, trim" production and are expanding into more value-added services, including yarn and fabric production, garment design, ticketing, and quality lab services (McKinsey, 2011). This increase in productive diversity in the garment sector implies that coordination failures are not a problem within that specific sector. As demand growth for Bangladeshi-made RMGs is expected to continue to increase until 2020 (McKinsey, 2011) and clothing exports make up the vast majority of the country's exports, evidence that Bangladesh is expanding into high value-added areas within the sector is a positive sign for short- to medium-term economic growth, though larger, economy-wide diversification issues remain of long-term concern.

6.4 Product Space Analysis

Product space analysis is another tool that can be used to examine diversification in a country's economy. The product space methodology is driven by the notion that a production activity with a natural comparative advantage can be identified by examining current production activities within an economy. These activities exist due to an establishment of networks and specific inputs, including infrastructure, human capital and other essential resources. In theory, production activities using similar capabilities show great potential for future growth while

activities using dissimilar inputs demonstrate less potential.   Hausmann and Klinger (2006) developed a method for measuring the distance between production activities in what is known as a product space. This methodology has been adapted to conduct a product space analysis for Bangladesh.

Bangladesh's EXPY value (a measure of export sophistication) has increased by 52% over the past 30 years, from $5,400 in 1980 to $8,195 in 2010 (Figure 6.4). Despite this long-term growth, Bangladesh has averaged slightly negative growth since 1992, when its EXPY value was $8,317. This provides additional evidence of Bangladesh's continued specialization in export activities that are low in value and less sophisticated than many exporters, such as RMGs.

Figure 6.4: EXPY Values, Constant 2005 US$, PPP (1980-2010)
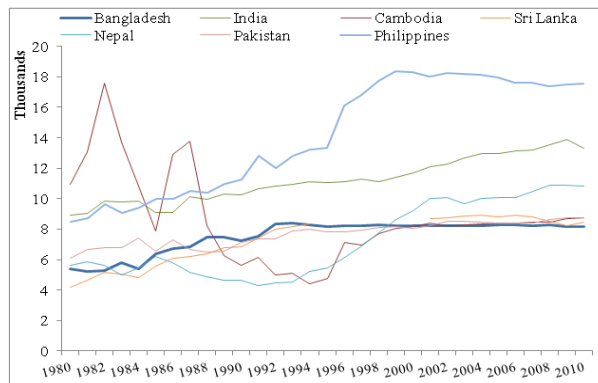
Figure 6.5: EXPY Values vs. GDP Per Capita, 2010

Source: Comtrade; World Bank
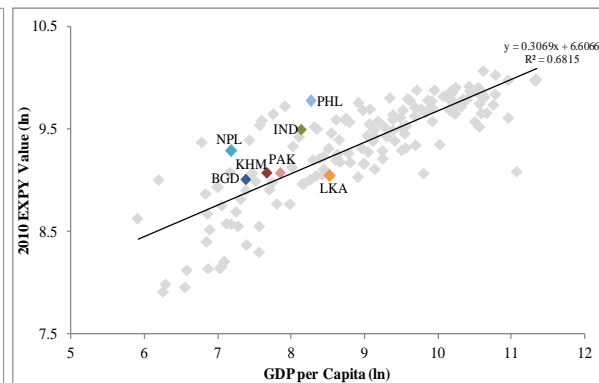
Source: Comtrade; World Bank

In 2010, the Philippines and India had the highest average EXPY values among comparator countries at $17,572 and $13,318, respectively. In 2010, Bangladesh had similar EXPY values to Sri Lanka ($8,447), Cambodia ($8,753) and Pakistan ($8,753), meaning the value of the export baskets for each of these countries is fairly similar. From 2000 to 2010, the comparators with the highest average annual growth in their EXPY include Nepal (2.3%), India (1.5%), and Cambodia (.8%). During this same period, Bangladesh's EXPY value experienced annual average growth of -.03%.

The Economic Complexity Index (ECI) is a global index that utilizes trade data to measure the productive knowledge of 128 economies based on the complexity of exports in which the country has a comparative advantage. As opposed to EXPY, a measure using GDP per capita to determine a product's value, the ECI "exploits the network of connections between a country, the products that it makes, the other countries that make them, the products that they make, etc." (Hausmann, Hidalgo et al 2014).   A country with a high ECI ranking generally means it has developed new productive knowledge, thus enabling additional opportunities for progress. An economy moves up the ECI ranking by diversifying production and by moving into more complex activities (Hausmann, Hidalgo et al 2011). For the purposes of this analysis, the ECI

68

ranking is used for two distinct purposes – to examine changes in export complexity in Bangladesh and its comparator countries from 1980 to 2010 and to calculate a projection of these same countries' expected growth in per capita GDP to 2020.[37]

Spatial maps are used by the ECI to show the level of complexity of the exportable goods in which the country in question has a revealed comparative advantage. Exports on the left side of the map represent highly sophisticated export activities, while exports on the right side of the map represent less sophisticated activities. Additionally, the visual representation depicts the relationship between export products with linkages demonstrating the "density" or similarity between activities.

In 1980, Bangladesh had few exports and no apparent export clusters. By 2010, however, Bangladesh had developed clusters on the right side of the export map, including exports in the garment, fish and seafood, leather, and tobacco industries. The movement into more complex activities has thus far eluded the Bangladeshi economy. As Figure 6.6 demonstrates, Bangladesh has been unable to move into more sophisticated products (circles with brighter colors are exports where the country has a revealed comparative advantage).

The level of complexity of Bangladesh's exports is similar to the comparator countries of Cambodia and Sri Lanka. More sophisticated comparators include India and the Philippines. The lack of diversification in Bangladesh's exports has resulted in a country ranking of 104 in the 2008 ECI – the lowest country rank among all comparators including Cambodia (98), Pakistan (82) and Sri Lanka (71). India, on the other hand, had a rank of 51 – the highest ranking country in South Asia.

---

[37] Hausmann, Hidalgo et al. "The Atlas of Economic Complexity: Mapping Paths to Prosperity." 2010.

Figure 6.6: **Bangladesh product space measuring the level of complexity (left side of each map represents more sophisticated export activities)**

1980
Total Value: $540,906,000

2010
Total Value: $18,130,589,879
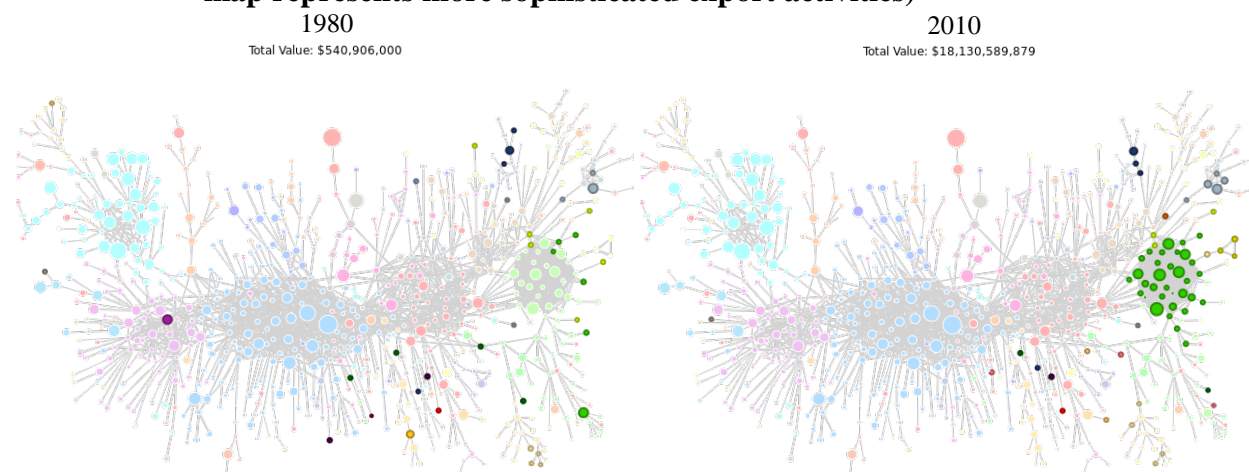
Source: Hausmann, Hidalgo et al. – Economic Complexity Index

The ECI also uses the gap between a country's level of income and the level of complexity it its economy in order to estimate projected growth in per capita GDP to 2020. A country with a low level of income relative to its complexity will grow faster, while a country with a high income level relative to its complexity will grow slower.[38] With an expected per capita annual growth rate of 2.4%, Bangladesh ranks behind each of the following comparators: India (4.2%); Philippines (3.5%); Pakistan (3.1%); Sri Lanka (2.9%); Cambodia (2.6%). Taking into consideration countries with high levels of natural resource wealth, Bangladesh's low growth potential is based on the country's low level of income relative to a slightly higher level of economic complexity (Figure 6.7).[39]

---

[38] Hausmann, Hidalgo et al (2011) state that "countries whose economic complexity is greater than what we would expect, given their level of income, tend to grow faster than those that are "too rich" for their current level of economic complexity. In this sense, economic complexity is not just a symptom or an expression of prosperity: it is a driver."

[39] Bangladesh ranked 65 in terms of per capita growth potential, while it ranked 51 in terms of GDP growth.

Figure 6.7:   GDP per capita vs. Economic Complexity Index (2008)
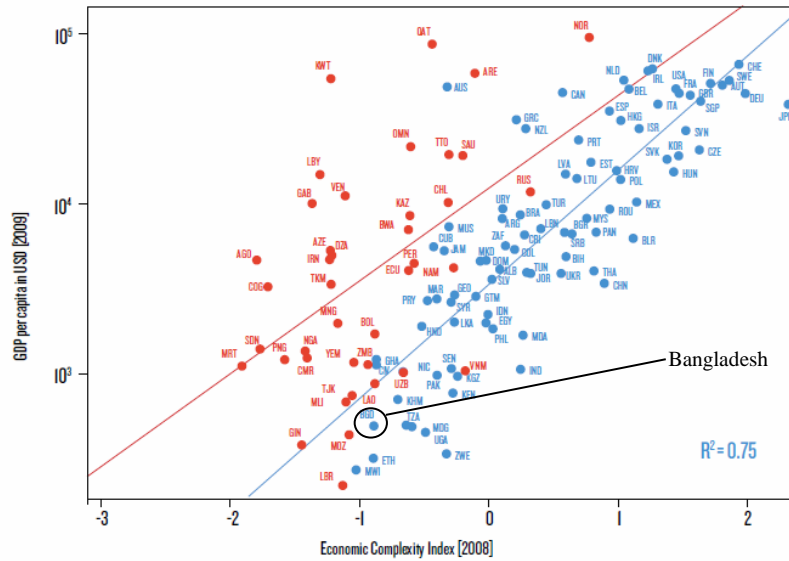
Source: Hausmann, Hidalgo et al 2011
Note: Countries in red represent countries with natural resource exports
*   greater than 10% of GDP*

Several parameters within the product space dataset have been modified in order to identify production activities that are of relatively high value and close to current activities. For example, products that are similar to current activities are considered to have a high value if their PRODY value (defined as the average income per capita of countries that have a comparative advantage in a product, as weighted by the respective country's revealed comparative advantage (RCA) value for the commodity) is greater than a country's EXPY value. Similarly, the team has decided to classify nearby products (those products with strong "density" relative to current activities) as those with an inverse value less than 10. It should be noted that selecting an inverse value will differ from country to country.

Table 6.1 provides a summary list of products that have high values (PRODY – EXPY), as well as a strong relationship to current activities (low inverse density). These products are ranked by the number of times the SITC[40] 2-digit division appears in the analysis as being in the "nearby forest," i.e. near to Bangladesh's current export basket in the product space. The SITC 2-digit division with the greatest number of sub-groups (SITC-4) is textile yarn and fabrics (16 products), followed by articles of apparel and clothing accessories (15), miscellaneous manufactured articles (8), and vegetables and fruits (7). Meanwhile, sugar, fertilizer, and apparel products have the greatest percentage of SITC-4 sub-groups within the nearby forest. In terms of value, the SITC-2 division tobacco, iron and steel, and furniture products have the highest average value among each of their sub-groups, while ores and metal scraps, hides and fur skins,

---

[40] The Standard International Trade Classification (SITC) system is an export and import classification system maintained by the United Nations and created to enable comparisons across countries.

and cereals have the lowest average value. The nearest SITC-2 divisions to current exports are apparel and clothing, footwear, and fish.

Table 6.1: SITC-2 Products with Positive PRODY and Inverse Densities Less than 10

SITC-2 Division Code	SITC-2 Division Description	Number of Sub-groups at the SITC-4 level	% of All SITC-4 Sub-groups represented	Average Value of Sub-group: ln(PRODY)-ln(EXPY)	Avg. Inverse Density (lower value = strong relationship to current activites)
65	Textile yarn, fabrics, made-up articles, n.e.s., and related products	16	7%	0.3	8.3
84	Articles of apparel and clothing accessories	15	16%	0.1	6.2
89	Miscellaneous manufactured articles, n.e.s.	8	6%	0.4	8.7
5	Vegetables and fruit	7	8%	0.3	8.9
66	Non-metallic mineral manufactures, n.e.s.	6	6%	0.4	9.2
3	Fish (not marine mammals), crustaceans, molluscs, etc.	5	11%	0.5	6.7
27	Crude fertilizers and crude minerals (excluding coal, petroleum and precious stones)	4	9%	0.2	8.7
6	Sugars, sugar preparations and honey	3	18%	0.2	8.6
56	Fertilizers (other than those of group 272)	3	16%	0.2	9.0
82	Furniture and parts thereof	3	13%	0.6	9.9
4	Cereals and cereal preparations	2	6%	0.1	8.2
9	Miscellaneous edible products and preparations	2	11%	0.4	9.2
11	Beverages	2	15%	0.2	9.4
24	Cork and wood	2	11%	0.4	8.7
28	Metalliferous ores and metal scrap	2	5%	0.1	8.2
63	Cork and wood manufactures (excluding furniture)	2	7%	0.4	9.7
64	Paper, paperboard and articles of paper pulp, of paper or of paperboard	2	3%	0.4	8.2
69	Manufactures of metals, n.e.s.	2	2%	0.2	8.9
77	Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof	2	2%	0.3	8.2
8	Feeding stuff for animals (not including unmilled cereals)	1	4%	0.5	7.7
12	Tobacco and tobacco manufactures	1	13%	0.7	8.5
21	Hides, skins and furskins, raw	1	9%	0.1	9.3
26	Textile fibres (other than wool tops and other combed wool) and their wastes	1	2%	0.5	9.3
29	Crude animal and vegetable materials, n.e.s.	1	3%	0.4	8.8
33	Petroleum, petroleum products and related materials	1	7%	0.5	8.3
61	Leather, leather manufactures, n.e.s., and dressed furskins	1	5%	0.5	9.6
67	Iron and steel	1	1%	0.6	9.6
68	Non-ferrous metals	1	2%	0.4	9.1
78	Road vehicles (including air-cushion vehicles)	1	3%	0.2	8.8
81	Prefabricated buildings; sanitary plumbing, heating and lighting fixtures and fittings	1	6%	0.4	9.0
83	Travel goods, handbags and similar containers	1	11%	0.4	9.0
85	Footwear	1	6%	0.2	6.6

Source: Comtrade

In general, the findings of the product space analysis further underscore that Bangladesh's exports are highly undiversified and that short- and medium-term growth are likely to be concentrated further in the textile and garment sectors. However, it should be noted that the product space analysis does have some serious limitations as a predictive tool. First, the product space uses the final value of all exported goods to estimate relative values, thus not taking into consideration the value of intermediate goods, many of which may be imported from other countries. Second, the product space does not take into account exported services or domestic consumption. Finally, a more focused analysis (e.g. a feasibility study; cost-benefit analysis) would be needed to determine the true potential of export activities identified in the product space.

6.5 Conclusion

In spite of shortcomings in intellectual property rights enforcement, evidence shows that Bangladesh's patent application numbers and export sophistication are in line with a country of its development level. Using these indicators as an indirect measurement of the level of innovation taking place in Bangladesh, it is likely that a lack of innovation as a result of information externalities is a most binding constraint to growth in the economy.

Bangladesh's export basket through time shows an increasing lack of diversification and overreliance on the textile and ready-made garment sectors. The product space analysis, a tool

used to identify short and medium-term growth potential in tradable goods, demonstrates the high likelihood of Bangladesh further expanding into areas where it has already developed export clusters, including garments, textiles, and fish products.

Diversification outside of these sectors is likely hampered by path dependence, which precludes expansion into new production areas due to a lack of complementary inputs and processes. However, diversification within these sectors identified by the product space, in particular the textile and garment sectors, is expected to help drive short- to medium-term growth, meaning that in that time frame, coordination failures are unlikely to be a most binding constraint to Bangladesh's economy growth. Based on the severity of other constraints (discussed in other areas of this report), even if coordination failures were instantaneously removed, there would likely be little change in Bangladesh's growth rate.

Currently, information and coordination externalities, the two types of market failures discussed in this chapter, are not the primary binding constraints to economic growth in Bangladesh. Neither are they the only challenges inhibiting Bangladesh's economic diversification. Diversification is likely primarily constrained by the other factors identified as binding constraints to growth in Bangladesh, such as infrastructure and microeconomic distortions. Addressing these concerns appears to be a requisite first step in diversifying Bangladesh's economy and enhancing its growth rates.

In the future, assuming these other most binding constraints are dealt with, it may become necessary to take more active measures to ensure Bangladesh's economic diversification. Currently, the best way to aid such diversification would be to focus on the provision of complementary public goods useful to all industries, such as infrastructure and the enforcement of contracts. Given binding constraints in these areas, any government-made attempts to actively support economic diversification through direct financial support to emerging industries or the strengthening of intellectual property protection will likely accomplish very little.

7 HUMAN CAPITAL

Human capital, a country's supply of labor as a factor of production, can be an important source of or constraint to growth in a country, especially diversified, sustained growth in the global marketplace. Education and health are two nodes under this branch of the growth diagnostic tree.

7.1 Education

Improving education is an important goal in Bangladesh's Sixth Five-Year Plan: "Achievement of universal primary education, extending this stage to grade 8; elimination of illiteracy; removing the education gap between the poor and rich, creating a new generation equipped with technical skills and scientific knowledge; better remunerations for teachers; and overall improvement of quality and equity in education are key education goals of Vision 2021." As we will see below, education is not currently a binding constraint for growth. In the long term, as Bangladesh seeks to diversify its economic base and binding constraints to growth are resolved, the supply of skilled labor will likely become a binding constraint.

7.1.1 Participation in Education

Seeking equity in educational access, the Government of Bangladesh has focused on improving enrollment rates, especially in basic education, achieving nearly universal access to primary education (World Bank, 2013a). As the Sixth Five-Year Plan (FY2011-2015) notes, however, completion rates were still relatively low in Bangladesh in 2010, though significantly improved from 2000 up to the junior secondary level (Figure 7.1). However, there has not been much improvement in completion rates at the senior secondary and tertiary levels since 2000.

Figure 7.1: School Completion Rates by Education Level in Bangladesh
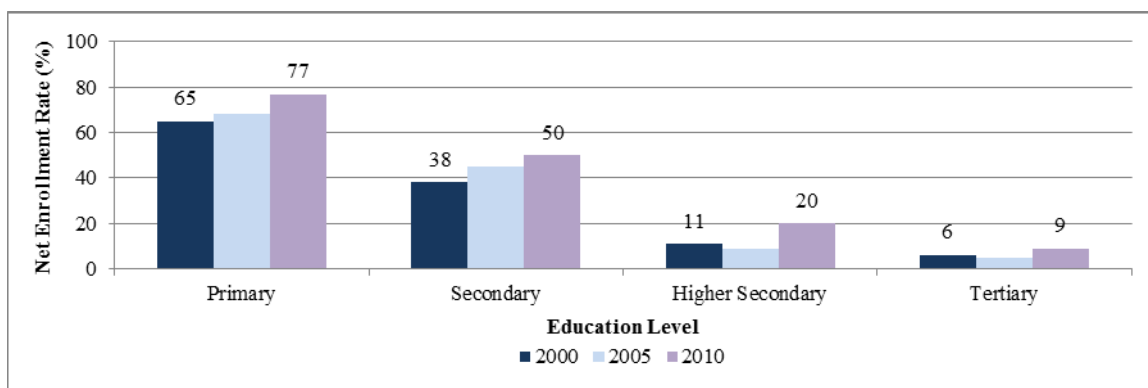
Source: World Bank 2013, based on HIES

When considering Bangladesh's levels of income and education (Figure 7.2), we can also see that it is more or less in the middle of the pack for lower and lower-middle income countries. The same is true for the tertiary graduation ratio, again taking income levels into account (Figure 7.3).[41]

---

[41] Data on tertiary completion since 2000 is not available for any of Bangladesh's chosen comparator countries

Figure 7.2: Year of Education vs. Income in LIC and LMICs, 2010
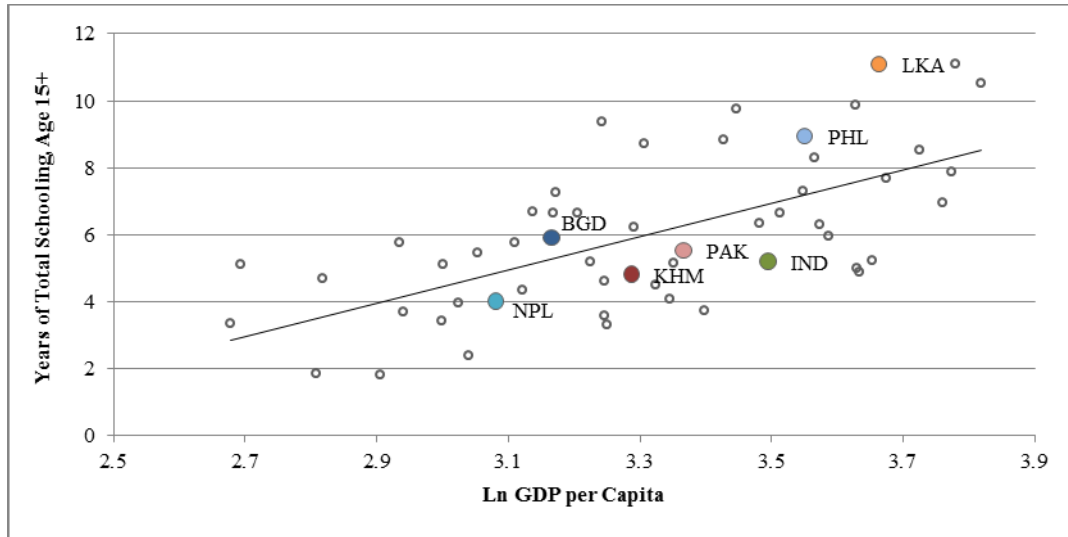
Figure 7.3: Tertiary Education Completion vs. Income, 2009 and 2011
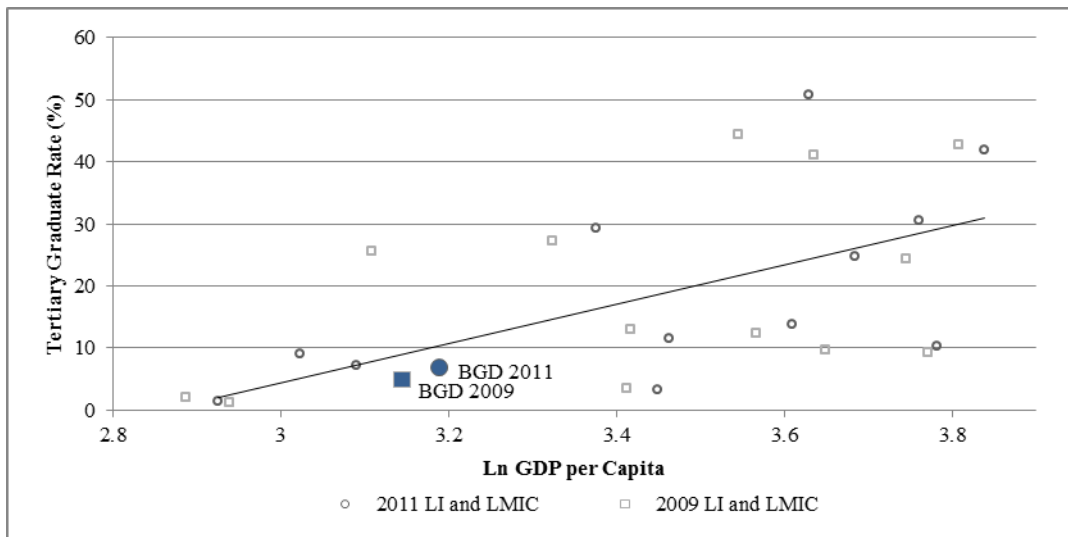
Looking forward to the future, a similar pattern is seen in school life expectancy, with Bangladesh having a shorter school life expectancy than most comparators except Pakistan, but with marked improvement of around 19% since 2005 (Figure 7.4). As for sex ratios, the gender gap in survival rate is actually in favor of girls in Bangladesh up to the secondary level, in contrast to some comparators such as Pakistan, where girls' primary enrollment rate is only 87.2% that of boys. This achievement in access for girls has much to do with the Government's Female Secondary School Stipend Program launched in 1994 (Khandker et al, 2013).

Figure 7.4: School Life Expectancy, Primary to Tertiary
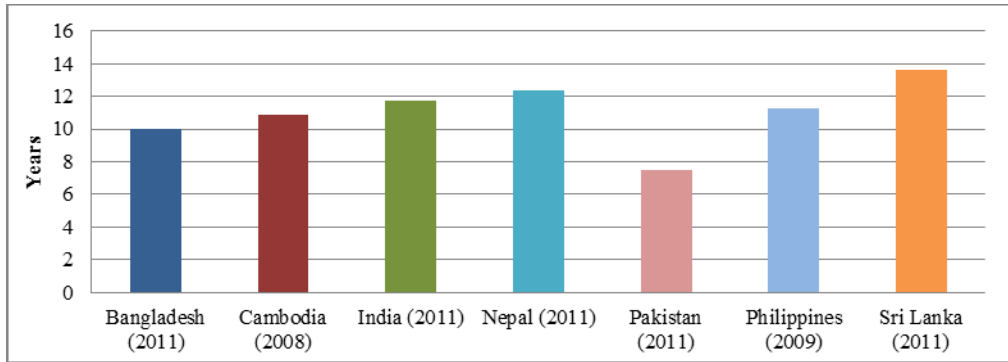
Figure 7.5: Survival Rate through Education System in Bangladesh, 2009
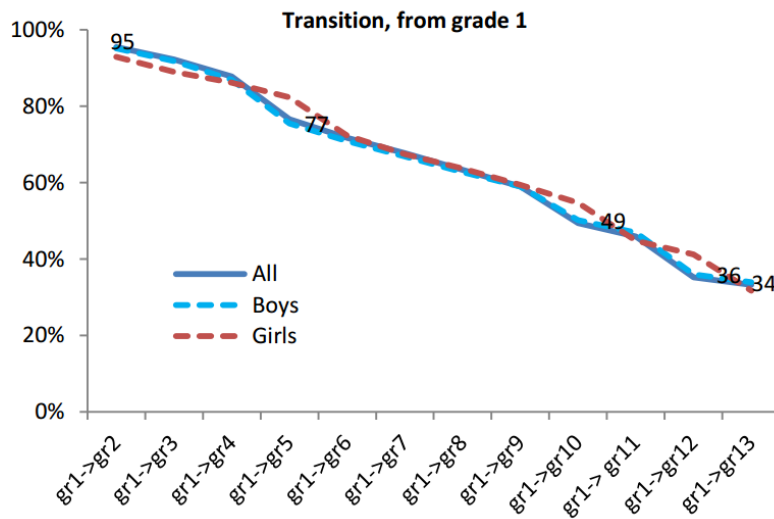
Source: World Bank 2013, based on Multiple Indicator Cluster Survey 2009

By the tertiary level, this gender gap reverses and widens in Bangladesh, especially in contrast to comparators that sustain their higher proportion of females through tertiary education (Figure 7.6).

Figure 7.6: Ratio of Female to Male Tertiary Enrollment
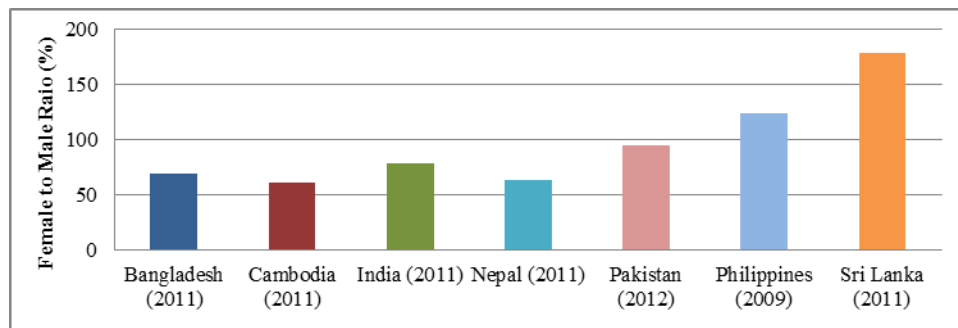
Source: WDI

Looking at income distribution and education levels, higher household income levels correlate with higher levels of educational attainment for individuals, although we will see that this relationship translates weakly into learning outcomes.

Table 7.1: Household income by level of education

Household Income	No education	Incomplete Primary	Primary	JSC	SSC
Tk 5,000 or less	12	11	7	6	3
Tk 5,001 - 7,500	33	30	21	18	18
Tk 7,501 - 10,000	24	28	28	38	31
Tk 10,001 - 15,000	19	20	30	29	32
Tk 15,001 - 20,000	7	9	12	7	11
Tk 20,001 - 30,000	4	1	1	1	3
Tk 30,001 -50,000	1	0	0	0	1
Tk 50,001or above	0	0	0	0	0

Household Income	HSC	TVET	Bachelor	Post-graduate	Total
Tk 5,000 or less	1	0	0	1	4
Tk 5,001 - 7,500	14	3	10	1	17
Tk 7,501 - 10,000	26	5	10	15	26
Tk 10,001 - 15,000	36	44	30	21	29
Tk 15,001 - 20,000	13	25	24	18	13
Tk 20,001 - 30,000	8	9	16	22	6
Tk 30,001 -50,000	1	12	9	21	3
Tk 50,001or above	0	1	0	1	0

Source: World Bank based on Enterprise-based Skills Survey, 2012

7.1.2   Educational outcomes

We now turn to Bangladesh's educational outcomes, and how these might relate to inclusive growth. Low completion rates and variable quality at all levels of schooling have been well documented. Bangladesh's literacy rates are relatively low, although not unexpected given its GDP per capita (Figure 7.7). Literacy rates have improved by about 10 percentage points since 2002 across the board. Outcomes for math and science are also important for an economy seeking to upgrade and diversify its exports, but a recent study found that a child who had completed grade 5 is only 11.7% more likely to be competent at basic arithmetic (51.7 versus 40.2) than a child with no schooling at all (Asadullah and Chaudhury, 2013). Only about 25% of Grade 5 students master Bangla and 33% master Mathematics at their curriculum level (World Bank, 2013a).[42] Lant Pritchett (2013) calls this a "serious learning crisis," where students who go to school have very little to show for it.

World Bank (2013a) analysis on the reasons for inconsistent learning outcomes found that the important determinant for learning is the school/institution that students attend. Their analysis of variance found that school-related factors (such as whether the school is government-run, class size, and the overall Primary School Certificate pass rate) account for about 73% of the differences in students' performance at grades 3, 5 and 8, while student and family-related factors such as age, sex, parents' education, and indigenous heritage account for only about 27%. At grade 5, the community's average poverty level only accounts for 6.5 % of the 55% of

---

[42] Internationally standardized achievement tests such as TIMSS or PISA data covering math and science were not available for Bangladesh, nor for most of the comparators.

variance between schools' overall scores. Hence the education system in Bangladesh, however variable in quality, does not reinforce inequality.

Figure 7.7: Literacy Rates vs. Income Levels in Bangladesh and Comparator Countries
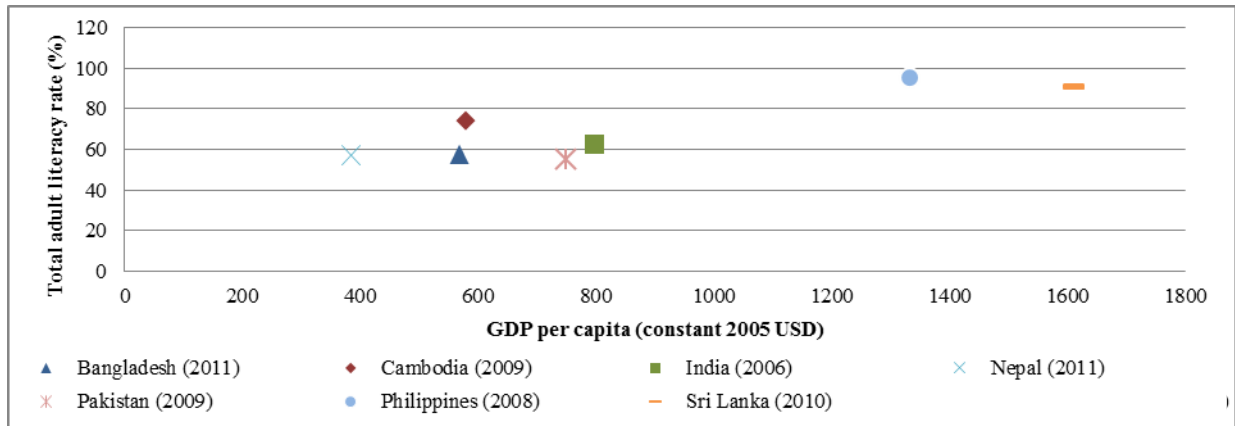
Source: WDI

Figure 7.8: Literacy Rates in Bangladesh and Comparator Countries by Gender
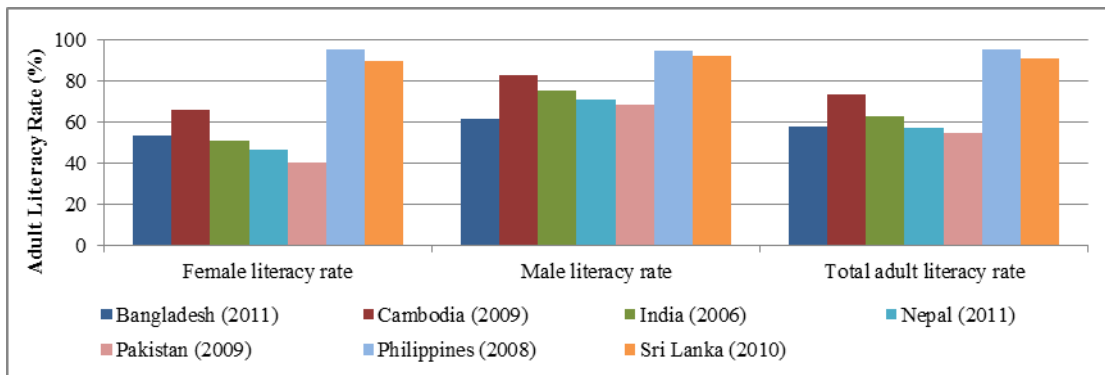
Source: WDI

As for the gender gap, while literacy rates have improved for both sexes, the gender gap has narrowed only somewhat, from 13 to 8 percentage points. However, a 2013 Center for Global Development study could not find any innate or school factors that could explain the fact that girls, while getting slightly more education than boys, do not do as well at basic arithmetic, which suggests other social, non-school factors at play in their learning experience.

7.1.3   Test 1: Shadow Price and Returns on Education

We now apply the four principles of differential diagnostics to education, starting with the shadow price. Looking simply at labor force participation and unemployment, there is a clear economic benefit to tertiary education (Figure 7.9).[43] There is a sharp drop-off in labor force participation at the secondary school level, however, likely due to graduates being discouraged

---

[43] The sample size for Technical and Vocational Education and Training (TVET) graduates in the 2010 Labor Force Survey is very small (0.1% of the total sample), and shows signs of sampling error (e.g. all respondents in this group were employed). Hence the graphs using LFS 2010 data in this document do not show figures for TVET.

from frustration in the job search (World Bank, 2013a). These graduates are also those most likely to be able to afford to emigrate for work, as we will see later in this chapter. The drop in labor force participation for secondary school graduates is not because they are enrolled in university, since about 34% of age-appropriate individuals survive through Grade 13, but only about 7% graduate from university (Figure 7.3, Figure 7.5).[44]

Also, there is a very large gender gap in labor force participation in all pre-university levels, suggesting some other social and cultural forces causing this labor market failure that leaves much female labor untapped. These include phenomena such as early marriage and cultural expectations around women's work[45].

Figure 7.9: Bangladesh Labor Force Participation and Unemployment, 2010
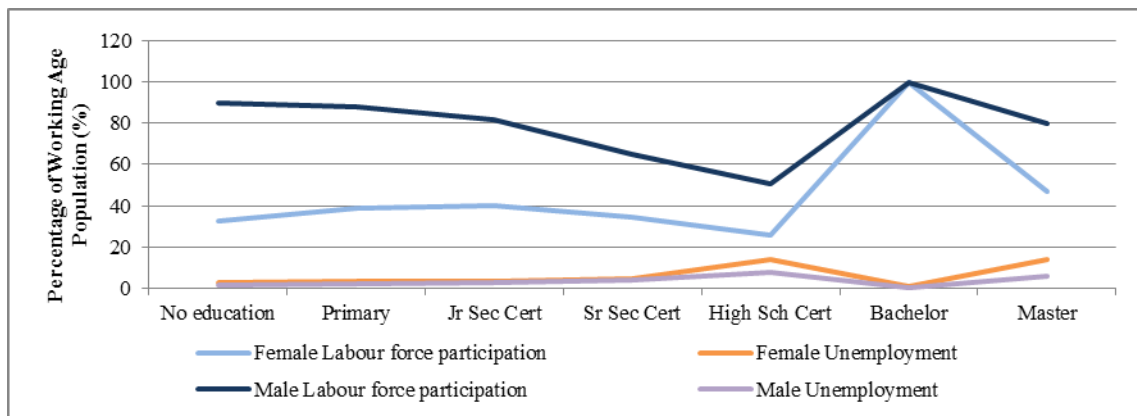
Source: World Bank, using LFS 2010 data

Returns on education calculate the wage premium for each additional completed level of schooling relative to the previous one, and is an important signal for what is going on in the labor market. Comparing Bangladesh over time, wage premiums for all education levels except for secondary are falling, while the wage premium for the latter has grown significantly. However, Bangladesh's wage premium is still low relative to comparators, which means that it fails the first test of human capital being a binding constraint (Figure 7.11).[46] This pattern fits into the regional trend of increasing participation in primary and junior secondary education and thus corresponding falling returns to these levels of education as demand for lower skills does not grow as quickly as their supply. For the senior secondary level, since completion rates have not changed significantly in the past decade or so, it is likely that demand for certain segments of these graduates has grown between 2005 and 2010, which is shown by the increase in their wage premiums during that time. While tertiary completion rates have not changed significantly in the

---

[44] This is also unlikely to be due to unionization and labor regulations, since at the time of the Labor Force Survey, workers who wanted to establish unions still had to get employer approval and support from at 30% of workers at the establishment; and currently unions are still not allowed in EPZs.
(http://www.nytimes.com/2013/07/17/world/asia/under-pressure-bangladesh-adopts-new-labor-law.html?_r=0, http://online.wsj.com/news/articles/SB10001424127887323664204578607814136238372)
[45]See women's entrepreneurship section for further discussion.
[46] The Bangladesh Household Income & Expenditure Survey does not distinguish between vocational and other education.

past decade either, the falling tertiary wage premium since 2005 suggest that demand for these workers has also fallen since that year.[47]

While returns across all levels of education in Bangladesh are lower than for the comparators with available data, India is the only country with more recent wage premium data, with the other results being more dated.

Figure 7.10: Wage Premiums in Selected Comparator Countries by Education Level
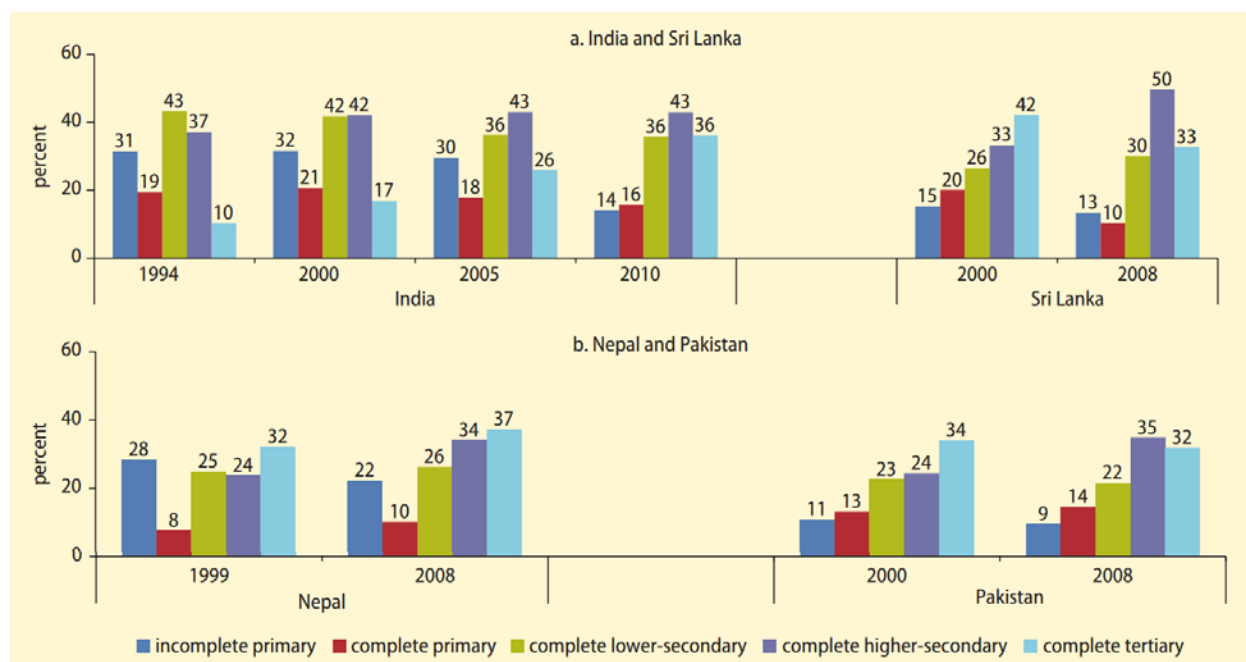
Source: Authors, based on data from national labor force and household surveys.
Note: The first bar for each country-year pair reflects the wage premium for even some primary education relative to no education; the last bar reflects the wage premium for completing tertiary relative to completing upper-secondary education. The wage premiums represent the differences in the coefficients of a regression of log hourly wage on basic controls (the highest level of education completed, experience, and experience squared). The qualitative results are robust to other specifications with additional controls.
Source: More & Better Jobs in South Asia, World Bank 2012

---

[47] While there is some evidence of important skills mismatches in vocational training, the effect of this on firm productivity and economic growth is hard to establish without representatively sampled data.

