

Working Paper 5/2010  
Investment Climate Series

# Assessment of Investment Climate in Northern Bangladesh

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Economic Research Group

# **Assessment of Investment Climate in Northern Bangladesh**

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Published By Economic Research Group (ERG), Dhaka, Bangladesh

The papers in this series are published as part of contract under the Small Grants Program, implemented by ERG and BMB Mott MacDonald and supported by the Bangladesh Investment Climate Fund (BICF). BICF is managed by IFC, in partnership with the U.K. Department for International Development and the European Union. Details about the program can be found at

[http://www.ergonline.org/ifc/index\\_of\\_SGAPP.html](http://www.ergonline.org/ifc/index_of_SGAPP.html)

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**Title: Assessment of Investment Climate in Northern Bangladesh**

ERG Working Paper 5/2010

***Investment Climate Series***

Series Editor: Dr. A.K. Enamul Haque

Technical Editor: Zahidul Naim Zakaria

Research Coordination: Rizwana Subhani

The views expressed in this publication are those of the author(s) and do not necessarily represent those of the publisher or the funding agencies.

## **Acknowledgment**

We gratefully acknowledge the research grant under Small Grants Pilot Project of IFC BICF which was facilitated by the Economic Research Group (ERG) and BMB Mott MacDonald. The grant has made it possible for us to embark on a comprehensive study of the investment climate in northern Bangladesh.

We are thankful to Professor Wahiduddin Mahmud for his suggestions during our research, and to our two mentors, Dr. Fahad Khalil and Dr. Syed A Mahmood for their insightful comments in various stages of our study. We have greatly benefited from those.

We are thankful to Dr. A. K. Enamul Haque of ERG for paying a visit to Rajshahi and discussing various aspects of our work, which benefited us much as well.

We are also thankful to other staffs of ERG and BMB Mott MacDonald, particularly Ms. Rizwana Subhani who corresponded with us and also visited Rajshahi.

We are thankful to our research assistants for collecting data and information and to the firms for their cooperation in providing the data.

Rajshahi University  
June, 2010

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# 1

## INTRODUCTION

Investment climate (IC) refers to the degree of affability of a country's environment for private sector activity. The investment climate comprises institutional and policy variables that have crucial bearings on business performance, but over which firms have no control individually. Determinants of IC include macroeconomic variables, governance, and infrastructural conditions. Improvements in IC are largely in the realm of the government, which can influence macroeconomic management, trade and investment policies, and strengthen infrastructure, institutions, and the rule of law. Deficiencies in the investment climate pose critical constraints on private sector investment and performance, particularly on industrial competitiveness.

Private sector development is key to a country's long-run economic growth and poverty reduction. Steady growth in investment and productivity, which underpin the evolution of the private sector, critically hinge on the quality of the investment climate. The quality of the investment climate affects the performance of an economy in two ways: first, through its influence on a firm's decision about geographical location, that is, whether the firm will locate in a particular region of an economy or not and second, through its effect on the firm's performance. Fostering a sound investment climate is one of the fundamental responsibilities of the government for a country to achieve rapid and sustained growth and poverty reduction. An improvement in the investment climate is called for to spur investment and productivity increases toward strengthening the private sector that would drive the economy's long-run growth (ADB, 2004).

The northern part of Bangladesh has a weak investment climate. This is evident from the state of firms in northern Bangladesh described in Section 4. It is necessary to look into the causes of such weakness by using various indicators. Based on the results of such an investigation,

appropriate policy recommendations may be made to improve the state of the investment climate.

### **1.1 Objectives of the Research**

The general aim of this study is to understand the present state of investment climate in the northern region of Bangladesh. Specific objectives are to:

- identify and analyze the main investment climate constraints (ICCs) that hamper investment in northern Bangladesh as a whole and individually in Rajshahi, Bogra and Rangpur;
- compare the ICCs identified in this study with those found in the first investment climate assessment (2003) and the second investment climate assessment (2008);
- compare and contrast the ICCs of different parts of the study areas – Rajshahi, Borga, and Rangpur;
- assess the overall and firm-specific efficiency performance and study whether the ICCs really affect the efficiency performance of the firms or not;
- suggest measures for easing the ICCs in this region.

This study is divided into nine sections. Section 2 discusses the importance of a sound investment climate, which also includes its key constraints, namely, macroeconomic constraints, governance and institution-related constraints and infrastructural constraints. Section 3 contains a description of previous investment assessments in Bangladesh, that is, the first investment climate assessment (2003) and the second investment assessment (2008). Section 4 provides the status of industries in northern Bangladesh. Section 5 discusses ICA in northern Bangladesh. Investment climate constraints and performance of firms focused in section 6. Inefficiency effects using stochastic frontier analysis are discussed in section 7. Summary and policy recommendations of this study are given in Section 8. Finally scopes of further research works are mentioned in Section 9. This is followed by a selected bibliography and appendices.

# 2

## INVESTMENT CLIMATE INDICATORS

In recent times, policymakers have increasingly emphasized the importance of a sound investment climate for promoting economic growth in developing countries (Stern, 2002). Researchers have found surprisingly little correlation between investment levels and growth rates, at least in the short run (Easterly, 1999). This study focuses on the institutional and policy environment that discusses the degree to which the existing investment climate generates return on business. A productive investment climate can be broadly thought of as an environment in which governance and institutions support entrepreneurship and well-functioning markets in order to help generate growth and development (BEI, 2003).

### **2.1 Classification of Investment Climate Indicators**

Determinants of IC include macroeconomic, governance, and infrastructural conditions in which business firms operate. It is worthwhile to elaborate on these determinants.

#### **2.1.1 Macroeconomic Indicators**

Macroeconomic issues are concerned with the overall economic and political stability of a country, influenced by national policies, which affect trade and investment. Such national policies include fiscal, monetary, and exchange rate policies.

Thus macroeconomic indicators (constraints) include the cost of finance, foreign exchange availability, depreciation of foreign exchange rate, inflation, price fluctuation and the price of land.

#### **2.1.2 Governance and Institutional Indicators**

Governance relates to government interactions with business, which affects businesses in the private sector in two ways. Firstly, through regulatory standards which businesses have to adhere to and secondly, through the payment of unofficial fees to corrupt officials, both of which affect the costs of starting and running a business.

The structure of governance and the institutions that govern interactions between businesses and the government determine the burden that firms face in complying with government regulations. The term governance used here also includes the quality of government services, such as the issuance of a license, and also the extent to which corruption is associated with the procurement of these services. A large burden is often associated with corruption, which involves making payments to inspectors who visit firms or to officials who grant permits.

While higher tax rates do not appear to drive away investors the myriad obstacles to starting and running a business do. This is evident from the fact that firms regarded constraints like power failure, price fluctuation, inflation, access to land and access to finance to be more significant as bottlenecks than tax rates are. A particularly important aspect of governance is the ease with which firms can enter and exit a market—an important determinant of productivity, investment, and entrepreneurship (Lansbury and Mayes, 1996).

The governments of many developing and transition economies have erected a maze of administrative obstacles to starting, operating, and closing firms. Compilation of data on entry regulations in 85 countries reveals enormous variations in the number of procedures required to start firms, ranging from 2 procedures in Canada to 20 in the Dominican Republic (with Bolivia and the Russian Federation also close to 20) (Djankov et.al. 2002).

### **2.1.3 Infrastructural Indicators**

Infrastructure refers to the quality and quantity of physical infrastructure (such as power, transport, and telecommunications). Broadly, it can also refer to financial infrastructure (such as banking), which could therefore bring is access to finance, access to land and extortion as indicators.

If the infrastructural conditions are poor, businesses must devote more resources to establishing new firms, acquiring information, procuring inputs, and delivering their products to market. For firms who market goods internationally, poor infrastructure can undermine their competitiveness - in the least increasing their costs of doing business, and at worst deterring them from entering markets where they would otherwise be able to operate efficiently. Infrastructure and firm performance interact in several ways. Established firms already

connected to utilities are affected by the quality of the service. New firms or firms hoping to expand face difficulties in connecting to utilities.

# 3

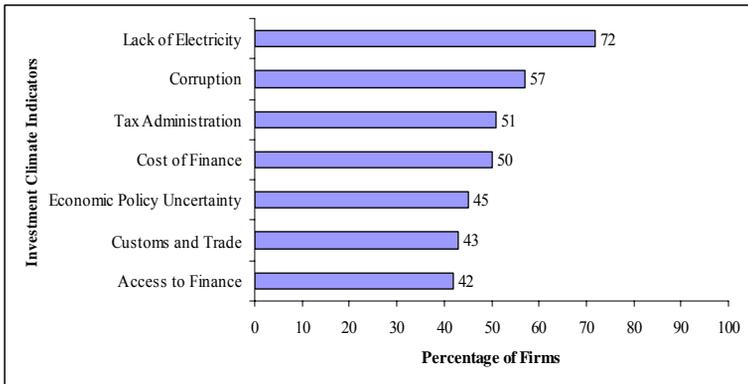
## PREVIOUS INVESTMENT CLIMATE ASSESSMENTS IN BANGLADESH

So far, two investment climate assessments (ICAs) have been conducted in Bangladesh. The main ICCs identified by these studies are described below.

### 3.1 The First Investment Climate Assessment (2003)

The first ICA in Bangladesh was done in 2003, which covered Dhaka and Chittagong. The exercise was carried out by the World Bank and Bangladesh Enterprise Institute (BEI). The main constraints to business operation and growth as perceived by firms revealed in the ICA of 2003 are shown in Figure 3.1.