Figure 7.11: Wage Premiums in Bangladesh by Education Level
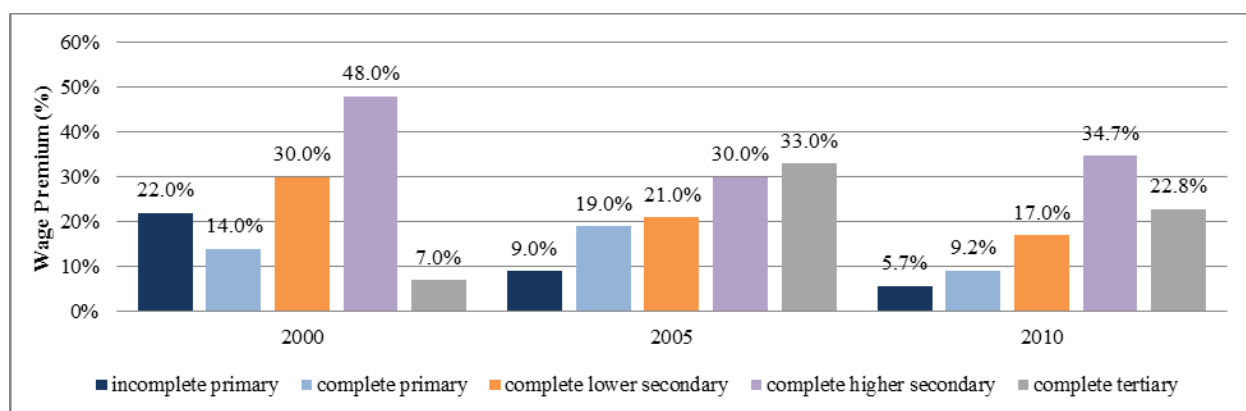
Source: 2000 and 2005 World Bank calculations, 2010 author's calculations, all based on HIES

Looking at the more simple measure of returns to education, Bangladesh's very low figure of 1.9% (Figure 7.12) makes clear that education is not a binding constraint to economic growth.[48] However, comparing with , it also becomes clear that the Bangladeshi education system and labor market are highly segmented, with certain high school graduates able to find jobs with much higher income than junior secondary school graduates (as seen by the wage premium for complete higher secondary education being higher than the premium for completed lower secondary education), but with most high school graduates unable to find employment that they can accept (as seen by their relatively low labor force participation rate). This confirms the World Bank's (2013a) finding that skill levels, and thus the value of the certificate in the job market, vary greatly by individual schools, which again, is seen in the dichotomy of a relatively high wage premium for complete higher secondary and a low labor force participation rate for those with that level of schooling. Additionally, at lower levels of education, it is unclear that the boost in female education (discussed early in the chapter) will by itself result in better employment for women.

---

[48] This conclusion could be wrong if, akin to Borenzstein et al (1998)'s finding in a global study, Bangladesh's secondary school-level skills stock is just below the threshold to benefit from technology transfer of FDI, for example. Indeed, looking at Figure 7.2, Bangladesh's education levels have only caught up with its low-income and lower-middle income peers, not the rest of the world. If this is the case, increasing secondary school completion rates could unleash more growth once Bangladesh hits some hypothetical "catch-up" threshold to activate productivity benefits. However, the rest of the world may well continue to improve the quantity and quality of their education at the same time, so it is unclear when Bangladesh might hit such a moving target.

Figure 7.12: Average Return to an Additional Year of Schooling, Most Recent Year (2008-2011)
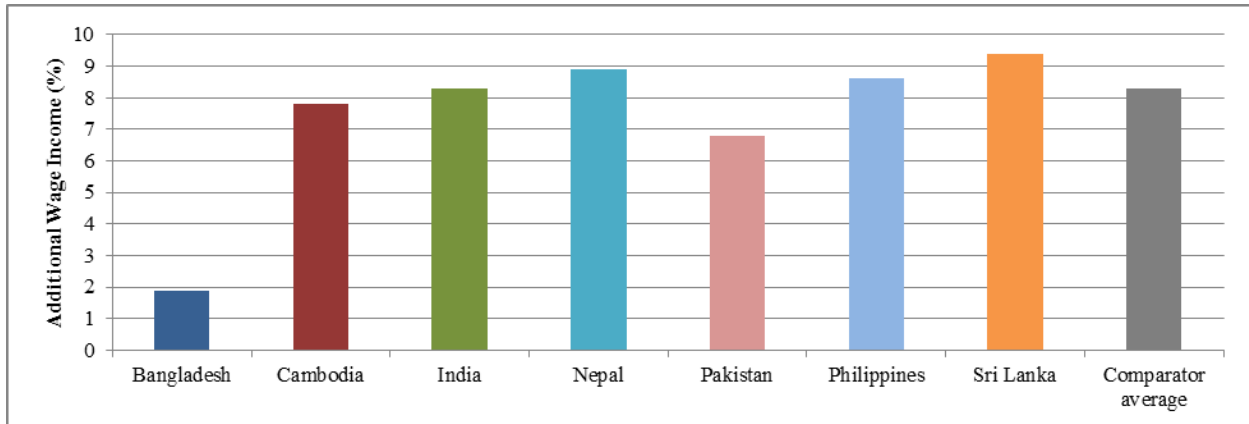
Source: Estimates by Claudio E. Montenegro and Harry Anthony Patrinos for forthcoming working paper, based on World Bank International Income Distribution Database (I2D2). Note that the number of Bangladesh is averaged between two different numbers.

7.1.4 Test 2: Movement in Education Results in a Movement in Economic Growth

The second test of differential diagnosis asks whether the objective function improves when the potential constraint is relaxed. Based on available data, this seems to be the case between GDP growth and tertiary completion rates in Bangladesh (see Figure 7.13). Additional data may suggest that more skilled workers are a binding constraint to investment and growth, but the few data points available on tertiary education and possible alternative explanations make this test inconclusive. (For example, one alternative explanation could be that the influence is in the opposite direction, with overall income growth allowing some families to fund students finishing their degrees.)

Figure 7.13: Tertiary Education Completion Rates and GDP Growth in Bangladesh
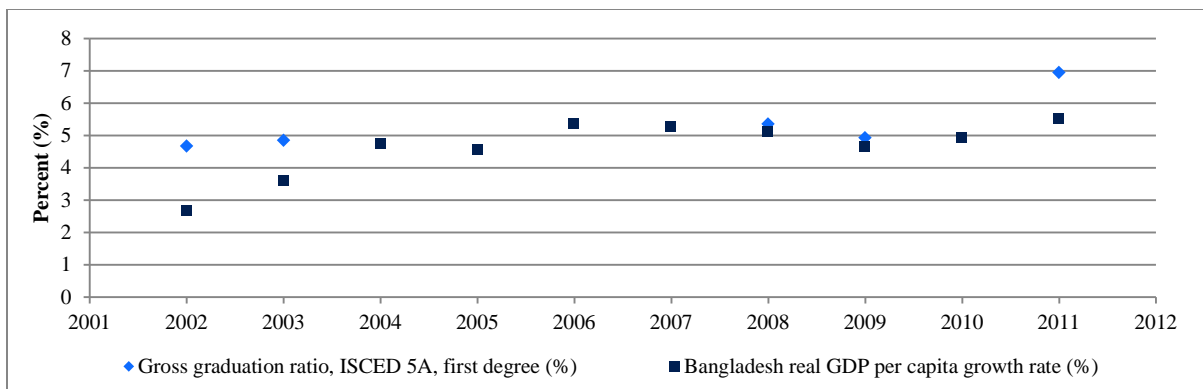
Source: WDI, UNESCO

7.1.5 Test 3: Circumvention of the Education Constraint by Firms

If investment growth is being held back by local skill availability, employers should recognize it and seek alternative solutions. Based on the World Bank 2013 Enterprise Survey, Bangladeshi

82

managers had an average portion of managers (16%) cite an inadequately trained workforce as a major constraint for their firms, relative to comparators, which though it is a subjective ranking is certainly lower than that of electricity, for example.

Figure 7.14: Firms Identifying an Inadequately Educated Workforce as Major Constraint to Doing Business
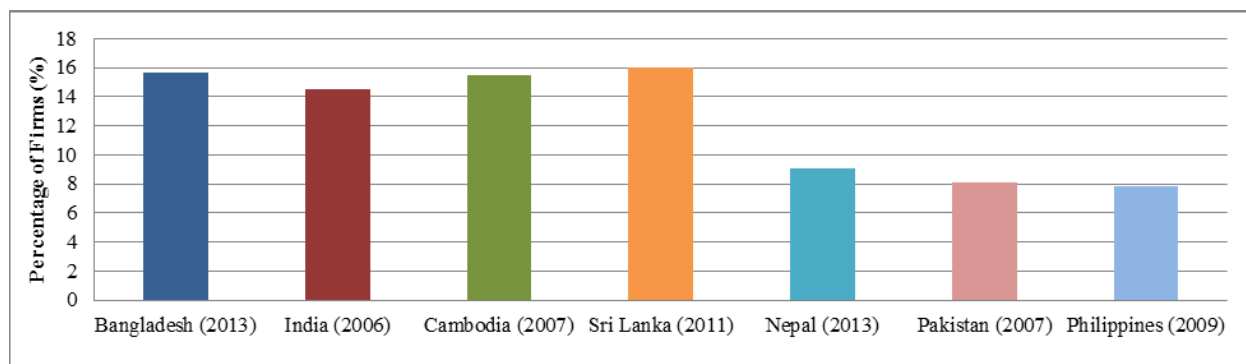
Source: World Bank Enterprise Surveys

If skills are relatively scarce, the pattern of migration should show relatively high net immigration of skilled workers and net emigration of unskilled workers. A regional 2013 study found that the majority of aspiring Bangladeshi emigrants were currently unemployed (33%) or running a business enterprise (22%), with only 9% currently working in a skilled job.[49] The vast majority (84%) of emigrants was interested in migrating or had migrated for better economic opportunities abroad. Emigrant workers predominantly go abroad to fill jobs in the lower half of the skills spectrum. (The Bureau of Manpower, Employment & Training (BMET) collects emigrant skills profiles based on the jobs they intend to fill, rather than their actual credentials.) Compared to the overall educational profile of domestic workers, the average emigrant from Bangladesh is significantly more educated. A 2010 study showed that about 71% of emigrant workers had an education level between grades 5-12, while 29% had only a primary education (Maxwell Stamp, 2010). As the World Bank has noted, this is not because they are finding jobs that better match their educational levels in other countries. Rather, it is likely because the better educated are also better able to afford the costly fees that must be paid to middle men in order to emigrate for work (World Bank, 2013b). Since 2000, the proportion of emigrants taking less-skilled jobs has increased, while the proportion of professional jobs that Bangladeshi emigrants take has fallen from about 4% to approximately 0%.

---

[49] This study did not use random sampling and had a total of 250 respondents for Bangladesh.

Figure 7.15: Proportion of Emigrant Workers by their Skill Categories (1976-2012)
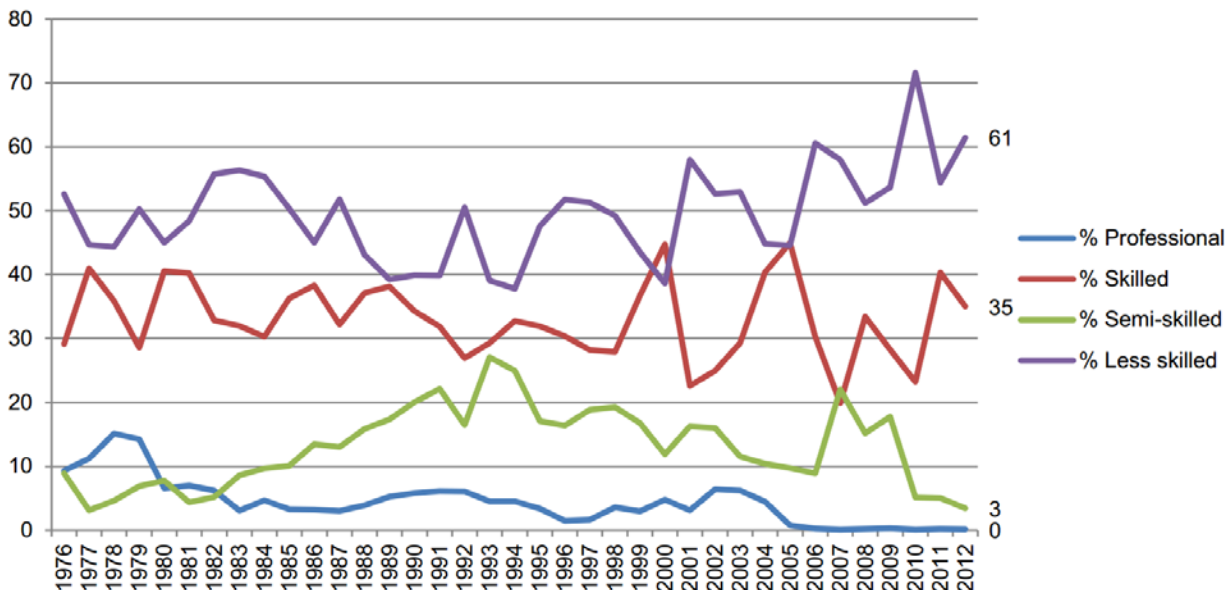
Source: BMET.

Source: World Bank, 2013 Bangladesh Education Sector Review

The pattern of emigration shows that with the current structure of the economy, there is excess supply of labor up to the secondary education level, as seen in and Figure 7.15 above, with these less-skilled workers choosing to seek suboptimal employment overseas. At the same time, there are no official reports on the number of foreigners taking up domestic jobs in Bangladesh. In 2011, McKinsey reported that local middle management was hard to hire, and cited a 25% skilled labor shortage in the ready-made garment industry that was hampering both productivity and diversification into more sophisticated products, but it is not clear that this is constraining the rest of the economy. This again suggests that education is not a binding constraint for overall growth. However, there is evidence of a lack of inclusivity in the labor market, as those with low levels of education are less able to save up sufficient funds to pay the high transaction costs necessary to seek better employment overseas.

7.1.6   Test 4: Constraint Intensity and Firm Performance

If skills are a binding constraint, then firms that consider them to be a less crucial input should be thriving relative to firms that consider them essential to their production processes. However, comparing a variety of sectors' growth rates with their labor intensity, there does not seem to be a clear pattern or relationship between the two, i.e. that overall the more labor-intensive sectors do not perform worse relative to those that are less labor-intensive.

Table 7.2: Sector Growth Rates and Labor Intensity by Sector in Bangladesh

Industry Components	2012 Annual Growth Rate	Average unskilled labor intensity	Average skilled labor intensity	Average labor intensity
Mining and Quarrying	10.5%	3.7%	18.8%	22.5%
Education	9.2%	4.8%	77.7%	82.6%
Manufacturing	8.9%	23.3%	23.0%	46.2%
Financial Intermediations	8.6%	5.5%	53.3%	58.8%
Electricity, Gas and Water Supply	8.2%	2.2%	11.4%	13.6%
Construction	7.7%	30.8%	12.4%	43.2%
Hotel and Restaurants	7.3%	28.9%	31.7%	60.6%
Health and Social Works	7.2%	2.8%	44.6%	47.3%
Transport, Storage, and Communication	6.5%	14.6%	36.7%	51.4%
Fishing	5.4%	16.4%	26.9%	43.3%
Public Administration and Defense	4.9%	7.5%	72.5%	80.0%
Community, Social, and Personal Services	4.7%	10.7%	46.0%	56.7%
Wholesale and Retail Trade	4.6%	19.8%	43.0%	62.8%
Real Estate, Renting, and Business Activities	4.0%	6.2%	59.5%	65.7%
Agriculture and Forestry	1.2%	29.4%	8.7%	38.2%

Source: BBS and University of Dhaka

Note: Labor intensity is based on a 2007 Social Accounting Matrix

7.1.7   Conclusion: Structural Issues in Education

To sum up the balance of evidence, education is not currently a binding constraint to economic growth in Bangladesh. Returns to education are low relative to those found in other countries. Any causal relationship between improved tertiary education and GDP growth is not clear. There is some evidence of employers importing middle management and skilled workers staying in Bangladesh, but there is no clear relationship between labor intensity and growth by industry that would suggest firms that require fewer skilled workers are outperforming those that do. Hence, increasing or improving the supply of education alone will not boost economic growth while more binding constrains such as electricity are not resolved. This finding is updated from Rahman & Yusuf (2009), since the labor market has evolved since their study. While they find education to be a binding constraint to growth in Bangladesh at the time, they also note the phenomenon of relatively low human capital stock without an exodus of skilled workers, and that the transmission of growth from investment in human capital, to education outcomes and employment is not straightforward. The depth of this paradox has only deepened since their analysis, as human capital stock has increased and returns on education have fallen further, while skilled emigration has fallen to zero.

This conclusion is not to say that education will never matter to overall growth. In the long term and as binding constraints are relaxed, Bangladesh will need to focus on improving the quality and relevance of education to increase the supply of skilled workers, and thus productivity and economic diversification. The causes of weaker educational outcomes in Bangladesh are well known, and are issues of both quantity and quality. Public spending on education is relatively low (Figure 7.16). Even for those who enroll, grade repetition and dropout rates are high, leading to the lower completion rates described earlier in the chapter. There are also low levels of learning in schools due to weak teacher motivation and development, high variation in quality among schools, lack of performance-based management, and little contact time between teachers and students, among other reasons (World Bank, 2013a).

Figure 7.16: Public Spending on Education
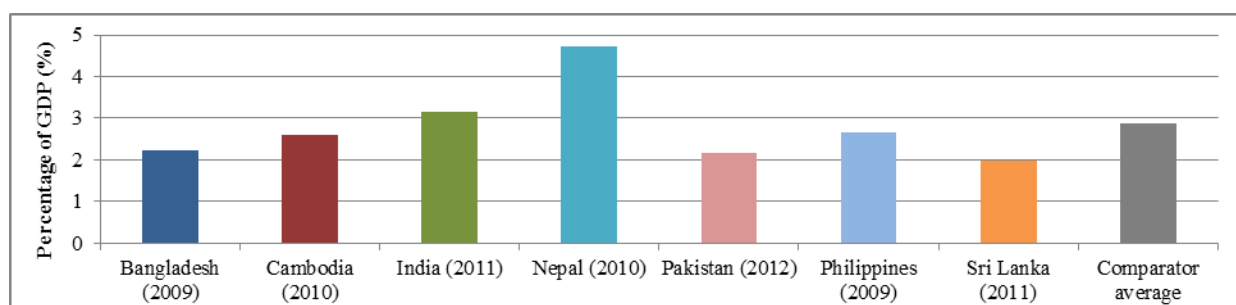
Source: World Bank WDI

Besides issues of education quantity and quality, there are also information and coordination failures in the education system and labor market. A student's subject of study strongly influences the sector he or she will work in as a future worker or entrepreneur, which in turn affects both firm-level productivity as well as the diversity of the national economy. Yet many Bangladeshi students do not choose their area of study based on market signals. For example, a World Bank study found that suggestions by experienced relatives and friends, as well as a lack of available course options influenced students to choose particular vocational training courses, even if there was weak local demand for those skills (World Bank, 2006.) Likewise, for 37% of "household unincorporated enterprises" or informal microenterprises with high amounts of unpaid labor, a micro-entrepreneur's knowledge of the sector is the main reason for his or her chosen business, although for 39% of microenterprises, family tradition is the primary factor considered. [50] At the tertiary level, in comparison with comparator averages, Bangladesh had similar proportions of graduates in most subjects, but about 15 percentage points fewer majoring in education, and nearly 20 percentage points more majoring in humanities and the arts (Figure 7.17)[51].

---

[50] BBS, Informal Sector Survey Report, 2012.

[51] This data on graduates is not available for India or Pakistan. India's 2005 university enrollment figures showed divergent trends, with 46% of enrollment in the arts but 20% in science, although this may reflect different definitions for academic subjects.

Figure 7.17: Percentage of Tertiary Graduates in Different Subjects in Bangladesh and Comparator Countries

Bangladesh (%, 2011)

- agriculture
- education
- Engineering, manufacturing & construction
- health and welfare
- Humanities & arts
- science
- Services
- Social sciences, business & law
- Unspecified

Average of Comparators (%, Most Recent Year)
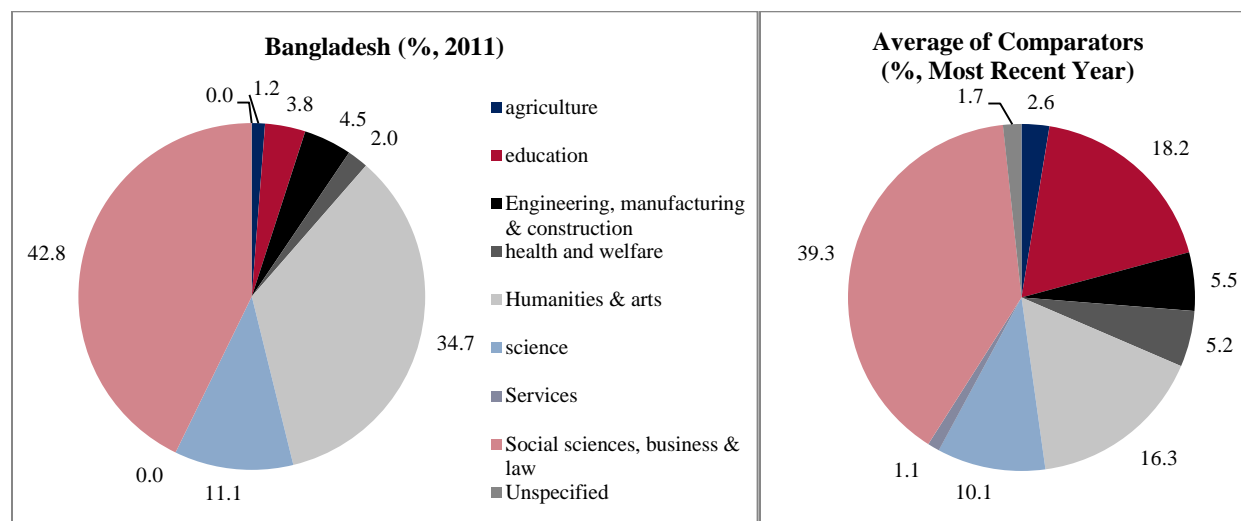
Source: WB Edstats

As for the labor market itself, there are signs of low turnover. Only about 10% of workers in low-skill formal jobs and 15% of workers in professional formal positions have ever changed jobs (World Bank, 2013b). Informal networks were used by 54% of formal workers to find their current jobs. As we have seen, family-related factors are a minor influence on learning outcomes relative to the school attended. However, regression analysis of returns to education did uncover a significant family background influence on wages, specifically that of mothers with at least a junior secondary education[52] (see the annex at the end of this chapter for regression results). In other words, some aspect of family connections likely influences graduates' participation in the labor market more so than a year of additional schooling does.

7.2 Health

The general health of a country's population can also affect economic growth, especially if education and skills are a binding constraint. Poor health can prevent children and adults from participating in schooling, learning as effectively from instruction, and performing successfully and consistently in their work (Hoddinott et al, 2013). Specifically, inferential macroeconomic research on OECD countries has shown that improved nutrition in early childhood (and even maternal nutrition) improves organ health and extends the economically active years of workers through delaying the onset of chronic disease and death, primarily in middle and later age, as well as by reducing the incidence of infectious diseases (Fogel, 2004). This boost in labor force participation is most marked when it benefits the ultra-poor. Microeconomic research on individuals has also shown that, controlling for family socioeconomic status and other variables, better fetal growth leads to better educational outcomes and higher wages in the long run in high-income countries (Weil, 2007) and Brazil (Thomas & Straus 1997).

---

[52] Similar to Krishnan's (1996) finding in Ethiopia, the regression shows that a father's education did not have a statistically significant effect on returns to education.

In the case of Bangladesh, malnutrition and wasting in children under 5 is significantly more severe than in comparators, especially in malnutrition for girls, though with some small declines since 2004 (Table 7.3; JPGSPH & HKI, 2012). (Note that in contrast to WDI data, the Food Security Nutritional Surveillance Project did not find much of a gender gap in chronic undernutrition(a dimension of malnutrition) for the same age group and year: see JPGSPH & HKD, 2012.) However, undernourishment in the general population, while a concern, is not much higher than in Bangladesh's comparator countries (Table 7.3).

Table 7.3: Nutrition and Wasting

	Bangladesh (2011)	Comparators average (most recent year)
Malnutrition prevalence, height for age (% of children under 5)	41.4	37.5
Malnutrition prevalence, height for age, female (% of children under 5)	42.1	36.6
Malnutrition prevalence, height for age, male (% of children under 5)	40.7	38.3
Malnutrition prevalence, weight for age (% of children under 5)	36.8	29.1
Malnutrition prevalence, weight for age, female (% of children under 5)	38.8	29.0
Malnutrition prevalence, weight for age, male (% of children under 5)	34.8	29.1
Prevalence of undernourishment (% of population)	16.8	19.9
Prevalence of overweight (% of children under 5)	1.9	2.8
Prevalence of wasting, female (% of children under 5)	15.3	12.1
Prevalence of wasting, male (% of children under 5)	16	13.2
Prevalence of wasting (% of children under 5)	15.7	12.7

Source: WDI

In terms of other health indicators, Bangladeshis now have a slight higher life expectancy than comparators at birth, with a very small gender gap (Table 7.4). Bangladeshi babies are slightly more likely to have a low birth weight, but in the more important metric of infant mortality, Bangladesh does a bit better than comparators, though the gender gap remains the same. The same is true for child mortality under 5. However, in neonatal mortality Bangladesh has slightly worse figures than its comparator countries.

Bangladeshi health indicators fare better in relative to comparators for adults. Mortality is significantly lower for Bangladeshi adults, with a smaller gender gap than comparators. The same is true with the elderly generation, with more Bangladeshis surviving to age 65 and a small gender gap, and better survival rates for men in Bangladesh relatively to comparators in particular.

Table 7.4: Overall Health Indicators, Most Recent Year, 2006-2012

	Bangladesh	Comparators average
Life expectancy at birth, female (years)	70.7	69.9
Life expectancy at birth, male (years)	69.2	65.9
Life expectancy at birth, total (years)	69.9	67.8
Low-birthweight babies (% of births)	21.6	20.8
Mortality rate, adult, female (per 1,000 female adults)	129.1	157.6
Mortality rate, adult, male (per 1,000 male adults)	158.8	221.9
Mortality rate, infant (per 1,000 live births)	33.1	35.4
Mortality rate, infant, female (per 1,000 live births)	30.3	32.8
Mortality rate, infant, male (per 1,000 live births)	35.7	37.9
Mortality rate, neonatal (per 1,000 live births)	24.4	22.6
Mortality rate, under-5 (per 1,000 live births)	40.9	43.8
Mortality rate, under-5, female (per 1,000)	37.9	41.6
Mortality rate, under-5, male (per 1,000)	43.7	46.0
Survival to age 65, female (% of cohort)	75.5	73.0
Survival to age 65, male (% of cohort)	71.3	64.8

Source: WDI

In conclusion, the health of adults (and therefore the labor force) does not seem to be a binding constraint for growth in Bangladesh in the next five years, especially given that empirical research on the links between nutrition and wages have been done only in other countries (commonly cited cost-benefit estimates on nutrition in Bangladesh are based on hypothetical programs, e.g. Horton, 1999). Assuming that these links do apply to Bangladesh's labor market to an extent, then the nutrition of young children and maternal/neonatal health could become a binding constraint for growth in ten or more years, as today's young children enter the labor force. As for the multi-faceted issues underlying maternal and early childhood nutrition in Bangladesh, these include constraints due to income and awareness as well as food availability, and this study will not delve into this well-covered topic here (e.g. Somanathan et al, 2008; Ministry of Food, 2013; and JPGSPH & HKI, 2012).

7.3 Annex

Table 7.5: Results of Return to Education Regressions

Log (hourly earnings), on	Model 1		Model 2		Model 3	
Incomplete primary	0.06	**	0.01		-0.02	
Primary	0.15	***	0.11	***	0.07	**
Junior secondary	0.32	***	0.29	***	0.10	***
Senior secondary	0.67	***	0.67	***	0.34	***
Bachelor's	0.89	***	0.91	***	0.54	***
Master's	1.22	***	1.24	***	0.94	***
Age	0.06	***	0.06	***	0.06	***
Age squared	0.00	***	0.00	***	0.00	***
Female			-0.56	***	-0.34	***
Father primary					-0.03	
Father junior secondary					0.10	**
Mother primary					0.00	
Mother junior secondary					0.24	***
Constant	1.73	***	1.84	***	1.74	***
N	9983		9983		3727	
R2	0.232		0.302		0.293	
Adjusted R2	0.232		0.301		0.291	
Note: Significance levels are indicated for 1% (***), 5% (**), and 10% (*) by using robust standard errors.						
Also, Model 3 only includes individuals who have at least one parent in the same household.						

Source: 2010 HIES

8 INFRASTRUCTURE

8.1 Introduction

According to the HRV methodology, infrastructure is a complementary factor of production that helps investors to realize returns on their investments. There are many different facets of a country's infrastructure, and problems in any of them can cause significant barriers to economic growth. A lack of access to reliable electricity and telecommunication can directly inhibit production, while poor quality transport and ports can make trade and transportation difficult.

This section provides an analysis of electricity infrastructure, transport infrastructure (including roads, rail, inland waterways, and air), ports, and information and communication technology (ICT) infrastructure. Of these various types of infrastructure, only electricity is a most binding constraint to growth in Bangladesh. Of the remaining infrastructure areas examined, Bangladesh's transport network is plagued by an overburdened road network and insufficient development of its rail and inland waterways, though these concerns are secondary to Bangladesh's inadequate electricity infrastructure.

8.2 Electricity

As mentioned above, electricity is a most binding constraint to growth in Bangladesh, a claim that is well-supported by the evidence and analysis in this section. Additionally, it has been recognized as such in previously undertaken growth diagnostics, analysis by the World Bank and other development institutions, as well as by the government of Bangladesh itself.

8.2.1 Sector Overview

Electrification rates in Bangladesh are quite low relative to its comparator countries. As of 2011, 59.6% of Bangladesh's population had access to electricity, which is roughly 10 percentage points lower than the next nearest comparator country, with the exception of Cambodia at 34.0% (World Bank, 2014a). Bangladesh's 2011 power consumption pattern, based on the most recent data available, was broken down among the following sectors: 48.0 % used residentially, 4.8% in agriculture, 29.0% in industry, 9.7% commercially, and 8.5% for other uses (BPDB, 2012). This power is overwhelmingly generated using natural gas, which is used to produce 65% of Bangladesh's total installed capacity; liquid fuel, including heavy furnace oil and diesel, make up 26% of installed capacity, while the remaining roughly 10% consists of imported electricity, hydropower, and coal (BPDB, 2014a).

Bangladesh's overwhelming reliance on natural gas for its power generation is of great concern. Though Bangladesh has had large reserves of natural gas in the past, its extensive use in power generation and as a transport fuel has put pressure on these reserves. Proven reserves have dropped from 25.4 trillion cubic feet in 1994 to 6.5 trillion cubic feet in 2013 (U.S Energy Information Administration, 2013). Diversifying Bangladesh's sources energy used in electricity generation would help alleviate this pressure on reserves and would also put the entire sector on much firmer long-term footing.

The government of Bangladesh is aware of the need for diversification in its sources of power generation. The above breakdown of installed capacity by fuel type is a far cry from the government's generation targets by 2030. Under Vision 2021, the Bangladeshi government aims to add approximately 36,000 MW to installed capacity (which is currently approximately 10,000 MW), with 50% of it generated by coal, 25% by natural gas, and the remaining 25% consisting of cross-border power, liquid fuel, renewable energy, and hydropower (Ministry of Power, Energy & Mineral Resources, 2013). This plan provides much needed diversity to how Bangladesh generates its power. The planned increase in supply is also critical, as demand for electricity is expected to grow annually by 10% for the foreseeable future (BDBP, 2013a).

Currently, demand for electricity far outstrips supply in Bangladesh, more than doubling in the past decade; the Bangladesh Power Development Board (BPDB) estimated an aggregate electricity demand of 3,659 MW in 2002, which ballooned to 7,518 MW in 2012 (BPDB, 2012). Though BPDB finds that the country's de-rated installed capacity can more than cover its currently forecasted demanded electricity levels, they still expect a maximum load shedding amount of 1,058 MW. One in-country energy expert who was interviewed as part of this study estimated a current actual supply deficit of between 1,500 and 2,000 MW.

To attempt to bring load shedding and supply deficits down to manageable levels, the government of Bangladesh has begun to rely heavily on independent power producers (IPPs) and quick rental power plants (QRPPs). As of November 2013, the public sector supplied 58% of Bangladesh's total power production; the rest was supplied by the private sector, with 20.5% coming from rental plants, 16.2% coming from IPPs, and the remaining 5% coming from imported power (BPBD, 2013a).

These rental plants are extremely expensive due to their use of diesel and furnace oil as fuel. In FY 2012-13, the Bangladesh Power Development Board spent over Tk103 billion on electricity from rental power plants, which outstripped its own generation costs by Tk58 billion and was the primary contributor to BPDB's Tk50 billion net loss for the year (AB Saha & Co. and Marhk & Co., 2013). Though rental plants have eased current supply deficits and load shedding, they are not a long-term solution for Bangladesh's electricity needs. Through 2018, the BPBD is installing 10,359 MW of capacity, though the majority of this capacity is via liquid fuel or natural gas powered plants; the portion of the capacity originating from renewable and coal plants won't begin to come online until 2015 and 2016, respectively (BPBD, 2013a).

The precarious state of Bangladesh's power generation is seen in numerous surveys and indices on firm perceptions and business competitiveness in Bangladesh. The 2014 Global Competitiveness Report ranked Bangladesh's quality of electricity supply 133rd out of 148 countries (Schwab and Sala-i-Martin, 2013). This ranking is one of the lowest in the world, and lower than all of its comparator countries with the exception of Pakistan (135) and Nepal (144), both which have severe issues with electricity supply, generation, and distribution themselves. Additionally, the 2013 Enterprise Survey finds that over half of firms in Bangladesh consider access to electricity to be a constraint to doing business (World Bank, 2013). This finding, that electricity is considered a constraint to Bangladeshi firms, is found to be broadly consistent across sector, firm size, and location.

Though this finding from the Enterprise Survey can only measure firm perceptions, it is supported by past analysis as well as data. On average, Bangladesh has 64.5 electrical outages per month, the highest number found worldwide; the next closest comparator country is Pakistan, which has an average of 31.7 outages per month (World Bank, 2013). Additionally, four past studies on economic growth and the development challenges faced by Bangladesh identified electricity as a critical problem, including the most recent Article IV IMF staff report from 2013 (Mahaja, 2005; Rahman and Yusuf, 2010; World Bank, 2012a; IMF, 2013). Electricity was also repeatedly raised as a most binding constraint to growth during interviews with numerous in-country experts from the Bangladeshi government, the private sector, and development partners.

8.2.2 Test 1: If electricity is a binding constraint to growth in Bangladesh then its shadow price should be high.

One way to test whether or not electricity is a binding constraint to growth is whether or not its shadow price is high. Electricity, when it is available, is not particularly expensive in Bangladesh. According to a 2011 study, Bangladesh has the lowest tariff rates in South Asia, though it was noted that rates will likely increase in the near future as Bangladesh shifts to other sources of power generation besides natural gas (Jamil, 2012). Electricity tariffs have been raised in the past few years, but still remain low for the region. However, due to the combination of Bangladesh's low tariff rates and chronic electricity shortages, the price paid for electricity in the economy is not market clearing, making it likely that the actual shadow price of electricity much higher than what is being paid by customers.

A recent study by the Bangladesh Institute of Development Studies (BIDS) found that the average cost of unserved energy (that is, the cost of procuring electricity outside of the national grid to make up for supply shortfalls) is Tk26.73 per kWh, which is much higher than the current average bulk electricity tariff of Tk4.02 per kWh (Mujeri and Chowdhury, 2013). This high shadow price implies that individuals and firms would be willing to pay a much higher tariff in exchange for additional, reliable electricity, an indication that electricity constrains producers, consumers, and growth in Bangladesh.

Widespread generator use can be seen as another indirect measure that the shadow price of electricity is high in Bangladesh. Because generators are generally much more expensive than electricity purchased on the grid, their use is indicative of a high willingness to pay for reliable electricity. Figure 8.1 below shows that Bangladeshi firms are willing to pay this higher cost, with over 60% of them owning or sharing a generator, which is a higher proportion that those found in any of the other comparator countries.

Figure 8.1: Generator Use by Bangladesh and Comparator Countries
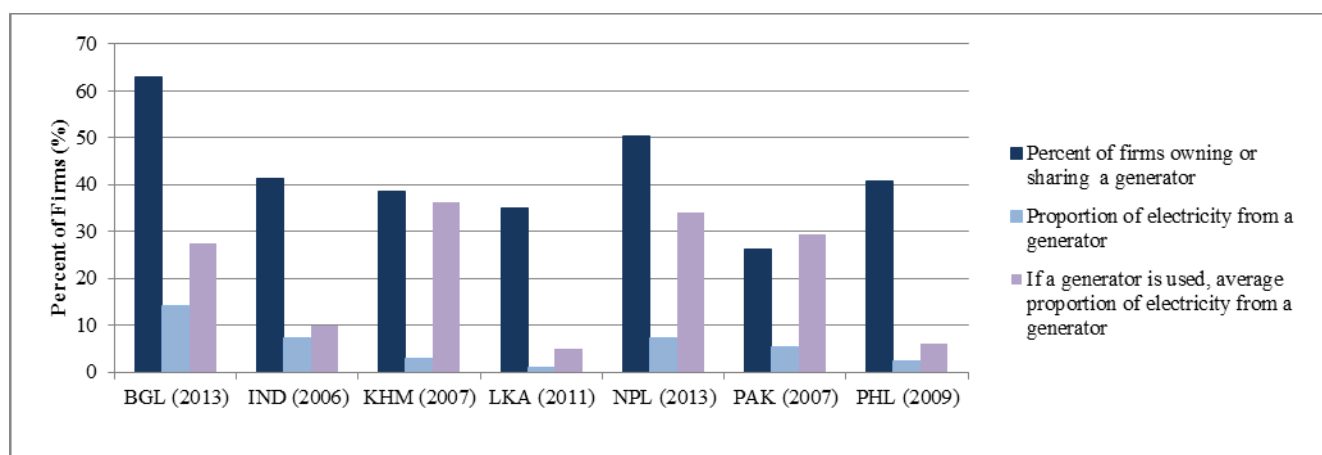
Source: Enterprise Surveys, World Bank

8.2.3 Test 2: If electricity is a constraint then changes in the amount of electricity supplied to the economy should lead to significant changes in investment.

Though evidence thus far points to electricity being a binding constraint to growth in Bangladesh, one of the properties of a constraint being binding is that changes is that it should produce changes in the amount of private investment in the economy. Thus far in this chapter, this causal relationship has been taken as fait accompli. Nevertheless, there is substantial evidence that economic growth and private investment in Bangladesh increase with an increase in electricity access and consumption. The previously-mention BIDS study on quick-rental power plants found that economic growth over 2011-12 would have been between .6 and 1.4 percentage points lower than the recorded 6.32% without the quick rental power plants (Mujeri and Chowdhury, 2013, author calculation).

Additionally, a recent co-integration and causality analysis by the Bangladesh Ministry of Finance using time series data between 1981 and 2011 found unidirectional causality running from electricity consumption to both economic growth and investment in the short-run; in the long-run, the relationship is bi-directional (Masuduzzaman, 2012). Based on these studies, movement of the potential binding constraint does have an effect on the object function; therefore, increasing electricity consumption and production in Bangladesh will have a positive effect on investment and economic growth.

8.2.4 Test 3: If electricity is a constraint to growth, then agents should be attempting to circumvent the problems it causes in the economy.

The frequent use of generators by Bangladeshi firms was discussed in a previous section and providing evidence of a high shadow price of electricity. This same indicator demonstrates that firms in Bangladesh are attempting to mitigate the effects of a lack of reliable electricity from the

grid and thus bypass the electricity constraint, which is another key test in determining whether or not something is a binding constraint to growth.

Another example of entities in the economy attempting to bypass the electricity constraint is through the government's building and promotion of special economic zones. These Export Processing Zones (EPZs) are special areas set up to attract foreign and local investment by offering high quality infrastructure and logistics, among other incentives. A recent study by the World Bank on these EPZs noted that they are "at the heart of Bangladesh's dynamic garment sector… [and] have played a critical role in attracting large-scale FDI" (Farole and Akinci, 2011). In the same article, the authors highlight the importance of high quality infrastructure as an incentive for attracting investment:

> *"Another key area of infrastructure provision by BEPZA [the Bangladesh EPZ Authority] is electricity and gas. Outside of the zones, power is a major problem in Bangladesh, and most companies rely on their own generators. Inside the zones, BEPZA purchases power from the national grid and sells it to enterprises in the zones… Although the country faces an acute power shortage, BEPZA's power supply takes priority over other national usage. BEPZA also has allowed companies to produce power within the zone for the zone's use only."*

Firms are taking advantage of these EPZs in large numbers. As of February 2014, 5 of the 8 EPZs are at maximum capacity, with 93% of all slots occupied, and demand remains high; three additional economic zones are currently in the planning stages (Kobayashi, 2014). This use of EPZs demonstrates additional behavior by firms focused on bypassing the electricity constraint. Furthermore, by prioritizing power to the EPZs over other usage, the government of Bangladesh implicitly acknowledges their belief that access to reliable electricity is crucial for attracting private investment and thus increasing economic growth. Comments made by a number of high-level Bangladeshi government officials at a February 2014 stakeholder workshop on the three planned economic zones further underscore this point. Outfitting these EPZs with the necessary infrastructure demonstrates that the government of Bangladesh, in addition to firms, is trying to bypass the country's electricity constraint.

8.2.5 Test 4: If electricity is a constraint then firms or sectors less intensive in electricity are expected to thrive relative to firms that are more intensive.

This test is often difficult to run, and in the case of Bangladesh provides contrary evidence to electricity being a binding constraint to growth. In order to conduct this test, we made the assumption that the manufacturing sector requires larger electricity inputs than the service section, which means that if the latter sector is thriving relative to the former, then there is evidence that electricity is a binding constraint to growth in Bangladesh.