**Figure 3.1: Investment Climate Indicators (Constraints) Identified by the First Investment Climate Assessment in Bangladesh**



Source: Field Survey, 2008

The lack of electricity poses the most severe obstacle facing firms. A vast majority of firms report that unreliable supply of electricity seriously hampers their growth.

The crisis of electricity plagues firms in Bangladesh. Firms report experiencing power outages or surges nearly every day they operate. As

a result, more than 70 percent of firms rely on electric generators - a great addition to their cost of doing business.

Corruption is pervasive. Bangladesh ranks poorly on measures of corruption with more than half of the firms reporting it as a major or very severe obstacle.

Firms view regulation as a serious problem. Starting a firm in Bangladesh is fairly difficult. And once firms are operational, they receive frequent visits from government agencies - about 17 per year on an average.

Finance appears to be a looming problem. While most firms appear to have the access to finance, it is mostly short-term and nearly 60 percent of firms with a line of credit have reported the exhaustion of that credit, that is, borrowed funds were exhausted.

Small- and medium-sized firms are disproportionately affected by all these problems. The smaller the firm, the more of its resources in proportion does it devote to bribes and to deal with government visits and inspections. On top of which, smaller firms are also less likely to have access to formal finance. These problems can pose great barriers to market entry and growth for small firms (World Bank and BEI, 2003).

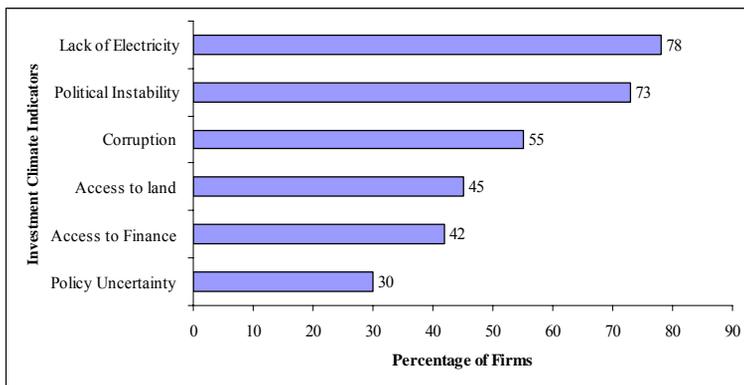
### **3.2 The Second Investment Climate Assessment (2008)**

The report of the second investment climate assessment in Bangladesh was published in October 2008 (World Bank, 2008). This assessment took a more comprehensive look at the business environment by extending its survey beyond Dhaka and Chittagong. This permitted locational issues to be more explicitly dealt with.

This study included six metropolitan areas of Bangladesh, which are Dhaka, Chittagong, Rajshahi, Khulna, Sylhet and Barisal as well as some peri-urban areas around the six cities. It also included a sample of some small towns and rural areas. These areas outside the six metropolitan centres are collectively referred to as “non-metropolitan areas”.

The main constraints which this study identified are shown in Figure 3.2 and 3.3 for metropolitan and non-metropolitan areas respectively.

**Figure 3.2: Investment Climate Constraints Identified by the Second Investment Climate Assessment in Metropolitan Areas**

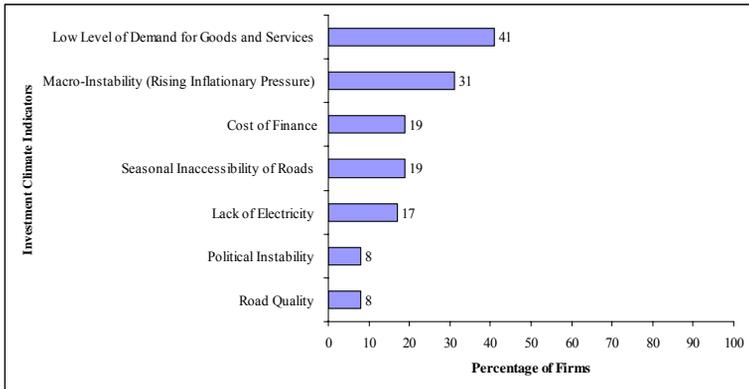


Source: Field Survey, 2008

Compared to the first ICA, the second ICA shows that political instability and access to land have appeared as two new constraints significant for the metropolitan area. The result is understandable since political instability intensified during between 2003 and 2005. Access to land appeared as an emerging constraint due to the increasing demand on existing business plots

Again, in comparison to the first ICA, the absence of tax administration, and customs and trade as constraints in the second ICA may suggest an improvement on those two fronts. This is a result that contradicts the prevailing public notion of little or no improvement in tax administration, and customs and trade. One possible explanation for this could be that the first ICA included only Dhaka and Chittagong whereas the second ICA included four other metropolitan areas – Rajshahi, Khulna, Sylhet and Barisal along with some peri-urban areas. Since larger and export-oriented firms are concentrated in Dhaka and Chittagong, they felt these constraints more severely than the firms in the other four areas where the firms were smaller, mostly did not engage in international trade, and had much less interaction with tax and customs administration. It is possible that the inclusion of these smaller firms in the overall picture have overshadowed the severity of those two constraints, which may still be severe in Dhaka and Chittagong.

**Figure 3.3: Investment Climate Constraints identified by Second Investment Climate Assessment in Non-Metropolitan Areas**



Source: Field Survey, 2008

Results for the non-metropolitan area provide a very different picture. It should be noted that the perception overall regarding the severity of constraints is very low - only two constraints are perceived to be severe by over 30 percent of the firms. The top two constraints are low level of demand for goods and services and macroeconomics instability, which refers to rising inflationary pressure.

# 4

## INVESTMENT CLIMATE IN NORTHERN BANGLADESH - THE STUDY

### 4.1 Status of Industries in Northern Bangladesh

It can be seen in Table 4.1 that per capita value added is lowest for Rajshahi among all divisions both in absolute and per capita terms. Although the number of establishments in Rajshahi is nearly twice that of Chittagong, the gross value added is less than twenty percent of that of Chittagong. Khulna having about one-third the numbers of establishments has higher value added than that of Rajshahi. The picture becomes clearer if we consider value added per worker, which is given in the last column. It is evident that the per capita value added is by far the lowest for Rajshahi among all divisions. These could be indicative of a weaker investment climate of northern Bangladesh.

**Table 4.1: Status of Industrial Establishments of Divisions in Bangladesh (in Million), 1999-2000**

Division	Number of establishment	Total persons engaged	Gross output	Gross value added	Value added per establishment	Value added per worker
Chittagong	3831	492229	124027	48979	12.7849	0.0995
Dhaka	11588	1566379	438247	163420	14.1025	0.1043
Khulna	2314	146316	32278	10487	4.5320	0.0717
Rajshahi	6570	248161	35636	9437	1.4364	0.0380
Barisal	45	6622	661	359	7.9778	0.0542
Sylhet	404	53858	8372	2761	6.8342	0.0513
Total	24752	2613564	639220	235443	9.5121	0.0901

Sources: Bangladesh Bureau of Statistics, 2004, Report on Bangladesh Census of Manufacturing Industries (CMI), 1999-2000, Government of the People's Republic of Bangladesh.

## **4.2 Investment Climate Assessment (ICA) In Northern Bangladesh (2009)**

This section presents the analysis of the investment climate assessment in northern Bangladesh conducted in 2009. The first ICA did not include northern Bangladesh and the second ICA included only the Rajshahi metropolitan area. This study takes a more comprehensive view in assessing investment climate in northern Bangladesh. It takes into consideration not only Rajshahi (including Natore) but also Bogra and Rangpur which are situated north of Rajshahi. It is possible to compare of the ICCs perceived in the three zones as a whole and as well as individual units, allowing the analysis of the diversity of constraints that are significant across northern Bangladesh.

### **4.2.1 Sample and Data**

A questionnaire was prepared with the objective of extracting information regarding the perception of firms regarding constraints and their severity. Once the information have been obtained by surveyors, it would be analyzed to reveal the state of the investment climate and to prepare a set of policy recommendations.

This study uses both secondary and primary data. Secondary data, used to describe the state of firms in northern Bangladesh, have been collected from various publications of the Bangladesh Bureau of Statistics (BBS) and other government and non-government institutions.

Primary data have been collected to investigate the main indicators of investment climate and explore features of the investment climate in different parts of northern Bangladesh. The primary data have been collected from field surveys, to which different industrial establishments have responded. The field survey includes 110 individual firms spread over the four districts.

Data have been collected from three districts of Bangladesh from south to the north. The districts are Rajshahi (including Natore), Bogra, and Rangpur. These enable us to examine the differences between Rajshahi (including Natore), which is relatively backward, Bogra, which is slightly advanced, and the Monga-affected district of Rangpur. Therefore, the sampling is purposive. It has been designed to capture the prevailing differences in investment climate conditions in different parts of northern Bangladesh. Table 4.2 gives the classification of investment climate indicators.