When the most recent World Bank WDI data was examined, we found that value added in both manufacturing and services as a percent of GDP is average in Bangladesh relative to comparator

countries, providing no evidence that electricity-intensive sectors are performing worse than those that are less electricity-intensive. However, this is not particularly strong evidence due to the variety of factors that can affect the value added to GDP via different sectors. For example, in Bangladesh it is likely that cheap labor availability outstrips the effect of poor electricity provision in the manufacturing sector. This gives the conflicting evidence of this test relatively less weight in determining our overall conclusions than the other, more strongly-supported tests.

8.2.6 Conclusion

Power infrastructure improvements are recognized as critical to private investment and economic growth by the Bangladesh government, private firms, and development partners. However, the building of this infrastructure has not managed to keep up with electricity demand, resulting in the large numbers of power outages and load shedding seen in the country. Based on both in-country interviews and previously conducted analysis, the reasons for this gap in infrastructure appear to be two-fold: a lack of incentive for private sector development and a public sector that lacks the capacity to deal with large-scale infrastructure, particularly during implementation.

Private sector investment in large-scale infrastructure projects, such as power plants, has decelerated in the past few years. According to data from the Bangladesh Bank, FDI to the power sector in FY 2001 made up 31% of total FDI flows, while in FY 2010 through FY 2012 the percentage ranged from 4% to 7% (CPD, 2013). A number of in-country experts agreed that one likely reason for this decline in investment is the recent political instability; each time the government changes, infrastructure projects are renegotiated, which lessens incentives for potential investors. The most recent World Bank Bangladesh Development Update also found political uncertainty to be exacerbating the power and electricity deficits in the country (Hussain and Rizwan, 2013). Additionally, though IPPs sell their electricity directly to the BPDB, in certain instances private generation companies are able to sell directly to large industrial consumers; however, these are sales are allowed at tightly regulated prices and as a result commercial investment is risky (UNCTAD, 2013). These regulations further stifle private investment in Bangladesh's electricity infrastructure.

One potential alternative to the purely private infrastructure investment discussed above is that of the public-private partnership (PPP) model. This is an investment avenue that the government of Bangladesh is actively pursuing. However, PPP infrastructure investment is being hindered by a lack of public sector capacity to manage and implement both PPP partnerships specifically and large-scale public infrastructure projects more generally, the main second reason for Bangladesh's infrastructure gap. The Bangladesh government does not have the capacity to monitor timely project implementation for either IPPs or BPDB power plants (CPD 2013). This finding was confirmed by a number of experts during in-country interviews on infrastructure. The Bangladesh government also currently lacks the experience and expertise needed to successfully undertake PPP infrastructure projects. A 2012 study on PPPs in Bangladesh found that the public sector struggles with their implementation due to a skeptical bureaucracy and a lack of training and experience with the framework (Hassan, 2012). However, UNCTAD notes that the PPP office is headed by competent leadership and that the process and framework itself is often learned through experience (UNCTAD, 2013), meaning that PPPs could be a viable way of bridging Bangladesh's electricity infrastructure gap in the future.

8.3 Transport

Given the available evidence, transportation infrastructure is not currently the most binding constraint to economic growth in Bangladesh. Though the ability to conduct formal HRV tests for bindingness on transport infrastructure is limited due to data availability, the small amount of data available, previous studies, and in-person interviews of experts in Dhaka appear to confirm that poor electricity infrastructure considerably outweighs poor transport infrastructure as a binding constraint to growth in Bangladesh. Additionally, as displayed below in Table 8.1, the number of firms in Bangladesh that perceive transportation to be a major constraint to business is well within range of its comparator countries and actually lower than the South Asia and worldwide averages.

Table 8.1: Percent of Firms Identifying Transportation as a Major Constraint

Country	%
Bangladesh (2013)	14.6
Cambodia (2007)	12.9
India (2006)	7.8
Nepal (2013)	31.7
Pakistan (2007)	14.2
Philippines (2009)	15.1
Sri Lanka (2011)	10.2
South Asia	23.3
All Countries	22.7

Source: 2013 Enterprise Survey

Though not a most binding constraint, Bangladesh's domestic transportation infrastructure poses significant barriers to growth that could rise in profile over time as other more pressing constraints are improved. These issues are interconnected across transportation modes, primarily roads, railways, and inland waterways. An over-reliance on roads as a means of transport has led to a decaying and low-quality road network plagued by congestion and delays. As roads have become the primary means of domestic transport, investment in and use of railways and inland waterways have declined, which in turn has further strained the road network.

8.3.1   Roads

Based on the evidence available, Bangladesh's road network is not currently a most binding constraint to growth. Bangladesh occupies a reasonable place in the ranks of its comparators with respect to a number of road transport indicators. In Table 8.2, Bangladesh's km of road per million people far exceeds that of any of its comparator countries. According to UNCTAD, Bangladesh has built over 21,000 km of road since its independence, with over 80% of these new roads being paved (UNCTAD, 2013). Additionally, per Figure 8.2, the proportion of products lost due to breakage or spoilage during domestic transport in Bangladesh is well within the accepted range of its comparator countries for which data was available.

Table 8.2: Km Road per Million People for Bangladesh and Comparators

Country	Km road per million population
Bangladesh	166
Cambodia	21
India	125
Nepal	14
Pakistan	32
Philippines	67
Sri Lanka	148

Source: Blanke and Chiesa, 2013

Figure 8.2: Percentages of Products Lost Due to Breakage or Spoilage during Domestic Transport
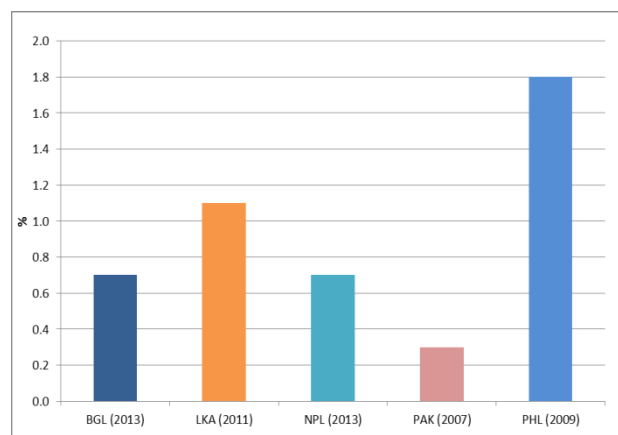
Source: World Bank

Roads are the primary means of domestic transportation in Bangladesh of both passengers and goods, with 88% of transport needs being met via the road network, far outstripping the portions handled by rail and inland waterways (World Bank, 2014b). This means that the indicator quantifying the proportion of products lost during transport is a reasonable proxy for the proportion of products lost via road transport only. Furthermore, this indicator can also be used as an indirect measure of the shadow price of road transport, revealing it to be well within the range of those found in its comparator countries.

However, a separate attempt to examine the shadow price of road infrastructure via port and terminal handling costs (discussed below in the chapter's port section) finds a relatively high shadow price of road infrastructure relative to comparator countries. Unfortunately, due to data limitations, it is not possible to verify either of these findings directly with actual road tariff rates for freight, as the most recent data available is from 2002. These conflicting relative shadow prices of road infrastructure make it difficult to conclude that it is a most binding constraint to growth, particularly relative to the more clear-cut evidence used to identify electricity as a binding constraint.

Though Bangladesh's transportation infrastructure is not currently the country's most binding constraint to growth, the road network does suffer from significant quality and congestion issues. As mentioned above, this is due primarily to the country's overreliance on roads for the domestic transport of both passengers and freight. As a result, approximately 40% of Bangladesh's roads are considered to be in bad condition (World Bank, 2014b). According to the most recent Global Competitiveness Report, Bangladesh's road quality ranks 118th out of 148 ranked countries. This is on the extreme low end of all of the comparator countries, with only Nepal (126) ranked worse and most of the other countries ranked 30+ places higher (Schwab and Sala-i-Martin, 2013). Bangladesh's poor road quality and their overburdened conditions also result in extremely high injury and mortality rates from traffic accidents. Using official statistics (which are generally held to be a vast underestimation), Bangladesh's accident fatality rates are four times those of neighboring India (World Bank, 2009).

Of particular concern from an economic growth perspective is the performance of the Dhaka-Chittagong Corridor. This highway is a key link between Dhaka and Chittagong and a crucial pipeline for much of Bangladesh's trade, serving approximately one-third of Bangladesh's total import-export flows (World Bank, 2014b). This glut of goods on a single highway results in severe traffic blockages and many delays.

Though not currently a most binding constraint to growth, Bangladesh's road infrastructure is of poor quality and extremely overburdened. This latter characteristic is exacerbated by a lack of development of Bangladesh's inland waterways and rail network.

8.3.2   Inland Waterways

The lack of development of inland waterways contributes to Bangladesh's overreliance on its road network for the movement of both freight and passengers. Though inland waterways are one of the country's oldest and cheapest means of domestic transport, their upkeep and expansion has failed to keep pace with transport demand.

Natural inland waterways in Bangladesh are extensive and provide transportation opportunities to much of the country. They are particularly important for connecting the rural poor to the rest of the country, many of whom reside in remote areas with limited access to other types of domestic transport infrastructure.

In 1970, Bangladesh had approximately 8,000 km of navigable inland waterways, a number that has shrunk to 6,000 km as of 2009 due primarily to inadequate dredging and a lack of berthing facilities (World Bank, 2009). Inland waterways have also shrunk as a percentage share of Bangladesh's total freight and passengers by transport mode. Inland waterways carried 16% of passengers and 37% of freight in 1975, with those shares dropping to 8% and 16% in 2005 (World Bank, 2009). According to a policy memo by the Dhaka Chamber of Commerce, the increase in government funding to the roads sector over that period was undertaken primarily at the expense of waterways funding (DCCI, 2009). According to a recent project information document by the World Bank, waterways receive approximately 1% of transportation funding in Bangladesh's Annual Development Program, while roads receive 80% (World Bank, 2014b). Additionally, the further development of the road networks has caused blockages of previously navigable inland waterways (Mishra and Hussain, 2012).

This lack of upkeep and funding, and development of the road network at the expense of inland waterways further exacerbates Bangladesh's domestic transportation infrastructure quality and congestion issues.

8.3.3   Rail

Bangladesh's rail infrastructure also contributes to the country's lack of capacity with regard to domestic transportation infrastructure. According to Figure 8.3 and Figure 8.4, the amount of freight Bangladesh transports via rail is roughly in line with that of an average country of its development level, while the number of passengers carried is slightly above average. The total number of rail lines in the country is also roughly on par with its income level (World Bank

2014a). However, due to Bangladesh's high population and according to other studies, these simple correlation regression results mask significant capacity issues.

Figure 8.3: Freight Transported via Rail vs. GDP Per Capita, 2011
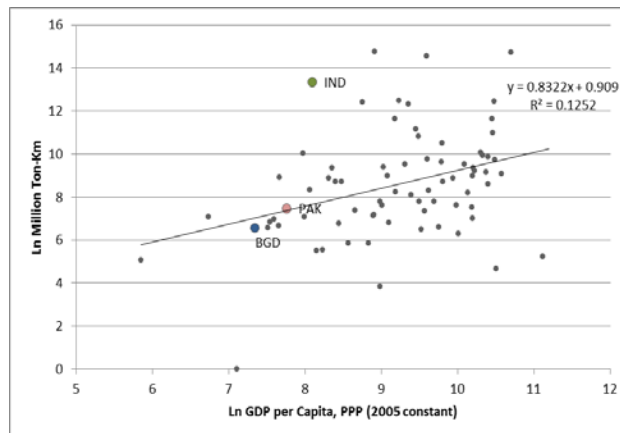
Source: World Bank

Figure 8.4: Passengers Transported via Rail vs. GDP Per Capita, 2011
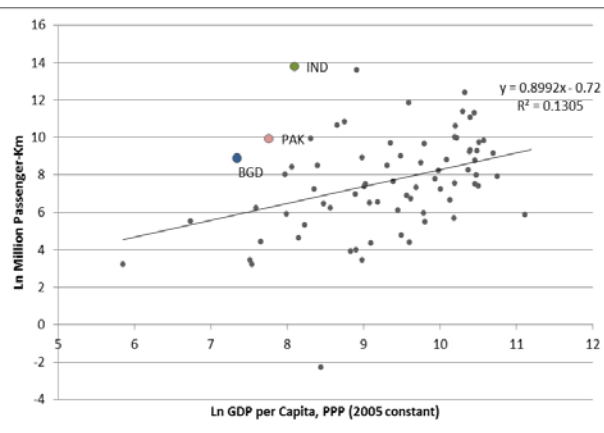
Source: World Bank

According to its most recent government budget, Bangladesh's state-owned railway agency (which owns and operates the country's entire rail network) has seen an increasing number of passengers each year since 2004, though the total amount of freight carried peaked in FY2007-08 and has declined each year since (Bangladesh Ministry of Finance, 2013). A recent study by UNCTAD finds that transport costs are lower via railroad instead of by road, but that capacity falls well short of demand (UNCTAD, 2013). Estimates of the percentage of freight and passengers carried by railway in Bangladesh are out of date and poorly sourced, and range from 4% to 12% (World Bank 2009, Nasirullah et al, 2011). This portion of freight and passengers carried by rail has declined over time as roads have become the primary means of transport in the country. Improving Bangladesh's railway infrastructure would improve domestic transport bottlenecks in the country by easing the congestion and deterioration of the nation's overused road network.

8.3.4   Air

Air transport does not contribute to the problems facing Bangladesh's domestic transport sector. Based on a number of different air transport indicators, Bangladesh's air infrastructure appears to be in line with or exceeds that of other countries of its income level. Figure 8.5 and Figure 8.6 show that Bangladesh transports more freight and passengers via air transport than expected for a country of its income level.

Figure 8.5: Freight Transported via Air vs. GDP Per Capita, 2012
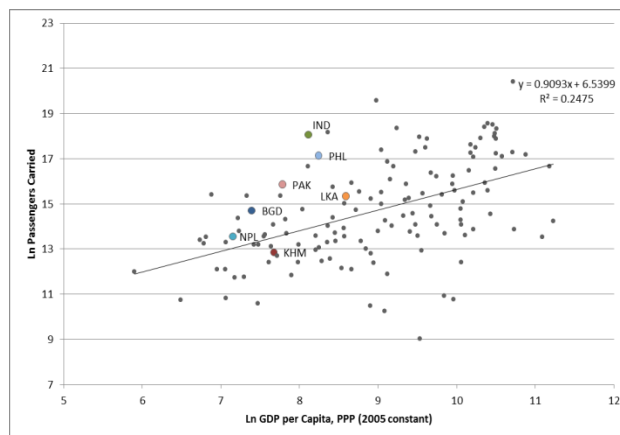
Source: World Bank

Figure 8.6: Passengers Transported via Air vs. GDP Per Capita, 2012
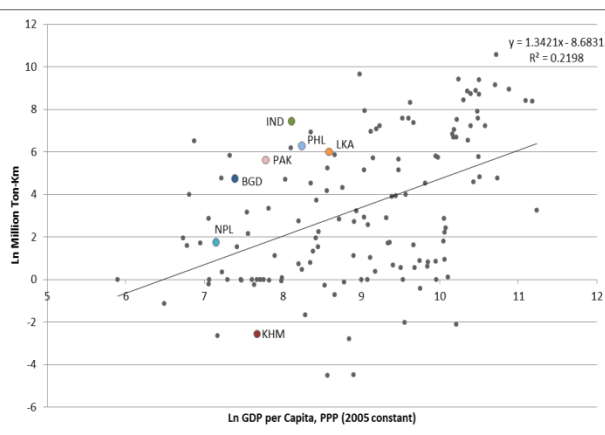
Source: World Bank

Additionally, though its air infrastructure quality is ranked poorly by the World Economic Forum, Bangladesh ranks in the top 50% of countries in available airline seat-kilometers both internationally and domestically (Blanke and Chiesa, 2013). Bangladesh's air infrastructure is not of high quality, but it currently adequately serves the needs of the country. Additionally, air transport is not a common or perfect substitute for domestic overland transport in developing countries, and as such its lack of quality does not contribute to the strains on the country's domestic transportation network.

8.4 Ports

Bangladesh's ports are not currently a most binding constraint to growth. As is shown in Figure 8.7, port quality in Bangladesh is as expected for a country of its income level. However, Figure 8.8 shows that the cost of ports and terminal handling for both imports and exports in Bangladesh are significantly higher than any of the costs seen in its comparator countries.

101

Figure 8.7: Port Quality vs. GDP Per Capita, 2012
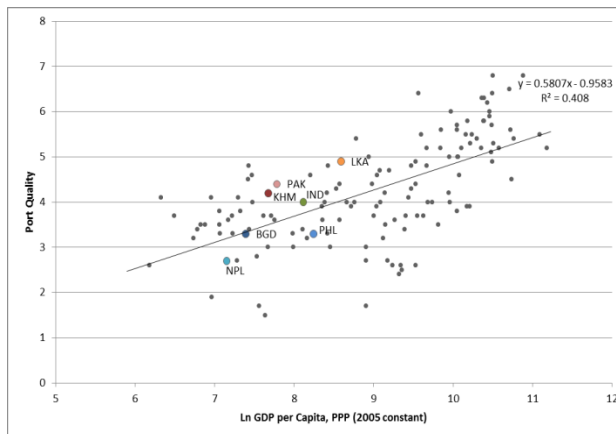
Source: World Bank

Figure 8.8: Ports and Terminal Handling Costs, 2013
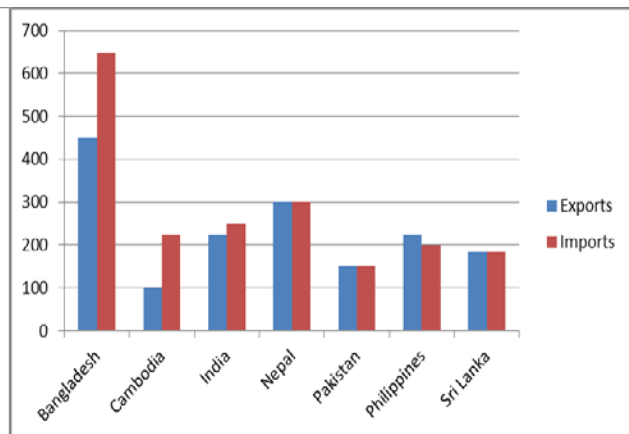
Source: World Bank

Though this may seem to reveal that the shadow price of port use is high in Bangladesh, in actuality, this exposes the inadequate transportation infrastructure used to travel to and from Bangladesh's ports. Because of shortcomings in the Dhaka-Chittagong Corridor and the transport infrastructure linking Mongla Port to the rest of the country, containers are unable to be immediately offloaded onto trucks and transported by road. Rather, most containers must be stripped of their imported goods at the port and then loaded as loose cargo into trucks; similarly most goods for export are shipped to the ports loose and then packed into containers upon arrival (IMF, 2013). The World Bank has found that this practice results in significant delays, damage, and loss of shipped goods (World Bank 2009). This additional cost of unpacking and repacking is likely what is driving up the ports and terminal handling cost in Figure 8.8.

Chittagong Port itself, which handles 95% of the country's maritime cargo, is reasonably well-equipped to handle containers and heavy cargo; though Bangladesh's cargo volumes are currently growing at 20% annually, they are still well within the capacity of the port (UNCTAD, 2013).

8.5 ICT Infrastructure

ICT infrastructure is not currently one of the most binding constraints to growth in Bangladesh. As seen in Figure 8.9 and Figure 8.10, both the rate of cellular subscriptions and internet users in Bangladesh is roughly in line with a country of its income level and also within range of the levels in its comparator countries.

Figure 8.9: Mobile Cellular Subscriptions vs. GDP Per Capita, 2012
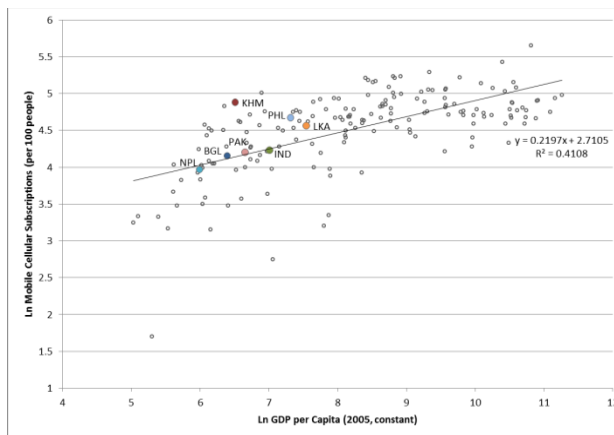
Figure 8.10: Internet Users vs. GDP Per Capita, 2012
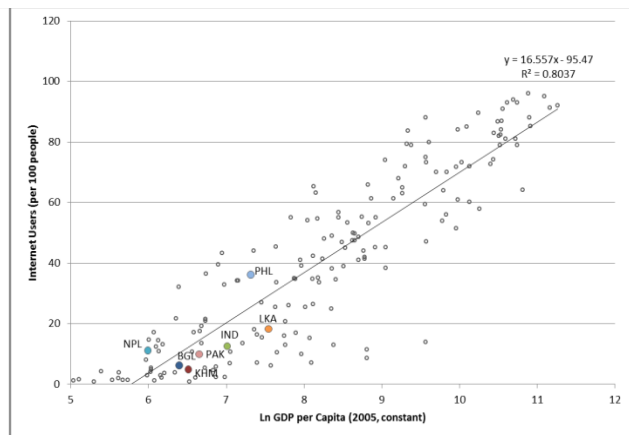
Source: World Bank

Source: World Bank

Additionally, a 2012 World Bank survey of Bangladeshi logistics professionals found that none of them rated the country's telecommunications and IT infrastructure quality as it pertains to trade as "low/very low" (World Bank, 2012b). Furthermore, 100% of surveyed logistics professionals found that telecommunications and IT infrastructure were "improved or much improved" in 2012 as compared to its conditions in 2009 (World Bank, 2012b).

The Bangladeshi government's "Digital Bangladesh" initiative, a key part of the country's 2021 Vision for reaching middle-income status by that year, intends to set up infrastructure for enhancing connectivity (Nyenrode Business Universiteit, 2014). The improving conditions of ICT infrastructure and the attention paid to it by the government of Bangladesh provide further evidence that ICT infrastructure is not a binding constraint to growth in Bangladesh.

8.6   Conclusion

Electricity is a most binding constraint to economic growth in Bangladesh. The shadow price of electricity is extremely high, and firms as well as the government itself attempt to bypass the difficulties caused by lack of electricity access by using private generators and building EPZs with reliable electricity supplies that will attract FDI. Additionally, analysis has shown that increasing power generation and consumption has in turn increased Bangladesh's investment levels and economic growth rates. Unless strides can be made in bridging the electricity supply gap, Bangladesh's economic growth rate will continue to underperform relative to its potential.

Bangladesh's transportation system is not a most binding constraint to economic growth. Road density is one of the highest in the region, though two indirect measures of the shadow price of road transport provide conflicting evidence regarding whether or not transportation costs are high. Nevertheless, road networks are overtaxed, resulting in congestion, delays, and road deterioration. Rail lines and inland waterways are unable to ease the overcrowding crowding of domestic transport due to a lack of capacity stemming from low investment levels. Though not currently a most binding constraint, Bangladesh's domestic transportation infrastructure poses

significant barriers to growth that could rise in profile over time as other more pressing constraints are improved.

Air, port, and ICT infrastructure, though not of particularly high quality, are within the averages of what is expected for a country of Bangladesh's infrastructure. They are not believed to be binding constraints to economic growth.

9 NATURAL CAPITAL

9.1 Introduction

Adverse geographic characteristics increase the risks to investment opportunities, raise costs for businesses, and have a negative impact on poor and remote populations. Bangladesh has a long history of exposure to natural disasters, including floods, storm surges, and tropical cyclones. In addition, the country's natural resource endowments are limited and quickly diminishing. These challenges will only grow as the effects of climate change intensify and the population expands. Up to the present, however, Bangladesh's overall economy has withstood these threats with remarkable resiliency. As a result, geography and natural capital have not been identified as a most binding constraint to growth, although the country's resiliency may lessen as natural calamities become more frequent and severe.

Bangladesh is a low-lying South Asian country situated along the confluence of the Ganges, Brahmaptura and Meghna rivers.[53] The Bay of Bengal forms a 580 kilometer (km) deltaic coastline along the south with territorial waters extending 12 nautical miles (22 km) and an exclusive economic zone extending 200 nautical miles (370 km). India forms a 2,400 km land border to the east, north and south, while Myanmar forms a small land and water border of 193 km in the southeast. Several hundred rivers flow through Bangladesh, including 57 that are transboundary. These rivers carry an average of 2 billion tons of sediment each year (GOB 2009). Located along the Tropic of Cancer, Bangladesh has a tropical monsoon climate.

9.2 Climate Change and Environmental Risk

Bangladesh experiences cyclones during two periods throughout the year – from April to May and from October to November – with a major cyclone hitting the country an average of one time every three years (GOB 2009). With such major risks, Bangladesh is considered to be a "most at risk" country in terms of economic loss due to cyclones (Figure 9.1). Storm surges, rises in the water levels of coastal or inland bodies of water, typically accompany cyclones ranging in height from 1.5 to 9 meters (Dasgupta 2010). Over 8 million people currently live in coastal areas that are vulnerable to cyclonic storm surges.[54] The World Bank estimates this figure will increase to 13.5 million people under a baseline scenario, while under a climate change scenario this figure may increase to 22.5 million (2011).[55]

According to the 2004 UNDP Global Report "Reducing Disaster Risk: A Challenge for Development," Bangladesh is the sixth most flood-prone country in the world (Figure 9.2). Extreme vulnerability to flooding is primarily due to intense monsoon rainfall, high vulnerability to storm surges, and the fact that over two-thirds of the country is less than 5 meters (16 feet) above sea level (GOB 2009). In an average year, approximately 25% of Bangladeshi land is

---

[53] In Bangladesh, the Padma and Jamuna rivers are part of the Ganges and Bahmaputra rivers, respectively.

[54] Populations living in areas vulnerable to inundation depths greater than 3 meters (approximately 10 feet)

[55] Under the climate change scenario, rising seas levels and increased ocean surface temperature increase the coastal area at risk of inundation depths greater than 3 meters by 15%.

flooded and more than 60% of the country is at risk of being inundated (Ahmed and Mizra 2000). An estimated 23 million people live in areas that are at high risk of flooding.[56] While the percentage of land exposed to flooding is expected to rise due to climate change, the number of people at risk is projected to decline to between 19.2 million and 21.1 million by 2050 as people continue to migrate from rural to urban areas further away from the coast (World Bank 2011).

Figure 9.1: Cyclones and Economic Loss   **Figure 9.2: Floods and Economic Loss**
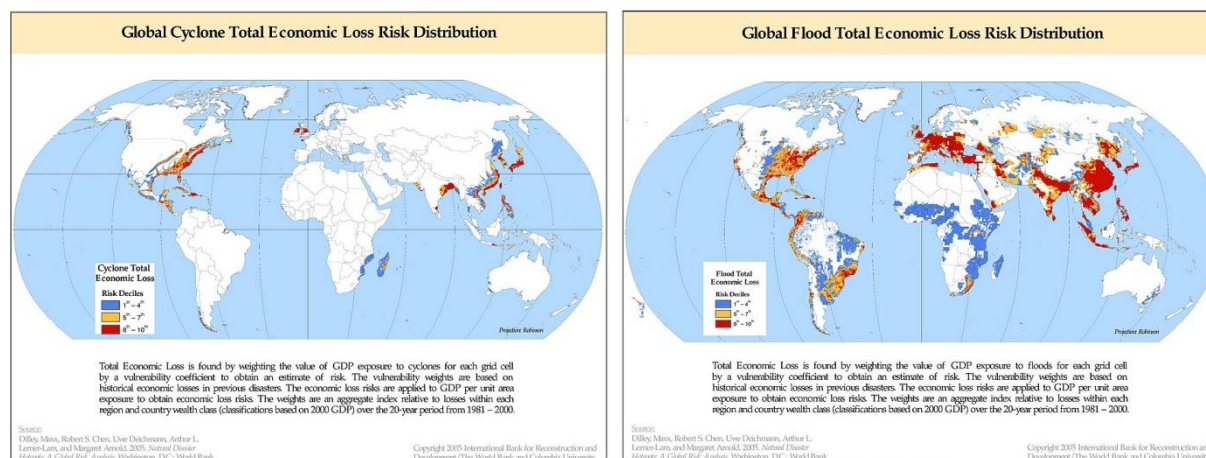
Source: Dilley et. al. (2005)

Floods, cyclones, and storm surges cause severe human suffering and destruction of economic assets such as housing, land, and crops. In 2007, 32,000 square km of land were inundated, affecting 3 million households and costing over US$1 billion (1.5% of GDP) and partially or fully damaging 1.12 million hectares (ha) of agricultural land (GOB 2007). Cyclone Sidr (2007) affected 8.9 million people and resulted in 3,406 deaths and 55,282 injuries. Economic losses from Cyclone Sidr totaled US$ 1.67 billion (2.4% of GDP), including losses amounting to US$1 billion and US$490 million to infrastructure and agriculture, respectively (GOB 2008).

Natural disasters occur in areas where there are high levels of poverty, providing one explanation as to why the incidence of poverty remains so high in these locations (Rahman 2012). For instance, the highest incidences of poverty are in coastal regions of Barisal (39.4%) and Khulna (32.1%), while Rangpur (46.2%), located in a northeastern region, has frequent flooding and droughts.[57] The large number of poor living in vulnerable areas has resulted in Bangladesh being listed as one of the countries most likely to experience substantial poverty increases due to climate change (World Bank 2012).

The negative social and economic impact of natural disasters will most likely continue to pose a major development challenge for Bangladesh. The World Risk Index (WRI), an index of 173 countries, uses a series of indicators under four components – exposure, susceptibility, lack of coping capacities, and lack of adaptive capacities – to determine country risks to disasters. In 2013, Bangladesh ranked 5th in the WRI, meaning it is the 5th most at-risk country in the world.

---

[56] At risk populations are those of threatened with inundation greater than 0.3 meters (approximately one foot).
[57] Poverty levels based on 2010 Household Income and Expenditure Survey (HIES).

This compares to similar rankings for the Philippines (3rd) and Cambodia (8th), although each of the remaining compactor countries have rankings greater than 60th.

In addition to receiving a low WRI score for the number of structures, environmental areas, and people exposed to disasters, Bangladesh received a low score for its coping and adaptive capacities. This low score for coping capacity means the country has inadequacies related to the ability to mitigate damages during a natural catastrophe, such as in the areas of disaster preparedness and medical services. At the same time, the low adaptive capacity means the country is not developing long-term adaptive changes (e.g. investments, research, ecosystem protection, etc.) necessary for structural transformation. The World Bank has attempted to capture some of the infrastructure costs related to adaptation. For example, by 2050 investments to infrastructure totaling US$3.2 billion are needed to cope with inland monsoon floods while US$2.4 billion is needed for infrastructure to help adapt to cyclones and storm surges. These estimates increase under different climate change scenarios.

9.3 Land Resources

Bangladesh's surface area is 14.4 million hectares (ha), of which 53% (7.6 million ha) is arable land – a percentage that is much greater than that of any other comparator country aside from India, where 48% of land is arable. Bangladesh is one of the most densely populated countries in the world (1,174 people per square mile), making the share of arable land per capita relatively constrained. There are only 50 hectares of arable land per 1,000 inhabitants – a figure that is similar to Sri Lanka (58 ha/1000 inhabitants) and the Philippines (57 ha/1000 inhabitants), although much lower than each of the remaining comparator countries.

The number of Bangladeshis living in rural areas relative to the amount of available arable land is one of the highest in the world (Figure 9.3). As such, many rural Bangladeshis will most likely seek future income growth from non-agricultural activities that require more productive usage of land assets in terms of total factor productivity. In 2012, Bangladesh's agriculture value added per worker was US$492 (PPP 2005 US$) – the second lowest among comparators. Although Bangladesh ranks quite low in terms of productivity per worker, its agriculture productivity has grown at a much faster rate than any other comparator since 1993 (Figure 9.4).

Figure 9.4: Rural Land Density and GDP   **Figure 9.3: Agricultural Productivity**
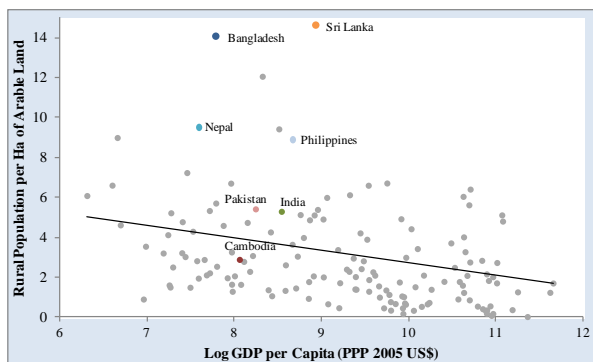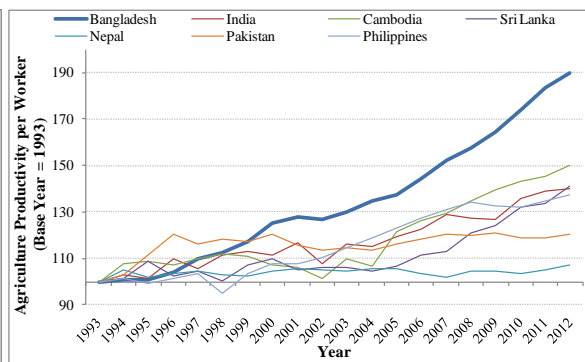
Source: World Bank: World Development Indicators (city states and small islands excluded)

Bangladesh has 14,934 square miles of forest area, which makes up roughly 11% of total land area. Out of 237 reporting countries in the World Bank's World Development Indicators, Bangladesh ranked 63rd in regards to forest area as a percentage of total land. Since 1990, however, forest area has declined from 14,940 to 14,934 square miles in 2011(World Bank WDI 2014).

9.4 Water Resources

A little over 1,220 km^3 of Bangladesh's renewable water resources are available on an annual basis, out of which 98% originates from surface water and the remaining 2% comes from underground aquifers. The country's dependency ratio, its share of water resources originating from outside the country, is much greater than each of the comparator countries at 91%. Bangladesh's water supply is 8,051 m^3 per capita – the largest among each of the comparator countries with the exception of Cambodia (at 32,884 m^3 per capita). Only 3% of the country's renewable water resources are currently being used, with 87% going towards agriculture. According to Yale's Environmental Performance Index (EPI), Bangladesh ranks 92nd (out of 178) in the world in terms of fish stocks and 95th with regards to pressure on coastal shelf fishing. Fish and fish products are greatly valued in Bangladesh, as they have become an important part of the national diet; fish products are also an important export product with great potential (see Chapter 6 section on product space analysis).

9.5 Mineral Wealth

Natural gas, solid biomass, and waste account for a large share of Bangladesh's total primary energy consumption, with coal, hydro, and oil meeting the remaining demand. Bangladesh is the 7th largest natural gas producer in Asia, increasing production by an average of 7% per year from 2002 to 2011. Nevertheless, all national gas is being used to meet domestic consumption. In 2011, 59.6% of the population had access to electricity, meaning domestic demand is expected to rise as more Bangladeshis gain access to the grid and the country's population continues to grow. Additional energy needs will require a 35% increase in natural gas supplies; however, proved reserves have declined from 25.4 trillion in 1994 to 6.5 trillion in 2013 (EIA 2013).[58]

Bangladesh oil production totaled 6,000 barrel per day (bbl/d) in 2012. Limited oil resources mean Bangladesh is a net importer of oil, importing a net total of 108,000 barrels per day (bbl/d) in 2012 compared to 65,000 bbl/d in 2000. Similarly, net coal imports increased from 727 million short tons in 2000 to 934 million short tons in 2011, although coal production has slightly increased over a portion of this period, from 0.9 million short tons in 2005 to 1.1 million in 2011 (EIA 2013). When assessed relative to the comparator countries, however, oil and coal imports are not relatively high at the aggregate level or on a per capita basis. According to the Geological Survey of Bangladesh, estimated coal reserves are 1.6 billion tons. Other notable mineral deposits include peat and limestone at 170 million and 142 million tons, respectively.

---

[58] Additional oil and natural gas reserves may be identified by International Oil Companies currently exploring for hydrocarbon reserves in the Bay of Bengal.

9.6 Distance to Markets

Long distances to markets can create a binding constraint if they results in significant cost disadvantages for firms dependent on imports or for exporters competing with countries that have lower transport costs. Trade has been a key driver of Bangladesh's recent economic success, expanding from 33% of GDP in 2000 to 55% in 2012. During this same period, exports increased from 14% to 23% of GDP. The growing importance of trade, however, does not yet appear to have created a strong dependence on international markets relative to the six comparator countries. In 2011, for example, Bangladesh's total trade accounted for 54% of GDP compared to an average of 60% for the comparator countries.

Regional trade partners, including China, India, and Malaysia, rank among the top 10 countries for Bangladeshi imports. This is in contrast to Bangladesh's export markets, where there are no regional markets in its top ten export destinations. In 2011, the United States was the largest export market, followed by Germany, the United Kingdom, and France (Figure 9.5 and Figure 9.6).   The average distance traveled by transported Bangladeshi goods to the top 10 export markets was 8,772 nautical miles and the average time to market was 36 days (National Geospatial Intelligence Agency).

Figure 9.5: Main Export Markets by Value   Figure 9.6: Main Export Markets by Distance
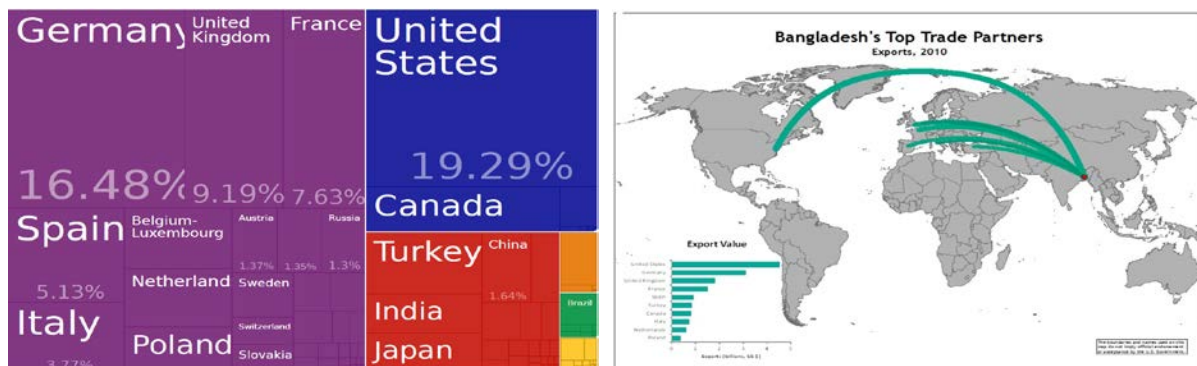
Source: Massachusetts Institute of Technology Media Lab (data from 2011); Aaron Chafetz (USAID)

The Transportation Cost Index (TCI), a ratio comparing transport and insurance costs to the value of traded goods and services, provides a good measurement of the costs that exporters must deal with when transporting exports from a given country (Faye 2004). Bangladesh's TCI ratio was 0.14 – greater than each of the comparators where information was available including India (0.13), Cambodia (0.11) and Nepal (0.05). However, the TCI was compiled in 2003, so the World Bank's Logistics Performance Index (LPI) provides more recent information pertaining to the cost and time associated with transporting goods.

The LPI indicator for international shipment measures the ease of arranging competitively priced shipments. In 2010, Bangladesh ranked 61st out of 155 countries for the international shipment indicator. This rank was lower than the Philippines (20th) and India (46th) although higher than remaining comparator countries. The LPI timeliness indicator ranks the likelihood of exported goods in reaching their destination within the expected delivery time. In terms of timeliness Bangladesh ranked 69th, once again only lower than the Philippines (41st) and India (56th).   The

LPI indicates that while transport costs in Bangladesh are higher than in many countries, they have not yet risen to a level that would constrain a significant number of exporters.

9.7 Conclusion

Bangladesh faces serious challenges in terms of its geographic location and its natural resource endowment. Despite these obstacles and its status as one of the most densely population countries in the world, Bangladesh has managed to expand its economy by an average of 5% to 6% per year over the past decade. This resilience, in the face of so many geographic and natural resource impediments, speaks to the sheer determination of millions of Bangladeshis. At the same time, there is no denying the social and economic costs natural disasters pose to millions living in extreme poverty. In 2007, flooding costs accounted for 1.5% of GDP and cyclone costs made up 2.4%. Moreover, a significant percentage of the Bangladeshis living in the areas most affected by this flooding were poor and dependent on income generation from agriculture – one of the sectors most vulnerable to cyclones and floods.

There is no denying the impact these catastrophes have on poorer households, and this is why the Government of Bangladesh, donors, and others should continue to support Bangladeshis living in vulnerable locations. However, even in the face of the flooding discussed above, Bangladesh's overall economy managed to expand, in terms of GDP per capita, at a rate of 5.3% and 5.1% in 2007 and 2008, respectively. This indicates that although growth may be impacted by a natural calamity in any given year, it does not present itself as an endemic issue that the people or the Government of Bangladesh have full control over. As a result, natural disasters, including cyclones, storm surges, and floods, are not currently considered a most binding constraint to growth.

With regards to natural endowments, the country faces severe obstacles when it comes to its dwindling natural gas supply. However, there is no indication that this deficiency specifically is causing problems in Bangladesh's energy infrastructure. Additionally, Bangladesh has made remarkable strides in terms of its productive usage of arable land, although this has been from a considerable low base. This is not to say that agriculture productivity will not need to improve in future years, only that it does not yet appear to be a most binding constraint to growth. Similarly, distance to markets will continue to pose an additional cost to Bangladeshi exporters, if they are not able to export to markets within their region, yet this does not yet appear to put said exporters at such a disadvantage that it would be considered a most binding constraint to economic growth.

10 WOMEN'S ENTREPRENEURSHIP DIAGNOSTIC

While the standard HRV methodology does not focus on the individual entrepreneur as a decision-making agent, there are important differences in how individuals approach the business of entrepreneurship, especially between men and women. Given that the entrepreneur is a key agent in the efficient allocation of economic resources to maximize productivity and aggregate growth, it is important to examine inclusivity in this area, in the sense that women entrepreneurs have as much opportunity as their male counterparts in the market. Yet globally, the International Finance Corporation (IFC) estimates that SMEs with full or partial female ownership represent 31 to 38% of formal SMEs in emerging markets. This compares to 12.7% of formal SMEs in Bangladesh that have female participation in ownership[59].

As an addendum to an aggregate, economy-wide inclusive growth diagnostic, assuming that growth according to the current pattern will continue produce the current low pattern in proportions of women's entrepreneurship, this chapter will focus on gender-specific constraints to entrepreneurship in Bangladesh, i.e. the constraints that are faced by women entrepreneurs rather than men. It should be noted that this chapter did not benefit from interviews with enough women entrepreneurs and experts, particularly for the investment demand nodes, which qualifies the conclusions in those areas. Following the chapter's identification of binding constraints, the constraints are given a rough rank in order of "bindingness" on investment by women entrepreneurs, though given the paucity of data this ranking is tentative.

10.1   A Word on the Women's Entrepreneurship Framework

This chapter applies USAID's Women's Entrepreneurship Diagnostic framework[60], using an adapted version of the HRV growth diagnostic framework (see Figure 10.1 below). similar to the standard growth diagnostic methodology, it applies a series of test to produce a prioritized short list of potential binding constraints in this case specific to women entrepreneurs. This tool is not designed to address constraints for the smallest microenterprises, typically self-employed women, but focuses on constraints to starting or growing small and medium enterprises. Also, the tool focuses on those constraints most directly relevant to women's entrepreneurship, and thus does not consider other important issues such as women's employment options or ethnic divisions.

---

[59] World Bank Enterprise Survey (2013)
[60] See the full tool at http://wlsme.org/sites/default/files/resource/files/WED_Sept%203%20final.pdf

Figure 10.1: USAID's Women's Entrepreneurship Diagnostic framework
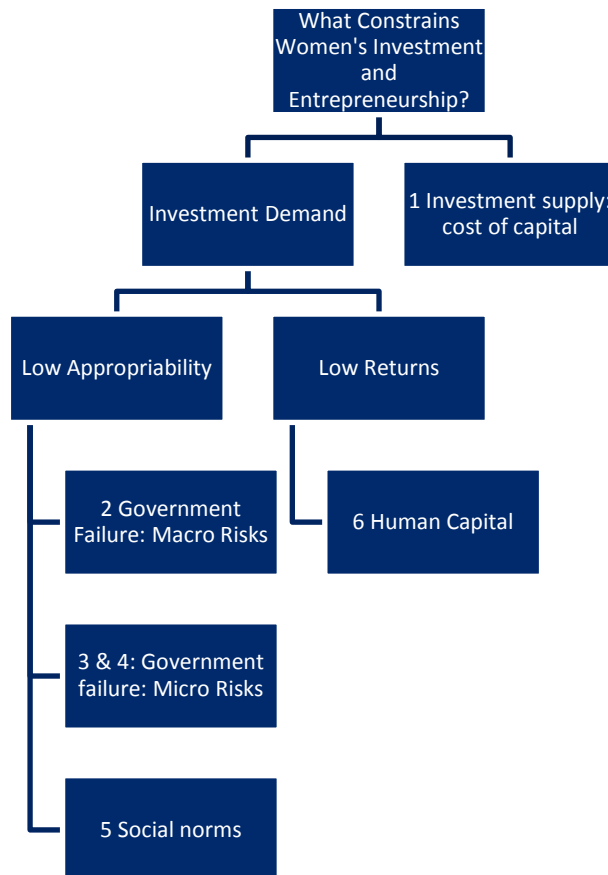
10.2 Overview of Women-Managed Firms in Bangladesh

In this chapter, we focus on women managers instead of women-owners of firms, since legal owners do not always have decision-making power in practice, and the available data on female business ownership does not distinguish between full or partial ownership or indicate the ownership share. In 2007, only 1.3% of top managers of formal Bangladeshi firms with at least 5 employees were women[61]. By 2013, the proportion of women managers had risen to 4.8%, albeit still very low. In contrast, the average proportion of women managers in comparator countries where such data was available was 14.7% (Table 10.1).[62]The fact that much available data is from this small group of existing women entrepreneurs qualifies the conclusions of this diagnostic.

---

[61] An important qualification for the 2007 Enterprise Survey data is that there were so few top managers who were women (1.3%, or 24) that only preliminary conclusions can be drawn from it.

[62] Quite a few of the comparator countries (Cambodia, India and Pakistan) did not have the sex disaggregation question in their most recent Enterprise Survey, and so cannot be used as comparators for many questions on women's entrepreneurship relying on that survey database.

Table 10.1: Female Entrepreneurship

Country	Year	Firms with a female top manager (%)
Bangladesh	2013	4.8
Sri Lanka	2011	8.8
Nepal	2013	17.2
Philippines	2009	32.7
Available Comparators Average	--	14.7

Source: World Bank Enterprise Survey

In terms of performance, in 2007, women-managed firms had slightly higher capacity utilization, but did not report data on sales, employment, or productivity growth. In 2013, they outperformed men-managed firms by a few percentage points in capacity utilization, sales, and employment growth, and their labor productivity slowed a bit less over that time period than did their men-managed counterparts. A related finding is that while women-managed firms are much fewer in number than men-managed ones, those that do exist tend to employ significantly more workers (Table 10.2.)[63] The high average firm age for both women-managed (22 years) and men-managed (18 years) firms alike reflects the very limited turnover and dynamism in the Bangladeshi economy. Taken together, this reflects the highly constrained nature of women's entrepreneurship and the strong outcomes from those women entrepreneurs who are able to succeed.

Table 10.2: Firm Employment by Gender of Manager

Number of employees	Women-managed firms (%)	Men-managed firms (%)
5-19 (small)	27.3	43.8
20-99 (medium)	26.0	29.7
>100 (large)	46.7	26.4
Total	100	100

Source: WB Enterprise Survey

Women-managed firms are significantly more concentrated in certain sectors such as garments, chemicals, and wholesale trade (Table 10.3). Of these three sectors, women are relatively less concentrated in chemicals, which also happens to be a capital-intensive (an over 50% share of factors of production) sector; whereas garments and wholesale trade are less capital-intensive (a less than 50% share of factors of production). Overall, perhaps the most important difference in an economy with already limited economic complexity (as discussed elsewhere in this report) is that men-managed firms have a greater diversity of sectors than do women-managed firms.[64]

---

[63] The Enterprise Survey does not include firms with fewer than 5 workers.
[64] The Enterprise Survey only covers firms in manufacturing and services; the limited complexity would likely be found to be more severe if agricultural sectors were to be included.

Table 10.3: Sectoral Distribution by Gender in Bangladesh, 2013

Sector	Women-managed firms (%)	Men-managed firms (%)	Capital intensity (%)
Food	8.4	7.5	60.2
Textiles	10.2	16.4	32.7
Garments	30.4	17.9	41.8
Leather	2.8	3.2	50.1
Wood	0.0	1.1	63.1
Paper	3.3	3.6	64.0
Publishing, printing and recorded media	3.3	5.6	42.4
Chemicals	9.0	2.4	69.4
Plastics & rubber	0.6	1.8	N/A
Non-metallic mineral products	0.0	2.4	77.5
Basic metals	0.0	1.9	55.7
Fabricated metal products	0.8	2.7	56.8
Machinery	0.0	1.4	37.9
Electronics	0.4	0.6	N/A
Transport machines	0.0	1.0	65.6
Furniture	1.3	2.7	63.2
Construction[65]	3.1	0.0	56.8
Services of motor vehicles	0.0	2.7	N/A
Wholesale	16	3.0	38.1
Retail	8.0	4.0	36.3
Hotel & restaurants	2.5	17.3	39.4
Transport	0.0	0.4	45.1
IT	0.0	0.3	52.4
Total	100.1	99.8	

Source: WB Enterprise Survey (2013), Social Accounting Matrix (2007)[66]

10.3 Investment Supply

10.3.1 Cost of Capital

Looking at Bangladesh Bank data, the disbursement value and number of borrowers for women entrepreneurs, compared to the overall SME lending sector[67], is still miniscule. It is also important to note that among those women that do access loans, their average loan size (Tk1.2 million /US$19,460) is lower than that of the overall SME loan market (Tk1.5 million/US$15,090) (see Table 10.4 below). We also saw in Table 10.3 that women entrepreneurs are more concentrated than are men in less capital-intensive sectors such as wholesale and garments, although also to a lesser extent in some capital-intensive sectors such as chemicals (and unexpectedly, construction).

---

[65] There was only one woman-managed and one man-managed firm in construction in the sample, which of course represented a much larger proportion among women-managed firms than among men-managed firms.

[66] University of Dhaka

[67] Bangladesh Bank defines an SME loan as starting at Tk50,000, and this includes "cottage and microenterprises" whose group loans can be refinanced.

Table 10.4: SME Lending, January 2010 - March 2013

	Overall SME loans	Women SME loans	Women as % of total
Total disbursement in country (billion Tk)	1,964	67	3.4%
Number of borrowers	1,300,000	57,722	4.4%

Source: Bangladesh Bank, SME & Special Programmes Department

In 2007, there was no data reported for women-managed firms on the percentage with a bank loan, and what collateral was required to secure it. However, there was a significant gap between women- (42.6%) and men-managed firms (28.5%) that did not need a loan, with the proportion being quite high for the former relative to the latter. The corollary to this is that women-managed firms internally financed a greater proportion of their investments than did men-managed firms (87.2% vs. 79%). (A little harder to explain is the fact that bank loans financed a slightly higher proportion of their working capital relative to men.) Subjectively speaking, fewer women managers saw access to finance as a top constraint for their firm (30.4% vs. 42.7% for men).

In 2013, there was no significant gender gap in likelihood of having a loan in Bangladesh, though in comparators women-managed firms were slightly more likely to have a loan (Table 10.5). Nor were there significant gender gaps in sources of working capital in Bangladesh, though again women-managed firms were more likely to finance working capital with bank loans. Answers on collateral requirements and rates of loan application rejections were so few (16-18 total) as to make these figures not statistically meaningful[68]. In comparator countries, women managers were slightly more likely to need collateral for loans, and also had to come up with more collateral than did male managers.

As seen in Table 10.6, among those who did not apply for loans, a majority of women entrepreneurs said they did not need one. One reason potential women borrowers may be discouraged from applying for loans is a lack of dedicated desks for them at bank branches. However, bank officials countered that this is not currently commercially viable given relatively few women borrowers (Rahman et al, 2013). If this were a binding constraint to women's entrepreneurship, it would indeed be a vicious cycle for women borrowers; however, the other evidence so far does not suggest this. One important gender difference in Bangladesh (with most respondents answering) was that male managers were nearly twice as likely to cite access to finance as a major constraint for their firms, whereas the average female manager in comparator countries were the ones more likely to cite access to finance as a major constraint (Table 10.5).

---

[68] A small sample size is also an issue for the Nepal 2013 Enterprise Survey, since there were only 56 women managers in that survey. The figures are nonetheless included.

Table 10.5: Enterprise Survey Responses by Gender of Top Manager, Most Recent Year

		Women-Managed	Men-Managed
Percent of firms with a line of credit (%)	Bangladesh	35.4	34.1
	Comparators	43.4	36.0
Percent of firms using banks to finance working capital (%)	Bangladesh	28.8	29.9
	Comparators	30.4	22.9
Proportion of loans requiring collateral (%)	Bangladesh	N/A	84.2
	Comparators	81.7	77.6
Value of collateral needed for a loan (% of the loan amount)	Bangladesh	N/A	274.9
	Comparators	275.5	256.1
Percent of firms whose recent loan application was rejected (%)	Bangladesh	N/A	12.8
	Comparators	0.6	8.3
Percent of firms identifying access to finance as a major constraint (%)	Bangladesh	13.4	23.3
	Comparators	35.7	26.5

Source: World Bank Enterprise Survey
Note: n<50

Table 10.6: Primary Reason for not Applying for a New Loan

	Women-Managed Firms (n=53) (%)	Men-Managed Firms (%)
Don't know	0	0.7
No need for a loan - establishment had	54	52.8
Application procedures were complex	11.4	11
Interest rates were not favorable	9.4	20.5
Collateral requirements were too high	17.4	8.5
Size of loan and maturity were insufficient	1.3	1.9
Did not think it would be approved	4.3	3.7
Other	2.4	0.8
Total (with rounding error)	100.2	99.9

Source: World Bank Enterprise Survey 2013

Yet, while men-managed firms with a line of credit have significantly lower average sales relative to their counterparts without credit, the difference is the opposite for women-managed firms – with those with credit doing much better in sales. This finding is not consistent with women managers' low subjective perception of access to credit as a constraint, although it is based on a very small sample with limited reliability.

Table 10.7: Average Annual Sales in Bangladeshi Firms

Average annual sales (Tk)	Women-managed	Men-managed
Firms with a line of credit	19,317	7,124
Firms without a line of credit	13,451	10,572

Note: n<50
Source: World Bank Enterprise Survey

The balance of evidence thus far points to the supply of finance not being a gender-specific constraint . However, when those firms who did not apply for new loans were asked why they chose not to, fewer women-managed firms cited interest costs, and more of them cited collateral problems (Table 10.6). According to multiple expert sources and as confirmed by Table 10.6, one of the primary difficulties women entrepreneurs have in getting loans is that they lack the collateral for it (e.g. MIDAS, 2009). One social venture capital firm noted that the same few women entrepreneurs with strong business acumen can get investment from multiple financial institutions. In other words, the underlying issue is the property rights needed to utilize collateral, not the supply of credit itself. This conjecture is also supported by the fact that sons and daughters and male and female surviving spouses do not legally have equal inheritance rights.[69]

To address this, the Center for International Private Enterprise assisted the Bangladeshi Women's Chamber of Commerce and Industry (BWCCI) in advocating for collateral-free loans. A 2008 study by CIPE and BWCCI cited access to start-up capital as a serious issue for women entrepreneurs, with 54% of women entrepreneurs relying on family and/or own income for start-up funds (Rahman et al; see also MIDAS 2009). However, the same studies also noted multiple underlying reasons that women entrepreneurs were not eligible for formal bank loans, including lack of collateral but also more importantly a lack of business opportunities, a trade license or tax ID, and poor business planning and bookkeeping practices. The 2008 study did find practices of husbands being asked to guarantee loans to their wives, which seem to continue today, but it is not clear that this is the main reason for women not accessing loans.

In 2007, in response to BWCCI's advocacy, the Bangladesh Bank launched a "Refinancing Scheme for Women SMEs", including for women's SMEs a 10% quota of its aggregate SME lending at interest rates of the Bank rate (5%) plus a maximum of 5%, and collateral-free loans up to Tk1.5 million (about US$19,000) (CIPE, 2008). This scheme now includes a 15% refinancing fund for bank and non-bank financial institutions. It seems that not all banks are offering loans at these terms—one leading bank, for example, only gave women borrowers a 1 percentage point interest rate discount and charging them over 20%. (Although this is understandable, since Bank's program would have incentivized abuse of the fund by male entrepreneurs using their female relatives' name to take advantage of the much cheaper credit). This same bank noted that there are not many eligible women borrowers, and they are often segmented into "feminine" sectors such as beauty salons. Another study of Bangladeshi female entrepreneurs in 2012 found that their loan interest rates ranged between 10 and 16%[70]. However, on balance, as BWCCI noted, the scheme has significantly alleviated capital constraints for women entrepreneurs, at least in urban centers.

Having eliminated the possibility of cost of capital as a gender-specific constraint, we can move on to examining investment demand from women entrepreneurs.

---

[69] World Bank, Women, Business and the Law 2014
[70] Rahman, M et al. (20113) The Role of Banks in Promoting Women Entrepreneurship in Bangladesh
http://www.bangladesh-bank.org/pub/special/20131104women_entrepr.pdf:

10.4 Investment Demand

10.4.1 Macro Risks

Based on Enterprise Survey data, there are few gender gaps in time spent dealing with tax officials, in both Bangladesh and its comparator countries. The same goes for the proportion of firms identifying tax rates as a major constraint for their business. Interestingly, women-managed firms are actually less likely to see tax administration as a major constraint, in comparator countries on average but especially in Bangladesh.

Table 10.8: Enterprise Survey Responses on Tax Policy, Most Recent Year

		Women-Managed Firms	Men-Managed Firms
Number of visits or required meetings with tax officials	Bangladesh	1.5	1.9
	Comparators	1.3	1.6
If there were visits, average number of visits or required meetings with tax officials	Bangladesh	2.3	3.3
	Comparators	2.0	2.4
Percent of firms identifying tax rates as a major constraint (%)	Bangladesh	9.1	7.2
	Comparators	20.9	18.6
Percent of firms identifying tax administration as a major constraint (%)	Bangladesh	4.3	11.2
	Comparators	9.1	15.3

Source: World Bank Enterprise Survey

10.4.2 Micro Risks

Government failures in microeconomic policy could also disproportionately affect women entrepreneurs' ability to keep their business earnings. It is important to note that Bangladesh's original 1972 constitution enshrines equal rights for all citizens, including men and women, although this may not be reflected in specific laws and regulations, and is flaunted in practice.

In Bangladesh in 2013, women-managed firms were over 20 percentage points more likely than men-managed firms to be expected to give gifts to "get things done," although the gap was reversed in relation to tax officials specifically. A survey in Bangladesh found that government officials were more likely to target female applicants for informal "speed payments" because they were assumed to have a male provider[71]. However, the depth and incidence of outright bribery was lower for women-managed firms. Subjectively, women managers were slightly more likely than men to see corruption and the court system as major constraints to their business. This perception of the court system as a constraint may be due to the fact that legally, a woman's testimony does not carry the same evidentiary weight in court as a man's[72].

---

[71] Government of Bangladesh. G*overnance, Management and Performance in Health and Education Facilities in Bangladesh: 2007* (Oxford Policy Management, Financial Management Reform Program, Ministry of Finance) cited in Simavi, S et al (2010) Gender dimensions of investment climate reform
[72] World Bank, Women, Business and the Law 2014

Table 10.9: Enterprise Survey Responses on Corruption by Gender, Most Recent Year

		Women-Managed Firms	Men-Managed Firms
Percent of firms expected to give gifts to public officials "to get things done" (%)	Bangladesh	68.2	47.5
	Comparators	11.5	16.6
Percent of firms expected to give gifts in meetings with tax officials (%)	Bangladesh	16.7	42.5
	Comparators	9.6	13.3
Bribery depth (% of public transactions where a gift or informal payment was requested)	Bangladesh	30.5	44.8
	Comparators	10.3	12.2
Bribery incidence (percent of firms experiencing at least one bribe payment request)	Bangladesh	42.7	48.0
	Comparators	15.0	16.3
Percent of firms identifying corruption as a major constraint (%)	Bangladesh	51.2	49.5
	Comparators	26.3	28.2
Percent of firms identifying the courts system as a major constraint (%)	Bangladesh	12.5	10.0
	Comparators	13.0	8.6

Source: World Bank Enterprise Survey

At the same time, women-managed firms who considered corruption a major or very severe constraint had, on average, lower revenues than women-managed firms that felt corruption was less of a burden. The difference is smaller and reversed among men-managed firms. Thus, it seems that corruption may actually be limiting growth of more dynamic women-managed firms, although again the sample size is too small to be reliable. As an example of women entrepreneurs' attempt to bypass bribery, a previous USAID anti-corruption program worked with the Bangladesh Women's Chamber of Commerce & Industry (BWCCI) to reduce women entrepreneurs' exposure to bribery requests, which they saw as more severe than for men. The program did this through a "buddy" system put in place when members went to apply for trade licenses.

Table 10.10: Average Revenue of Bangladeshi Firms Given Corruption Obstacles and Gender of Manager, 2013

	Identified corruption as a major obstacle (Tk)	Did not identify corruption as a major obstacle (Tk)
Women-managed firms	16,935.4	19,823.4
Men-managed firms	4,739.7	3,934.9

Note: n<50
Source: World Bank Enterprise Survey

The mixed and weak evidence on implicit corruption and explicit bribery requests is not enough to consider either a gender-specific constraint to entrepreneurship.

10.4.3 Property Rights

Women's property rights, especially over real property (land and buildings), is an area where Bangladesh has much room for improvement. As discussed elsewhere, due to its geopolitical legacy as well as ongoing environmental degradation, Bangladesh is a land-scarce country, and in 2011 approximately 57% of rural households were landless (Ahmed et al, 2013). Estimates are that Bangladeshi women own 2-3.5% of agricultural land (*Economist*, 2013.) In contrast, women own 11% of land in the Philippines and India, and 8% in Nepal (CIPE, 2013).

In terms of global norms, personal law covering inheritance and marriage is the most important determinant for the security of women's property tenure. In de jure terms, married women have the same property usage rights as married men in Bangladesh (World Bank *Women, Business & the Law*, 2013.) But in terms of inheritance, as mentioned previously, sons and daughters and surviving male and female spouses do not have equal legal inheritance rights, and for Bangladesh's Hindu and Buddhist minorities, daughters have no inheritance rights. Under sharia law applying to the vast Muslim majority, sons inherit twice as much as daughters. Additionally, in practice, women often do not actually control any property that they do inherit, losing or ceding control to brothers, sons, and husbands (*Economist*, 2013). Anecdotally, the norm amongst families with higher levels of education and income is that "good" daughters will turn over their portion of an inheritance to their brother(s).

These findings are confirmed in the Women's Empowerment in Agriculture Index, where IFPRI (Sraboni et al, 2013) found that in Bangladesh, ownership of assets and purchase, use, sale, or transfer of assets contributed to 6.5% of disempowerment of rural men, but 14.7% to the disempowerment of women[73]. This is partially explained by the view that women do not belong to their natal family permanently, since they will leave and join their husband's family in marriage (RDI, 2009). Women are also not always aware of their rights, and rural illiteracy is challenge for groups seeking to raise legal awareness.

Property rights issues have been hotly contested among different political and religious groups in Bangladesh, though no legislative change to bring gender equality to property tenure has been enacted (*Economist*, 2013). As discussed under the cost of capital section, the concrete implication of this for women entrepreneurs is that they cannot collateralize land and buildings for loans, thus having to limit themselves to smaller and sometimes less capital-intensive and less productive sectors (CIPE, 2013; Rahman et al, 2013). The 2013 Bangladesh Bank study of women entrepreneurs with bank loans found that 73% of them had established their enterprises on their own land, showing that those few women with land tenure do much better in getting credit to grow their business. Again, BWCCI's advocacy for the Bangladesh Bank's loan fund for collateral-free SME loans for women is an example of trying to bypass this binding constraint.

---

[73] The Index defines empowerment using the five domains of agricultural production, resources, income, leadership, and time. See Sraboni et al for more details.

Table 10.11: Netbook Value of Assets by Gender of Manager, 2013

	Women-Managed Firms (N=58) (Tk)	Men-Managed Firms (Tk)
Movable property	6,648	5,395
Fixed assets (land and buildings)	6,320	7,282

Source: World Bank Enterprise Survey 2013

Comparing their asset holdings, women-managed firms tend to hold slightly more movable property such as machinery and equipment than do men-managed firms, whereas men-managed firms do have more land and buildings (Table 10.10). Even among women SME entrepreneurs, it is more common to own jewelry ("ornaments") than houses (Figure 10.2). Though subjectively speaking, women-managed and men-managed firms are equally likely to cite access to land as at least a major constraint (World Bank Enterprise Survey 2013), with limited data, the balance of evidence shows that access to land and buildings is likely a gender-specific binding constraint, although not the top one.

Figure 10.2: Asset Holdings among Women SME Entrepreneurs
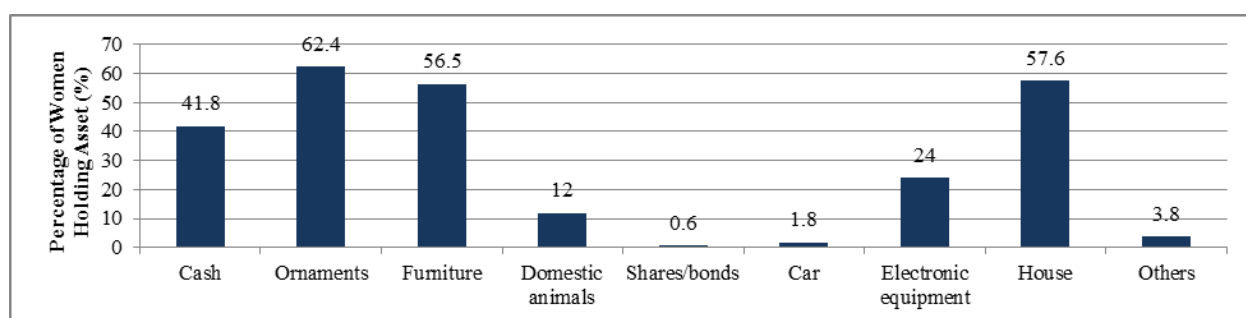
Source: MIDAS 2009

10.5 Social Norms

There are two aspects of normative constraints for would-be women entrepreneurs: first, that few women have the family and community endorsement for entrepreneurship, such that they manage only about 4% of formal firms. This is a most striking gender gap and likely reflects the formidable social barriers to entry. Specifically, one study found that the opposition for (mostly married) women becoming entrepreneurs came most often (32.1%) from parents, possibly with concerns about marriage and family prospects in mind, compared to 20.9% from in-laws and husbands (MIDAS, 2009). This is probably the most important social constraint for women's entrepreneurship in Bangladesh, specifically that marriage often spells the end or suspension of women working outside the home, including in entrepreneurship.

As mentioned earlier in the inclusive growth diagnostic, overall female labor force participation is less than 50% in Bangladesh for all educational levels except for those with undergraduate degrees. Also, 64.6% of women SME entrepreneurs were housewives prior to starting their business, with only 17.5% being students and 9.7% being wage workers; for the majority of women, marriage, childbearing, and housework interrupt their working lives (MIDAS 2009).

Given this, the common phenomena of early marriage (the average marriage age being 16) and abandonment (RDI, 2009) are problematic for women's entrepreneurship.

When asked what impediments they faced from society, the highest proportion of respondents (28%) said that their fellow countrymen and women generally did not like women to be in business (MIDAS, 2009). In contrast, a very high 37% of women entrepreneurs who are currently bank customers indicated that they became entrepreneurs because of motivation from family members or family tradition, perhaps reflecting different family attitudes that could support women deviating from broader social norms (Rahman et al, 2013).

The second issue in social norms is the sectoral segmentation that we have seen, particularly with regard to women's concentration in specific service sectors, and a lack of innovation and diversification. Women-managed formal firms are more concentrated in garments, chemicals and wholesale than those managed by men, and are most notably missing from the potentially profitable hospitality sector of hotel and restaurants (Table 10.3). In addition, the range of sectors that include women-managed firms is relatively small. Multiple sources cited strong social norms, some of them based on particular interpretations of Islamic law, that make it difficult for women entrepreneurs to work in an office or factory late into the night, interact directly with male customers or manage male workers, or even use public transportation without sexual harassment (BWCCI, 2008). The underlying patriarchal concepts include *izzat* (honor, or modesty), *lajja-sharam* (shame) and *parda* (or *purdah*, restrictions on women's mobility) (Rabbani et al, 2013).

Relevant formal legal barriers should also be noted here: for example, non-pregnant and non-nursing women cannot legally do the same jobs as men[74]. The woman entrepreneur may have to depend on male relatives to escort her as a way to bypass these constraints, or women may simply choose to have showrooms in their own home, for example, and make a number of sub-optimal business decisions as a result of these obstacles (BWCCI, 2008). One women entrepreneur explained that she had her customers' trust only because they are multinational companies seeking specifically to procure from women-owned businesses, and that she might be much less successful catering to local customers.

As for social networks and information, between 2009 and 2011, 51% of Bangladeshi men knew an entrepreneur, whereas only 25% of women knew an entrepreneur[75]. Additionally, a number of women's business associations have been started because the main chambers did not welcome women, and women did not feel comfortable voicing their concerns there. Though these associations have significant numbers of members (BWCCI, for example, has about 4,000), most of them are micro-entrepreneurs and this workaround is not as effective as women being equal members in industry associations. Though the Women's Empowerment in Agriculture Index found that rural men are more disempowered by not being members of any organized groups (Sraboni et al, 2013), this could be because rural Bangladeshi women have good access to social groups such as self-help groups, but not necessarily business-focused networks. This lack of

---

[74] World Bank, Women, Business and the Law 2014
[75] George Mason University Gender Global Entrepreneurship & Development Index team calculation, using Global Entrepreneurship Monitor data.

social networks and information by women entrepreneurs, then, is also a gender-specific constraint.

Childcare and other domestic responsibilities inhibiting entrepreneurship is a potential constraint that did not come up in interviews or in previous studies (BWCCI, 2008). Although BWCCI contacts tended to have fewer children (perhaps as a way of reducing their domestic workload, the socioeconomic profile of women SME entrepreneurs also suggests that they would be able to afford the inexpensive care that domestic workers can provide.

On balance, there is evidence of gender norms around entrepreneurship, in the form of prohibitive traditions regarding women interacting with non-related men in a professional setting, women's mobility, and women's business networks, being a gender-specific constraint to entrepreneurship that results in women's sectoral segmentation.[76] As we will see below, this segmentation starts during the education of women and girls, including via their self-selection into certain subjects while attending university.

10.6 Human Capital

An entrepreneur's skills and knowledge in her line of business, as well as general financial and business literacy, are important for the growth of her firm. As can be seen comparing the below graphs (Figure 10.3 and Figure 10.4), the educational profile of women entrepreneurs with existing bank loans is significantly better than that of the general workforce, suggesting that when the constraint of education is relaxed, women can successfully access credit and grow their firms.

Figure 10.3: Education Qualifications of Women Entrepreneurs
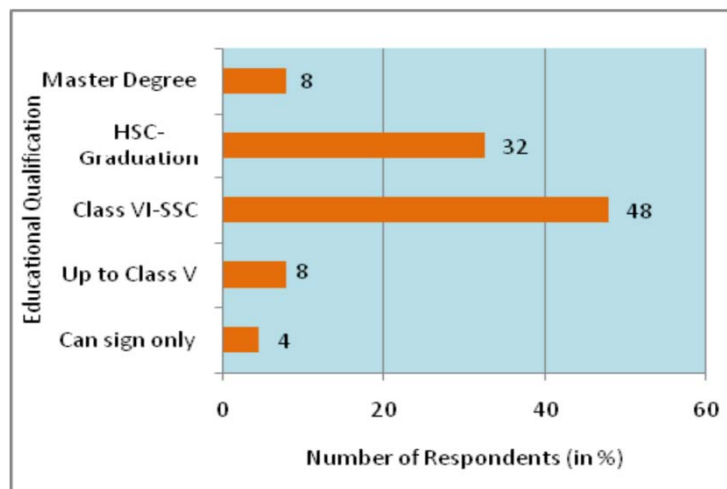
Source: Rahman et al, 2013

---

[76] This section particularly suffered from the author's inability to conduct more focus groups with women entrepreneurs. Also, data on social networks (knowing an entrepreneur personally) and views on women as business executives were not available.

123

Figure 10.4: Proportion of Bangladeshi Workers by Age Cohort and Education Level
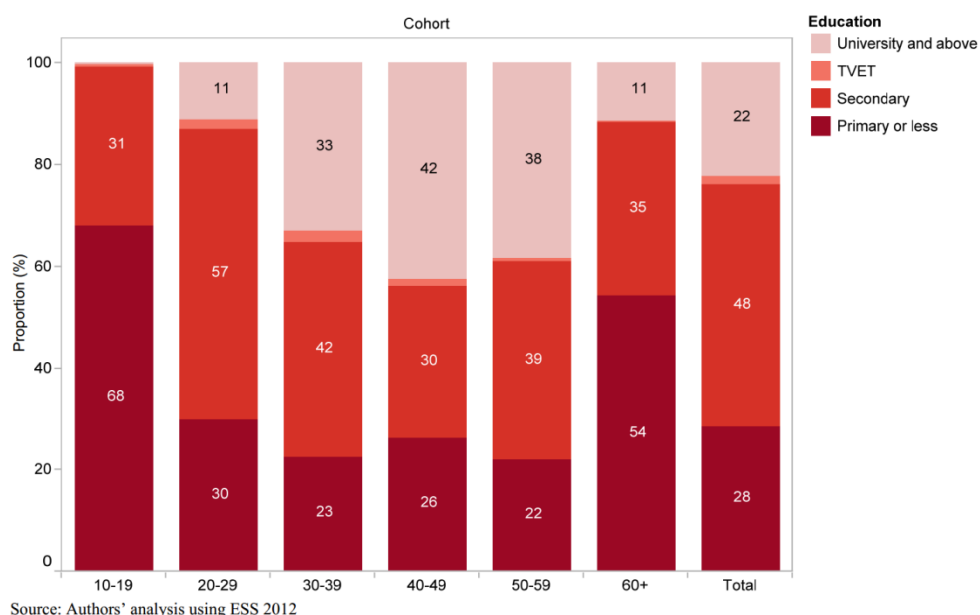

Source: World Bank using Enterprise-based Skills Survey 2012

For those women-managed firms that do exist, their managers have about the same amount of sector-specific knowledge as their male counterparts –approximately 17 to 18 years of sectoral experience (World Bank Enterprise Survey). However, as we have seen in the report's human capital chapter, there are proportionally fewer women participating at the tertiary education level, with female students being about one-third of all enrolled tertiary students. Women are also proportionally fewer across all specific majors relative to comparators with available data (Figure 10.5). This is a problem for women's entrepreneurship most directly in the areas of social sciences, business, and the law, but clearly women's tertiary education is a general issue for the overall diversification of the economy, especially in agriculture, science, and engineering. And while there are proportionally more Bangladeshi women in service majors than in comparator countries, the percentage is still quite low (approximately 27%), and likely contributes to the low representation of women entrepreneurs in hospitality.

As for more general business acumen, women entrepreneurs lack knowledge of how to understand a market, write an effective business plan, and execute it with sophisticated product development (BWCCI, 2008). Using formal bank account usage as a proxy for overall financial literacy, we can see a severe gender gap in Bangladesh (matched only by Pakistan among comparators), whereas in some comparators women are more likely to use bank accounts for business than are men (Table 10.12). This gap in Bangladesh is likely due to women having less access to tertiary education in general, and business education in particular (Figure 10.5). Even among existing women bank borrowers, 68% have not had any training relevant to their business (Rahman et al, 2013).

Figure 10.5: Female Tertiary Graduates as a Percentage of All Graduates in Major
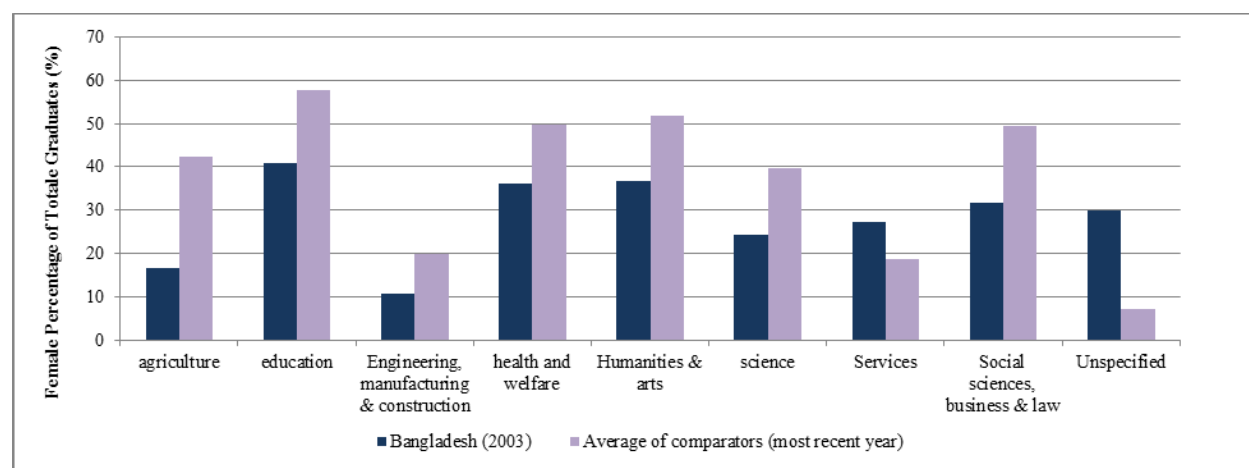
Source: World Bank Edstats

Similarly, the World Bank's Bangladesh Investment Climate Assessment in 2008 found that 70% of the female entrepreneurs surveyed reported being self-taught in skills needed to run a business, compared to 44% of male business owners in Bangladesh[77].

Table 10.12: Formal Bank Account Usage, 2011

Country	Account used for business purposes (% age 15+)	Account used for business purposes, female (% age 15+)	Account used for business purposes, male (% age 15+)	Account used for business purposes, secondary education or more (% age 15+)
Bangladesh	5.5	0.8	10.0	8.9
Cambodia	0.2	0.3	0.1	0.3
India	4.1	2.0	6.1	6.0
Nepal	3.0	2.1	4.0	6.8
Pakistan	2.9	0.3	5.4	6.9
Philippines	5.6	7.1	4.0	6.9
Sri Lanka	4.6	5.1	4.1	4.0
Grand Total (average)	3.7	2.5	4.8	5.7

Source: World Bank Global Findex

10.7 Conclusion

The gender-specific constraints to entrepreneurship in Bangladesh are, in order: social norms around women's roles as professional service-providers and managers that are able to move around at different times and in public spaces, and in women's weaker business networks and access to information; women's education, especially at the tertiary level and in business,

---

[77] World Bank (2008) *Harnessing competitiveness for stronger inclusive growth: Bangladesh Second Investment Climate Assessment*

agriculture, science, and engineering; and weak property tenure for women, especially in land, buildings, and enforcement of family law. The first constraint involving social norms keeps women from entering the market as SME entrepreneurs, whereas the education and property tenure constraints keep them from operating larger, more profitable firms. Other issues such as the cost of capital, corruption and taxation, and childcare, while important, were not found to be gender-specific constraints to entrepreneurship. This conclusion is based on limited data, and an examination of new data, whether qualitative and quantitative, might yield a different and/or stronger conclusion. Additionally, further analysis is needed to understand the interrelationships among these constraints for women's entrepreneurship.

11 SECTOR DIAGNOSTIC FOR GARMENTS AND TEXTILES

11.1 Introduction

The growth diagnostic framework is an attempt to identify the underlying issues most adversely impacting the prospects for sustainable economic growth. The framework, assuming the widely accepted linkage between private investment and economic growth, aims at identifying the areas of the socio-economic landscape that are currently the largest deterrents to private investment – the "most binding constraints" to growth (Hausmann, Rodrick, and Velasco (HRV) 2005).

The traditional HRV Growth Diagnostic does not, however, focus on patterns of growth across a country, thus limiting the tool's usefulness of identifying the most binding constraints to *broad-based* or *inclusive* economic growth. This is particularly important for those concerned with the extent to which growth reduces poverty and improves household welfare across income groups. Several adaptations of the traditional HRV model have been created in an attempt to incorporate considerations of inclusiveness.[78] In order to apply a more inclusive approach to the Bangladesh analysis, DFID and USAID have applied two variations of the HRV framework – the Women's Entrepreneurship Growth Diagnostic (covered in the previous chapter) and the Disaggregated Growth Diagnostic (DGD), which is the focus of this chapter.

The DGD is based on the idea that growth in certain productive sectors is likely to have greater impacts on poverty than growth in others. Such sectors with a large impact on poverty would be both labor-intensive and potentially dynamic. The poor, primarily comprised of low-skilled workers, seek sustainable income opportunities. Addressing constraints to rapid growth in sectors intensive in low-skilled labor would provide rapidly expanding economic opportunities for the poor.[79]

Upon review of two social accounting matrixes, as well as a product space analysis (discussed in detail in Chapter 6 of this report and further below), the garment and textile sectors were identified as two labor-intensive sectors where there are a large number of low-skilled workers and where rapid growth in output would be associated with rapid growth in employment. In particular, these two sectors show potential for growth under the product space analysis. Preliminary results obtained from applying the HRV framework to both sectors show that energy poses the most binding constraint to growth in each, supporting the aggregate findings presented previously. There are indications that education also presents a second-tier constraint to growth for garment firms, although the team, although without access to the 2010 Labor Force Survey, it was difficult to determine the magnitude of this constraint. Lastly, results from the analysis indicate that finance poses a second-tier constraint to firms in the textile sector and to a lesser extent in the garment sector.

This chapter has been structured into two distinct sections. The first section identifies the production sectors that currently provide, and have the strong potential to provide, income

---

[78] USAID has developed two inclusive approaches. Guidance for each of these approaches can be found by contacting Dr. Lisa Ortiz at lortiz@usaid.gov.

[79] The objective is not to pick winning sectors but to provide case studies of sectors where rapid growth in output could generate rapid growth in employment of unskilled labor.

generation opportunities for low-skilled labor. After making this identification, the next section applies the HRV framework to two of these production sectors – garments and textiles.

11.2 Selection of Inclusive Sectors

Cord, Lopez, and Page et al. (2003) – among several others – broadly define pro-poor growth as growth that benefits the poor. The rate at which poverty reduction occurs is based on the number of easily accessible opportunities provided to the poor. According to Loayza and Raddatz (2006), the sectors that have that greatest impact on poverty alleviation, in terms of increased income growth opportunities, are those that are most labor intensive, such as agriculture, construction, and manufacturing. Focusing on how a sector uses factors of production for growth will help to identify activities that will help lift the poor out of poverty.

Factors of production – labor, fixed assets, and capital services – are vital inputs to production activities. In return, value added is distributed to factors of production through wages, salaries, profits, and rents. Labor is often separated into different categories (e.g. unskilled, low-skilled, and skilled labor), and it is a factor of production that is fully owned by households. Identifying productive sectors that make intensive use of low-skilled labor is one way to select an inclusive sector. If data is available to make the distinction, it is optimal to select a low-skilled labor intensive sector that demonstrates high growth potential. Applying the use of a social accounting matrix (SAM) will help to identify the inclusive sectors for Bangladesh.