**Table 4.2: Classification of Investment Climate Indicators 1**

Macroeconomic	Governance and Institutional	Infrastructure
Cost of finance	Bureaucratic red tape	Access to finance
Foreign exchange availability	Business licensing	Access to land
Foreign exchange depreciation	Corruption	Lack of electricity
Inflation	Crime, theft and disorder	Extortion
Price fluctuation	Customs and trade regulations	Jamuna bridge toll
Price of land	Informal payment or bribe	Telecommunication
	Labour regulation	Transportation
	Legal system	
	Policy uncertainty	
	Skill and education	
	Tax administration	
	Tax rate	

### 4.3 Investment Climate Assessment Results

#### 4.3.1 Investment Climate Assessment Results of Northern Bangladesh as a whole

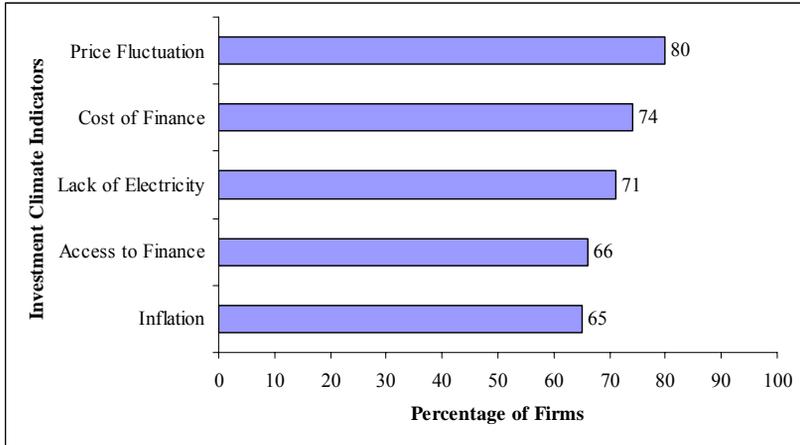
The top five ICCs for northern Bangladesh are shown graphically in Figure 4.1. Tables presenting the top five constraints for northern Bangladesh as a whole and its different parts are given in Appendix 1.

It is seen from Figure 4.1 that, of the five ICCs, only one is physical. The rest are monetary in nature. It appears that the firms placed a greater weight on financial than on physical constraints. Price fluctuation<sup>2</sup> (80%)

- 
- 1 Access to finance is considered to be an infrastructural indicator while cost of finance is a macroeconomic indicator of the investment climate. Access to finance implies whether finance is readily available from financial institutions. On the other hand, cost of finance implies, among others, rate of interest which is the cost of borrowing funds. By extortion we here mean money which is charged unlawfully in different point of roads while transporting goods. Jamuna bridge toll is a lawful payment. Since Jamuna bridge toll is infrastructure, extortion is therefore put under infrastructure. Price fluctuation means to upward and downward swings of price of raw materials.
  - 2 While inflation refers to steady rise in price, price fluctuation refers to upward and downward swings of price often in short-interval. Our surveyors, who were properly trained, did not notice any difficulty on the part of the respondents in understanding and distinguishing between these two concepts.

is found to be the top constraint in the eye of the firms. In northern Bangladesh, the firms are very small in size and, therefore, felt the pinch of this constraint. Larger firms can cope easily with price fluctuation than small firms.

**Figure 4.1: Top Five Constraints in Northern Bangladesh**



Source: Field Survey, 2008

The cost of finance (74%) and access to finance (66%) has been found to be second and fourth most important constraints. This reflects the difficulties these firms face in obtaining fund for their business.

Inadequate electricity supply (71%) is perceived to be the third most important constraint. Per capita electricity generation in Bangladesh has been increasing over the years, rising from 143 KWh in 2004 to 155 KWh in 2007. Although the overall generation capacity in Bangladesh stands at 5,300 MW, capacity in use is only about 4,400 MW. Attempts have been made to reduce the gap but the efforts have met with limited success. Although data on northern Bangladesh is not available but it appears that industrial firms in northern Bangladesh felt the brunt of this shortage.

Inflation is reported to be the fifth most important constraint. There has always been some inflationary pressure, which accentuated in recent years causing rise in most input prices. This might be the reason why firms perceived inflation to be a major problem.

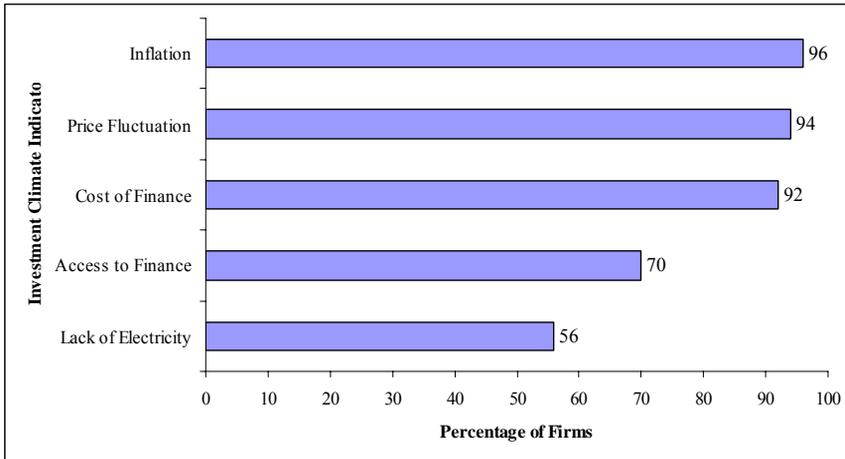
The results for northern Bangladesh presented above as a whole may camouflage regional considerations. Hence, the investment climate conditions for Rajshahi, Bogra, and Rangpur are individually examined in the next sub-section.

### **4.3.2 Investment Climate Assessment Results – Rajshahi**

The top five ICCs for Rajshahi are shown graphically in Figure 4.2. It can be observed from Figure 4.2 that out of the five ICCs, only one (lack of electricity) is physical. The rest are monetary in nature. It appears that like northern Bangladesh as a whole, the business firms of Rajshahi placed a greater weight on financial than physical constraints.

Like northern Bangladesh as a whole, Rajshahi perceives the same set of constraints to be significant, but their ranking has changed. Here the monetary constraints occupy the first four positions and lack of electricity appears as the fifth constraint. It appears that the prominence of such investment climate constraints are higher here than northern Bangladesh as a whole.

Perception of the lack of electricity as a constraint may depend on three things – frequency, length of outages and the state of industrialization of the firm. If the state of industrialization is comparatively advanced such as in Bogra, electricity outages will be felt to be a bigger constraint than a less industrially advanced area, such as Rajshahi. The fact that the lack of electricity came last in ranking among the top five constraints in Rajshahi could also be because outages are less frequent and perhaps last for shorter periods of time than the other two regions.

**Figure 4.2: Top Five Constraints in Rajshahi**

Source: Field Survey, 2008

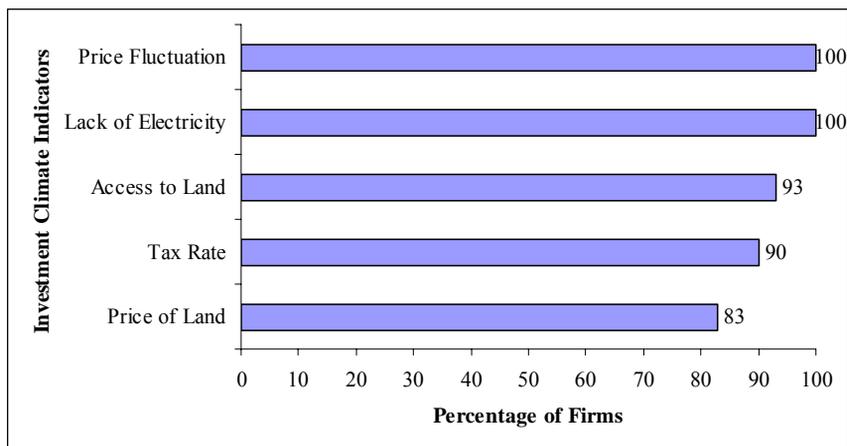
Since firms in Rajshahi are not export-oriented, they do not feel that foreign exchange availability and its depreciation are major constraints. Besides firms hardly use imported raw materials and most of the businesses use reconditioned capital machinery.

### 4.3.3 Investment Climate Assessment Results – Bogra

The assessment of ICCs significant in Bogra provides a somewhat different picture. The top five ICCs are shown graphically below in Figure 4.3.

The set of ICCs significant in Bogra is different compared to that of northern Bangladesh as a whole and for Rajshahi on several grounds. Three new constraints now find their place among the top five. These are access to land, price of land, and tax rate.

Also, a comparatively high number of private sector businesses in Bogra (as high as 100%) have reported two constraints to be severe. Only 56% or more firms in Rajshahi perceived five constraints to be severe, compared to 83% or more firms in Bogra reporting five ICCs as severe.

**Figure 4.3: Top Five Constraints in Bogra**

Source: Field Survey, 2008

Perhaps, the more inclusive perception of ICCs in Bogra is due to its advanced state of industrialization. Having confronted the constraints, the firms in Bogra demonstrated a wider realization of the difficulties the constraints pose.

Also, the list of top constraints in Bogra highlights several changes and emerging conditions. Access to land and price of land are found to be among the top five constraints. With advancement in the state of industrialization, the Jamuna bridge and supply of gas in place, the price of industrial land has been on the rise and the access to land in Bogra has reduced.

Another constraint that finds its place among the top five is the tax rate. Bogra's advanced state of industrialization could also account for this. The individual firms of Rajshahi, being very small, didn't exceed the tax-free bracket by very much, and did not have to pay much tax. Therefore, tax rate did not appear to be a major ICC to them. But in the case of Bogra, this appeared as the third most important constraint.

#### **4.3.4 Investment Climate Assessment Results – Rangpur**

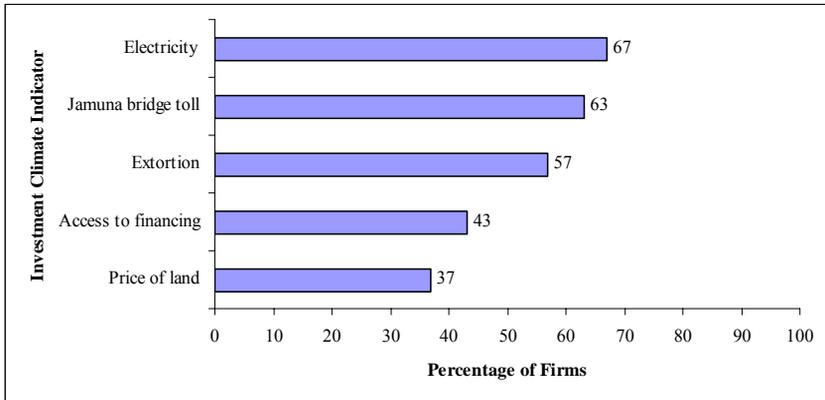
Characteristics of ICCs in Rangpur are again somewhat different from the rest. Perception of ICCs of firms in Rangpur appears somewhat weaker. This means that investment climate constraints exist but these do

not hamper businesses remarkably. Only three of the top five constraints are reported to be severe by more than 57 percent or more firms.