A SAM is a structural representation of an economy that captures the inflows and outflows of financial resources between various actors and institutions. It captures, among other things, the value addition created by production activities and the structure of household income (Breisinger, 2009). The SAM is constructed using macroeconomic information from national accounts, as well as data from micro surveys such as labor force and household surveys. A SAM can be a useful tool for decision makers who would like to determine the sources of income for low-income households.
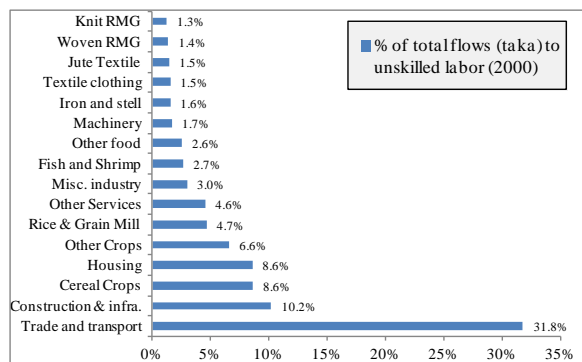
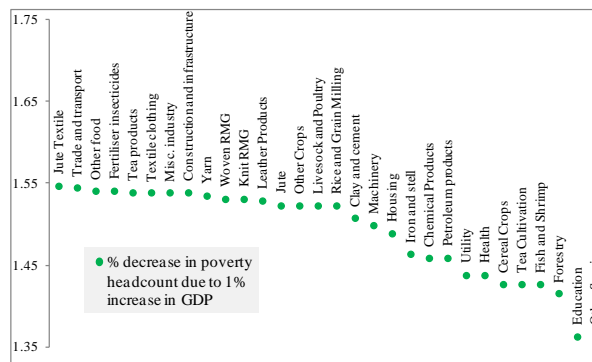**Figure 11.1: Low-Skilled Labor (2000)**   **Figure 11.2: Production Sectors and Poverty**

Source: Hussain; data taken from Bangladesh Bureau of Statistics and Ministry of Planning

Hussain's 2006 analysis of a SAM constructed by the Government of Bangladesh (GOB) in 2000 provides a snapshot of where the poor were employed at the turn of the century. [80] Figure 11.1 shows that trade and transport provided the greatest share of income for low-skilled labor at 32%, followed by construction (10%), cereal crops (8.6%) and housing (8.6%). The remaining top sources for low-skilled labor can be found in Figure 11.1. Hussain also used information from the 2000 SAM to create a multiplier simulation model in order to quantify the interactions among various economic agents and the poverty dynamics within each sector of the economy.

Output from this multiplier simulation model provided evidence regarding what would happen to poverty if there was a one percent increase in GDP originating from a specific sector. For example, an additional one percent increase in GDP due to growth in the production of jute textiles would result in a 1.5% percent reduction in Bangladesh's poverty headcount. The sectors showing the greatest potential for poverty production were jute textiles (a 1.547% reduction in poverty), trade and transport (1.545%) and other food cultivation (1.541%) (Figure 11.2). Other sectors within the top 10 for poverty reduction using the model include fertilizers, tea, textiles and yarn, construction, and ready-made garments.

Khondker and Raihan (2008) developed a 2006/07 Bangladesh SAM, separating the analysis into four accounts: (1) production activity and commodity accounts for 86 sectors; (2) factors of production (labor, fixed assets, and capital); (3) current account transactions; and (4) two consolidated capital accounts (public and private). Information for this report was taken from more recent surveys, including the HIES 2005 and 2008 Economic Survey.

Considering the sources of income for households (HH), it is clear that unskilled labor serves an important role for poorer Bangladeshis. For example, Figure 11.3 shows that unskilled labor accounts for 62% of income for low education HH; 36% for landless HH; 33% for rural non-farm HH; and 30%-31% for marginal, small, and large farmers. Skilled labor contributes 50% to the income of highly educated HH and 22%-23% to rural non-farm poor HH and landless HH. Total labor income contributed the largest share of household income for low education HH (77%), followed by landless HH (59%), rural non-farm poor HH (55%) and high education HH (52%). Total labor income accounted for 46%-49% of income for small, medium, and large farm HH.
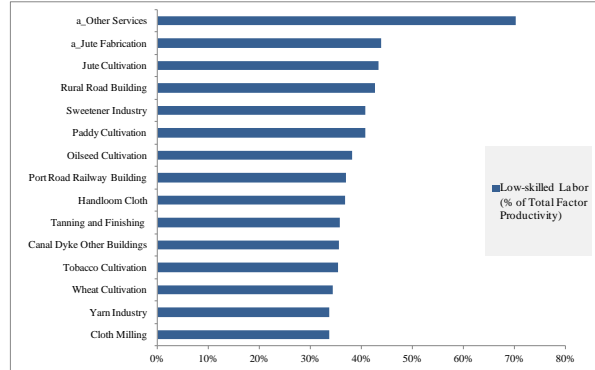
---

[80] The 2000 SAM used data from Household Income Expenditure Survey (HIES) 2000 and the Bangladesh Labor Force Survey (LFS) 2000, among other data sources (e.g. national account statistics).

Figure 11.3: Sources of HH Income | **Figure 11.4: Low-skilled Labor Intensity**
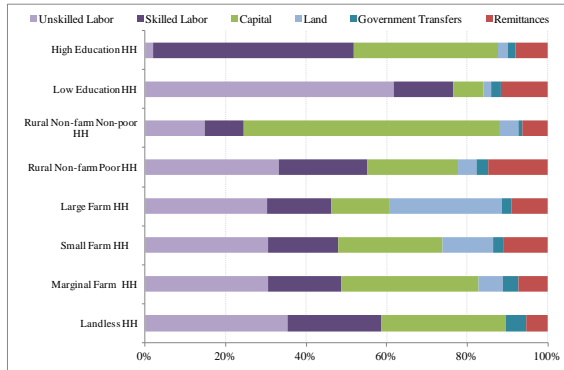
Source: Khondker and Raihan

Identifying the sources of monetary flows associated with unskilled labor provides evidence as to the main income sources for poor and less educated households. In 2005, the primary income sources for unskilled labor included other services (25%), rice cultivation (12%), and land transport (10%). Additional sectors providing substantial income to unskilled labor include retail trade and rural building (6%); wholesale trade (5%); knitting (4%); and rice milling and garments (both at 3%). Figure 11.4 provides a list of the top 20 sectors in terms of their intensity of unskilled labor. Other services lead all activities at 70% labor intensity (unskilled), followed by jute fabrication and cultivation, rural road building and the sweetener industry. Other notable unskilled labor intensive sectors are rice and oilseed cultivation, infrastructure building (port, road, and railway), and textiles.

Chapter 6 and Annex 3 provide an overview of the product space analysis. In this chapter it will be used to identify the sectors that show great potential as high-growth areas in the short- to medium-term. PRODY, EXPY, and density are the three measurements used to conduct the product space analysis. PRODY is calculated using the average income per capita of countries that have a comparative advantage in the export of a particular product. This PRODY value is weighted by a country's share of the revealed comparative advantage (RCA) of the commodity in question. EXPY is the weighted average of PRODY values for products that a country exports, thereby measuring the "income level" associated with an individual country's export basket. Finally, the density is used to estimate a country's potential ability to start producing a new commodity. In order to make this calculation, there needs to be a determination of how current export activities are related to the potential export product under investigation.

Table 11.1 provides a listing of potential export products at the 4-digit SITC level. The products are rank ordered by their proximity or density to current export activities.[81] It is clear from Table 11.1 that there is high likelihood that export diversification in Bangladesh take place in low-value activities, primarily related to garments and textiles. At the same time, there are several other areas where there is high growth potential. Certain seafood and fish products have high PRODY values and are located near current exports. There are also certain manufacturing activities, including the manufacture of ropes and cables, which also have strong potential.

---

[81] For this analysis, the inverse density has been used so countries with low inverse density values are closer to the exports in which Bangladesh currently has a comparative advantage.

Table 11.1: Low Density Exports in the Product Space

Code-SITC - 4 digit	SITC 4 Digit Description	PRODY Value 2005-2009 (Constant 2005 US$, PPP)*	ln(PRODY) - ln(EXPY)	Inverse Density (lower value = strong relationship to current activites)
8459*	Outerwear knitted or crocheted, not elastic nor rubberized; other, clothing accessories, non-elastic, knitted or crocheted	9,377	0.1	4.84
8439*	Womens, girls, infants outerwear, textile, not knitted or crocheted; other outer garments of textile fabrics, not knitted, crocheted	9,224	0.1	5.09
8452*	Outerwear knitted or crocheted, not elastic nor rubberized; womens, girls, infants, suits, dresses, etc, knitted, crocheted	11,344	0.3	5.28
8429*	Men's and boys' outerwear, textile fabrics not knitted or crocheted; other outer garments	8,919	0.1	5.39
8421*	Men's and boys' outerwear, textile fabrics not knitted or crocheted; overcoats and other coats	9,497	0.1	5.75
8424*	Men's and boys' outerwear, textile fabrics not knitted or crocheted; jackets, blazers and the like	10,575	0.2	5.75
8433*	Womens, girls, infants outerwear, textile, not knitted or crocheted; dresses	8,704	0.1	5.77
350	Fish, dried, salted or in brine; smoked fish	15,416	0.6	5.90
8465*	Corsets, garters, etc, not knitted or crocheted, elastic or not	9,312	0.1	6.04
8431*	Womens, girls, infants outerwear, textile, not knitted or crocheted; coats and jackets	10,003	0.2	6.10
8422*	Men's and boys' outerwear, textile fabrics not knitted or crocheted; suits	10,547	0.2	6.23
341	Fish, fresh or chilled, excluding fillet	9,475	0.1	6.24
8472*	Clothing accessories, knitted or crocheted, nes	8,528	0.0	6.32
6575*	Twine, cordage, ropes and cables and manufactures thereof	9,562	0.1	6.60
8510	Footwear	10,165	0.2	6.61
6589*	Other made-up articles of textile materials, nes	8,383	0.0	6.64
371	Fish, prepared or preserved, nes	12,778	0.4	6.75
8484*	Headgear and fitting thereof, nes	8,818	0.1	6.84

Source: Author's calculations; Comtrade; World Bank
All SITC codes starting with 84 are garments; all SITC codes starting with 65 are textiles

Two sectors – garments and textiles – will be analyzed using the HRV framework as both sectors rank in the top 10 to 15 for both employment of unskilled labor and labor intensity in each of the SAMs. Additionally, both sectors show potential for growth under the product space analysis. Furthermore, according to the most recent labor force survey, both the garment and textile sector (for both formal and informal workers) were well over the national average, implying that increased employment in these sectors will lead to increased incomes for Bangladesh's poor.

Data for this analysis will come primarily from the World Bank Enterprise Surveys, which allowed for disaggregation of data by sector. Unfortunately, it was not possible to obtain disaggregated data from the 2010 Labor Force Survey from the Bangladesh Bureau of Statistics, though the chapter would surely have benefitted from its inclusion.

11.3   Applying the HRV Framework to Garments and Textiles

According to Hausmann, Klinger, and Wagner (2008), there are several tests which can be applied to determine whether a constraint is binding. One diagnostic test involves the determination of whether movements in the constraint produce significant movements in the objective function. In other words, the test should be able to prove there will be a significant impact on growth and investment if the constraint is relaxed. To perform this test, this analysis will adapt an econometric model developed by Escribano et. al (2008) and applied to the World Bank's "Bangladesh Towards Accelerated, Inclusive and Sustainable Growth: Opportunities and Challenges." This particular application of that model uses data from the World Bank Enterprise Surveys in 2006 and 2013 to identify the impact of a number of investment climate (IC) variables on firm productivity.[82]

---

[82] The use of this methodology in the aforementioned 2012 World Bank report, "Bangladesh Towards Accelerated, Inclusive and Sustainable Growth: Opportunities and Challenges" used only 2006 data. Investment Climate Assessments were used by Escribano, although much of this information can also be found in the Enterprise Surveys.

There are several major calculations within this method that must be made in order to measure the contribution of each IC variable on total factor productivity. The first calculation involves the estimation of aggregate average cost shares of materials, labor, and capital to acquire Solow residuals. An extended production function determined using two-step ordinary least squares is then used to estimate IC elasticities and semi-elasticities with respect to production. The last calculation involves the use of this equation to measure the impact of each IC variable, using the sample mean, on average log productivity. The percentage contribution of each IC variable is computed using absolute values and the total for any IC category (e.g. infrastructure) is the summary of these contributions with each of its subcategories. Refer to the steps below for reference.

Step #1: Estimate the Solow residual with restricted cost shares:

$$log\ Y_{j,it} = \bar{s}_L\ log\ L_{j,it} + \bar{s}_M\ log\ M_{j,it} + \bar{s}_K\ log\ K_{j,it} + log\ P_{j,it}$$

Step #2: Estimate performance variables:

$$log\ P_{j,it} = \alpha'_{IC}IC_i + \alpha'_C C_i + \alpha'_{Ds}D_j + \alpha'_{DT}D_t + \alpha_P + U_{j,it}$$

Step #3: Evaluate the performance variable regression using the same sample mean:

$$lo\bar{g}\ \bar{P}_{j,it} = \hat{\alpha}_P + \bar{\alpha}'_{IC}\overline{IC} + \hat{\alpha}'_C\bar{C} + \hat{\alpha}'_{Ds}\overline{D}_j + \hat{\alpha}'_{DT}\overline{D}_t$$

Step #4: Divide the whole expression by the dependent variable:

$$100 = \frac{\hat{\alpha}_P}{lo\bar{g}\ \bar{P}_{j,it}}100 + \frac{\bar{\alpha}'_{IC}\overline{IC}}{lo\bar{g}\ \bar{P}_{j,it}}100 + \frac{\hat{\alpha}'_C\bar{C}}{lo\bar{g}\ \bar{P}_{j,it}}100 + \frac{\hat{\alpha}'_{Ds}\overline{D}_j}{lo\bar{g}\ \bar{P}_{j,it}}100 + \frac{\hat{\alpha}'_{DT}\overline{D}_t}{lo\bar{g}\ \bar{P}_{j,it}}100$$

Where P = multifactor productivity; Y = output; L = labor; K = capital; M = intermediate materials; IC = investment variables; C = control variables; D = industry dummies

Output from this model, as well as data from the Enterprise Surveys, will be used for three other diagnostic tests where applicable. One of these tests is to determine if the shadow price of a constraint is high, while a second is related to determining if economic agents are attempting to bypass a constraint. A final test seeks to determine if a firm that is less intensive in a constraint is likely to succeed relative to other firms more vulnerable to the constraint. It should be noted that the comparator countries used for this analysis do not match those used in the aggregate report, due to a lack of data. Instead, China, the Philippines, Sri Lanka, and a South Asia regional average will be used as comparators for garments while, China, Indonesia, Turkey, and Vietnam will be used for textiles.

This section will start with a brief overview of the sector, followed by the diagnostic tests and any other evidence that will help to identify the most binding constraints to Bangladesh's textile and garment sectors.

11.4   Findings for Garments

The development of Bangladesh's garment sector was due to favorable trade incentives under the Multi-Fiber Arrangement (MFA) in textiles and clothing, as well as favorable government policies including back-to-back Letters of Credit, special bonded warehouse facilities, and other policies in support of trade liberalization.[83]   The garment sector has experienced remarkable growth in recent years, expanding from 53% of all exports in 1995 to almost 80% in 2013. This growth has been primarily volume-driven. From 2005 to 2009, the volume of exports in knitwear and woven garments increased by 26.2% and 13.6%, respectively. During this same period, the unit price of knitwear declined by an average of 1.2% per year compared to a 2.2% decline in woven garments. There are currently 5,000 garment manufacturers, of which 3,500 produce woven products; 2,000 produce knitwear; and 500 are involved in some combination of the two (World Bank 2012).

In 2010, over 3 million Bangladeshis aged 15 years and over were employed in the garment sector. Of the 3 million workers, 59% were female and 80% were between the ages of 15 and 34. Nearly 40% of all female formal employment is represented by workers in both textiles and garments. Informal and formal sector wages in the garment sector average US$18.1 per week (US$941 per year) – 135% above the national average. However, as a share of average formal wages, incomes in the garment sector are 78% of the national average. In addition, women are paid 74% of a man's average wage and men have much higher representation in professional jobs (UNCTAD 2012). The wage rates of Bangladeshi garment workers are much less than any of its Asian rivals. It is estimated that a tripling of the minimum wage would not make garment sector labor rates uncompetitive (Economist 2013).

Formal sector employment has the potential to reduce poverty by providing higher wage premiums, stable employment, and employee benefits, among other factors. Around 80% of garment sector employees receive paid sick leave and vacations, while 45% of women receive paid maternity leave. The portion of workers in the garment sector receiving pension contributions from their employer was much lower than the formal sector average of 52% (UNCTAD 2012).
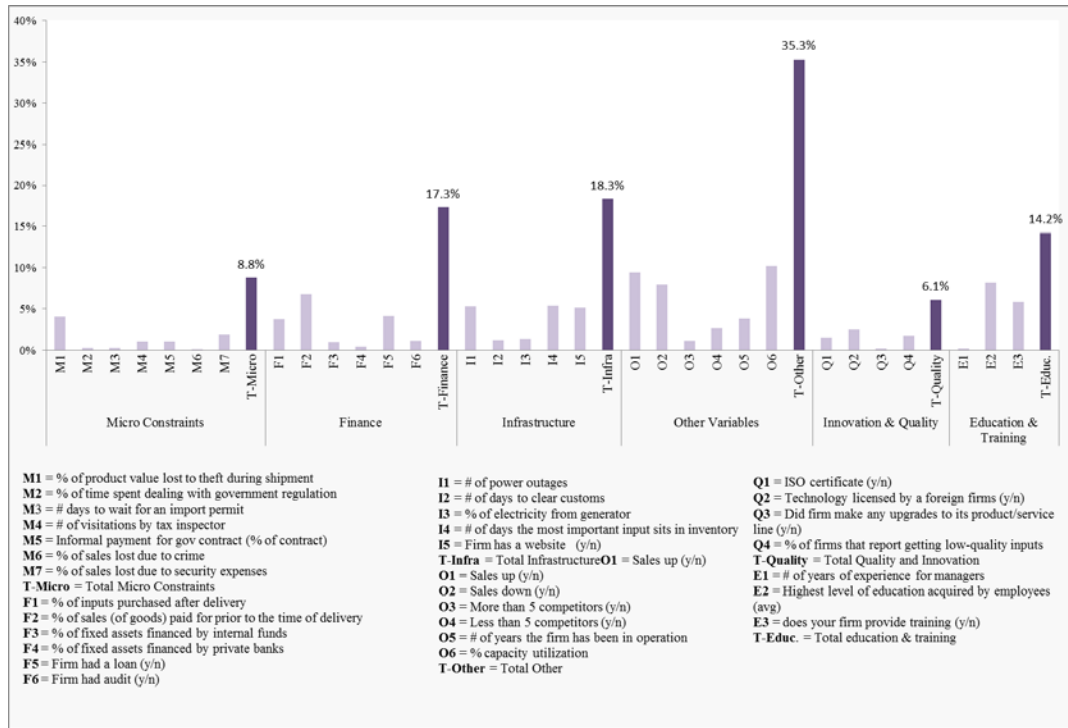
11.4.1 Diagnostic Tests

Movements in the constraint should produce significant movements in the objective function:
According to the 2013 Enterprise Survey (ES) and output from Escribano's model, the IC variable group with the largest percentage contribution to total factor productivity (TFP) is "total other" at 35% (Figure 11.5). Capacity utilization, accounting for 10.2% of TFP, has the greatest share of any IC variable under this category, followed by the increase and decrease of sales at 9.4% and 8%, respectively. This is a positive indication of competiveness being the main driver of TFP, as opposed to the previous ES (2006) when micro constraints were the major contributor. Other major contributing categories to TFP in 2013 include infrastructure (18.3%), finance (17.3%) and education (14.2%).

---

[83] A Letter of Credit provides a guarantee by a bank that a buyer will provide payment to the seller. In the event that the buyer does not provide full payment, the bank will cover the shortfall or the entire cost.

Figure 11.5: Major Contributors to TFP of Bangladeshi Garment Producers in 2013

M1 = % of product value lost to theft during shipment
M2 = % of time spent dealing with government regulation
M3 = # days to wait for an import permit
M4 = # of visitations by tax inspector
M5 = Informal payment for gov contract (% of contract)
M6 = % of sales lost due to crime
M7 = % of sales lost due to security expenses
T-Micro = Total Micro Constraints
F1 = % of inputs purchased after delivery
F2 = % of sales (of goods) paid for prior to the time of delivery
F3 = % of fixed assets financed by internal funds
F4 = % of fixed assets financed by private banks
F5 = Firm had a loan (y/n)
F6 = Firm had audit (y/n)

I1 = # of power outages
I2 = # of days to clear customs
I3 = % of electricity from generator
I4 = # of days the most important input sits in inventory
I5 = Firm has a website (y/n)
T-Infra = Total Infrastructure O1 = Sales up (y/n)
O1 = Sales up (y/n)
O2 = Sales down (y/n)
O3 = More than 5 competitors (y/n)
O4 = Less than 5 competitors (y/n)
O5 = # of years the firm has been in operation
O6 = % capacity utilization
T-Other = Total Other

Q1 = ISO certificate (y/n)
Q2 = Technology licensed by a foreign firms (y/n)
Q3 = Did firm make any upgrades to its product/service line (y/n)
Q4 = % of firms that report getting low-quality inputs
T-Quality = Total Quality and Innovation
E1 = # of years of experience for managers
E2 = Highest level of education acquired by employees (avg)
E3 = does your firm provide training (y/n)
T-Educ. = Total education & training

Source: Author's calculations; World Bank Enterprise Survey

In comparison to 2006 – when the last ES was conducted – micro constraints, in particular crime costs and security expenses have declined in terms of their percentage contribution to TFP (Figure 11.6). Meanwhile, infrastructure remains a significant contributing factor to TFP, accounting for 21.8% of TFP in 2006 and 18.3% in 2013. Finance was the third most significant IC variable category in 2013, increasing from 12.6% in 2006 to 17.3% in 2013, while education and training remained at around 14%. Innovation and quality were the lowest contributors to TFP in both 2006 and 2013.

Figure 11.6: IC Variables and TFP
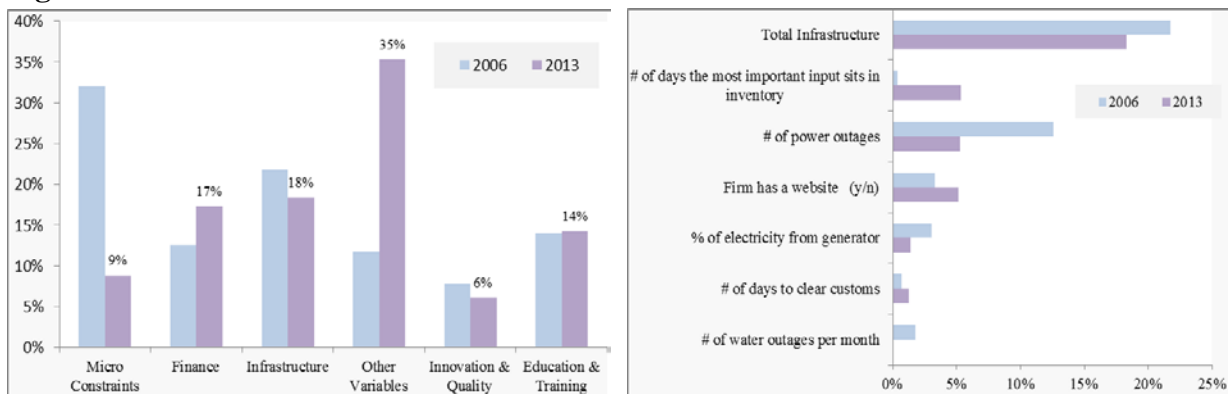
Source: Author's Calculations; World Bank Enterprise Survey 2013 and 2006

Movements in the constraint should produce significant movements in the objective function:
Infrastructure ranked as the second highest contributing factor to TFP in 2006 and 2013. In
2013, however, the infrastructure category was the HRV node that contributed the most to TFP –
a finding that matches the aggregate findings for this analysis. The amount of time an input sits
in inventory and the number of power outages provided the largest contribution to TFP in 2013
(Figure 11.7). The large amount of time an input sits in inventory could be attributed to political
instability in 2013, as hartals (strikes) typically shut down traffic and the movement of personnel
and goods.

Another consideration is centered on obstacles to transport. Garment firms choosing
transportation as a major constraint increased from 8% in 2006 to 15% in 2013. However, less
than 1% of firms selected transportation as the single biggest obstacle to their business in 2013.
It does not appear that the transportation of final goods, as measured by the number of days to
clear customs, was a major contributing factor to TFP. Nevertheless, the IMF identified
transportation as being a major challenge for garment exporters (2013). Finally, garment
manufacturers using a website as a medium to communicate with suppliers and buyers has
increased in significance in terms of its TFP contribution.

Figure 11.8: Number of Power Outages	Figure 11.9: Cost of Power Outages
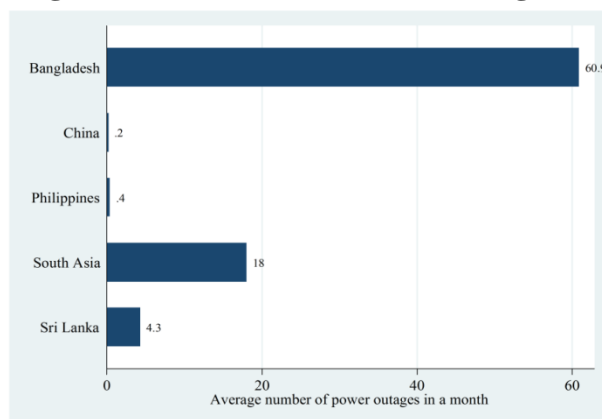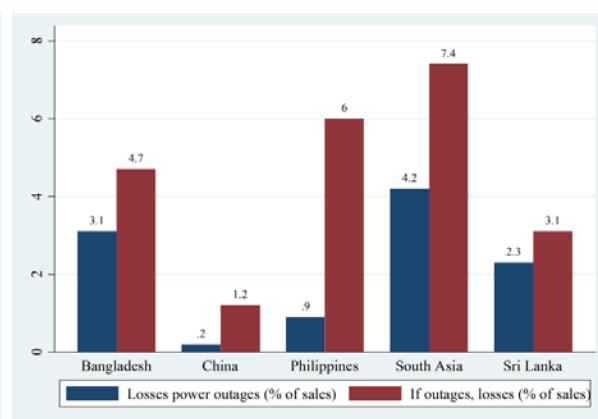
Source: World Bank Enterprise Survey

***The shadow price of the constraint is high and agents in the economy should be attempting to
overcome or bypass the constraint:*** Bangladesh garment manufacturers encounter an average of
60 power outages per month, compared to the South Asia average of 18 (Figure 11.8). Firms in
China – the world's largest exporter of garments – report an average of 0.2 power outages per
month, while Sri Lanka and the Philippines average 4.3 and 0.4 outages, respectively (Figure
11.9).[84] Bangladeshi garment firms report losses amounting to 3.1% of annual sales due to
power outages. Once again, this is higher than China (0.2%), Sri Lanka (2.3%) and the
Philippines (0.9%), although it is slightly lower than the South Asia average of 4.2%.

---

[84] While Bangladesh has more power outages than each of the countries mentioned here, the duration of these
stoppages in the power supply average 0.8 hours. This is lower than the average for South Asia (1.2) and Sri Lanka
(1.4), yet higher than in China (0.6) and the Philippines (0.4).
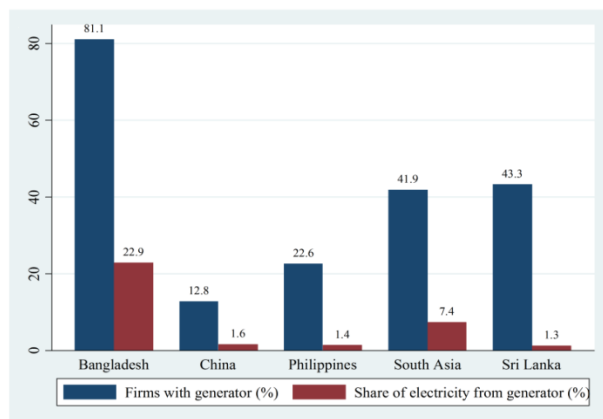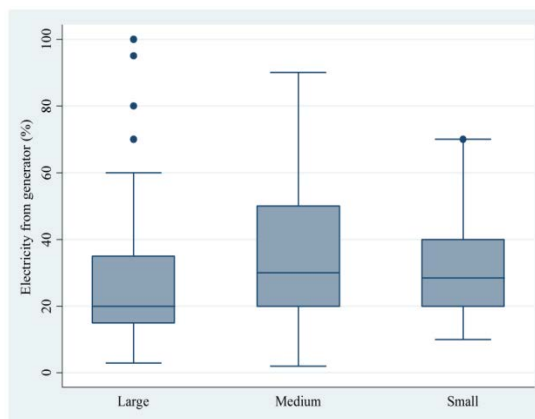
Figure 11.10: Electricity from Generators   **Figure 11.11: Generators by Firm Size**

Source: World Bank Enterprise Survey

With power outages posing a major constraint to business operations, a vast majority of garment firms own or share a generator. In fact, over 81% of firms report ownership of a generator – a figure that is almost twice the average for South Asia (Figure 11.10). Over 22.9% of Bangladeshi firms meet their electricity needs from a generator, indicating that firms pay a substantially higher price for electricity than the market tariff rate. For example, according to the Dhaka Chamber of Commerce generators cost more than US$20,000 to import and operation costs are 50% higher than electricity supplied from the grid (2004). A more recent report estimates that electricity provided through generators is ten times more expensive than that obtained from the national grid (BAPPG 2013).

This evidence indicates that Bangladeshi firms incur an additional cost to doing business as a result of inefficiencies in the supply of energy, particularly via the extremely high costs that firms are willing to pay for electric generators. These inefficiencies result in lost production time, during which time employees are reportedly not compensated. As a result, an improvement to this constraint would likely have a positive impact on firms, increasing productivity and freeing up additional resources to spend on investment, labor, and technology. Additionally, a majority of firms are bypassing the constraint associated with power shortages by purchasing electric generators.

According to the IMF, garment exporters face a high shadow price for transporting goods and are also attempting to bypass constraints related to transportation. In terms of a higher shadow price, the average cost for shipping a 20-foot container is $1,025, compared to $600 in other garment-exporting countries. The higher costs are attributed to a number of issues, including export fees and documentation, customs fees, and port and inland transport costs. The Dhaka-Chittagong road corridor is extremely important to exporters shipping goods through the Chittagong Port. However, this corridor is extremely congested and firms are unable to transport large containers. As a result, firms employ smaller 5-10 ton trucks which they must strip and load into larger vessels at Chittagong. The companies are using private container yards to perform these operations and reduce congestion at the port.

Agents less intensive in a constraint should be more likely to survive and thrive: Small firms have fewer employees, as well as physical assets, which may mean that their demand for

electricity is lower than for medium or large-sized firms.   Figure 11.11 shows that ownership of electric generators is slightly lower for small firms. However, small firms have experienced lower average growth rates over the previous three years than both medium and large-sized firms. Therefore, there is not enough evidence to show that firms using less of this input are able to survive and thrive relative to those that use more.

Finance – Garments

Movements in the constraint should produce significant movements in the objective function: Finance ranked as the fourth highest contributing factor to TFP in 2006 and the third in 2013. Figure 11.12 shows the sub-factors within finance with the greatest contributions to TFP in 2006, which were whether the firm had received an audit (4%), followed by the percentage of fixed assets financed by internal funds (2.9%), and the percentage of inputs purchased after delivery (2.6%). This is in contrast to 2013, when the percentage of sales paid for prior to delivery was the main contributor to TFP at 6.8%, followed by loan attainment (4.1%), and inputs purchased after delivery (3.7%). A firm with a very high or a very low proportion of sales that are pre-paid is thus a good predictor of TFP for Bangladeshi garment firms. This makes sense from a business standpoint. For example, a large firm with a solid reputation and a strong relationship with international buyers is likely to receive payments for goods that are yet to be shipped, as opposed to a smaller, less-known firm.

Figure 11.12: IC Variables - Finance
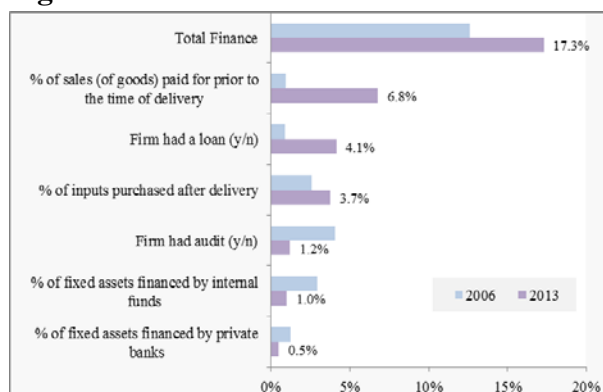
Figure 11.13: Loans and Collateral

Source: Author Calculations; World Bank Enterprise Survey
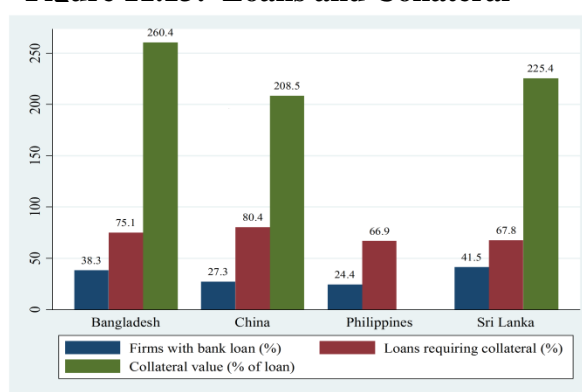
The shadow price of the constraint is high: The most common test for determining whether the shadow price of finance is high is to acquire reliable information on interest rates. At this point in time, the ES does not collect information pertaining to this indicator. There does, however, appear to be some evidence that garment firms in Bangladesh are required to hold larger amounts of collateral relative to the loan value than those in other countries.

A little over 75% of loans to the garment sector require some form of collateral, with the average value of this collateral amounting to 260% of the loan value (Figure 11.13). The share of loans requiring collateral is lower than China (80%) and slightly higher than Sri Lanka (68%) and the Philippines (67%). However, the collateral value is 52 percentage points higher than in China and 35 points above what is required in Sri Lanka. Bangladeshi garment firms are thus required to share more of the risk associated with acquiring a loan, and firms with low levels of collateral

are at a disadvantage when attempting to access loans. Lowering this burden may thus encourage more investment from Bangladeshi firms.

Agents in the economy should be attempting to overcome or bypass the constraint: Data related to accessing financial instruments and investment financing have been used to determine if firms are attempting to bypass constraints related to finance. Figure 11.14 provides a cross-country comparison of garment firms reporting a need for loans. In Bangladesh, 52% of garment firms state this need, slightly lower than China (57%) although higher than firms in the Philippines (37%) and Sri Lanka (20%). The rate at which loan applications are being rejected does not appear to be a driving the failure of some of these firms to access loans, as the rejection rate for Bangladeshi firms is 5.2% - lower than all of the comparators with available information.

Approximately 24% of Bangladeshi firms report using banks to finance investments (Figure 11.15).[85] This compares to 34% of firms in Sri Lanka; 25% in the Philippines; and 13% in China. Bangladesh ranks 2nd among the four-country comparator group in terms of the share of firms using banks to finance working capital. According to this very brief analysis, it does not appear that Bangladeshi firms are facing a constraint to official banking resources. As a share of all sources, however, internal financing makes up the largest share of investment financing for Bangladeshi firms, at 75% of the total. This means firms are using their own resources to invest. While the share of internal investment is higher than in Sri Lanka (55%) and the Philippines (66%), it is also quite a bit lower than in China (90%).

Figure 11.14: Loan Data
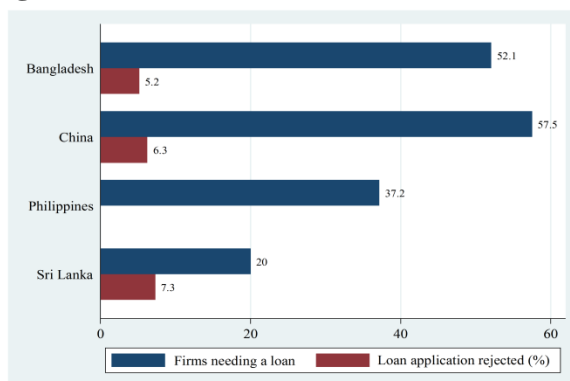
Figure 11.15: Sources of Investment
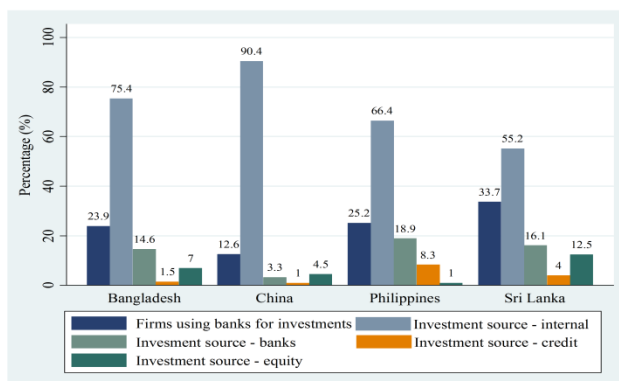
Source: World Bank Enterprise Survey

Agents less intensive in a constraint should be more likely to survive and thrive: In the 2013 ES, Bangladeshi garment firms were asked whether their firm applied for a line of credit or loan. If the answer to this question was negative, firms were then asked why they did not apply. A total of 65% of the firms who provided a response stated they did not need a loan, 18% said that the interest rate was too high, and another 10% stated that the collateral requirement was a major deterrent. Firms that did not need the loan experienced average sales growth of 38% over a three year period, compared to 16% and 18% for those mentioning interest rates and collateral, respectively. This suggests that firms without the access to loans are at a disadvantage while firms with adequate internal financial resources are successful.

---

[85] According to the World Bank, this is in line with the 23% of Bangladeshi's who have access to loans (World Bank Financial Inclusion Data).

Movements in the constraint should produce significant movements in the objective function:
Education and training decreased from the third most significant contributing factor to TFP in
2006 to the fourth in 2013. Nevertheless, the "highest level of education attained" variable had
the greatest impact of any individual IC variable on TFP outside of the "other variables"
category, providing an 8.2% contribution to TFP in 2013 (Figure 11.16). In addition, training
increased from a 5.3% contribution to TFP in 2006 to 5.8% in 2013.

Firms specializing in higher quality and higher value garment products require employees with
advanced skillsets. This may be one explanation as to the strong link between education level
and garment sector TFP. Moreover, removing this constraint, by raising education levels and
improving employee skills, should continue to remain important for garments as exporters move
into more advanced production lines and international buyers demand more sophisticated items.
In fact, the IMF identifies education as one of the key constraints to growth in the garment sector
(2013).

Figure 11.16: IC Variables – Education   **Figure 11.17: Education Levels**
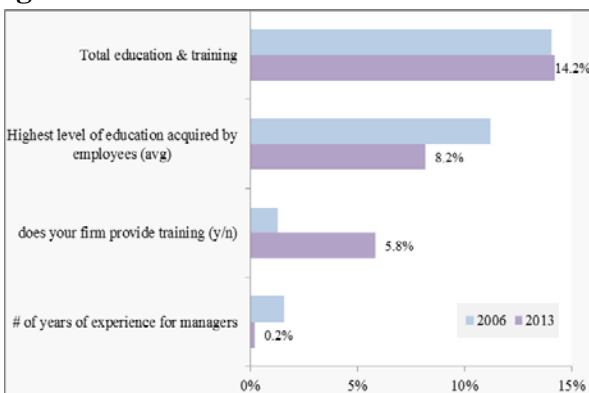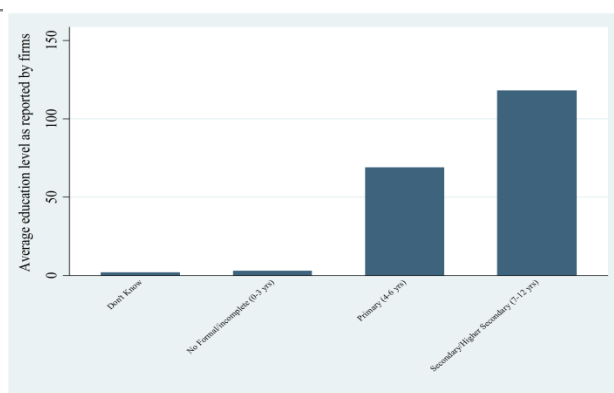
Source: Author's Calculations; World Bank Enterprise Survey

The shadow price of the constraint is high: The most important test for determining the shadow
price for education is based on the returns to education. The 2010 Labor Force Survey is the
only source that disaggregates this data into the sub-sector level (e.g. garments, textiles).
Because we were unable to acquire the Labor Force Survey, this test is unfortunately impossible
to conduct.

Further evidence of whether education is a binding constraint to growth: Figure 11.18 shows
that a majority of garment firms reported that the average education level of their employees was
at the secondary/higher secondary (7-12 years) and primary (4-6 years) levels. This average
level of employee education is not necessarily dependent on the size of the firm. In other words,
employees working for medium- and small-sized firms are bound to have similar education
levels. In comparison to garment producers in China, the Philippines, and Sri Lanka, Bangladesh
has the lowest share of workers offered formal training opportunities, at 61%. Part of this
discrepancy may have to do with the level of sophistication involved with the production of

garments originating from these other countries, which require additional training for their workers.
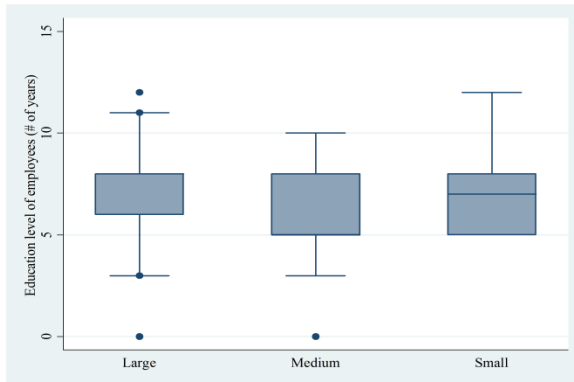
Figure 11.18: Education by Firm Size   **Figure 11.19: Worker Training**

Source: World Bank Enterprise Survey

According to several discussions with sector and country specialists, there is also a huge shortage of middle managers in garment firms. As a result, firms are importing large numbers of middle-managers from India and Sri Lanka. However, while this indicates that garment manufacturers are attempting to bypass a human capital constraint, there is no known survey that captures this information.

Microeconomic Constraints – Garments

Movements in the constraint should produce significant movements in the objective function: Microeconomic constraints accounted for the largest individual IC contribution (32%) for garment sector TFP in 2006. Losses due to criminal behavior were particularly significant, contributing 16% to TFP (Figure 11.20). According to the TFP model utilizing more recent ES data, however, microeconomic conditions have drastically improved, accounting for only 8.8% of TFP in 2013. The IC variables within the microeconomic constraints category which provided the greatest impact on TFP were product value lost to theft (4.1%) and sales lost due to security expenses (1.9%). While an improvement in the business environment may partly explain this, other explanations could include the rising importance of the Bangladesh Garment Manufacturers and Exporters Association and the political connectedness of firm owners (Hassan 2013).
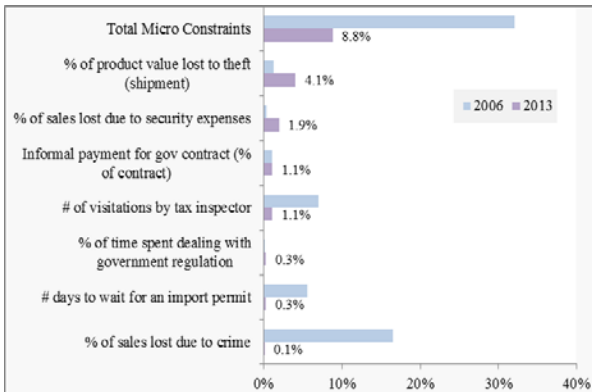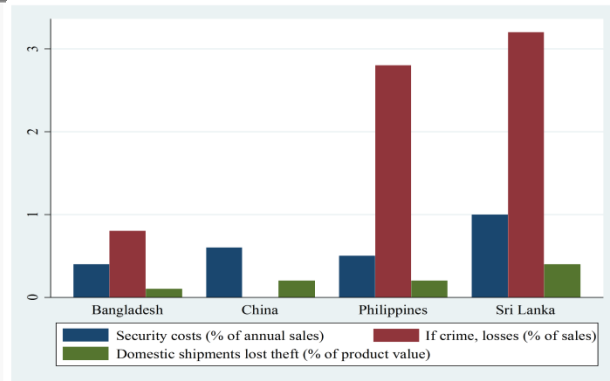
Figure 11.20: IC Variables – Micro   **Figure 11.21: Crime and Security**

Evidence of whether microeconomic constraints are a binding constraint: In comparison to the Philippines and Sri Lanka, Bangladeshi garment firms have lower reported costs associated with crime, security expenditures, and losses in domestic shipments due to theft (Figure 11.21). This implies that Bangladesh does not have a high shadow price due to excessively high crime and/or security costs. Figure 11.22 shows the Enterprise Survey results for the IC indicator dealing with regulations, namely the amount of time a senior manager spending dealing with government regulations as measured by the amount of time spent on these issues per week. At 4.8%, Bangladeshi managers spend more time dealing with government regulations than their counterparts in China (0.9%) and Sri Lanka (1.6%), though managers in the Philippines spent an average of 12.6% of their time per week on regulatory matters. Additionally, the IMF (2013) and other stakeholders believe that the regulatory framework governing safety and wages will need to improve for the garment sector to grow at its expected rate. As a result, many feel this is a potential binding constraint to growth.

Corruption is listed as a major constraint by over half of Bangladeshi firms and it is clear from the survey results that this issue is quite rampant. For example, over 60% of Bangladeshi garment firms report giving one or more bribes during the past year (referred to in Figure 11.23 as the depth of bribery). Similarly, over 70% of firms are expected to give gifts to government officials in order to get things done. Both of these figures are substantially higher than those found in the comparator countries provided in Figure 11.23. In 2006, the value of a gift expected to secure a government contract was 2.5% of the contract value – lower than in the Philippines (14.1%) yet higher than in Sri Lanka (1.6%). Finally, over 14.2% of firms list the court system as a major constraint – a figure that is higher than in each of the comparator countries (Figure 11.23).

Figure 11.22: Regulations
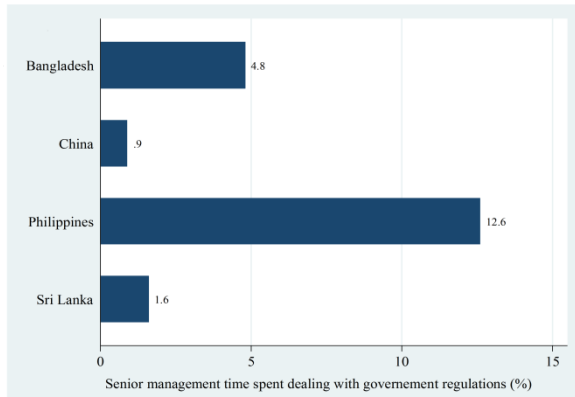
Figure 11.23: Corruption

Source: World Bank Enterprise Survey
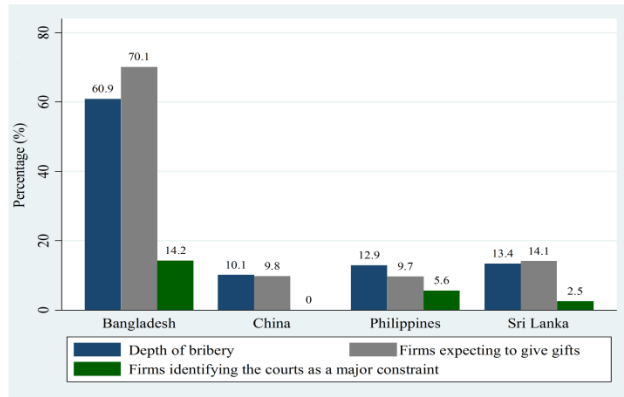
*Other Evidence of Possible Constraints – Garments:*

There are three additional areas to consider in terms of data from the ES Survey. First, firms are asked to rank order the biggest obstacles to their businesses. In 2013, 46% of firms selected political instability as the biggest obstacle, followed by electricity (22%) and education (10%). Finance and corruption each received around 7% of responses and less than 3% of all remaining topics were chosen by firms. As the ES Survey was conducted in 2013, it is no surprise that political instability was considered a primary obstacle. In the lead up to the political election of 2014, there were many strikes and a high degree of uncertainty regarding Bangladesh's future.

Figure 11.24: Biggest Obstacles to Growth

Biggest Obstacles to Firm Growth	Garments		Garments
	2006	**2013**	**(diff)**
Obstacles: Political instability	11%	46%	36%
Obstacles: Electricity	47%	22%	-25%
Obstacles: Inadequately educated workforce	3%	10%	7%
Obstacles: Access to Finance	26%	7%	-18%
Obstacles: Corruption	6%	7%	1%
Obstacles: Customs & Trade Regulations	1%	3%	2%
Obstacles: Access to Land	2%	2%	-1%
Obstacles: Licenses & Permits	1%	1%	0%
Obstacles: Labor regulations	0%	1%	1%
Obstacles: Crime, Theft & Disorder	0%	1%	1%
Obstacles: Tax Administration	1%	1%	-1%
Obstacles: Courts	0%	0%	0%
Obstacles: Practices Informal Sector	0%	0%	0%
Obstacles: Tax Rates	2%	0%	-2%
Obstacles: Transportation	1%	0%	-1%
	100%	100%	

Figure 11.25: Macro IC Variables

Source: World Bank Enterprise Survey
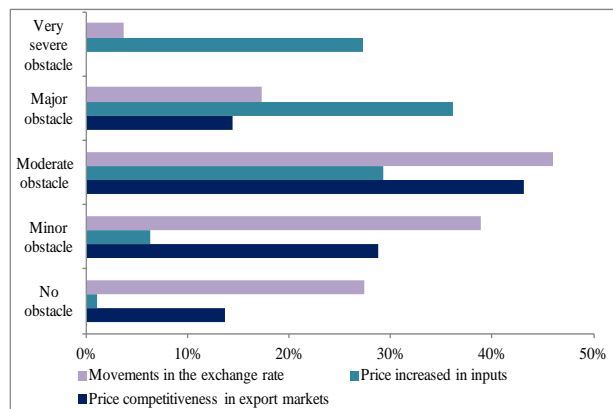
The only macroeconomic IC variables collected in the ES Survey have to do with firm perceptions regarding prices and exchange rates. Figure 11.25 provides a summary of these results for garment firms in 2013. It shows that 63% of firms felt that movements in input prices were a major or very serious obstacle to their firm. While some firms did feel that the exchange rate was major or very severe obstacle (21%), it is not clear if this was what is driving movements in input prices or if inflation or any number of other issues may be the cause. Meanwhile, also firms felt that price competitiveness in export markets was a moderate but not very severe obstacle.

142

11.5   Findings for Textiles

Textiles

Much of the growth in Bangladesh's textile sector is due to linkages with the garment sector, as well as favorable government policies. The ring spinning capacity of local textile firms increased from 1.5 million spindles in 1996 to 5.7 million in 2006. Similarly, open-end spinning frames have increased from 3,000 in 1994 to 7,876 in 2006 (Ahsan 2006). As a share of GDP, textiles have increased from 0.8% of GDP in 2001 to a little over 1% in 2010 (BBS 2010).

In 2010, 965,462 Bangladeshis aged 15 years and over were employed in the textile sector. Of the total number of textile workers, 49% were female and around 63% were between the ages of 15 and 34. Informal and formal sector wages in the garment sector average US$17.9 per week (US$930 per year) – 133% of the national average. However, as a share of average formal wages, incomes in the garment sector are 67% of the national average. In comparison to the garment sector, women are compensated more for the work they do relative to men. In 2010, for example, in the textile sector, women were paid 84% of a man's average wage compared to 74% in the garment sector (UNCTAD 2012). Nonetheless, a gender gap in wages remains.

Roughly 76% of textile sector employees receive paid sick leave and vacations, while 35% of women receive paid maternity leave. Twenty-five percent of workers in the textile industry receive pension contributions from their employer, much lower than the formal sector average of 52% although slightly higher than the 19% of garment workers who receive them (UNCTAD 2012).

Movements in the constraint should produce significant movements in the objective function:
The IC variable group with the most significant percentage contribution to textile firms' TFP is "total other" at 35% (Figure 11.26). This is in contrast to 2006 when the infrastructure category accounted for the highest share, at 36%. The number of years the firm has been in operation, accounting for 26% of TFP, determines the greatest share of TFP of any IC variable under this category, followed by whether or not firms have less than 5 competitors in their specific market area. In contrast to the garment sector, capacity utilization does not play a significant role in the TFP of textile firms. These results suggest that Bangladeshi textile firms will be more successful if they have been in operation a long number of years and have few competitors. It also indicates that new firms could face significant barriers to entry.

Infrastructure continues to remain a determining factor for TFP, accounting for a 29% contribution in 2013, while the finance IC variable contribution increased from 15% of TFP in 2006 to 22% in 2013 (Figure 11.27). Similar to garments, the contributing share of micro constraints has declined, from 12% of TFP in 2006 to 4.4% in 2013. This provides additional evidence of micro constraints declining in terms of their impact on businesses. Finally, quality and innovation are the fourth largest contributors to TFP, with education and training making up the sixth.

Figure 11.26: Major Contributors to TFP of Bangladeshi Textile Producers in 2013
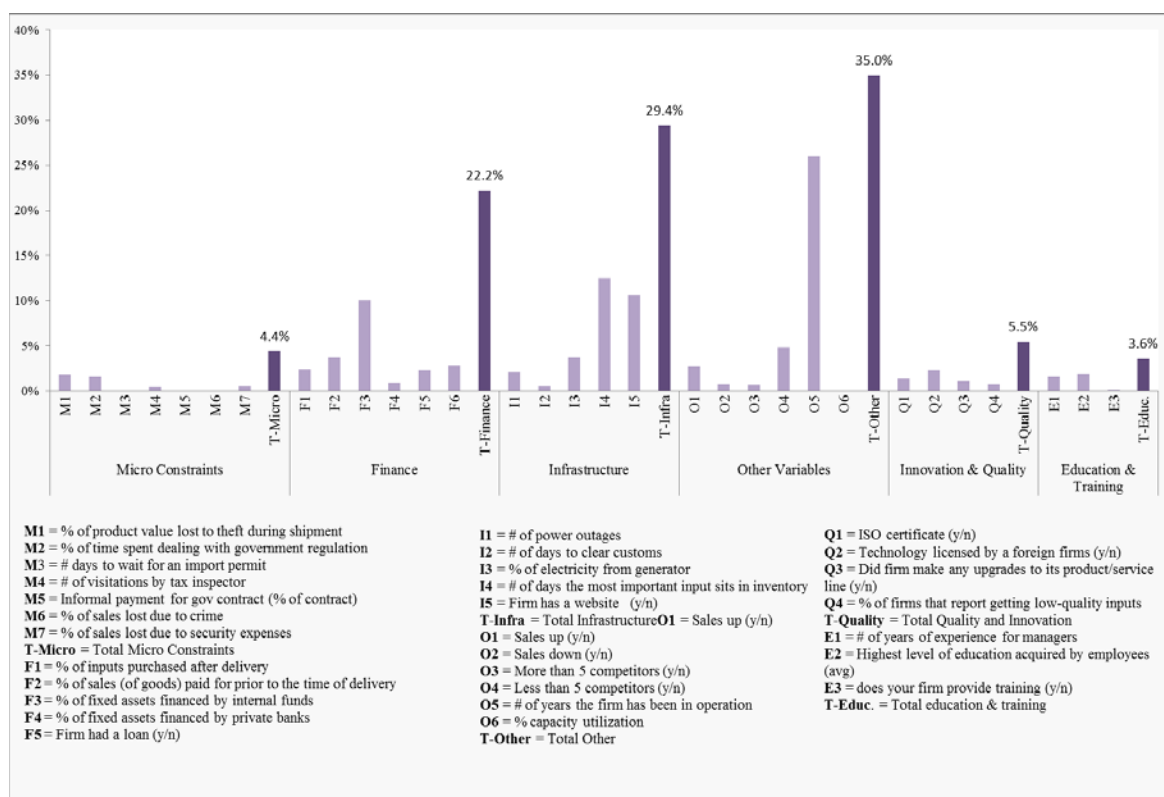
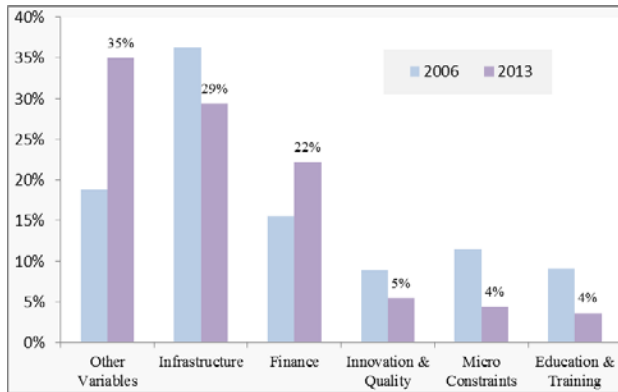*Source: Author's calculations; World Bank Enterprise Survey*

Infrastructure – Textiles

Movements in the constraint should produce significant movements in the objective function:
Infrastructure ranked as the highest contributing factor to TFP in 2006 and the second highest in 2013. Similar to what was found examining garments firms, the infrastructure category was the most significant HRV node contributing to TFP, with the number of days the most important input sits in inventory as the main contributing IC variable at 13%. Whether or not the firm created a website to conduct business was the second highest contributing IC variable (11%), while electric generator ownership (4%) and number of power outages (2%) contributed the next highest share.

According to the HRV test, it appears that neither power outages nor electric generator ownership are key determinants of TFP. The number of days an input sits in inventory is important to TFP, yet this does not appear to be directly associated with constraints related to transportation, as the contribution of the "number of days to clear customs" IC variable is minor. It is interesting that use of a website appears to be a key determinant for TFP, but it is not clear if this is due to the IT infrastructure to which a firm has access (e.g. within special economic zones) or if there is something else driving this variable.

144

Figure 11.27: IC Variables and TFP

Figure 11.28: IC Variables – Infrastructure
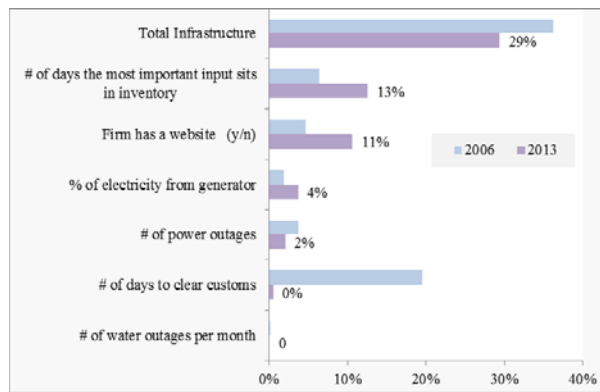
*Source: Author Calculations; World Bank Enterprise Survey*

The shadow price of the constraint is high and agents in the economy should be attempting to overcome or bypass the constraint: Bangladesh textile manufacturers encounter an average of 89 power outages per month – a substantially higher number than in each of the comparator countries and over four times the South Asia average of 18 (Figure 11.29). Moreover, Bangladeshi firms report losses amounting to 11.2% of annual sales due to power outages (Figure 11.30). In addition to being higher than the South Asian average of 4.2%, this figure is higher than in the following comparators: China (0.1%), Indonesia (1.4%), Turkey (2%), and Vietnam (3.2%).

Figure 11.29: Number of Power Outages
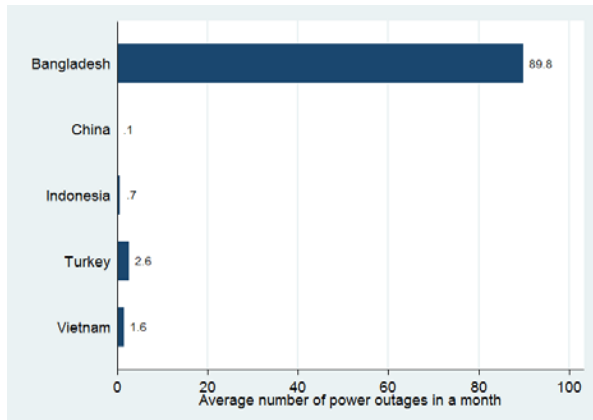
Figure 11.30: Cost of Power Outages

Source: World Bank Enterprise Survey
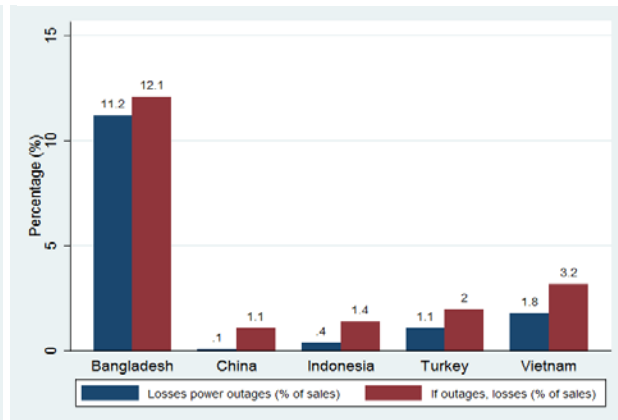
In response to this high number of power outages, many firms have attempted to bypass this constraint by purchasing a generator or a share in a generator. In 2013, 42% of textile firms claimed to have ownership of an electric generator (Figure 11.31). Although this is lower than the average for Bangladesh's garment sector (81%), this figure is significantly higher than in China (6%), Indonesia (4.6%), and Turkey (9.2%), and slightly higher than in Vietnam (36%). Textile firms in Bangladesh spend roughly 8% of their annual sales on electric generators. Once again, this figure is twice as high as in Vietnam (3.6%), which has the highest cost among comparators. In comparison, Bangladeshi garment firms also reported that electric generation costs amounted to 23% of their annual sales in 2013. The electricity intensity of the garment sector is obviously driving this figure.

This evidence suggests that Bangladeshi firms incur an additional cost to doing business as a result of inefficiencies in the electricity supply. While textile firms are not purchasing electric generators to the same extent as garment manufacturers, over 40% are making this investment.

Agents less intensive in a constraint should be more likely to survive and thrive: Small firms tend to have relatively few employees and physical assets, which may mean that their demand for electricity is lower than that of medium- or large-sized firms. However, when comparing the ownership of electric generators between small, medium, and large firms it appears that they have roughly equal ownership rates (Figure 11.32). Moreover, small firms have experienced lower average growth rates over the previous three years than both medium- and large-sized firms, although this may be due to factors that have nothing to do with the electricity supply.

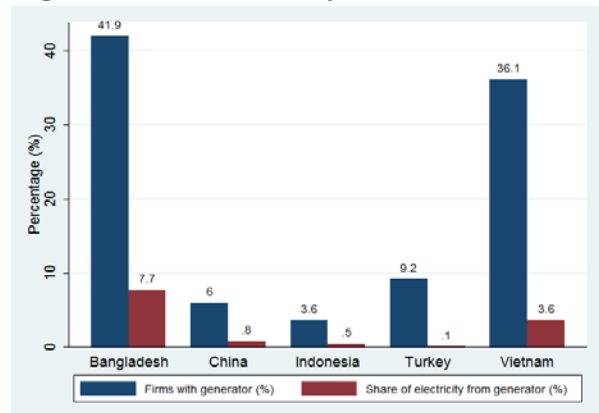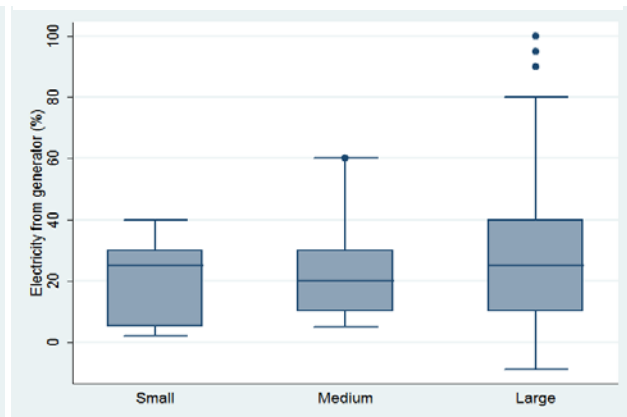**Figure 11.31: Electricity from Generators**   **Figure 11.32: Generators by Firm Size**
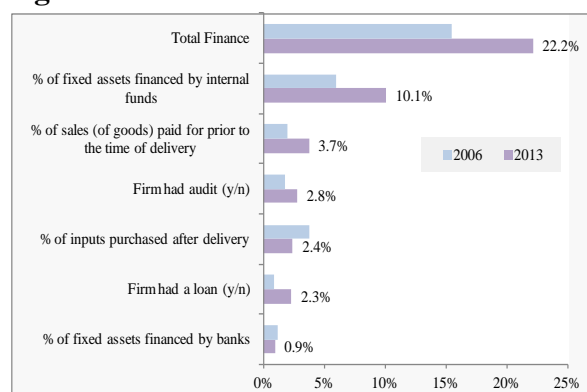

Source: World Bank Enterprise Survey

Finance – Textiles

Movements in the constraint should produce significant movements in the objective function: Figure 11.33 has the summary results for the finance IC variables in 2006 and 2013 when finance ranked as the third greatest contributing factor to TFP. In 2013, the main IC variable for finance was the share of fixed assets funded with internal resources (11%), followed by prepaid sales (4%), audits (3%), and inputs paid for after delivery (2.4%). Similarly in 2006, fixed assets purchased with internal resources and prepaid sales were the largest contributors to the finance variable. The use of internal resources to finance fixed assets contributed only 1% to the TFP of Bangladeshi garment factories, so this IC variable is relatively more important for textile firms.

146

Figure 11.33: IC Variables - Finance

Figure 11.34: Collateral Requirement

Source: Author Calculations; World Bank Enterprise Survey
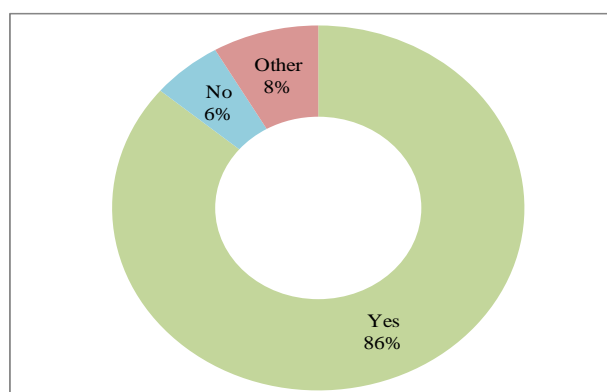
The shadow price of the constraint is high: The most common test for determining if the shadow price of finance is high is to acquire reliable information on interest rates. At this point in time, the ES does not collect information directly related to interest rates and no such data was available to examine directly.

However, over 28% of textile firms that did not have a loan when their ES interview occurred reported they did not have one because interest rates were too high, while another 11% claimed the collateral requirements were too burdensome. According to Bangladeshi textile firms who have received a loan, the percentage of financing requiring collateral is 85%, while 6% report no requirement and the remaining 8% did not answer (Figure 11.34). While data from the comparator countries is not available for this test, the share of loans requiring collateral in the textile sector is higher than what was reported by firms in the garment sector. Moreover, the average reported collateral value was 543% of the loan, and the median value was 300%.

Agents in the economy should be attempting to overcome or bypass the constraint: Information related to accessing financial resources for investment needs is used to test whether firms are attempting to bypass finance-related constraints (Figure 11.35). Sixty-nine percent of Bangladeshi textile firms report needing a loan, which is similar to what was reported by Vietnamese producers (68%) and much lower than what was reported by Indonesian firms (85%). At the same time, only 54% of firms in China and 63% in Turkey reported a need for loans. Data related to loan application rejection rates was not available for Bangladesh.

Over 31% of Bangladeshi firms use banks to finance investments – a percentage share that is greater than in all of the comparators with the exception of Turkey (47%) (Figure 11.36). At 63%, internal financing accounts for the largest source share of all Bangladeshi textile investments, followed by banks (27%), and equity (3%). Relative to the comparators, internal financing accounts for a smaller share of all investment sources than in China (91%) and Indonesia (81%), and has similar shares to Turkey (62%) and Vietnam (60%). In terms of investment needs met by banks, Bangladesh has the second highest rate behind Turkey at 34%. It is not clear if Bangladeshi firms lack adequate internal resources to invest in their operations, but there does not appear to be a shortage of bank loans in comparison to other countries.
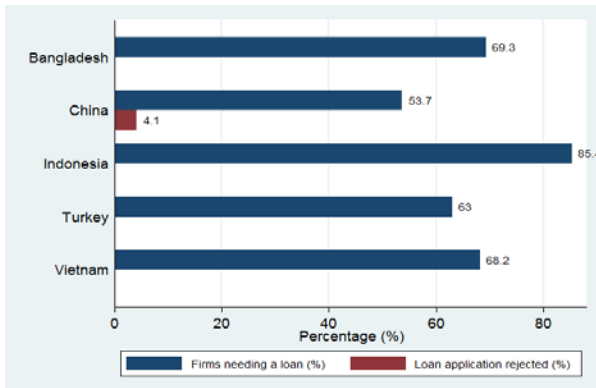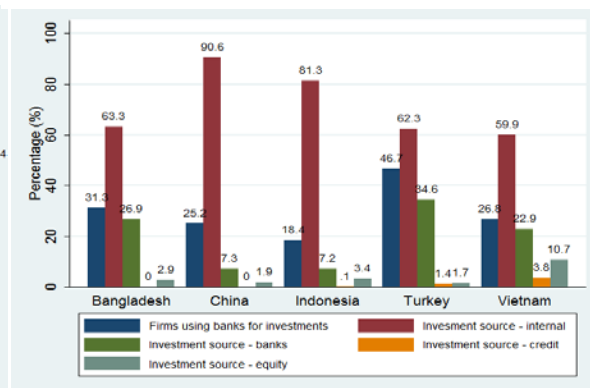
Figure 11.35: Loan Data

Figure 11.36: Sources of Investment

Source: World Bank Enterprise Survey

Agents less intensive in a constraint should be more likely to survive and thrive: In the 2013 ES, Bangladeshi textile firms were asked whether their firm applied for a line of credit or loan. If firms did not apply for a loan, they were then asked why. Firms with no need for a loan totaled 39%, while those reporting that interest rates and collateral requirements were too cumbersome accounted for 28% and 11%, respectively. Firms that did not need the loan experienced average sales growth of 19% over a three year period, compared to 17% for those mentioning interest rates and collateral as obstacles. In contrast to garments, there does not appear to be enough evidence to prove that firms with adequate internal financial resources have an advantage over those who do not.

Education – Textiles

Movements in the constraint should produce significant movements in the objective function: In 2013, educational attainment and training provided a 3.6% contribution to textile TFP – the smallest share among the IC variable categories (Figure 11.37). While the same category provided a larger contribution to TFP in 2006 (9.1%), it still provided a smaller share than four of the other IC categories. The average highest level of education of a firms' employees had the greatest impact of any education and training variable, although its percentage contribution declined from 6% in 2006 to 1.9% in 2013 (Figure 11.37). Manager experience level provided the next largest IC variable contribution at 1.6%, compared to 2.8% in 2006. Given this data, it appears that in the Bangladeshi textile sector, the demand for workers with advanced educational attainment is lower than in the garment sector.

The shadow price of the constraint is high: The most direct way to determine the shadow price for education is by examining the returns to education. The 2010 Labor Force Survey is the only known source of this data disaggregated to the sub-sector level (e.g. garments, textiles). Unfortunately, we were unable to obtain this data and thus unable to run this test.
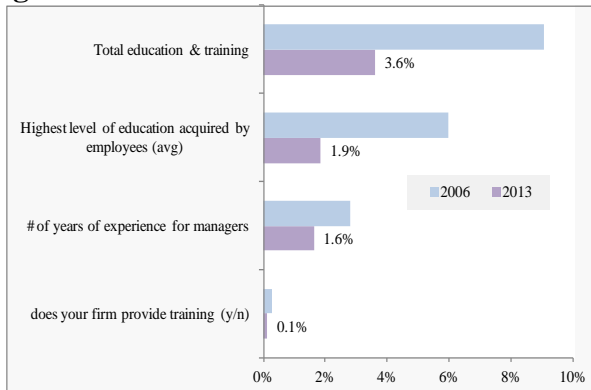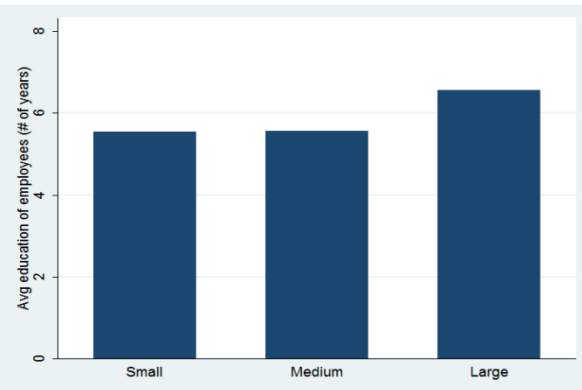
Figure 11.37: IC Variables – Education

Figure 11.38: Education Levels by Size

*Source: Author's Calculations; World Bank Enterprise Survey*

Other evidence of whether education is a binding constraint to growth: Figure 11.38 shows that a majority of firms report that the average education level of their employees was at the primary level, with larger firms reporting a slightly higher average. Although small firms reported the lowest average education level, the variance of firm responses was greatest among medium- and large-sized firms (Figure 11.39). In comparison to textile producers in Indonesia and Turkey, Bangladesh had a larger share of workers offered formal training opportunities, 72% of total workers (Figure 11.40), though China and Vietnam textile firms offered an even larger portion of their workforce formal training opportunities.

Figure 11.39: Education Level Variance
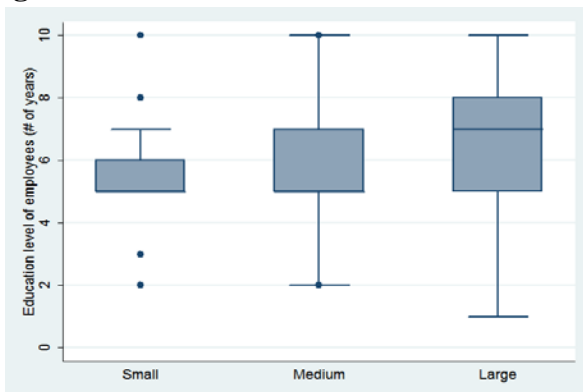
Figure 11.40: Worker Training

Source: World Bank Enterprise Survey
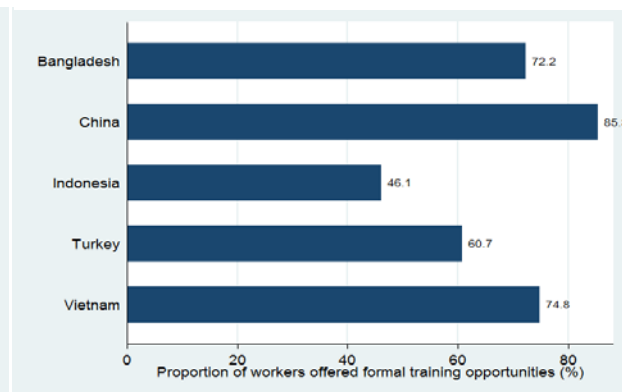
Microeconomic Constraints – Textiles

Movements in the constraint should produce significant movements in the objective function: Microeconomic IC variables provided the fourth highest contribution to textile firm TFP (11.5%) in 2006, with the number of days required to wait for an import permit (4.8%), number of visitations by tax inspectors (2.7%), and informal payments (2.4%) providing the greatest contribution share from this category (Figure 11.41). In 2013, microeconomic variables declined to 4.4%, with shipments lost due to theft (1.7%) and government regulations (1.6%) having the largest contribution to TFP. It the analysis in this and the previous sections, it appears these microeconomic issues having a lower overall impact on textile firms relative to firms in the garment sector.
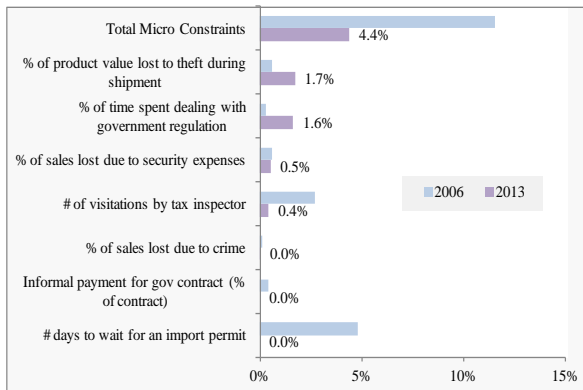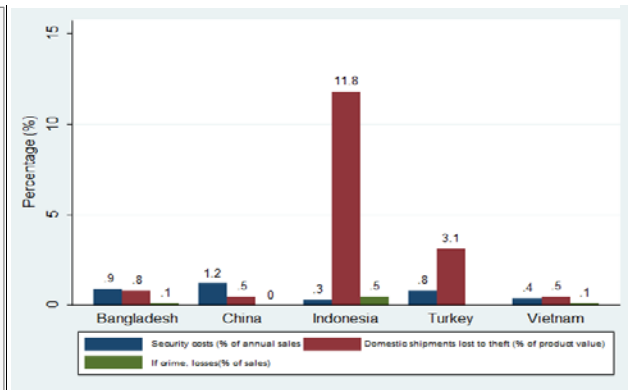
149

Figure 11.41: IC Variables – Micro

Figure 11.42: Crime and Security

Source: Author Calculations; World Bank Enterprise Survey

Other evidence of whether microeconomic issues are a binding constraint: In comparison to the textile firms operating in the countries listed in Figure 11.42, Bangladeshi firms have lower or similarly reported costs associated with crime, security expenditures, and losses in domestic shipments due to theft. This implies that Bangladesh does not have a high shadow price due to excessively high crime and/or security costs. Figure 11.43 shows the Enterprise Survey results for the IC indicator dealing with regulations, as measured by the average amount of time per week a senior manager spends dealing with government regulations. At 4.4%, Bangladeshi managers spend less time dealing with government regulations than their counterparts in Turkey (25.5%). Nevertheless, managers in Vietnam, Indonesia, and China all report spending less time on these matters than those in Bangladesh.

The depth of bribery, measured as the number of firms reportedly giving at least one bribe during over the course of a year, is higher for Bangladeshi firms (38%) than for any of the other comparators listed in Figure 11.44, yet lower than the depth reported by Bangladeshi garment firms (60%).   Additionally, over 92% of Bangladeshi textile firms are expected to give gifts to government officials in order to get things done. This figure is twice as high as Vietnam – the country with the second highest percentage at 46% – while also higher than in the Bangladeshi garment sector. Finally, over 12.6% of Bangladeshi textile firms list the court system as a major constraint to business (Figure 11.44).
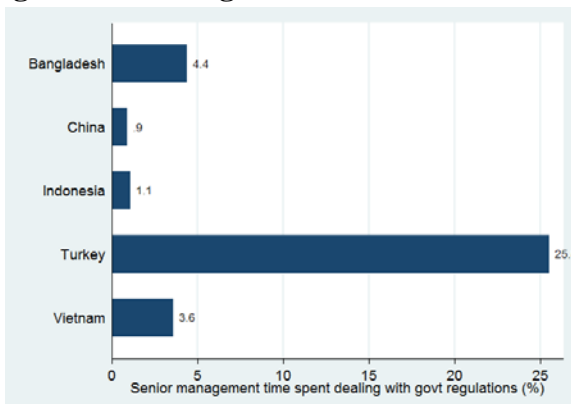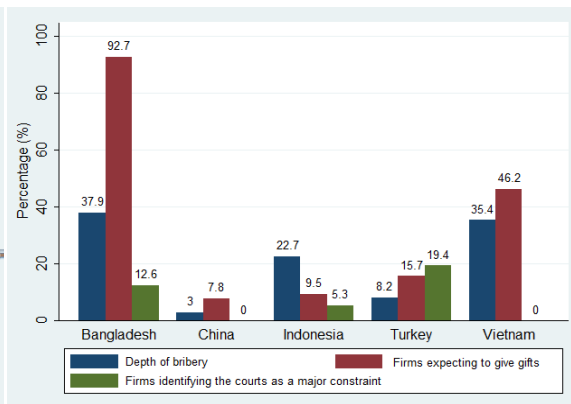
Figure 11.43: Regulations

Figure 11.44: Corruption

Source: World Bank Enterprise Survey

Other Evidence of Possible Constraints – Garments:

Similar to Bangladeshi garment firms, a large number of Bangladeshi textile firms (30%) selected political instability as their biggest obstacle to doing business – a 17 percentage point increase from 2006 (Figure 11.45). Although the number of firms that selected electricity as their biggest obstacle declined from 51% in 2006 to 28% in 2013, it remains a significant hurdle for textile firms. Access to finance was another major obstacle (22%), while corruption (6%), access to land (4%), and education (3%) all trailed in terms of level of importance to firms.
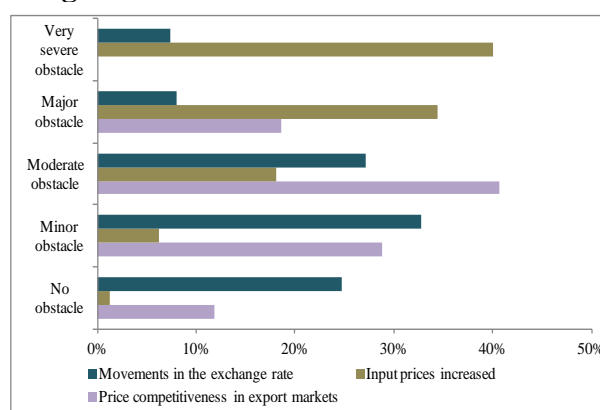
Increasing input prices was mentioned by 74% of firms as being a major or very severe obstacle to doing business for textile firms (Figure 11.46). A vast majority of firms felt that price competitiveness and movements in the exchange rate were a moderate, minor, or no obstacle at all to doing business.

Figure 11.46: Biggest Obstacles

Biggest Obstacles to Firm Growth	Textiles		Textiles (diff)
	2006	2013	
Obstacles: Political instability	13%	30%	17%
Obstacles: Electricity	51%	28%	-24%
Obstacles: Access to Finance	20%	22%	2%
Obstacles: Corruption	10%	6%	-4%
Obstacles: Access to Land	3%	4%	1%
Obstacles: Inadequately educated workforce	0%	3%	3%
Obstacles: Practices Informal Sector	0%	3%	3%
Obstacles: Licenses & Permits	1%	1%	0%
Obstacles: Crime, Theft & Disorder	0%	1%	1%
Obstacles: Tax Administration	0%	1%	1%
Obstacles: Transportation	0%	1%	1%
Obstacles: Courts	0%	0%	0%
Obstacles: Customs & Trade Regulations	1%	0%	-1%
Obstacles: Labor regulations	0%	0%	0%
Obstacles: Tax Rates	0%	0%	0%
	100%	100%	

Figure 11.45: Macro IC Variables

Movements in the exchange rate
Input prices increased
Price competitiveness in export markets

Source: World Bank Enterprise Survey

11.1   Conclusion

Applying the HRV framework to any individual sector is highly dependent on the availability and reliability of data resources. At this point in time, the Enterprise Surveys from 2006 and 2013 provide the most detailed information related to the constraints facing individual firms in the garment and textile sectors. Information from the 2010 Labor Force Survey and the 2012 Manufacturing Sector Survey would add significant value to this report. Unfortunately, this data was unavailable, so findings from the Disaggregated Growth Diagnostic use only the data from the Enterprise Survey and are provided below.

Results from the HRV differential diagnosis tests show that energy poses a most binding constraint to growth in the garment sector. There is substantial evidence indicating that the shadow price for electricity is high and that a large number of firms are attempting to bypass this constraint through the use of electric generators. Additionally, electricity provides a significant contribution to firm TFP, suggesting that the removal of this constraint would have a positive impact on growth. Finally, firms selected electricity as the second biggest constraint to their

firms in 2013. At the same time, there is evidence that other issues may also pose significant constraints to firms.

Information pertaining to sector specific interest rates was not available, although Bangladeshi garment firms do pay a higher price for their loans in terms of the large collateral requirement relative to comparator countries.   While many firms are attempting to overcome this constraint by using internal resources, this also appears to be a common practice among competing firms in other countries. Moreover, most garment firms do not identify finance as a major obstacle to their business. The average educational level of a firm's workforce did have a strong contribution to TFP and has been identified as one of the most binding constraints for the sector by the World Bank, the IMF, as well as the garment firms themselves. Microeconomic risks do not appear to be a binding constraint at this time. However, it is clear that firms will need to comply with safety and employee regulations if sectoral grow is to continue in the near to immediate future.

With regards to textiles, the application of the four tests for differential diagnosis provides evidence that electricity is a most binding constraint to growth in the sector.   For example, the shadow price of electricity is high, and there are a number of firms attempting to bypass its negative effects through generator use. Nonetheless, results from the tests for electricity were not as conclusive as those on the garment sector. This may be due to the energy intensity of the textile sector, as firms do not appear to have the same electricity demand as the garment firms.

Upon review of other constraints, there is evidence suggesting that finance and some additional issues with infrastructure may also be a deterrent for investment. The finance IC variables had the second highest percentage contribution to textile firm TFP and there were a large percentage of firms using internal finance for their investments. In addition, a large number of firms identified finance as being a major obstacle to their businesses. At the same time, access to bank loans did not appear to be a constrained and firms that had adequate resources to finance their investments did not experience growth at a substantially higher rate. Finally, the number of days an input sat in inventory provided a large contribution to textile firm TFP, though it is not clear what exactly is driving this figure.

REFERENCES CITED

AB Saha & Co and Marhk & Co. 2013. "Bangladesh Power Development Board Income Statement for the Year Ended June 30, 2013." Retrieved 24 April 2014 from BPDB website.