However, firms in Rangpur reported two new constraints which found their place among the top five, namely, they are Jamuna bridge toll and extortion. Rangpur, being further away from the Jamuna bridge spends a greater amount in transporting goods to eastern Bangladesh. Because of higher transport costs, firms might have felt the toll charged an extra burden and an important constraint. Besides, according to survey results, average size of firms in Rangpur is smaller. Hence, these costs constitute a higher fraction of the total costs since the scale of production is small for these firms.

Extortion, an important nagging constraint, is not reported by firms in Rajshahi and Bogra but is perceived as a significant constraint by firms in Rangpur. The top five ICCs for Rangpur are given in Figure 4.4.

**Figure 4.4: Top Five Constraints in Rangpur**



Source: Field Survey, 2008

#### 4.3.5 A Comparison of ICCs in the Three Study Areas

This section attempts to collate the differences in the lists of ICCs and their rankings in terms of the three individual areas. If we compare the top five constraints in Rajshahi and Bogra we find that three new constraints – access to land, tax rate and price of land have appeared among the top five constraints in Bogra instead of inflation, cost of finance and the lack of electricity. Advancements in the state of industrialization in Bogra have increased demand for land leading to the

appearance of price of land and access to it as top two constraints. While price of land refers to the cost (or rent?) of buying a piece of land, access to land refers to being able to buy (or rent?) the right piece of land. Because of the unplanned development of land without any government intervention, access to land has progressively become a problem.

The investment climate is meant to be largely facilitated by the government in order for the private sector to operate and grow. While the government can easily step in and ameliorate infrastructural constraints, it cannot directly intervene in determining the price of land and access to it. Though in the latter case, the government can help through indicative measures instead of direct ones. The government can frame rules and regulations, and in the process, plan the access to land. Although only Bogra reported these constraints, it is likely to appear in other regions as constraints at a later stage.

The differences in perception of investment climate constraints and their ranking as observed in the study depend, among others, on factors such as the state of industrialization, geographic locations of the regions<sup>3</sup>, and the scale of operation of the firms. Our research shows that Bogra is ahead of other regions in these three aspects. Hence Bogra's inclusion of tax rate and access to land among the top five constraints is understandable. Since firms in other regions are comparatively smaller, and pay proportionately less tax given the progressive direct tax scheme in Bangladesh, they did not feel tax rate to be a significant constraint. Also, access to land did not yet appear as a very important constraint to the other two regions, but is likely to become a problem when the state of industrialization advances to that of Bogra.

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3 As geographically Bogra is closer to Dhaka and Chittagong than Rajshahi and Rangpur, firms in Bogra are in a favourable position in transporting goods and they are ahead and advantageous in businesses.

# 5

## INVESTMENT CLIMATE CONSTRAINTS

So far, the analyses have been presented in terms of the top constraints in specific area and the overall northern zone. As already discussed in Section 2.1 and presented in Table 4.2, this paper divides particular constraints into the following three main categories:

- Macroeconomic constraints
- Governance and Institutional constraints
- Infrastructural constraints

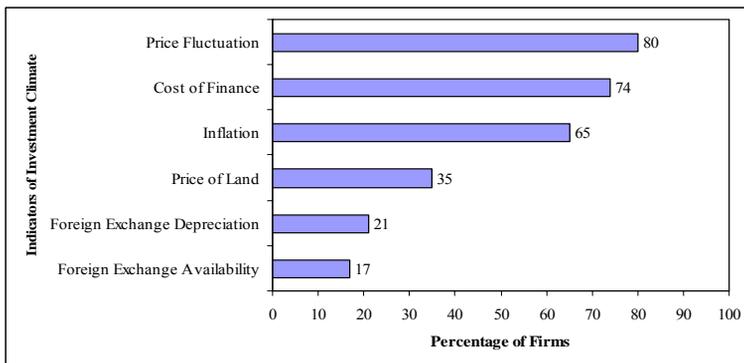
Dividing the constraints into these categories will give us a clear perception of which ones are more prominent in constraining growth of the private sector and help us to devise appropriate policy responses.

### **5.1 Macroeconomic Indicators**

Figures 5.1 to 5.4 depict macroeconomic investment climate indicators of northern Bangladesh, Rajshahi, Bogra and Rangpur respectively.

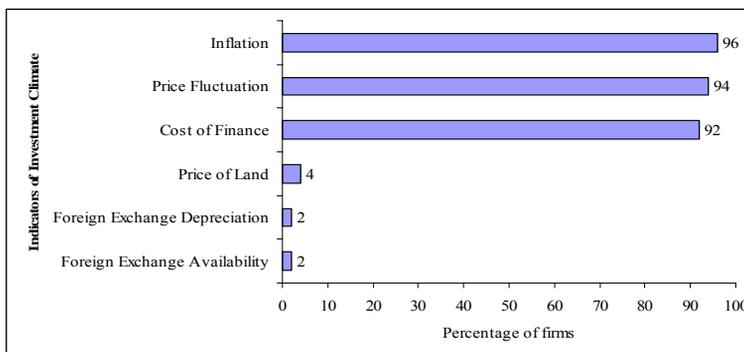
Figures 5.1 and 5.3 show that price fluctuation is the top main constraint to investment in northern Bangladesh and Bogra. In Bogra, 100 percent of the firms perceived that price fluctuation hampers investment environment whereas in northern Bangladesh overall, 80 percent firms perceived it to be a major constraint.

**Figure 5.1: Macroeconomic Indicators of investment Climate of Northern Bangladesh as a whole**



Source: Field Survey, 2008

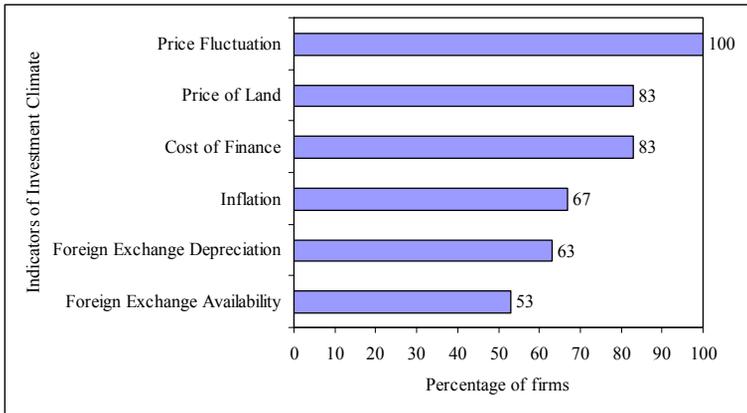
**Figure 5.2: Macroeconomic Indicators of Rajshahi**



Source: Field Survey, 2008

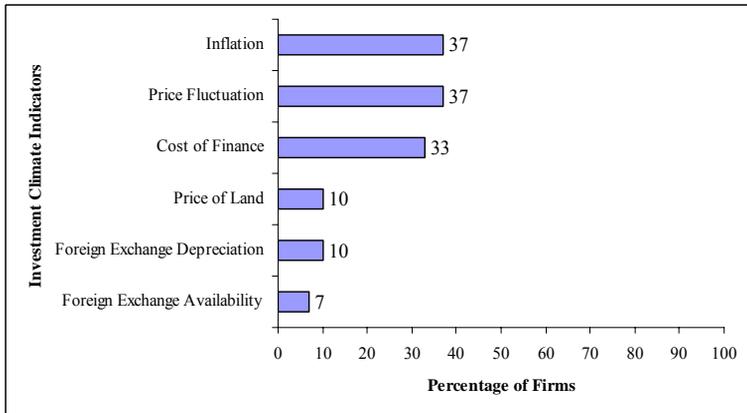
On the other hand, Figure 5.2 and 5.4 indicate that inflation stands as the major obstacles to business operation and growth in Rajshahi and Rangpur. 96 percent and 37 percent of firms in Rajshahi and Rangpur respectively reported inflation as the main macroeconomic constraint.

**Figure 5.3: Macroeconomic Indicators of Bogra**



Source: Field Survey, 2008

**Figure 5.4: Macroeconomic Indicators of Rangpur**



Source: Field Survey, 2008

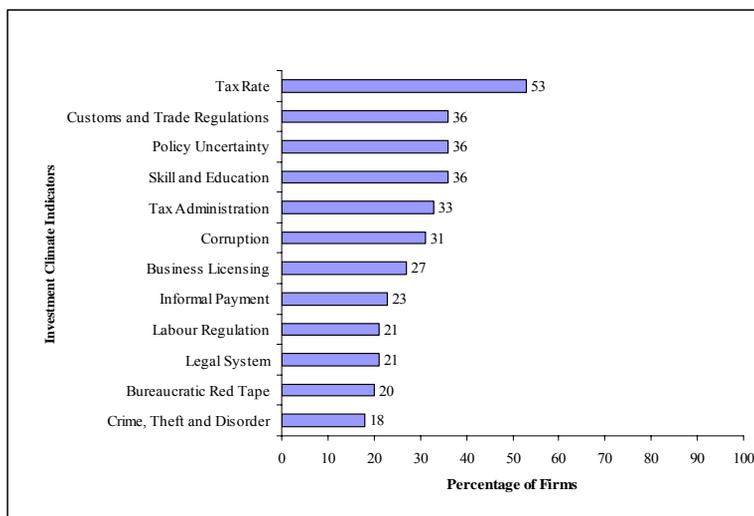
For northern Bangladesh as a whole, and for the three individual regions, foreign exchange depreciation and its availability stand as the least important two of all constraints among the macroeconomic ones. In Rajshahi, Rangpur and northern Bangladesh as a whole, 2 to 21 percent of the firms perceived these as constraints to the business environment. On the other hand, in Bogra, 63 of firms felt that foreign exchange depreciation is a major constraint and 53 percent of firms felt that foreign exchange availability act as an obstacle to the investment climate. This is

perhaps because of the availability of gas in Bogra and proximity of Bogra to Dhaka that helped Bogra establish export-oriented industries. Availability of gas lowered production costs and proximity to Dhaka reduced transporting costs of firms in Bogra. Firms in Bogra may require foreign exchange for importing inputs for those export-oriented industries and hence feel these as constraints.

## 5.2 Governance and Institutional Indicators

Governance and institutional indicators of northern Bangladesh as a whole are exhibited in Figure 5.5. Tax rate, reported by 53 percent of the firms, is perceived as the top investment climate constraint. This is followed by customs and trade regulations, policy uncertainty, and skill and education - each of which is regarded by 36 percent of the firms as constraints. Tax administration, fourth in rank, is mentioned as a constraint by 33 percent of the firms

**Figure 5.5: Governance and Institutions related Indicators of Northern Bangladesh as a Whole**



Source: Field Survey, 2008

Thirty one percent of the firms, or approximately one firm out of every three, perceived corruption as a major constraint. Business or trade licensing is found to be a constraint by 27 percent of the firms. Informal payment or bribe appeared as a problem to 23 percent of the firms.

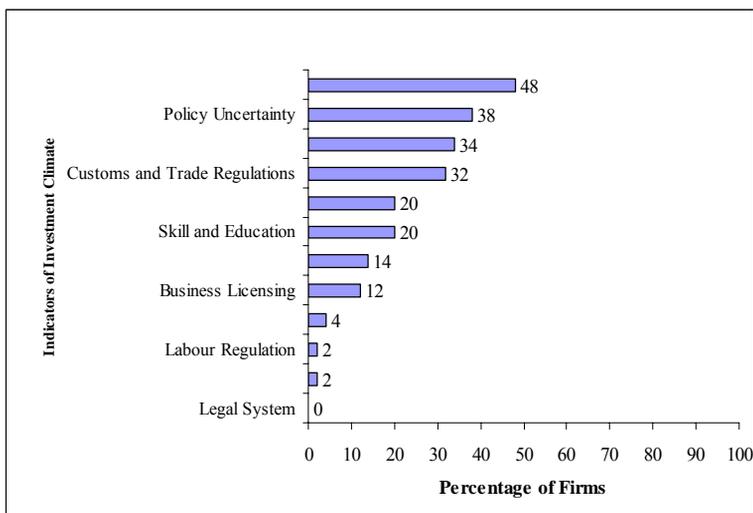
Other constraints which impede the investment climate of northern Bangladesh as a whole include labour regulation, legal system, bureaucratic red tape, and crime, theft and disorder.

It can be seen that constraints like corruption, informal payment, bureaucratic red tape, and crime, theft and disorder are man-made and not physical. If these could be removed or reduced, the investment climate can be greatly improved. However, the prevailing situation does not indicate any respite from these constraints.

Governance and institutional indicators of Rajshahi are shown in Figure 5.6. The survey shows that tax rate (48%) and policy uncertainty (38%) are the top two constraints in the region. Corruption appears as the third most important constraint. Based on the percentages, it is safe to assume that the incidence of corruption in Rajshahi (34%) is similar to that of the entire northern region (31%). Customs and trade regulation (32%) and tax administration (20%) appear as fourth and fifth most important constraints. Lack of skilled and educated workers, sixth in line, is found to be a constraint by 20 percent of the firms. This appears to be a constraint which is likely to become more significant as the state of industrialization advances.

Informal payment and business licensing are the other constraints which appear not to be very serious at this stage but could become a problem in the near future since such issues can be expected to become acute with the progress of industrialization.

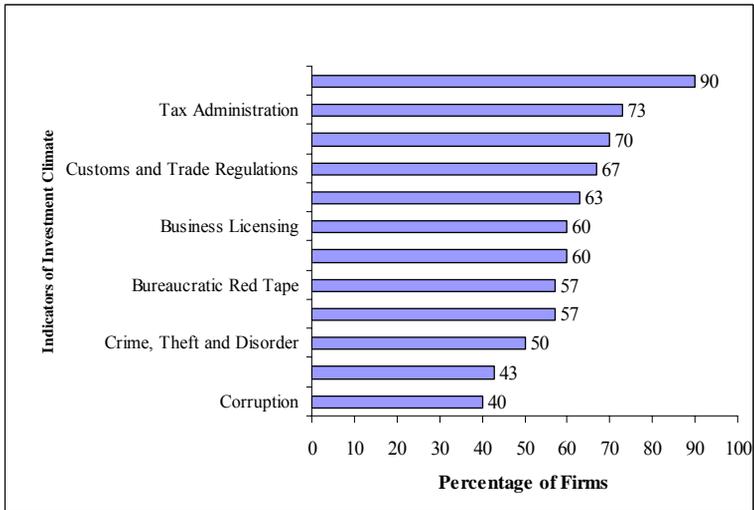
Bureaucratic red tape, labour regulation, crime, theft and disorder, and the legal system are not regarded as important constraints by the firms in Rajshahi, perhaps because the firms in Rajshahi are too small to be affected by these parameters at the moment.

**Figure 5.6: Governance and Institutional Indicators of Rajshahi**

Source: Field Survey, 2008

Figure 5.7 shows governance and institutional indicators for Bogra. It is evident that a much higher proportion of businesses in Bogra, compared to those in Rajshahi and Rangpur, face significant constraints. A whopping 90% of firms perceive the tax rate to be a significant constraint to doing business. Tax administration (73%), skill and education (70%), customs and trade regulations (67%), legal system (63%), business licensing (60%) and policy uncertainty (60%) are perceived to be important constraints. Bureaucratic red tape and labour regulation also appear as ICCs by 57 percent of the firms.

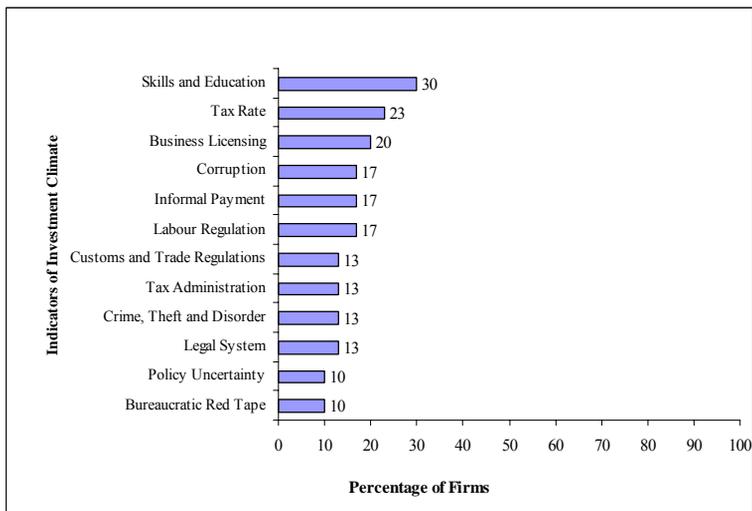
Crime, theft and disorder, informal payment, and corruption, although last in the list, are perceived to be ICCs by 50, 43 and 40 percent of the firms respectively. Based on the fact that comparatively a proportion of firms in Bogra face significant constraints, it is likely ICCs will become more prominent in other regions with further industrialization.

**Figure 5.7: Governance and Institutions related Indicators of Bogra**

Source: Field Survey, 2008

Compared to the other two areas, survey results of firms in Rangpur show that constraints are perceived to be significant by a small proportion of firms. Skill and education, the top-most constraint, is reported by only 30 percent of the firms and tax rate, the second-most important constraint, by only 23 percent of the firms. Nearly half the constraints are each perceived by only 13 percent or less of the firms. Rangpur, being less developed industrially, appears to be isolated from modern businesses which would be expected to be affected by ICCs. The governance and institutional indicators for Rangpur are exhibited in Figure 5.8.

With time and industrial growth, it is likely that ICCs will become more prominent in Rangpur.

**Figure 5.8: Governance and Institutional Indicators of Rangpur**

Source: Field Survey, 2008

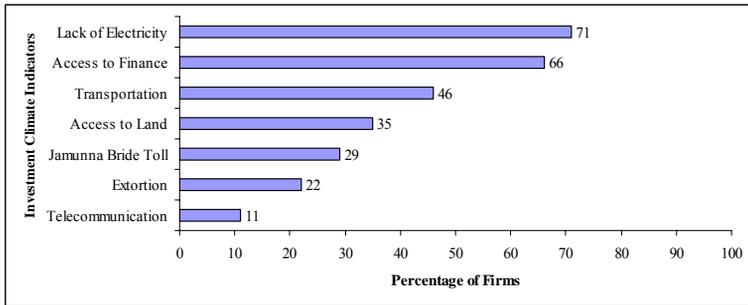
### 5.3 Infrastructural Indicators

Figures 5.9 to 5.12 show the infrastructural indicators for northern Bangladesh as a whole, Rajshahi, Bogra and Rangpur respectively.