Ahmed, A. U., and M. M. Q. Mirza. 2000. "Review of Causes and Dimensions of Floods with Particular Reference to Flood '98: National Perspectives." In Perspectives on Flood 1998, eds. Q. K. Ahmad, A. K. A. Chowdhury, S. H. Imam, and M. Sarker, 67-84. Dhaka: University Press Limited.

Ahmed, A.U., Ahmad, K., Chou, V., Hernandez, R., Menon, P., Naeem, F., Naher, F., Quabili, W., Sraboni, E., and Yu, B. (2013). The Status of Food Security in the Feed the Future Zone and Other Regions of Bangladesh: Results from the 2011–2012 Bangladesh Integrated Household Survey. Dhaka, Bangladesh: International Food Policy Research Institute.

Ahsan, Quamrul. "Sate of Cotton and Textile Industry of Bangladesh 2010 and Beyond." Manufacturedbd.com. Website accessed on March 30, 2014.

Ali, Muhammad Mahboob and Islam, Anisul M. (2010). "Macroeconomic Impacts of the Global Financial Crisis on the Bangladesh Economy," *Savings and Development*: 3(34).

Alliance Development Works. 2013. *World Risk Report 2013.* Website, Alliance Development Works, accessed on March 11, 2014.

Aparnaa Somanathan and Iffat Mahmud. April 07, 2008. Multisectoral approaches to addressing malnutrition in Bangladesh: The role of agriculture and microcredit. World Bank SASHD.

Asadullah, Mohammad Niaz and Nazmul Chaudhury. December 2013. "Primary Schooling, Student Learning, and School Quality in Rural Bangladesh." CGD Working Paper 349.

Asia Foundation. 2013. "Labour Migration trends and Patterns: Bangladesh, India, and Nepal 2013."

Asian Development Bank (2010). "The Informal Sector and Informal Employment in Bangladesh Country Report 2010." Manila, Philippines.

Aterido R., Hallward-Driemeier M, and Pagés C. 2009. Big Constraints to Small Firms' Growth? Business Environment and Employment Growth across Firms: Policy Research Working Paper 5032, World Bank

Backer, E., Jain, A., (1981), A clustering performance measure based on fuzzy set decomposition, IEEE Trans. on Pattern Analysis and Machine Intelligence, 3, 66-75

Bangladesh All Party Parliamentary Group (BAPPG). 2013. "After Rana Plaza A report into the readymade garment industry in Bangladesh." House of Commons, Westminster, London, SW1A 0AA.

Bangladesh Bureau of Statistics (2000). Bangladesh Household Income and Expenditure Survey.

Bangladesh Bureau of Statistics (2005). Bangladesh Household Income and Expenditure Survey.

Bangladesh Bureau of Statistics (2010). Bangladesh Household Income and Expenditure Survey.

Bangladesh Bureau of Statistics (2011). "Chapter VI Measurement of Poverty," *Report of the 2010 Household Income and Expenditure Survey*. Government of Bangladesh.

Bangladesh Bureau of Statistics (2013). "Table 1: Gross Domestic Product of Bangladesh at Constant Prices." Retrieved from http://www.bbs.gov.bd/WebTestApplication/userfiles/Image/BBS/GDP_2012_13.pdf.

Bangladesh Bureau of Statistics (BBS). 2012. "2012 Statistical Yearbook." Government of Bangladesh. Dhaka, Bangaldesh.

Bangladesh Ministry of Agriculture (2013). "Bangladesh Agriculture at a Glance." Retrieved from http://www.moa.gov.bd/statistics/bag.htm.

Bangladesh Ministry of Finance. 2013. "Chapter 11: Transport and Communication," from 2013-2014 Budget. Government of Bangladesh. Retrieved 24 April 2014 from Ministry of Finance website.

Bangladesh Power Development Board (BPDB). 2014a. "Power Generation Unites (Fuel Type Wise)." Dhaka: BPDB. Retrieved 24 April 2014 from BPBD website.

Bangladesh Women Chamber of Commerce and Industry. (2008). Building Women in Business: A Situation Analysis of Women Entrepreneurs in Bangladesh. Dhaka, Bangladesh.

Bardhan, P. (1997). Corruption and Development: A Review of Issues.   Journal of Economic Literature 35(September): 1320-1346.

Blanke, Jennifer and Thea Chiesa. 2013. The Travel & Tourism Competitiveness Report 2013: Reducing Barriers to Economic Growth and Job Creation. Geneva: World Economic Forum.

Borensztein, E., De Gregorio, J., and Lee, J-W. 1998. "How does foreign direct investment affect economic growth?" *Journal of International Economics* 45: 115-135.

BPDB. 2012. "Power Consumption Pattern of the Country and BPBD, 2010-11." Retrieved from Statistical Yearbook of Bangladesh 2012. Dhaka: Bangladesh Bureau of Statistics.

BPDB. 2013a. "Bangladesh Power Development Board Annual Report: 2012-2013."

BPDB. 2013b. "Present Installed Generation Capacity (MW) as on November, 2013." Retrieved 24 April 2014 from BPBD website.

Breisinger, C., M. Thomas, and J. Thurlow. 2009. "Social accounting matrices and multiplier analysis: An introduction with exercises." Food Security in Practice technical guide 5. International Food Policy Research Institute. Washington, D.C.

Brunetti, A. G. Kisunko and B. Weder (1997). Credibility of Rules and Economic Growth -
Evidence from a World Wide Private Sector Survey. Policy Research Working Paper No.
1760, The World Bank.

Center for Policy Dialogue (CPD). 2013. Bangladesh Economy in FY2012-13: Second Interim
Review of Macroeconomic Performance. Dhaka: Center for Policy Dialogue.

Chandy, Laurence, Natasha Ledlie and Veronika Penciakova. "The Final Countdown: Prospects
for Ending Extreme Poverty by 2030." Brookings Institution, April 2013.

Cord, Louise, Lopez, J. Humberto and John Page. 2003. ""When I Use a Word…" Pro-Poor
Growth and Poverty Reduction." The World Bank, Washington, D.C.

Cord, Louise, Lopez, J. Humberto and John Page. 2003. ""When I Use a Word…" Pro-Poor
Growth and Poverty Reduction." The World Bank, Washington, D.C.

Dasgupta, Susmita et. al. 2010. "Vulnerability of Bangladesh to Cyclones in a Changing Climate
Potential Damages and Adaptation Costs." The World Bank. Development Research
Group. Environment and Energy Team.

Deaton, Angus. "Price Indexes, Inequality, and the Measurement of World Poverty."
Presidential Address, American Economic Association, 2010

Dhaka Chamber of Commerce & Industry (DCCI). 2009. "Economic Policy Paper on
Tranportation (Air, Land, Water) and Policy Related to Infrastructure and Utilities."
Retrieved 24 April 2014 from DCCI website.

Dhaka Chamber of Commerce (2004). "Economic Policy Paper on Cost of Doing Business in
Bangladesh." Dhaka, Bangladesh.

Dilley et. al. 2005. "Natural Disaster Hotspots A Global Risk Analysis." The World Bank
Hazard Management Unit. Washington, D.C.

Elliot, Kimberly A. (1997). Corruption as an international policy problem: Overview and
recommendations, in Corruption and the Global Economy, Elliot, K.A. ed., Washington
DC: Institute for International Economics, pp. 175-233.

Environmental Performance Index. 2014. A Global Ranking for the Environment. Yale
University. Website, epi.yale.edu, accessed on March 14, 2014.

Escribano, Alvaro, Guasch, J. Luis, de Orte, Manuel and Jorge Pena. 2008. "Investment
Climate and Firm's Economic Performance: Econometric Methodology and Application
to Turkey's Investment Climate Survey." Working Paper 08-21, Economic Series 13.
Universidad Carlos III de Madrid.

Everitt, B. S., S. Landau, M. Leese, and D. Stahl. 2011. *Cluster Analysis*. 5th ed.
Chichester,UK: Wiley

Farole, Thomas and Gokhan Akinci. 2011. "Special Economic Zones: Progress, Emerging
Challenges, and Future Directions." Washington: The World Bank.

Faye et. al. 2004. "The Challenges Facing Landlocked Developing Countries." Journal of Human Development. Volume 5, No. 1, March 2004. Carfax Publishing.

Fisman, R and Vensson S. 2007. Are Corruption and Taxation Really Harmful to Growth? Firm-Level Evidence," *Journal of Development Economics*, May 2007, *83* (1), 63–75.

FPMU, Ministry of Food, June 2013. National Food Policy Plan of Action and Country Investment Plan: Monitoring Report 2013.

George Psacharopoulos and Harry Anthony Patrinos. September 2002. Returns to Investment in Education: A Further Update. World Bank Policy Research Working Paper 2881.

Gimenez, Lea; Ahmed, Faizuddin; Sharif, Iffath; Jolliffe, Dean (2013). *Bangladesh - Poverty Assessment: Assessing a Decade of Progress in Reducing Poverty, 2000-2010.* Bangladesh Development Series; Paper No. 31. Washington DC; World Bank Group.

Government of the People's Republic of Bangladesh (GOB). 2007. *Consolidated Damage and Loss Assessment, Lessons Learnt from the Flood 2007 and Future Action Plan.* Dhaka: Ministry of Food and Disaster Management, GOB.

Government of the People's Republic of Bangladesh (GOB). 2008. *Cyclone Sidr in Bangladesh Damage, Loss and Needs Assessment for Disaster Recovery and Reconstruction.* Dhaka: Ministry of Finance, GOB, and international donors.

Government of the People's Republic of Bangladesh (GOB). 2009. *Bangladesh Climate Change Strategy and Action Plan.* Dhaka: Ministry of Environment and Forests, GOB.

Government of the People's Republic of Bangladesh (GOB). 2014. Geological Survey of Bangladesh. Dhaka: Ministry of Power, Energy and Mineral Resources, Energy and Mineral Resources Division, GOB. GOB Website accessed on March 12, 2014.

Gupta, S., Davoodi, H., Alonse-Terme, R., 1998. Does corruption affect income inequality and poverty? IMF Working Paper, 98/76. International Monetary Fund, Washington, D.C.

Hassan, Md. Riad. 2012. "PPP in Bangladesh: Reality and Prospect," ASA University Review, 6(1): January-June 2012.

Hassan, Mirza. 2013. "Political settlement dynamics in a limited-access order: The case of Bangladesh." ESID Working Paper No. 23. BRAC Development Institute, BRAC University. ISBN: 978-1-908749-21-5.

Hausmann, R, CA Hidalgo, et al. 2014. The Atlas of Economic Complexity. Puritan Press. Cambridge MA.

Hausmann, R, CA Hidalgo, S Bustos, M Coscia, S Chung, J Jimenez, A Simoes, and M Yildirim. 2011. The Atlas of Economic Complexity. Puritan Press. Cambridge MA.

Hausmann, R., J. Hwang, and D. Rodrik. 2007. "What You Export Matters." Journal of Economic growth, 12(1): 1-12.

Hausmann, Ricardo and Bailey Klinger. 2006. "Structural Transformation and Patterns of Comparative Advantage in the Product Space." June 2006. Center for International Development, Kennedy School of Government and Harvard University. Link: IADB.

Hausmann, Ricardo and Bailey Klinger. 2006. "Structural Transformation and Patterns of Comparative Advantage in the Product Space." June 2006. Center for International Development, Kennedy School of Government and Harvard University. Link: IADB.

Hausmann, Ricardo, Klinger, Bailey, and Rodrigo Wagner. 2008. "Doing Growth Diagnostics in Practice: A 'Mindbook.' " CID Working Paper No. 177. Harvard University.

Hoddinott, John, Harold Alderman, Jere R. Behrman, Lawrence Haddad, and Susan Horton. 2013. "The Economic Rationale for Investing in Stunting Reduction." GCC Working Paper Series, GCC 13-08.

Horton, S., (1999). Opportunities for investments in nutrition in low-income Asia, Asian Development Review, 17(1,2), 246–273.

Huntington, S.P. (1968). Political Order in Changing Societies. New Haven: Yale University Press.

Hussain, M. Jami. 2006. "A SAM-Based Multiplier Model to Track Growth-Poverty-Inequality Nexus in Bangladesh." MPRA Paper No. 13517. Munich Personal RePEc Archive.

Hussain, Zahid and Nadeem Rizwan. 2013 Bangladesh Development Update. Washington DC: The World Bank.

Hussain, Zahid and Rizwan, Nadeen (2013). Bangladesh development update. Washington DC: World Bank.

International Labor Organization. 2013. "Bangladesh seeking better employment conditions for better socioeconomic outcomes." Studies on growth with equity. Geneva, Switzerland.

International Monetary Fund (2013). "Staff Report for the 2013 Article IV Consultation and Third Review." November 11, 2013.

International Monetary Fund (2013). Bangladesh: Poverty Reduction Strategy Paper. March 2013; IMF Country Report No. 13/63.

International Monetary Fund (IMF). 2013. "Bangladesh: Staff Report for the 2013 Article IV Consultation and Third Review under the Extended Credit Facility and Request for Modification of Performance Criteria." IMF Country Report No. 13/357.

International Organization for Migration (2010). "The Bangladesh Household Remittance Survey 2009." Conducted by Mitra and Associates. Dhaka, Bangladesh.

James P Grant School of Public Health (JPGSPH) and Helen Keller International (HKI). (2012).

Jamil, Faisal. 2012. "Comparison of Electricity Supply and Tariff Rates in South Asian Countries." The Energy Forum of Sri Lanka.

Kapsos, Steven. 2005. "The employment intensity of growth: Trends and macroeconomic determinants." Employment Trends Unit, Employment Strategy Department. International Labor Office (ILO). Geneva, Switzerland.

Keefer, P. and S. Knack, (1995). Institutions and Economic Performance: Cross-Country Tests using Alternative Institutional Measures.   Economics and Politics 7, 207–227.

Khan S. Toaha K. and Awal M. 2009.*International Technology Management Review*, October 2009, v2, n1.

Khandker, Shahidur; Pitt, Mark; Fuwa, Nobuhiko. 2013. Subsidy to promote girls secondary education : the female stipend program in Bangladesh. enGender Impact : the World Bank's Gender Impact Evaluation Database. Washington DC; World Bank. http://documents.worldbank.org/curated/en/2013/08/18329542/subsidy-promote-girls-secondary-education-female-stipend-program-bangladesh

Khondker, Bazlul H. and Selim Raihan. 2008. "A Social Accounting Matrix for Bangladesh, 2007: Methodology and Results." Dhaka University. Dhaka, Bangladesh.

Khondker, Bazlul H. and Selim Raihan. 2008. "A Social Accounting Matrix for Bangladesh, 2007: Methodology and Results. Dhaka University.

Knack, S and Philip K. 1995. Institutions and Economic Performance: Cross-Country Tests using Alternative Institutional Measures.   Economics and Politics 7, 207–227.

Kobayashi, Shoichi. 2014. "Technical Advisory Services for Feasibility Studies for Economic Zones." Workshop on Draft Final Report of Feasibility Study for Three Proposed Economic Zones. Dhaka: 23 February 2014.

Krishnan, P. (1996), "Family background, education and employment in urban Ethiopia. *Oxford Bulletin of Economics and Statistics*, 58: 167–183.]

Lambsdorff, G. (1999). Corruption in Empirical Research - A Review.   Transparency International Working Paper.

Leff, N.H. (1964). Economic development through bureaucratic corruption.   American Behavioral Scientist, 8(3): 8-14.

Loayza, Norman and Claudio Raddatz. 2006. "The Composition of Growth Matters for Poverty Alleviation." World Bank Research Working Paper 4077, World Bank, Washington, D.C.

Loayza, Norman and Claudio Raddatz. 2006. "The Composition of Growth Matters for Poverty Alleviation." World Bank Research Working Paper 4077, World Bank, Washington, D.C.

Mahaja, Sandeep. 2005. "Sources of Growth and Productivity in Bangladesh." Poverty Reduction and Economic Management Unit, South Asia Region, World Bank.

Masuduzzaman, Mahedi. 2012. "Electricity Consumption and Economic Growth in Bangladesh: Co-integration and Causality Analysis." Research Study Series No. FDRS 02/2013. Dhaka: Ministry of Finance.

Mauro P. 1995. Corruption and growth, Quarterly Journal of Economics, 110, 681-712.

Mauro P. 1996. The Effects of Corruption on Growth, Investment, and Government Expenditure. International Monetary Fund, Working paper No. 98.

McKinsey & Company Apparel, Fashion, and Luxury Practice. 2011. Bangladesh's Ready Made Garments Landscape: The Challenge of Growth. McKinsey & Company.

MIDAS. November 2009. "Women Entrepreneurs in SMEs: Bangladesh Perspective."

Millennium Challenge Corporation. (2013). Liberia Constraints Analysis based on Hausmann, Rodrik, and Velasco (2005), Growth Diagnostics.

Miller and Benjamin.2010.The Economics of Macro Issues. Addison-Wesley, 5th edition.

Ministry of Power, Energy & Mineral Resources. 2013. "Investment Potentials in Power Sector of Bangladesh." Retrieved 24 April 2014 from PowerCell website.

Mishra, Dinesh Kumar and Syed Monowar Hussain. Situation Analysis on Inland Navigation. Ecosystems for Life: A Bangladesh-India Initiative. International Union for Conservation of Nature (IUCN).

Mujeri, Mustafa K. and Tahreen Tahrima Chowdhury. 2013. "Quick Rental Power Plants in Bangladesh: An Economic Appraisal." Bangladesh Institute of Development Studies.

Murphy, Kevin M., Andrei Shleifer, and Robert W. Vishny. 1993. Why Is Rent-Seeking so Costly to Growth? American Economic Review 83(2): 409–14.

Nasirullah, Sayed, Md. Rubayet Mortuza, and Moazzem Hossain. 2011. "Cost-Benefit Analysis for Freight Transportation of Bangladesh." 4th Annual Paper Meet and 1st Civil Engineering Congress, December 22-24, 2011. Dhaka, Bangladesh.

Naznin, S.M. Atia. 2011. "Protecting Intellectual Property Rights in Bangladesh: An Overview." Bangladesh Research Publication Journal. 6(1): 12-21.

Nyenrode Business Universiteit. 2014. ICT Sector Study Bangladesh: Bridging the Gap between Dutch and Bangladeshi ICT sectors. Netherlands-Bangladesh Business Platform.

Parvin, L. et al. (2012). Women Entrepreneurship Development in Bangladesh: What are the challenges ahead? African Journal of Business Management Vol 6(11) pp.3862-3871, 21 March

P. L. S. (1982). Least Squares Quantization in PCM. IEEE Transactions on Information Theory, 28(2), 129–137.

Pritchett, Lant. 2013. A Learning Profile for Bangladesh: Too Darn Flat. CGD blog.http://www.cgdev.org/blog/learning-profile-bangladesh-too-darn-flat

Rabbani, Golam & Md. Solaiman Chowdhury. (2013). "Policies and Institutional Supports for Women Entrepreneurship Development in Bangladesh: Achievements and Challenges."

International Journal of Research in Business and Social Science Vol 2, No 1, 2013
ISSN: 2147-4478.

Rahman J and Yusuf A. 2009. Economic growth in Bangladesh: experience and policy priorities, Paper presented to 2nd BDI Conference, Boston. *See http://www. hks.harvard.edu/fs/drodrik/Growth%20 diagnostics%20papers/Economic%20 growth %20in%20Bangladesh%20-%20experience %20and%20policy%20priorities.pdf.*

Rahman, Jyoti and Asif Yusuf. 2010. "Economic Growth in Bangladesh: Experience and Policy Priorities." Journal of Bangladesh Studies.

Rahman, K.M. Mustafizur. 2012. "Incidence and Severity of Poverty." Pg. 17-37. Decelerated Decline: State of Poverty in Bangladesh. Unnayan Onneshan. Dhaka, Bangladesh.

Rahman, M. et al. (2013) The Role of Banks in Promoting Women Entrepreneurship in Bangladesh, accessed at http://www.bangladesh-bank.org/pub/special/20131104women_entrepr.pdf.

Rahman, M. Mahbubur. n.d. "Intellectual Property Protection in Bangladesh: An Overview." Department of Patents, Designs & Trademarks. Government of Bangladesh.

Rahman, Mustafizur; Bhattacharya, Debapriya; Iqbal, Md Ashiq; Khan, Towfiqul Islam; and Paul, Tapas Kumar (2009). "Global Financial Crisis Discussion Series, Paper1: Bangladesh," Overseas Development Institute.

Rose-Ackerman, S. (1997). The Political Economy of Corruption, In Elliott, K. A. ed. Corruption and the Global Economy, Washington, D. C., Institute for International Economics, pp.31-60.

Schwab, Klaus and Xavier Sala-i-Martin. 2013. Global Competitiveness Report 2013-2014: Full Data Edition. Geneva: World Economic Forum.

Simavi, S. et al. (2010). Gender Dimensions of Investment Climate Reform. Accessed at https://www.wbginvestmentclimate.org/uploads/Gender%20Dimensions%20of%20Investment%20Climate%20Reform.pdf

Simoes AJG and CA Hidalgo. 2011. The Economic Complexity Observatory: An Analytical Tool for Understanding the Dynamics of Economic Development. Workshops at the Twenty-Fifth AAAI Conference on Artificial Intelligence.

Sraboni, E. Quisumbing, A. R. and Ahmed, A. U. (2013). The Women's Empowerment in Agriculture Index: Results from the 2011-2012 Bangladesh Integrated Household Survey. Dhaka, Bangladesh: International Food Policy Research Institute.

Tanzi, V. and H. Davoodi.1997. Corruption, Public Investment, and Growth. International Monetary Fund Working Paper, 97/139.

The Economist. (2013, August 20). Women and property rights: Who owns Bangladesh? Message posted to http://www.economist.com/blogs/banyan/2013/08/women-and-property-rights

The Economist. 2013. "Bangladesh's Clothing Industry: Bursting at the seams." October 26, 2013. Dhaka, Bangladesh. Article accessed March 30, 2014.

Transparency International .2013. Corruption Perception Index 2012. Retrieved February 18, 2014, from, http://www.transparency.org/cpi2012/results

Transparency International-Bangladesh. 2012. Corruption in Service Sectors: National Household Survey 2012.

Treisman, D.(2000). The Causes of Corruption: A Cross-National Study.   Journal of Public Economics 76 (3), 399–457.

U.S. Energy Information Administration (US EIA). 2013. "Overview data for Bangladesh." Retrieved 24 April 2014 from US EIA website.

Uddin, Akand, M. F. and Haque, J. T. 2009. Agrarian transition and livelihoods of the rural poor: The agricultural land market. Publication of Unnayan-Onneshan, The Innovators.

United Nations (2010). United Nations Public Administration Network: Digitalizing Land Registration in Bangladesh. Retrieved March 30, 2014, from *http://www.unpan.org/PublicAdministrationNews/tabid/115/mctl/ArticleView/ModuleID/1467/articleId/23326/Default.aspx*

United Nations Conference on Trade and Development (UNCTAD). 2013. Investment Policy Review: Bangladesh. New York: United Nations.

United Nations Conference on Trade and Development. 2013. "Bangladesh Sector-specific Investment Strategy and Action Plan." September, 2013.

United Nations Development Program (2013). Human Development Report 2013. The Rise of the South: Human Progress in a Diverse World. New York, NY.

United Nations Development Programme (UNDP). 2004. *A Global Report: Reducing Disaster Risk: A Challenge for Development.* New York: UNDP Bureau for Crisis Prevention and Recovery.

United Nations. Gender Aspects of Migration in Asia Factsheet. United Nations Entity for Gender Equality and the Empowerment of Women.

United States Energy Information Administration. 2013. Bangladesh Country Analysis Note. Updated: August 2013. Website, EIA.gov, accessed on March 11, 2014.

Wallace, T. (2013, August 28). Property Rights and Women's Economic Participation in Bangladesh. Message posted to http://www.cipe.org/blog/2013/08/28/property-rights-and-womens-economic-participation-in-bangladesh/comment-page-1/#.Uv1MmvldVzc

Wei S. 1997. How Taxing is Corruption on International Investors: National Bureau of Economic Research Working Paper 6030

Weil, David N. ACCOUNTING FOR THE EFFECT OF HEALTH ON ECONOMIC GROWTH. The Quarterly Journal of Economics, August 2007.

Wheeler, David. 2011. "Quantifying Vulnerability to Climate Change: Implications for Adaptation Assistance." Working Paper 240. Center for Global Development.

World Bank (2008). *World Development Report 2009: Reshaping Economic Geography.* Washington, D.C.: World Bank.

World Bank (2011). *The Cost of Adapting to Extreme Weather Events in a Changing Climate.* Bangladesh Development Series Paper No. 28. World Bank: Office Dhaka.

World Bank (2012). "Bangladesh: Towards Accelerated, Inclusive and Sustainable Growth – Opportunities and Challenges. Volume II: Main Report." June, 2012. Report No. 67991.

World Bank (2012). *Turn Down the Heat Why a 4° Warmer World Must be Avoided.* World Bank: Washington, D.C.

World Bank (2013). World Bank World Development Indicators. World Bank: Washington, D.C. Accessed on March 14, 2014.

World Bank (2013a). 'PovCalNet: The on-line tool for poverty measurement developed by the Development Research Group of the World Bank.' Accessed at http://iresearch.worldbank.org/povcalnet/.

World Bank (2013b). "Bangladesh Development Update." October, 2013. Report No. 81347. Washington, D.C.

World Bank (2013c). World Bank Group – Bangladesh: country program snapshot. Washington DC, World Bank.

World Bank, South Asia Region. October 2013b. An Assessment of Skills in the Formal Sector Labor Market in Bangladesh. Discussion Paper Series, Report No. 64.

World Bank, South Asia Region. September 2013a. Bangladesh Education Sector Review. Report No. 80613-BD.

World Bank. (2007). Bangladesh: Strategy For Sustained Growth. Bangladesh Development Series, World Bank Office, Dhaka

World Bank. (2008). Harnessing competitiveness for stronger inclusive growth: Bangladesh Second Investment Climate Assessment.

World Bank. (2013). Women, Business and the Law 2014.

World Bank. (2014). World Bank Logistics Performance Index: LPI Results 2010. World Bank, Washington, D.C. Website, lpi.workbank.org, accessed on March 16, 2014.

World Bank. 2009. "Bangladesh: Transport Policy Note." Transport Unit, Sustainable Development Department, South Asia Region, World Bank.

World Bank. 2012. "Consolidating and Accelerating Exports in Bangladesh." Bangladesh Development Series. Paper No. 29. Document 70845. World Bank: Washington, D.C.

World Bank. 2012. Bangladesh: Towards Accelerated, Inclusive and Sustainable Growth – Opportunities and Challenges, Volumes I & II. Report No. 67991. Poverty Reduction and Economic Management Sector Unit, South Asia Region, World Bank.

World Bank. 2012. Main Report. Vol. 2 of Bangladesh Towards accelerated, inclusive and sustainable growth: opportunities and challenges. Washington, D.C.: World Bank.

World Bank. 2012. Worldwide Governance Indicators (WGI) project 1996-2012. Retrieved December 12, 2013, from http://data.worldbank.org/data-catalog/worldwide-governance-indicators.

World Bank. 2012b. "Domestic LPI, Environment and Institutions: Bangladesh 2012." Logistics Performance Index. Retrieved 24 April 2014 from World Bank website.

World Bank. 2013. Enterprise Surveys. Retrieved February 18, 2014, from http://data.worldbank.org/data-catalog/enterprise-surveys.

World Bank. 2014a. World Development Indicators 2014. Washington DC: The World Bank.

World Bank. 2014b. "Project Information Document (PID) Concept Stage: Bangladesh Trade and Transport Studies PETF Project." Report No. 84373. Washington DC: The World Bank.

World Economic Forum. 2013.The Global Competitiveness Report 2013–2014. Retrieved February 18, 2014, from http://www3.weforum.org/docs/GCR2013-14/Bangladesh.pdf

World Intellectual Property Organization (WIPO). 2009. "Bangladesh: Country Paper." Website accessed on 12 March 2014.

Wu, X., 2005. Firm Accounting Practices, Accounting Reforms and Corruption in Asia. Policy and Society, 24 (3), 53-78

Yoshida, Nobuo, Hiroki Uematsu, and Carlos E. Sobrado. "Is Extreme Poverty Going to End? An Analytical Framework to Evaluate Progress in Ending Extreme Poverty." World Bank Policy Research Working Paper, January 2014.

ANNEX 1: CLUSTER ANALYSIS

In preparation of the Bangladesh Inclusive Growth Diagnostic, the team utilized a K-means cluster analysis on publicly available economic data from the World Bank to semi-automate the process of comparator country selection. Eight World Development Indicators (WDIs) in the areas of population, poverty, trade, investments, remittances, and per capita income were compared across countries and chosen based on their ability to capture characteristics of the Bangladeshi economy that would be desirable to have present in comparators in order to make meaningful evaluations regarding differences in economic performance and constraint indicators across countries. While the selection of indicators should always be specific to the needs of the particular analysis since the type of indicators selected will have a drastic effect on the groups formed by the K-means analysis, the general methods applied within this analysis may be generalized for future growth diagnostics.

In the analysis described below, the world's countries were clustered over a 13-year timespan from the year 2000 to 2012 to identify countries with generally similar characteristics to Bangladesh (based on the specific WDI areas discussed above).

Cluster Analysis Methodology and Data

The K-means algorithm builds upon the sum-of-squares (SSQ) criterion. Given a set of observations ($\mathbf{x}_1$, $\mathbf{x}_2$, …, $\mathbf{x}_n$), where each observation is a d-dimensional real vector, k-means clustering aims to partition the n observations into k sets ($k \leq n$) $\mathbf{S} = \{S_1, S_2, …, S_k\}$ so as to minimize the within-cluster sum of squares (WCSS)

$$ J = \sum_{i=1}^{k} \sum_{\mathbf{x}_j \in S_i} \| \mathbf{x}_j - \boldsymbol{\mu}_i \|^2 $$

where $\boldsymbol{\mu}_i$ is the mean of points in S_i. (P.L.S., 1982).

The algorithm attempts to find the K-means of a dataset, where K is the number of clusters to be found. Once the number of groups, K, has been specified, each observation is assigned to a cluster for which its distance to the cluster's mean is the smallest (Everitt, Landau, and Stahl, 2011). The algorithm begins by randomly calculating an initial set of means, classifying each observation based on its distance to these temporary centers. Once each observation has been classified, the new cluster means are calculated and all other observations are reclassified based on the new set of means in the K clusters. This is repeated until the cluster means no longer change. The final cluster means are then calculated and all observations grouped into their permanent clusters.

The analysis conducted for Bangladesh follows a non-predictive model designed to locate and group observations (countries) which harbor similar attributes (WDI values). While the purpose of the analysis was to make the comparator country selection as objective as possible, this type of clustering of course retains some subjectivity. In general terms, a group of countries has been split up into a number of more or less homogeneous sub-groups on the basis of subjectively

chosen measures of similarity (i.e. WDIs chosen based on their ability to create "comparable" countries for this analysis) (Backer and Jain, 1981).

The analysis utilized the eight variables covering population, poverty, trade, investments, remittances, and per capita income, drawn from the WDIs. While it would have been interesting to include non-WDI indicators such as cultural or geographic variables, the nature of the K-means analysis makes it difficult to operationalize such variables. Early attempts to standardize and include the variables generated results which were inappropriate for the IGD (e.g. nonsensical country groupings of very dissimilar countries). Thus, only the WDIs covering the topics above were used for the analysis.

Choosing the number of groupings, K, was the most challenging task in this cluster analysis, and unfortunately, there seems to be no definite solution amongst scholars as to how to overcome this problem. In general, clustering data into groups without knowing the true number of groups within the dataset bears the risk of needlessly subdividing natural groups and/or inappropriately grouping distinct groups into a single cluster. This often generates comparator country clusters which are incompatible upon inspection; this problem can, however, be mitigated to a certain extent by running multiple analyses using different K values. In the Bangladesh analysis, countries which remained in constant groupings after 30 rounds were kept while countries which moved between groups were removed.

The analysis conducted here differs from the typical K-means application used for locating distinct groups within a larger group of globular data as the purpose of the presented analysis is to discover which countries are similar to Bangladesh rather than the natural number of distinct groups. Even if no distinct groups can be found within the dataset, the K-means algorithm will sub-cluster the data based on the greatest detected differences between the data points.

A challenge in the analysis was choosing the appropriate technique of normalizing the data, by transforming the data into percentages or using z-scores. With the first technique, when normalizing the data by transforming each observation into a percentage of the largest observation of that variable, outliers are problematic. If the indicators differ greatly in absolute values (e.g. GDP per capita), the generated normalized percentages will reflect this difference. As a consequence, a great number of observations will be on the extreme fringe. In the K-means analysis, variables with very large values impact the analysis more than variables that have smaller values. This is because the algorithm usually selects large values as initial cluster centers and then groups nearby by observations accordingly. As a result, countries with very large percentage values will be grouped normally, while countries with small values may be grouped inappropriately. The second method of normalizing the data by using z-scores with a mean of 0 and a standard deviation of 1 bears the risk of losing directional information associated with the score.

Since the degrees of the negative effects connected with the two normalizing techniques were unknown, the standard deviation and the simple percentage normalization were applied separately in two individual analyses. The results did not differ significantly.

Following the normalization, a K-means cluster analysis was conducted that compared all countries to Bangladesh between the years 2000 and 2012. This analysis was repeated 30 times

and performed for all possible K-groups in an effort to identify stable clusters. K values between 15 and 18 produced consistently stable clusters with very little variation in the groupings. K values under 15 produced cluster groups that were too large for a meaningful shortlist and K values over 18 produced non-consistent groupings that were too small.

Results

Below are two K-means analyses at cluster groupings of K=18. The table illustrated the shortlists of countries which were generated following 30 rounds of clustering the z-scored data (cluster A) and the percentage-normalized data (cluster B). The third column displays the list of comparative countries used in a 2009 growth diagnostics for Bangladesh. Two countries that appear in both cluster analyses as well as the 2009 diagnostic are Pakistan and the Philippines. Egypt, Indonesia, Nigeria, Thailand, and Vietnam were selected in the 2009 study but were not identified in the present cluster analysis, while Sri Lanka appeared as a result in both cluster analyses but was not used in 2009 study.

Figure A1.1 K-Mean Cluster Results using Average WDI Values, 2000-2012

Cluster Result A (z-scored data, K-value =18)	Cluster Result B (percentage-normalized data, K-value =18)	Comparator Countries Used in Previous Bangladesh Studies
Philippines	Pakistan	Pakistan
Turkey	Philippines	Philippines
Djibouti	Bangladesh	Thailand
Bangladesh	Morocco	Egypt
Pakistan	Nepal	Indonesia
Sri Lanka	Cambodia	Nigeria
	Sri Lanka	Vietnam
		India

Source: WDI; author calculations

This short list of comparator countries identified in the cluster analysis was then examined with an eye towards poverty data and trends as well as comparator countries used previously in similar studies.   As a result of these efforts and further consultations with in-country experts, the following comparator countries were selected for the Bangladesh growth diagnostic: Cambodia, India, Nepal, Pakistan, the Philippines, and Sri Lanka.

ANNEX 2: GROWTH ACCOUNTING

As discussed in chapter 2 of this report, growth accounting provides insight on what portion of GDP growth is derived from capital stock, labor, human capital per worker, and total factor productivity (TFP). Specifically, this method of analysis takes information regarding growth of factor inputs (capital, labor, and human capital) and determines what portion of a country's overall GDP growth comes from each factor. Any residual GDP growth is left after this decomposition is taken to represent increases in productivity, called TFP.

There are a number of different methods for conducting a growth accounting analysis, including simple growth accounting based on the Solow model (which contains only labor and capital as factor inputs), growth accounting with human capital (which as its name suggests includes human capital as a third factor input), and growth accounting adjusted for employment and labor participation rates (which adjusts both the human capital and labor factor inputs by these rates in order to obtain a more accurate decomposition).

The analysis for this report uses the second method listed above, which incorporates human capital. The results were obtained by means of a growth accounting Excel model created by the World Bank's Economic Policy and Debt Department, which contains documentation that is the source of many of these methodological details. Unless otherwise noted below, data used in the model came from the World Bank WDI, with schooling data information coming from Barro and Lee.

Growth accounting with human capital utilizes the following production equation for GDP:

$$Y_t = A_t K_t^{\propto} H_t^{1-\propto}, \text{ with}$$

$$H_t = h_t L_t, \text{ and}$$

$$h_t = \exp(\emptyset S_t)$$

where Y_t = GDP in year t, A_t = Total factor productivity in year t, K_t = Capital stock in year t, α = Income share of capital, L_t = Labor force (Population 15+) in year t, H_t = Estimated human capital in year t, h_t = Estimated level of human capital per unit of labor input in year t, ϕ = Return to education, and S_t = Average years of schooling in year t.

The portion of TFP that contributes to overall GDP growth is calculated as a residual:

$$\Delta \ln A_t = \Delta \ln Y_t - \alpha \Delta \ln K_t - (1-\alpha)\Delta \ln L_t - (1-\alpha)[\phi \Delta S_t]$$

The return to education parameter is an average of estimates by Claudio E. Montenegro and Harry Anthony Patrinos for a forthcoming working paper. The growth accounting analysis was repeated for a variety of income shares of capital, and only the results that persisted across these iterations were discussed in the report.[86]

---

[86] The graphs in the chapter show the results when the income share of capital was taken to be 40%.

To calculate the capital stock variable, K_t, we used the iterative "perpetual inventory method" shown below:

$$K_t = (1 - \delta)K_{t-1} + I_t$$

where t = Year 1, 2, 3, ... , n, δ = Assumed depreciation rate for generating capital stock series for the entire period, and I_t = Gross fixed capital formation in year t.

The perpetual inventory method requires knowing the initial capital stock for the period in question. In order to calculate the initial capital stock for Bangladesh and the selected comparator countries, we used the earliest observation of growth fixed capital formation in the data over the time periods of interest (both 1980-2012 and 2000-2012) and applied it to the following formula:

$$K_0 = I_0/(g + \delta)$$

where I_0 = Gross fixed capital formation, g = "steady-state" growth rate of output, and δ = Assumed rate of depreciation of capital.

The assumed depreciation rate of capital was calculated by averaging Penn World Table 8.0 data on the deprecation rate of total capital stock over the time period of interest (again, both 1980-2012 and 2000-2012).

ANNEX 3: PRODUCT SPACE ANALYSIS

Methodology

The product space methodology is driven by the notion that a production activity with a natural comparative advantage can be identified by examining current production activities within an economy. These activities exist due to the establishment of networks and specific inputs, including infrastructure, human capital, and other essential resources. In theory, production activities using similar inputs show great potential for future growth while activities using dissimilar inputs demonstrate less potential. Hausmann and Klinger (2006) developed a method for measuring the distance between production activities in what is known as a product space. This methodology has been adapted to produce this product space analysis for Bangladesh.

A country has a comparative advantage in a commodity when it is able to produce a good at a lower opportunity cost than its competitors (i.e. other countries). This relationship is captured by the equation for the Balassa revealed comparative advantage (RCA) index:

$$Balassa\ RCA\ Index = \frac{xval_{c,i,t}/\sum_c xval_{c,i,t}}{\sum_c xval_{c,i,t}/\sum_i \sum_c xval_{c,i,t}}$$

Where $xval_{c,i,t}$ is country c's export of commodity i at time t. The numerator captures the share of the commodity in the country's total export basket, while the denominator is the share of the commodity in total world exports. To illustrate this point, consider a country that exports coffee. If the share of coffee exports is .05 of total domestic exports, and coffee represents .04 of all world exports, then the country has an RCA of 1.25 in coffee (Note: for the IGD analysis the team looked at RCA trends in products over the past 10 to 20 years).

Using the notion of revealed comparative advantage, Hausmann and Klinger use three measurements – PRODY, EXPY and density – to conduct the product space analysis. PRODY is defined as the average income per capita of countries that have a comparative advantage in a product, as weighted by the respective country's RCA value for the commodity. Higher PRODY values represent more sophisticated products, such as chemicals, while lower PRODY values are indicative of less sophisticated products like agricultural goods. Highly industrialized countries typically export more sophisticated goods compared to countries at lower stages of development.

EXPY is the weighted average of PRODY values for products a country exports, thereby measuring the income level associated with an individual country's export basket. A country can increase its EXPY value by diversifying into products that have a higher PRODY or by increasing the export share of products that have a high PRODY value. The equation to estimate EXPY values is provided below:

$$EXPY_{ct} = \sum_i \left[\frac{xval_{c,i,t}}{\sum xval_{c,i,t}}\right] PRODY_{i,t}$$

A measurement referred to as density is used to estimate a country's potential ability to start producing a new commodity. In order to make this calculation, there needs to be a determination as to how current export activities are related to the export products under investigation. According to Hausmann and Klinger, density "is the sum of all paths leading to the product in which the country is present, scaled by the total number of paths leading to that product" (2006). Density values range from 0 to 1, with higher values representative of a potential comparative advantage for the product. Lower values are indicative of low-growth potential for the product. The equation for the density calculation is provided below:

$$density_{i,c,t} = \frac{\sum_k \varphi_{i,k,t} x_{c,k,t}}{\sum_k \varphi_{i,k,t}}$$

With the overall goal of selecting products with short- to medium-term growth potential, this analysis is focused on high-value activities that are not currently undertaken yet close to ongoing production activities. To accomplish this objective, two steps are necessary. First, products with a high relative value are identified by comparing their PRODY to the average EXPY value of a country. Second, production activities that are close to current activities are identified through the density measurement.

Summary Findings from the Product Space Analysis for Bangladesh

Bangladesh's EXPY value – the weighted average of PRODY values of products in its export basket – has increased by 52%, from $5,400 in 1980 to $8,195 in 2010 (Figure A3.1). Despite this long-term growth, the country has averaged slightly negative growth since 1992 when its EXPY value was $8,317. This provides additional evidence of Bangladesh's continued specialization in export activities that are low in value and less sophisticated than many exporters.