In northern Bangladesh as a whole, inadequate supply of electricity (71%) is the top constraint followed by access to finance (66%) and transportation (46%). Access to land, reported to be a major constraint by 35 percent of the firms, appears as the fourth important ICC. It appears that the access to land may become increasingly problematic and may appear as a more significant constraint in the future as the area becomes more industrialized than it is now.

Jamuna bridge toll, fifth most important infrastructural constraint, is perceived by 29 percent of the firms as an ICC. Since the toll stands as an impediment to many firms there is need for a downward revision. Extortion is perceived to be a constraint by 22 percent of the firms. With mobile phones being readily available, telecommunications (11%) is reported as the least important ICC.

**Figure 5.9: Infrastructural Indicators of Northern Bangladesh as a whole**

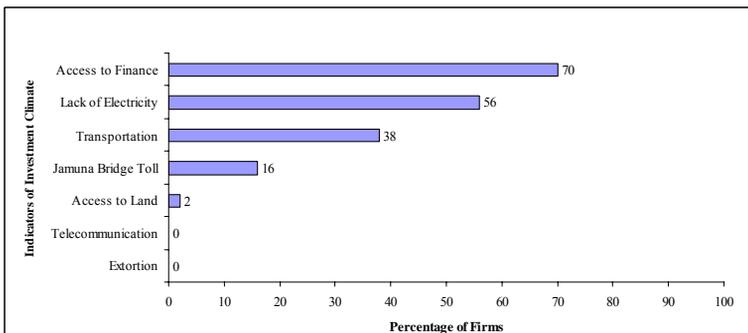


Source: Field Survey, 2008

For Rajshahi, access to finance (70%), lack of electricity (56%), transportation (38%) are the most important ICCs. Jamuna bridge toll rate is perceived to be constraint by only 16 percent of the firms

The access to land is perceived to be a constraint by only 2 percent of the firms, and telecommunication and extortion are not perceived to be constraints at all.

**Figure 5.10: Infrastructural Indicators of the Investment Climate of Rajshahi**



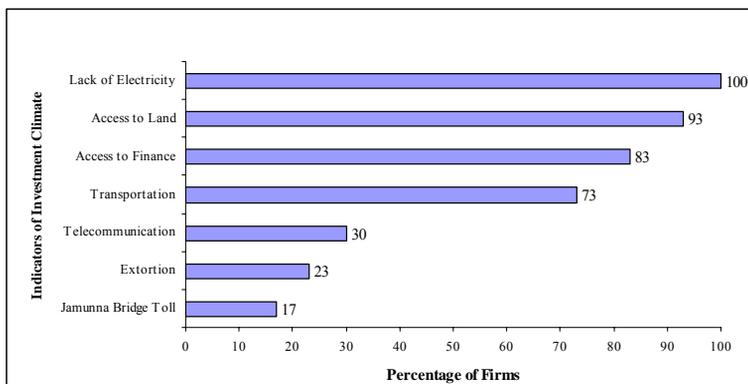
Source: Field Survey, 2008

Bogra provides a different picture with inadequate supply of electricity being perceived as a constraint by all firms (100 percent). The access to land (93%), access to finance (83%) and transportation (73%) are the next three most significant constraints. The three least constraints are

telecommunication (30%), extortion (23%) and Jamuna bridge toll (17%).

It should be noted that only 2 percent of firms in Rajshahi is contrasted by 93 percent of firms in Bogra perceiving access to land as a constraint.

**Figure 5.11: Infrastructural Indicators of Bogra**

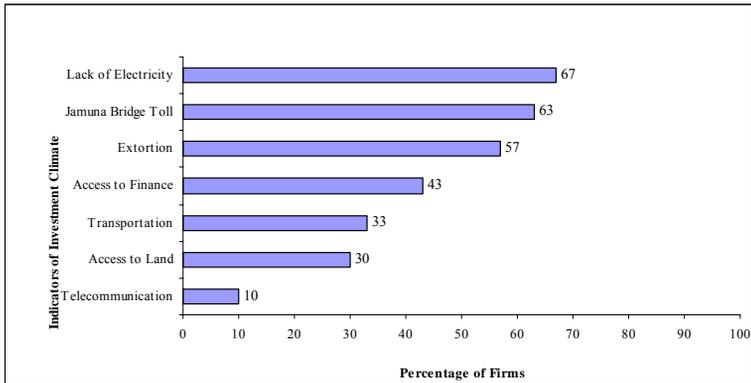


Source: Field Survey, 2008

In Rangpur, inadequate supply of electricity, Jamuna bridge toll and extortion are the top three constraints perceived by 67, 63 and 57 percent of firms in Rangpur respectively.

Access to finance (43%), transportation (33%), and access to land (30%) are the next three most important constraints. Telecommunication, a problem which has eased due to the presence of cellular phones, is the least most important constraint (10%).

A key dimension of the business environment is the quality of public services, which in turn indicates the state of governance. The delivery of government services determine whether government institutions facilitate business operation or hinder it. The survey results indicate that government institutions are not very satisfactory in terms of service delivery, for example, providing business or trade licenses and tax services.

**Figure 5.12: Infrastructural Indicators of Rangpur**

Source: Field Survey, 2008

It can be assumed that multiple regulatory reforms, undertaken simultaneously in order to tackle different constraints, in line with easing constraints found to be significant in specific areas and improving service delivery of government institutions would together boost productivity of the private sector and make the investment climate friendlier. A climate which is conducive to investment will encourage more investment and economic activities.

A list of constraints identified by previously done ICAs (in 2003 and 2008) and our study are presented side by side in Appendix Table 5.1 above. The first and second ICAs only presented major constraints while we have broken them down further into more specific constraints. If we compare the major constraints that we have identified with those of the first and the second ICAs, we find that price fluctuation has appeared as the top-most constraint of our study while it was even in the list of top constraints of the earlier ICAs. One possible explanation of this is that the firms covered in our study are smaller than those included in the first two assessments, and it is likely that smaller firms found price fluctuation to be a more difficult constraint to cope with.

# 6

## **INVESTMENT CLIMATE CONSTRAINTS AND PERFORMANCE OF FIRMS**

This section presents the econometric analysis of this study, which shows how investment climate indicators impact the efficiency performance of firms. Indicators of the investment climate may affect firm performances favorably or unfavorably. Using econometric analysis, we shall examine if the top five indicators, which have been perceived to affect firms unfavorably, actually has any effect on performance or not.

Predicting the potentiality of effective industrialization, a performance evaluation, that is, productivity performance assessment of the firms is of utmost important. Productivity performance is known as a success indicator. It is important to identify and quantify the investment climate indicators which affect the performance of the firms, either favorably or unfavorably. Measuring productivity, and separating the effects of productivity from the effect of the production environment, we can explore hypotheses concerning the sources of productivity differentials. Identification of sources of productivity differentials is essential to the institutions that design public and private policies to improve performance. Moreover, macro performance depends on micro performance. The ability to quantify productivity performance provides a control mechanism to the management of a firm with which to monitor the performance of production units under its control.

Productivity depends on how well the firms use their existing resources (Technical efficiency performance) and the extent of new inputs they are able to introduce (Technological improvement). Productivity advancement can be obtained through technological improvement and efficiency performance advancement. Technological advancement involves the introduction of new inputs like machinery, new production techniques, etc. Efficiency performance enhancement implies the improvement of capability of a firm so that it best utilizes available resources to produce maximum levels of potential output. Thus it implies the ability of the producers to utilize the factor inputs properly. Ability

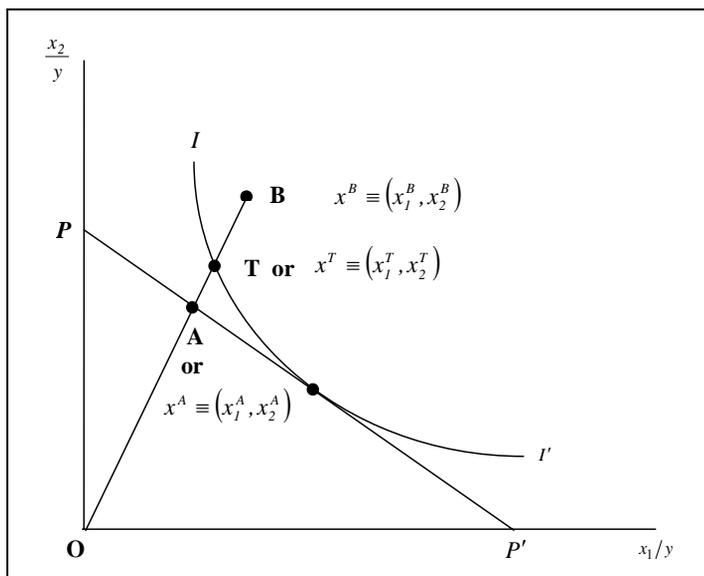
can be improved through training, learning by doing, etc. Variations in output among firms can be explained through differences in technology and efficiency performance.

Therefore, the how productively a firm performs has to do with technical change and technical efficiency component. With a view to assess productive performance and identify and quantify the investment climate indicators of firms, we apply the stochastic econometric frontier model and inefficiency performance effects model which are estimated simultaneously. This will give an estimate of how much output could be increased if inputs and material, which are in the production process, could be used cost-efficiently. We would like to point out that research work on the investment climate in Bangladesh and elsewhere has not, to the best of our knowledge, explicitly and/or formally dealt with this particular issue.

### **6.1 Efficiency Performance: Theoretical Issues**

The measurement of efficiency performance begins with Farrell (1957). The failure to produce the maximum output from a given input mix at minimum cost results in inefficiency performance. Inefficiency performance is explained by, inter alia, restricted access to technology, a lack of knowledge, restricted access to credit, an inappropriate scale of production and sub-optimal allocation of resources.

To explain diagrammatically the concept of efficiency performance, consider the production activity of a firm, following Kopp and Diewert (1982). In Figure 6.1, assume that the firm uses two inputs  $\chi_1$  and  $\chi_2$  to produce a single output  $y$ , and that the production technology is summarized by a linearly homogeneous production function following Farrell. The frontier unit isoquant for this technology and an inefficient production activity are depicted by and respectively. Along the ray, the production activity, denoted by  $T$  and defined by the intersection of line segment  $OB$  with the isoquant  $II'$ , represents a technically efficient input combination as it lies on the frontier isoquant. The inefficiency performance of the firm producing at point  $B$  is represented by the distance  $TB$  because this is the amount by which both inputs could be proportionally reduced producing the same level of output. In percentage terms, this is usually written as the ratio  $TB/OB$ .

**Figure 6.1: Measures of Efficiency Performance**

The efficiency performance of the firm operating at point  $B$  is expressed as:

$$TE = \frac{OT}{OB} = 1 - \frac{TB}{OB} = 1 - \text{Inefficiency performance} \\ (0 \leq TE \leq 1).$$

The firm operating at point  $T$  is fully efficient firm because it is located on the efficient and frontier isoquant and  $TE = 1$ .

Farrell's radial measures of efficiency performance are originally characterized by constant returns to scale and these measures have been generalized to less restrictive technologies by Fare and Lovell (1978) and Forsund and Hjalmarsson (1979).

## 6.2 Econometric Estimation of Efficiency

The seminal paper of Farrell (1957) on efficiency performance pioneered the development of different approaches to efficiency performance

measurement. The stochastic econometric frontier is one of the two main methods of measuring efficiency performance. The econometric approach includes both the stochastic econometric frontier (SF) and the deterministic frontier. The deterministic frontier approach does not allow for a stochastic random error component in the error term and hence is subject to the criticism that all deviations from the frontier are attributed to inefficiency performance. Accordingly, this section focuses on the stochastic econometric frontier approach to measuring efficiency performance.

The approaches to the measurement of efficiency performance and the analysis of productivity stem from Farrell (1957) who measured efficiency performance by estimating a fully-efficient frontier production model using linear programming. The general stochastic frontier production function model, independently proposed by Aigner et al. (1977) and Meeusen and van den Broeck (1977), decomposes the composed error term into two components: a stochastic random error component and a inefficiency performance component.

We specify the inefficiency performance effects (Kumbhakar et al., 1991) and estimates the stochastic frontier and the inefficiency performance effects simultaneously, given appropriate distributional assumptions (Battese and Coelli, 1995). The simultaneous estimation of the stochastic production frontiers and models of inefficiency performance using maximum likelihood techniques has been proposed by Kumbhakar et al. (1991), Reifschneider and Stevenson (1991), Huang and Lui (1994), Battese and Coelli (1995). This one-stage approach is statistically consistent and leads to more efficient inference with respect to the parameters (Coelli and Battese, 1996).

The general stochastic frontier production model is defined as:

$$y_i = f(x_i; \beta) e^{u_i} \quad (1)$$

$$u_i = \xi_i - \zeta_i, \quad i = 1, 2, 3, \dots, q, \quad -\infty \leq \xi_i \leq \infty \quad \text{and} \quad \zeta_i \geq 0.$$

where  $y_i$  represents the output of the  $i$ th firm,  $x_i$  denotes a vector of  $q$  inputs, and  $\beta$  denotes the parameters. The error term  $u$  is decomposed into a stochastic random disturbance and an asymmetric non-negative random error term. The stochastic random disturbances,  $\xi_i$ , the symmetric random errors, take account of measurement error and capture exogenous shocks and other factors not under the control of the farmers;  $\xi_i$  can take any real value and when added to the deterministic frontier,  $f(x_i; \beta)$ , gives rise to the stochastic frontier. The asymmetric non-negative random errors,  $\zeta_i$ , which are called inefficiency performance effects, account for inefficiency performance in production. When  $\zeta_i=0$ , the production function is the best-practice frontier, which yields the maximum output given the inputs; and when  $\zeta_i > 0$ , output is less than this maximum due to inefficiency performance. The greater the quantity by which the actual output falls short of the stochastic frontier output, the higher the level of inefficiency performance. The observed differences in output can be attributed to either inefficiency performance or stochastic disturbances or both. A model without  $\zeta_i$  is the average frontier model criticized by Farrell (1957). Further, a model without the random component results in a deterministic or full frontier model and can be estimated by linear programming techniques.

Assuming a probability density function for both  $\xi_i$  and  $\zeta_i$ , we can estimate (1) by maximum likelihood methods. This approach yields a means by which we can statistically examine the sources of differences between the farmer's output and the frontier output by calculating the variance parameters which relate the variance of  $\xi_i$  to the composed variance of (Kalirajan, 1981).

The variance parameters are expressed as:

$$\sigma_u^2 = \sigma_\xi^2 + \sigma_\zeta^2, \quad \gamma = \sigma_\zeta^2 / \sigma_u^2 \quad \text{and} \quad 0 \leq \gamma \leq 1 \quad (2)$$

Battese and Corra (1977) define  $\gamma$  as the total variation of output from the production frontier which can be attributed to efficiency

performance. If  $\gamma \rightarrow 0$  then  $\sigma_{\xi}^2 \rightarrow 0$  and  $\sigma_{\zeta}^2 \rightarrow \sigma_u^2$ , which implies that the symmetric error term  $\xi_i$  dominates the composed error term and output differs from the frontier output mainly due to measurement errors and the effect of other external factors on production. If  $\gamma \rightarrow 1$  then  $\sigma_{\xi}^2 \rightarrow 0$  and  $\sigma_{\zeta}^2 \rightarrow \sigma_u^2$  which indicates that the asymmetric non-negative error term  $\zeta_i$  dominates the composed error and the differences between output and frontier output can be attributed to differences in efficiency performance.

The efficiency performance of the  $i$ th firm is defined as the ratio of the observed output to the corresponding frontier output, given the levels of the inputs. The firm-specific efficiency performance,  $\varphi_i$ , can be measured as:

$$\varphi_i = \frac{y_i}{y_i^*} = \frac{f(x_i, \beta)e^{(\xi_i - \zeta_i)}}{f(x_i, \beta)e^{\xi_i}} = e^{-\zeta_i} \quad 0 \leq \varphi_i \leq 1$$

Alternatively,  $\varphi_i$  is defined as the ratio of the mean of production (given  $x_i$  and  $\zeta_i$ ) to the corresponding mean of production if there is no inefficiency performance (Battese and Coelli 1988):

$$\varphi_i = \frac{E(y_i | x_i, \zeta_i)}{E(y_i | x_i, \zeta_i = 0)}$$

Again the systematic random error,  $\xi_i$ , is assumed to be independently and identically distributed with mean zero and variance,  $\sigma_{\xi}^2$ . The probability density function of the symmetric random error,  $\xi_i$ , is defined as:

$$f(\xi_i) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2\sigma^2}\xi_i^2}$$

We can assume that the inefficiency performance term is half-normally distributed, a special case of the truncated normal distribution, so that:

$$f(\zeta_i) = \frac{1}{\sigma_\zeta \sqrt{\frac{1}{2}\pi}} e^{-\frac{1}{2\sigma_\zeta^2} \zeta_i^2}$$

The firm-specific efficiencies and mean efficiency performance are obtained respectively as:

$$\varphi_i = E\left[e^{-\zeta_i|u_i}\right] = 1 - \Phi\left(\sigma_i^*\right) e^{\frac{1}{2}\sigma_i^{*2}}$$

and  $\bar{\varphi}_i = 1 - \Phi\left(\sigma_i^*\right) e^{\frac{1}{2}\sigma_i^{*2}}$  (Jondrow et al., 1982).

Again the systematic random error,  $\xi_i$ , is assumed to be independently and identically distributed with mean zero and variance,  $\sigma_\xi^2$ ; and  $\zeta_i$  are non-negative truncations of the  $N(\mu, \sigma_\zeta^2)$  distribution,

$$\text{where: } \mu = z_i \delta_i \quad (3)$$

and  $z_i$  is a  $(k \times 1)$  vector of variables of investment climate indicators which may influence efficiency performance and  $\delta_i$  is an  $(1 \times k)$  vector of parameters.

Measurements of the firm-specific efficiency performance,  $e^{-\zeta_i}$ , depends upon the decomposition of  $u_i$ , which is derived from the conditional expectation of  $e^{-\zeta_i}$  given  $u_i$ . Thus the efficiency performance of each firm is given by

$$\therefore \varphi_i = \left[ \frac{1 - \Phi\left(\sigma_i^* - \left(\mu_i^* / \sigma_i^*\right)\right)}{1 - \Phi\left(-\mu_i^* / \sigma_i^*\right)} \right] e^{\left(-\mu_i^* + \frac{1}{2}\sigma_i^{*2}\right)} \quad (4)$$

which produces the measure of efficiency performance given the specification of the frontier production function model and the inefficiency performance effects model. Inefficiency performance is

estimated by  $1 - E\left\{e^{-\zeta_i|u_i}\right\}$ . The mean efficiency performance of all firms in the sample,  $\bar{\varphi}$ , is obtained as:

$$\bar{\varphi} = \left[ \frac{1 - \Phi\left\{\sigma^* - \left(\mu^* / \sigma^*\right)\right\}}{1 - \Phi\left(-\mu^* / \sigma^*\right)} \right] e^{\left(-\mu^* + \frac{1}{2}\sigma^{*2}\right)}.$$

The Frontier program (Coelli, 1996) calculates the maximum likelihood estimator of the predictor for the efficiency performance that is based on the conditional expectation of  $e^{-\zeta_i}$  given the composed error term of the stochastic frontier production model (Battese and Coelli, 1988). The parameters of the coefficients of stochastic frontier model,  $\beta$ , and the inefficiency performance effects model,  $\delta_i$ , along with the variance parameters are also estimated.