Figure A3.1: EXPY Values in Bangladesh and Comparator Countries, 1980 – 2010
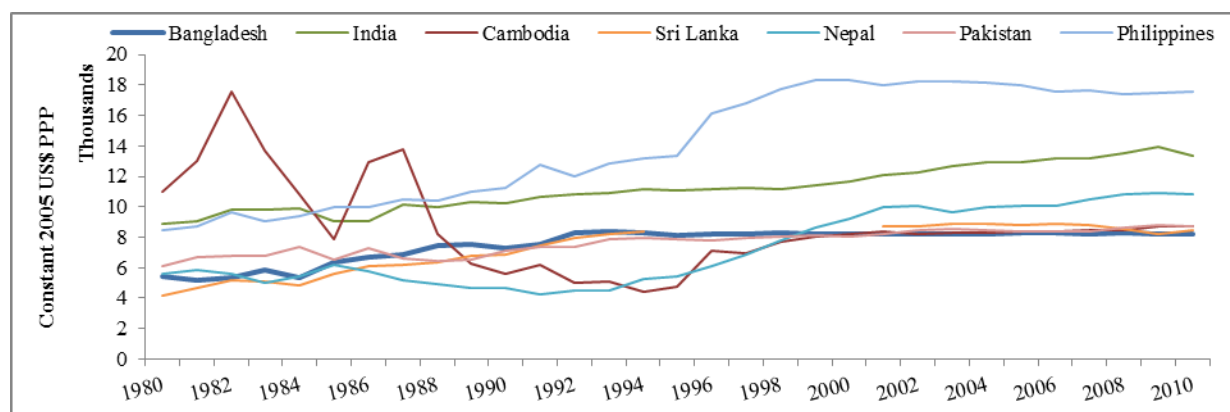
Source: Comtrade

In 2010, the Philippines and India had the highest average EXPY values among the comparators at $17,572 and $13,318, respectively. In 2010, Bangladesh had similar EXPY values to Sri Lanka ($8,447), Cambodia ($8,753), and Pakistan ($8,753), meaning the value of the export

baskets for each of these countries is fairly similar. From 2000 to 2010, the comparators with the highest average annual growth in their EXPY include Nepal (2.3%), India (1.5%), and Cambodia (0.8%). During this same period, Bangladesh's EXPY value experienced negative growth by annual average of -0.03%.

The Product Space – Potential Areas for Growth

Using the concepts of PRODY, EXPY and density, it is possible to map out potential growth activities for Bangladesh. Figure A3.2 provides this graphical representation or "open forest" – a comparison of the value of all exportable products where Bangladesh does not currently have a comparative advantage relative to its current exports. Positive values situated along the vertical axis are indicative of export products that have a greater value than Bangladesh's average EXPY ($8,242) from 2006 to 2009. Values along the horizontal axis represent the inverse density values of each export. Products closer to zero are similar to exports where Bangladesh had a revealed comparative advantage from 2006 to 2009, while values farther away from zero are far from production activities.

Figure A3.2: The Open Forest of the Bangladesh Product Space, 2005 – 2009 Averages
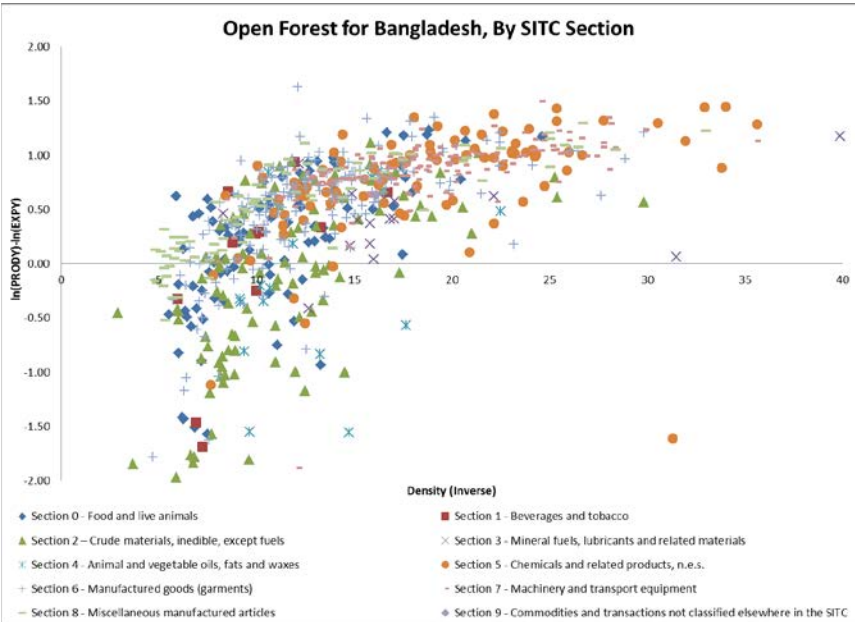
Source: Comtrade

It is apparent from Figure A3.2 that many of these potential production activities are closely associated with apparel and clothing exports, which can be expected from the country's current concentration in the garment industry. At the same time, products requiring higher levels of sophistication (e.g. chemicals) are further away from current production activities.

Several cutoff points have been determined within the product space dataset in order to identify production activities that are high in value and closer to current activities. For example, products are considered to have a high value if its PRODY value is greater than Bangladeshi's EXPY value. Similarly, the team has decided to classify nearby products as those with an inverse value

171

less than 10. It should be noted that selecting a concrete inverse value will differ from country to country.

The product space or "nearby forest" represented in Figure A3.3 further clarifies the production areas that have higher potential for growth: miscellaneous manufactured articles; food and live animals; crude materials; and garments.

Figure A3.3:   The Nearby Forest of the Bangladesh Product Space, 2005-2009 Averages
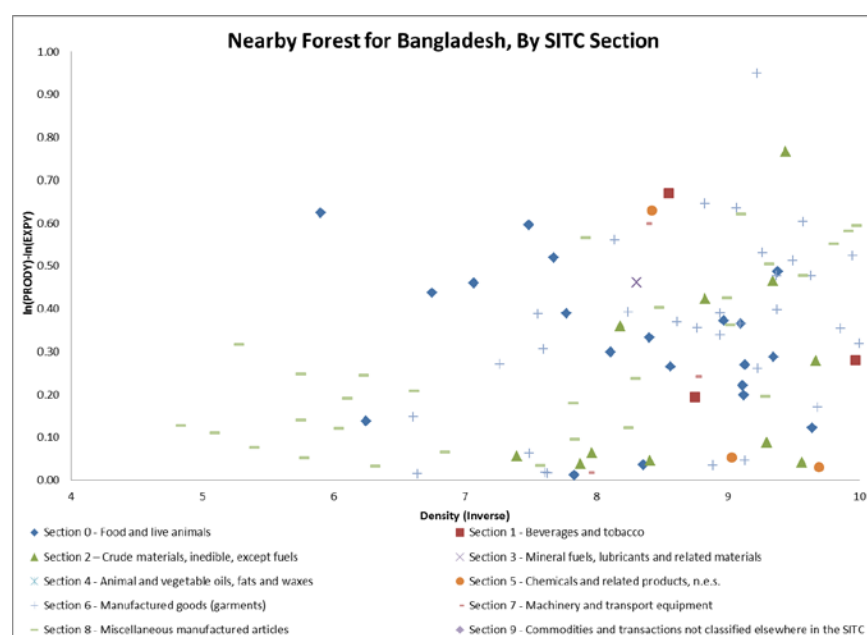
Source: Comtrade

While graphical representations of both the open and nearby forests provide a good visual overview of production activities that show the greatest near-term growth potential, further investigation is needed to identify tradable products at the SITC 2 and 4-digit levels. Once again, this is done by isolating within the product space dataset products with positive PRODY values and densities less than 10.

Table A3.1 provides a summary list of products within the nearby forest, which are ranked by the number of times the SITC 2-digit division appears in the nearby forest. The SITC 2-digit division with the greatest number of sub-groups (SITC-4) is textile yarn and fabrics (16 products), followed by articles of apparel and clothing accessories (15), miscellaneous manufactured articles (8), and vegetables and fruits (7). Meanwhile, sugar, fertilizer, and apparel products have the greatest percentage of SITC-4 sub-groups within the nearby forest. In terms of value (i.e. ln(PRODY) – ln(EXPY)) the SITC-2 division tobacco, iron and steel and furniture products have the highest average value among each of their sub-groups, while ores and metal scraps, hides and fur skins, and cereals have the lowest average value. The nearest SITC-2 divisions to current exports are apparel and clothing, footwear, and fish.

172

Table A3.1: SITC-2 Products with Positive PRODY and Densities less than 10

SITC-2 Division Code	SITC-2 Division Description	Number of Sub-groups at the SITC-4 level	% of All SITC-4 Sub-groups represented	Average Value of Sub-group: ln(PRODY)-ln(EXPY)	Avg. Inverse Density (lower value = strong relationship to current activites)
65	Textile yarn, fabrics, made-up articles, n.e.s., and related products	16	7%	0.3	8.3
84	Articles of apparel and clothing accessories	15	16%	0.1	6.2
89	Miscellaneous manufactured articles, n.e.s.	8	6%	0.4	8.7
5	Vegetables and fruit	7	8%	0.3	8.9
66	Non-metallic mineral manufactures, n.e.s.	6	6%	0.4	9.2
3	Fish (not marine mammals), crustaceans, molluscs, etc.	5	11%	0.5	6.7
27	Crude fertilizers and crude minerals (excluding coal, petroleum and precious stones)	4	9%	0.2	8.7
6	Sugars, sugar preparations and honey	3	18%	0.2	8.6
56	Fertilizers (other than those of group 272)	3	16%	0.2	9.0
82	Furniture and parts thereof	3	13%	0.6	9.9
4	Cereals and cereal preparations	2	6%	0.1	8.2
9	Miscellaneous edible products and preparations	2	11%	0.4	9.2
11	Beverages	2	15%	0.2	9.4
24	Cork and wood	2	11%	0.4	8.7
28	Metalliferous ores and metal scrap	2	5%	0.1	8.2
63	Cork and wood manufactures (excluding furniture)	2	7%	0.4	9.7
64	Paper, paperboard and articles of paper pulp, of paper or of paperboard	2	3%	0.4	8.2
69	Manufactures of metals, n.e.s.	2	2%	0.2	8.9
77	Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof	2	2%	0.3	8.2
8	Feeding stuff for animals (not including unmilled cereals)	1	4%	0.5	7.7
12	Tobacco and tobacco manufactures	1	13%	0.7	8.5
21	Hides, skins and furskins, raw	1	9%	0.1	9.3
26	Textile fibres (other than wool tops and other combed wool) and their wastes	1	2%	0.5	9.3
29	Crude animal and vegetable materials, n.e.s.	1	3%	0.4	8.8
33	Petroleum, petroleum products and related materials	1	7%	0.5	8.3
61	Leather, leather manufactures, n.e.s., and dressed furskins	1	5%	0.5	9.6
67	Iron and steel	1	1%	0.6	9.6
68	Non-ferrous metals	1	2%	0.4	9.1
78	Road vehicles (including air-cushion vehicles)	1	3%	0.2	8.8
81	Prefabricated buildings; sanitary plumbing, heating and lighting fixtures and fittings	1	6%	0.4	9.0
83	Travel goods, handbags and similar containers	1	11%	0.4	9.0
85	Footwear	1	6%	0.2	6.6

Source: Comtrade

Investigation of exports at the SITC 4-digit level provides more detailed information as to the likelihood of Bangladesh expanding into specific production activities. Table A3.2, a representation of export activities ordered by proximity to current activities, clearly demonstrates the greater likelihood that the country will jump to low-value activities, primarily related to garments and textiles, at least in the short- to medium-term. At the same time, there are several other areas where there is high growth potential. Certain seafood and fish products have high PRODY values and are located near ongoing exports (i.e. low inverse density values). There are certain manufacturing activities, including the manufacture of ropes and cables, and book materials, which also have strong potential. All remaining production activities in the nearby forest with a density value less than 8 are provided in Table A3.2.
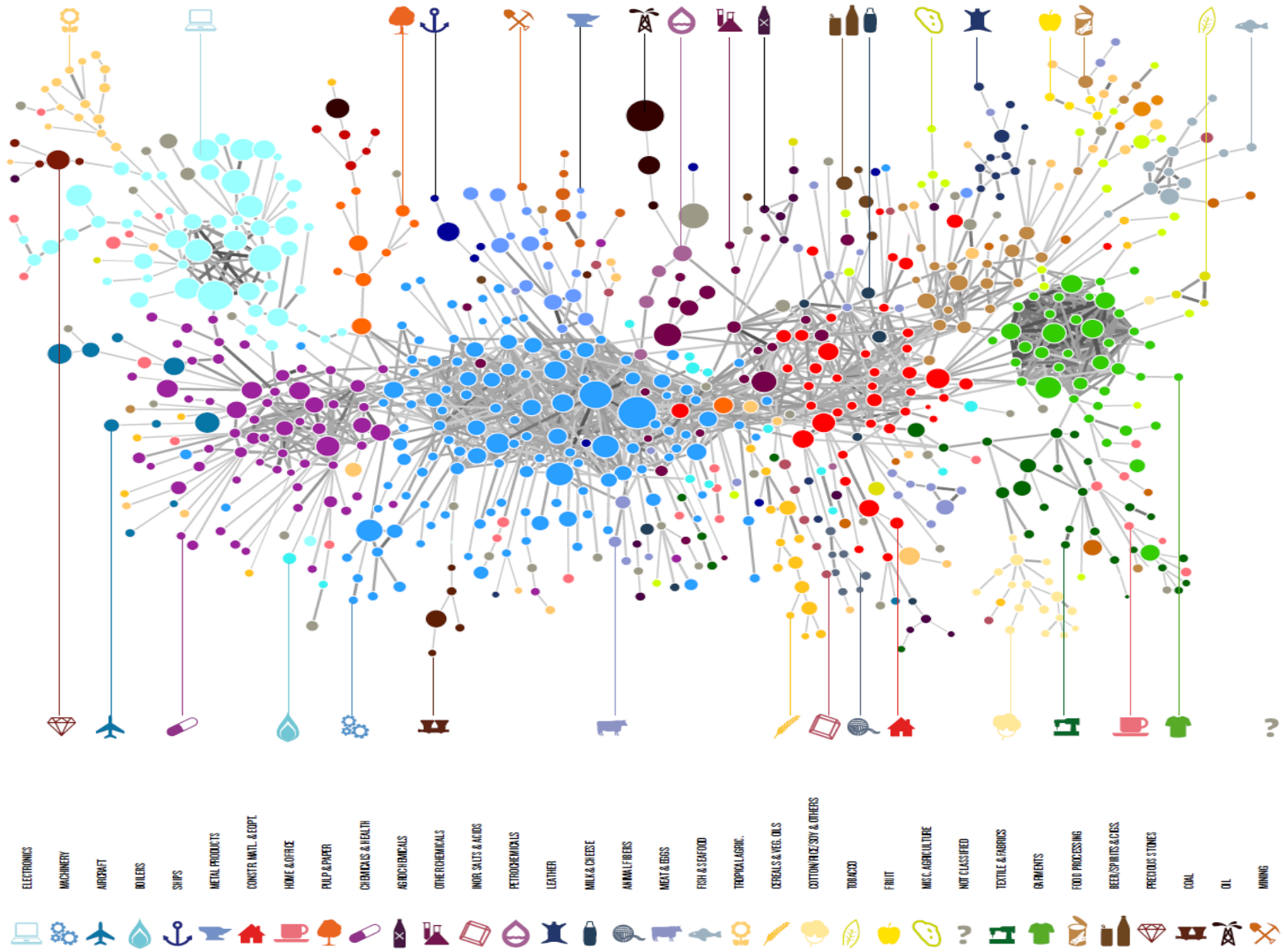
Table A3.2:   SITC-4 Products with Densities less than 8.0

Code-SITC - 4 digit	SITC 4 Digit Description	PRODY Value 2005-2009 (Constant 2005 US$, PPP)*	ln(PRODY) - ln(EXPY)	Inverse Density (lower value = strong relationship to current activites)
8459	Outerwear knitted or crocheted, not elastic nor rubberized; other, clothing accessories, non-elastic, knitted or crocheted	9,377	0.1	4.84
8439	Womens, girls, infants outerwear, textile, not knitted or crocheted; other outer garments of textile fabrics, not knitted, crocheted	9,224	0.1	5.09
8452	Outerwear knitted or crocheted, not elastic nor rubberized; womens, girls, infants, suits, dresses, etc, knitted, crocheted	11,344	0.3	5.28
8429	Men's and boys' outerwear, textile fabrics not knitted or crocheted; other outer garments	8,919	0.1	5.39
8421	Men's and boys' outerwear, textile fabrics not knitted or crocheted; overcoats and other coats	9,497	0.1	5.75
8424	Men's and boys' outerwear, textile fabrics not knitted or crocheted; jackets, blazers and the like	10,575	0.2	5.75
8433	Womens, girls, infants outerwear, textile, not knitted or crocheted; dresses	8,704	0.1	5.77
350	Fish, dried, salted or in brine; smoked fish	15,416	0.6	5.90
8465	Corsets, garters, etc, not knitted or crocheted, elastic or not	9,312	0.1	6.04
8431	Womens, girls, infants outerwear, textile, not knitted or crocheted; coats and jackets	10,003	0.2	6.10
8422	Men's and boys' outerwear, textile fabrics not knitted or crocheted; suits	10,547	0.2	6.23
341	Fish, fresh or chilled, excluding fillet	9,475	0.1	6.24
8472	Clothing accessories, knitted or crocheted, nes	8,528	0.0	6.32
6575	Twine, cordage, ropes and cables and manufactures thereof	9,562	0.1	6.60
8510	Footwear	10,165	0.2	6.61
6589	Other made-up articles of textile materials, nes	8,383	0.0	6.64
371	Fish, prepared or preserved, nes	12,778	0.4	6.75
8484	Headgear and fitting thereof, nes	8,818	0.1	6.84
344	Fish fillets, frozen	13,080	0.5	7.06
6522	Cotton fabrics, woven, bleached, dyed, etc, or otherwise finished	10,826	0.3	7.26
2731	Building and monumental (dimension) stone, roughly squared, split	8,732	0.1	7.39
372	Crustaceans and molluscs, prepared or prepared, nes	14,971	0.6	7.48
6576	Hat shapes, hat-forms, hat bodies and hoods	8,792	0.1	7.49
6423	Registers, exercise books, file and book covers, etc, of paper	12,166	0.4	7.55
8481	Articles of apparel, clothing accessories of leather	8,546	0.0	7.57
6582	Tarpaulins, sails, tents, camping goods, etc, of textile fabrics	11,218	0.3	7.60
6534	Fabrics, woven, less 85% of discontinuous synthetic fibres	8,397	0.0	7.61
6583	Travelling rugs, blankets (non electric), not knitted or crocheted	8,393	0.0	7.63
814	Flours and meals, of meat, fish,etc, unfit for human; greaves	13,874	0.5	7.67
589	Fruit prepared or preserved, nes	12,189	0.4	7.77
8997	Basketwork, wickerwork; brooms, paint rollers, etc	9,888	0.2	7.82
460	Meal and flour of wheat and flour of meslin	8,351	0.0	7.83
8999	Manufactured goods, nes	9,087	0.1	7.84
2450	Fuel wood and wood charcoal	8,583	0.0	7.88
8993	Candles, matches, combustible products, etc	14,548	0.6	7.92
7731	Insulated electric wire, cable, bars, etc	8,404	0.0	7.94
2882	Other non-ferrous base metal waste and scrap, nes	8,798	0.1	7.96

Source: Comtrade

The rest of the annex provides the maps of the general product space (i.e. a map of the relative nearness of all exports in the SITC catalogue), as well as the product spaces of Bangladesh and its comparator countries chosen for this analysis. These product space maps have been completed for the years 1980, 1990, 2000, and 2010 in order to show how each country's export basket has changed over time. Each of these maps was completed using MIT Media Lab's Observatory of Economic Complexity website.

The Product Space

ELECTRONICS · MACHINERY · AIRCRAFT · BOILERS · SHIPS · METAL PRODUCTS · CONSTR. MATL. & EQPT. · HOME & OFFICE · PULP & PAPER · CHEMICALS & HEALTH · AGROCHEMICALS · OTHER CHEMICALS · INOR. SALTS & ACIDS · PETROCHEMICALS · LEATHER · MILK & CHEESE · ANIMAL FIBERS · MEAT & EGGS · FISH & SEAFOOD · TROPICAL AGRIC. · CEREALS & VEG. OILS · COTTON/RICE/SOY & OTHERS · TOBACCO · FRUIT · MISC. AGRICULTURE · NOT CLASSIFIED · TEXTILE & FABRICS · GARMENTS · FOOD PROCESSING · BEER/SPIRITS & C'RES · PRECIOUS STONES · COAL · OIL · MINING

Bangladesh Product Space 1980 - 2010

Total Value: $18,130,589,879

2010

Total Value: $540,906,000

Total Value: $1,477,805,017

Total Value: $5,860,554,209
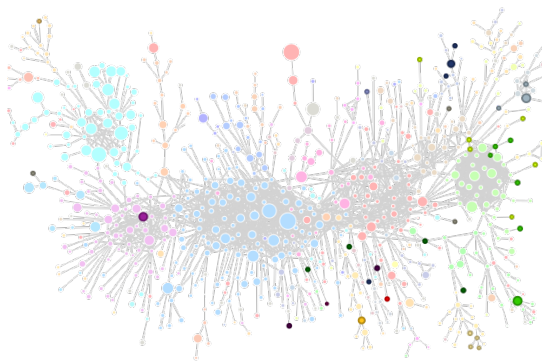
1980
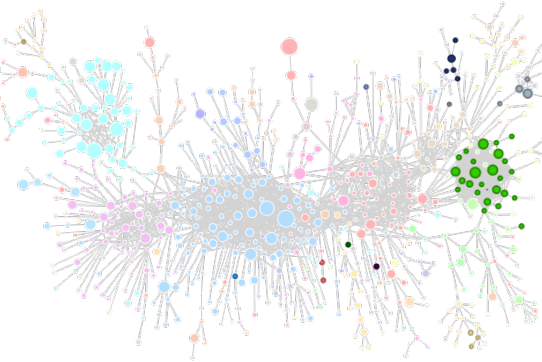
1990
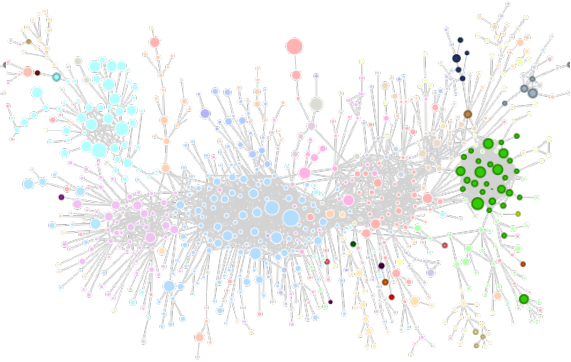
2000

Cambodia Product Space 1980 - 2010

Total Value: $5,112,204,567
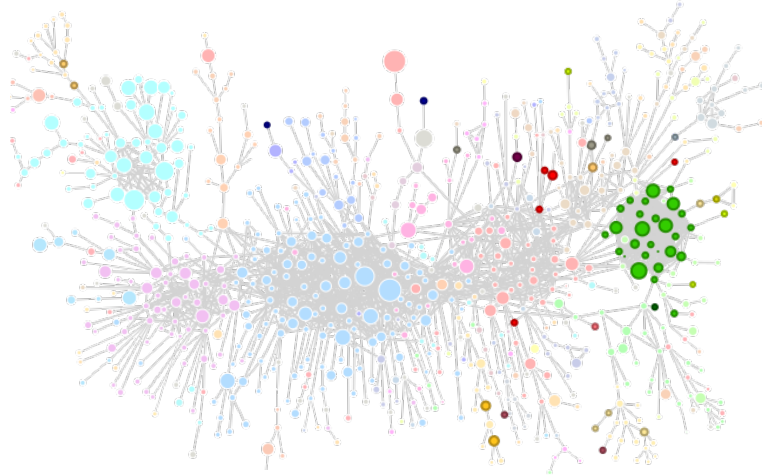
2010

Total Value: $5,646,000
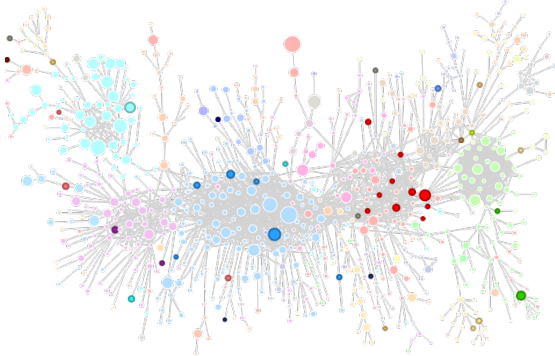
Total Value: $31,939,362
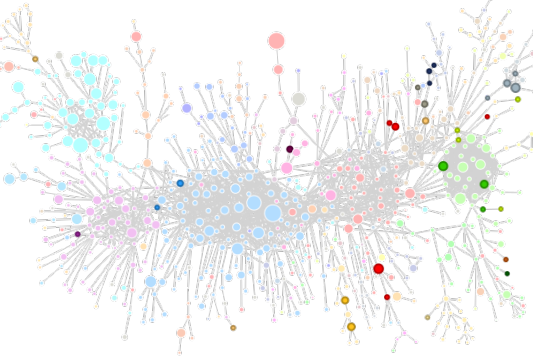
Total Value: $1,364,724,435

1980

1990

2000

177
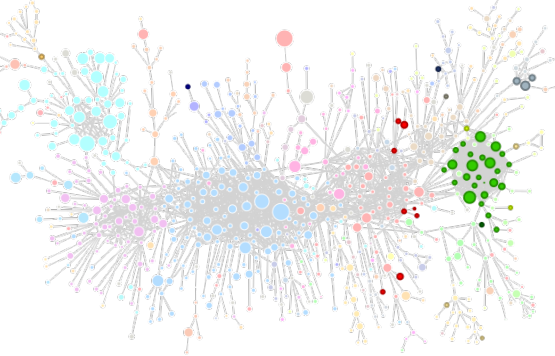
India Product Space 1980 - 2010

Total Value: $211,138,299,999
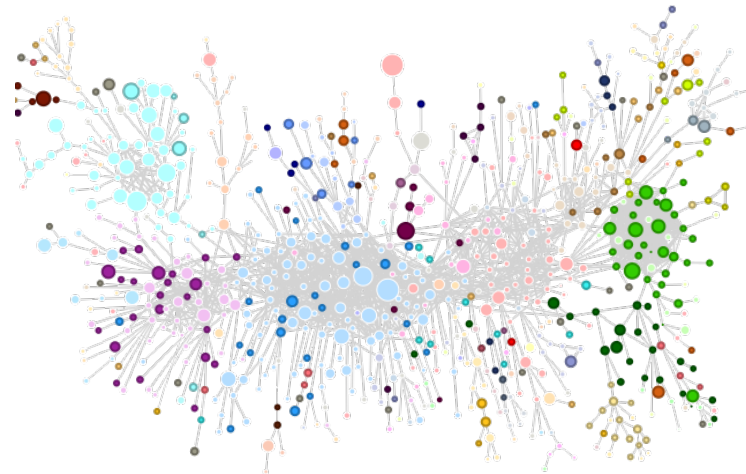
2010

Total Value: $5,272,384,000
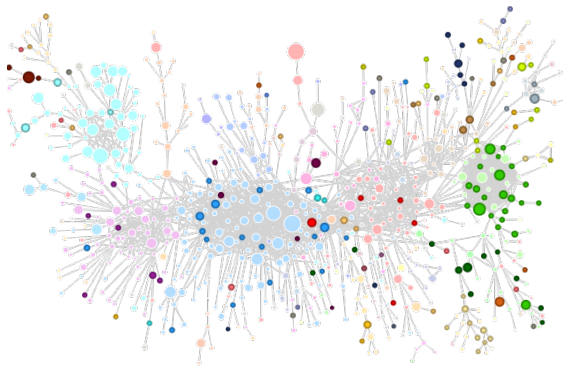
Total Value: $20,453,671,430
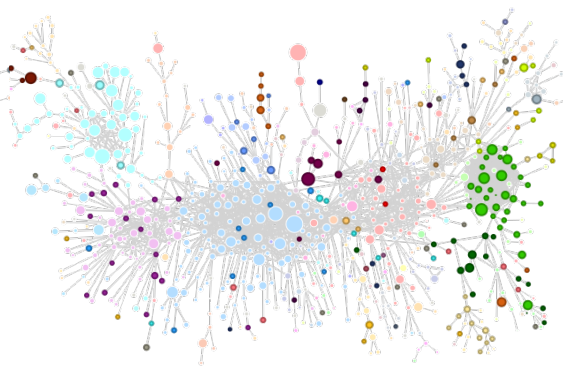
Total Value: $43,146,282,800

1980

1990

2000

178
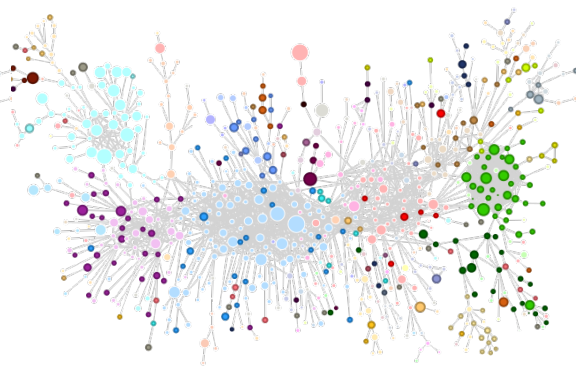
Nepal Product Space 1980 - 2010

Total Value: $714,792,916
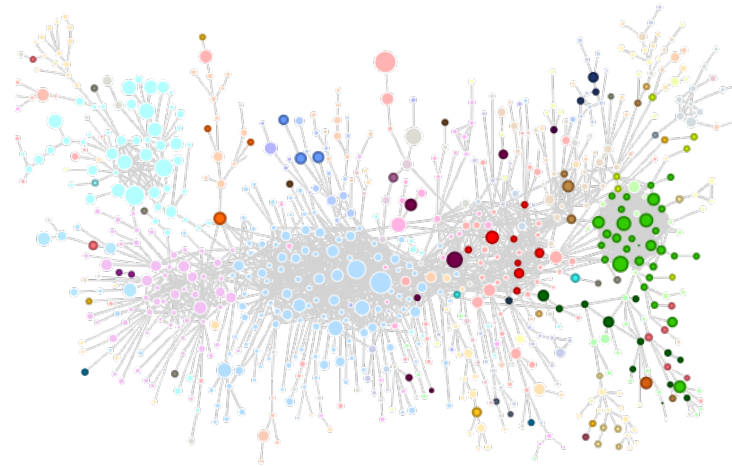
2010

Total Value: $81,536,000
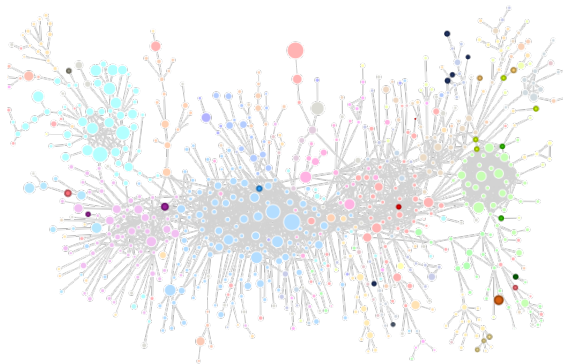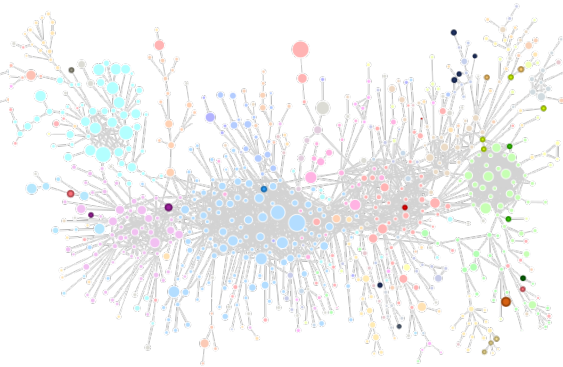
Total Value: $81,536,000

Total Value: $688,444,626

1980

1990

2000

179
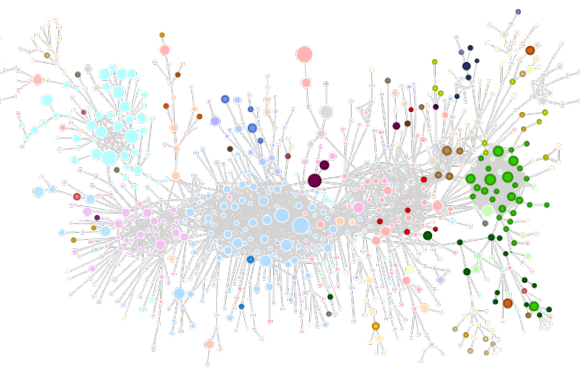
Pakistan Product Space 1980 - 2010

Total Value: $21,668,594,166
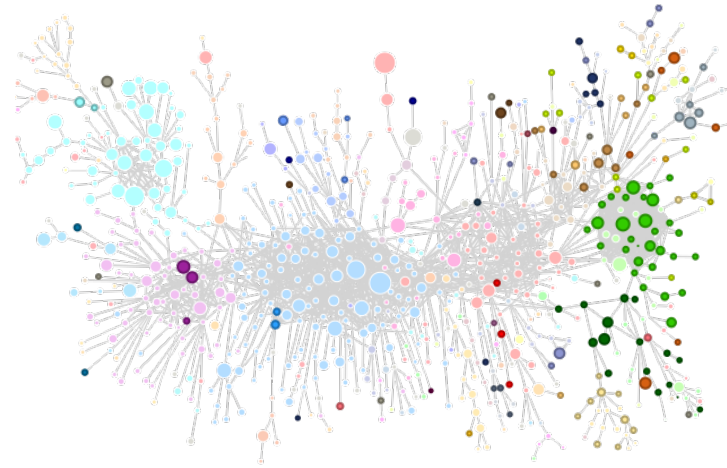
2010

Total Value: $2,328,726,000

Total Value: $4,304,795,941

Total Value: $7,587,551,922
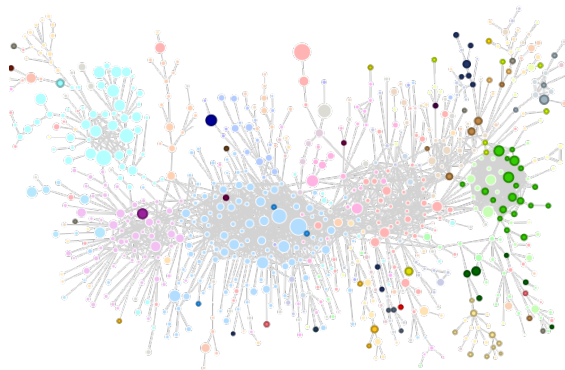
1980
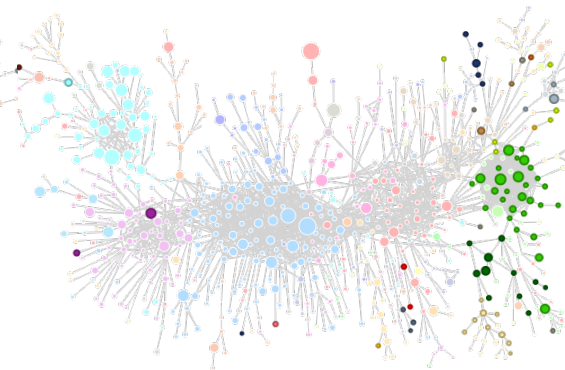
1990
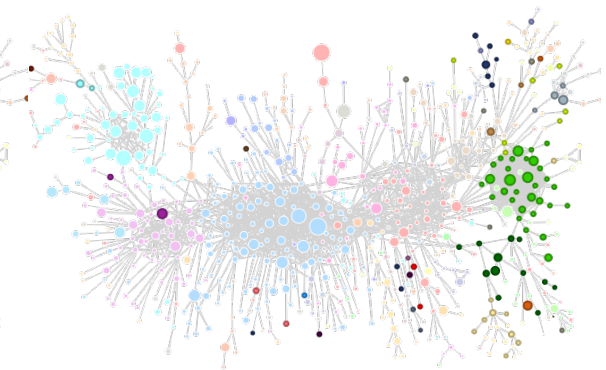
2000

180

Philippines Product Space 1980 - 2010

Total Value: $64,380,113,886
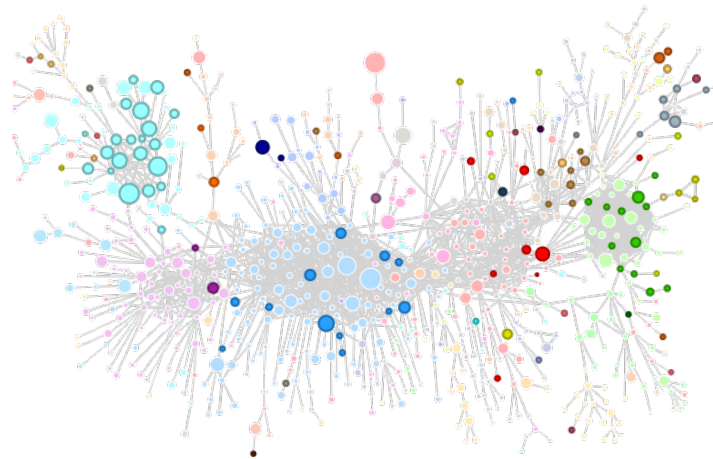
2010

Total Value: $5,751,611,000
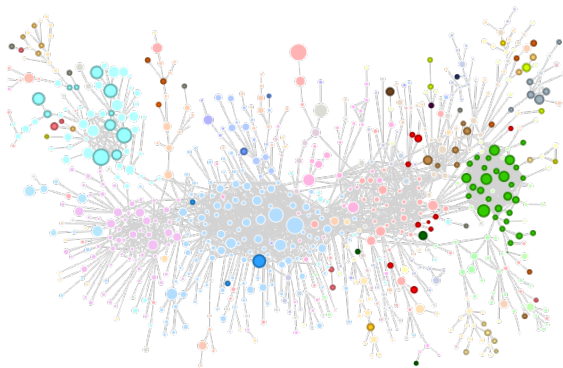
1980

Total Value: $8,730,008,178
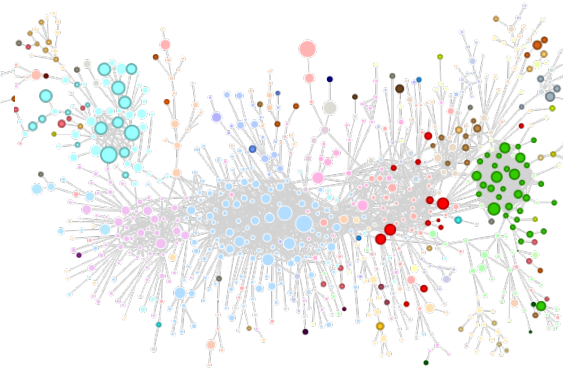
1990

Total Value: $39,252,349,172

2000

181
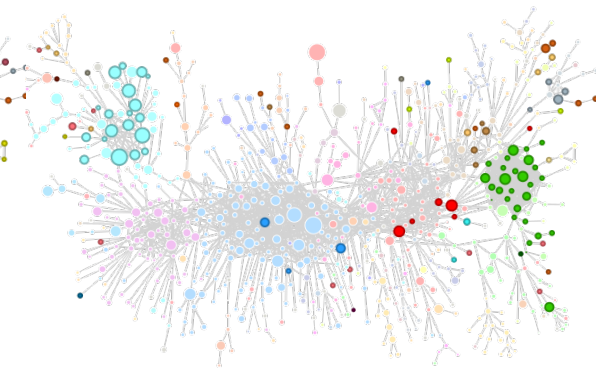
Sri Lanka Product Space 1980 - 2010
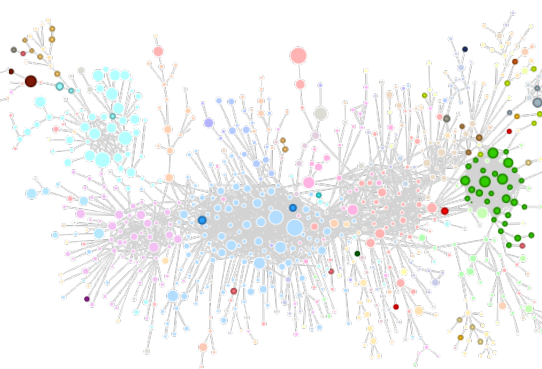
Total Value: $7,339,588,366
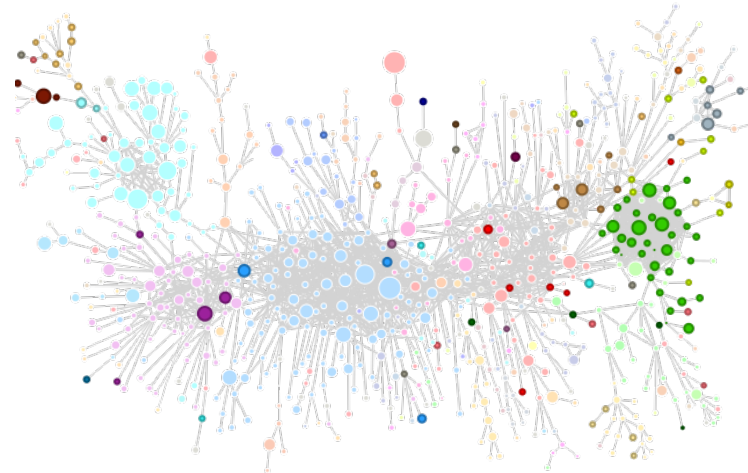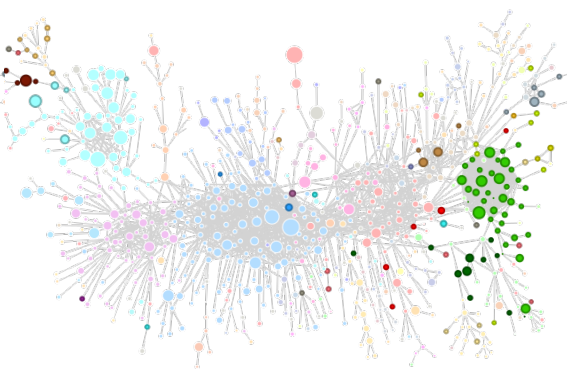

2010

Total Value: $941,717,000
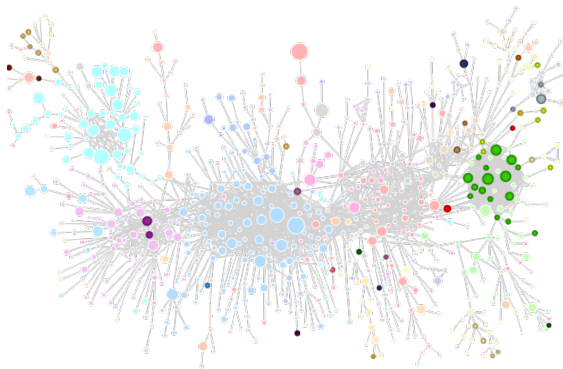
1980

Total Value: $1,708,810,001

1990

182

Total Value: $4,402,363,264

2000

Photo: Nathan Martinez/USAID

U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523
Tel: (202) 712-0000
Fax: (202) 216-3524
www.usaid.gov

UK Department for International Development

22 Whitehall

London

SW1A 2EG

Tel: 020 7023 0000

Fax: 020 7023 0012

www.gov.uk/government/organisations/department-for-international-development