The log-likelihood function for the sample observations is:

$$L(\Omega^*, y) = \sum_{i=1}^n \ln[1 - \Phi(-\mu_i^* / \sigma_{i\zeta}^*)] - \frac{1}{2} \sum_{i=1}^n \left[ \{y_i - f(x_i; \beta)\}' \{y_i - f(x_i; \beta)\} / \sigma_{\xi}^2 \right] - \frac{1}{2} n (\mu / \sigma_{\zeta})^2 + \frac{1}{2} \sum_{i=1}^n (\mu_i^* / \sigma_{i\zeta}^*)^2 - \frac{1}{2} n \ln(2\pi) - \frac{1}{2} n \ln(\sigma_{\zeta}^2 + \sigma_{\xi}^2) - n \ln[1 - \Phi(-\mu / \sigma_{\zeta})]$$

$$\text{where } \Omega^* \equiv (\beta', \sigma_{\xi}^2, \sigma_{\zeta}^2, \mu)'$$

The principal drawbacks of this approach are assumptions about the distributions of inefficiency performance and the random term and the nonexistence of an *a priori* justification of choosing the distributional form of the random noise (Coelli, 1995).

# 7

## INEFFICIENCY EFFECTS MODEL USING STOCHASTIC FRONTIER ANALYSIS

The stochastic frontier model and inefficiency performance effects model have been simultaneously applied to assess the impact of the investment climate indicators on the efficiency performance of firms. The top five indicators of the investment climate used here for each individual region are the same as those identified as top five constraints for the same region as elaborated in Section 6. Maximum likelihood estimation (MLE) technique is used to estimate the models. We conduct the estimation for firms of northern Bangladesh as a whole and for firms of the Rajshahi and Bogra zones separately.<sup>4</sup>

### 7.1 Northern Bangladesh

Table 7.1 shows that inflation, lack of electricity, access to land and price fluctuation affect the performance of firms negatively. This implies that these indicators adversely influence the growth and operation of firms in northern Bangladesh (as a whole). However, caution should be taken before interpreting the results as they are not statistically significant.

**Table 7.1: Performance of Firms in Northern Bangladesh**

Indicators	Coefficient	t-ratio
Constant	0.2116	0.2469
Inflation	-0.1482	-0.2891
Lack of Electricity	-0.1063	-0.1761
Access to Land	-0.4273	-0.8366
Cost of Finance	0.1351	0.1831
Price Fluctuation	-0.9945	-0.1912
Sigma-squared	0.1345	0.3719
Gamma	0.3766	0.2857
Log likelihood function	-0.1900	

Source: Field Survey, 2008

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4 Besides data on investment climate indicators, data on inputs and output of firms are also required for this econometric estimation. As there were some incompleteness in inputs-output data for Rangpur, therefore we did not include Rangpur in this econometric analysis.

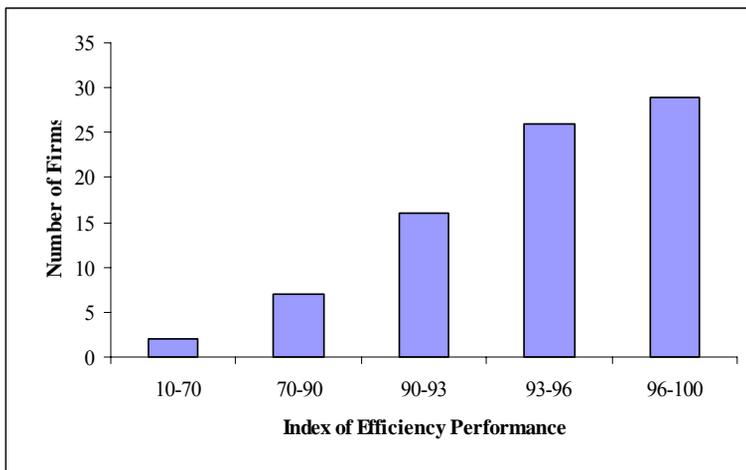
Table 7.2 and Figure 7.1 present the efficiency performance of the firms in this region. The mean efficiency performance of the firms is 93 percent.

**Table 7.2: Results of Efficiency Performance of Firms in Entire Northern Bangladesh**

Percentage Index of Efficiency performance	Number of Firms
10-70	2
70-90	7
90-93	16
93-96	26
96-100	29
Total	80

Source: Field Survey, 2008

**Figure 7.1: Efficiency Performance of Firms in Entire Northern Bangladesh**



Source: Field Survey, 2008

## 7.2 Rajshahi

Results for the assessment of firm performances and investment climate indicators of firms of Rajshahi are given in Table 7.3. It is evident from

Table 7.3 that inflation, inadequate electricity, cost of finance and price fluctuation are indicators which negatively affect the efficiency performance of firms.

**Table 7.3: Results of Inefficiency Effects Model - Assessment of Investment Climate Indicators on performance of firms in Rajshahi**

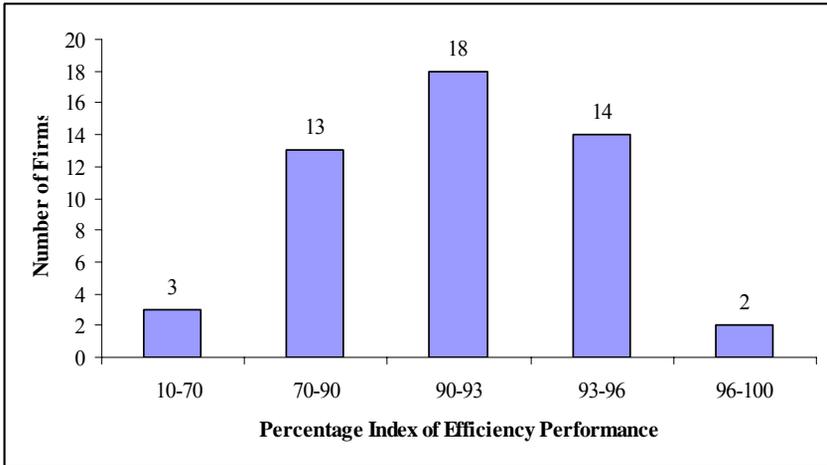
Indicators	Coefficient	t-ratio
Constant	0.2221	0.2578
Inflation	-0.1622	-0.2670
Lack of Electricity	-0.5922	-0.1025
Access to Land	0.1203	0.1604
Cost of Finance	-0.1621	-0.2485
Price Fluctuation	-0.9225	-0.1586
Sigma-squared	0.1702	0.2158
Gamma	0.5588	0.3414
Log likelihood function	-0.8919	

Source: Field Survey, 2008

Efficiency performance of the firms in this region is presented in Table 7.4 and Figure 7.2. The average performance of firms in Rajshahi is 90 percent.

**Table 7.4: Performance of Firms in Rajshahi**

Percentage Index of Efficiency performance	Number
10-70	3
70-90	13
90-93	18
93-96	14
96-100	2
Total	50

**Figure 7.2: Efficiency Performance of Firms in Rajshahi**

Source: Field Survey, 2008

### 7.3 Bogra

Table 7.5 provides results of the assessment of firm performances and investment climate indicators of firms in Bogra. It shows that inflation, inadequate electricity and price fluctuation pose constraints to investment performance of firms.

**Table 7.5: Results of Inefficiency Effects Model - Assessment of Investment Climate Indicators on Performance of Firms for Bogra**

Indicators	Coefficient	t-ratio
Constant	-0.0287	-0.0351
Inflation	-0.0449	-0.7778
Lack of Electricity	-0.0287	-0.0351
Access to Land	0.1518	2.2223
Cost of Finance	0.0152	0.1727
Price Fluctuation	-0.0287	-0.0351
Sigma-squared	0.0305	4.2335
Gamma	0.0065	6.5168
Log likelihood function	11.1765	

Source: Field Survey, 2008

Productive performance of the firms in Bogra is given in Table 7.6 and Figure 7.3. The average performance of firms in Bogra is 96 percent.

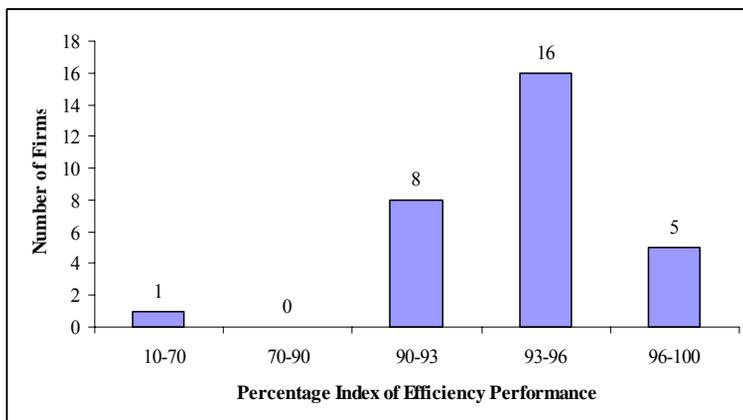
Therefore, we can comment that keeping the price level stable is important for growth and operation of firms. Further, supply of electricity and quality of services can also greatly help in the regard.

**Table 7.6: Efficiency Performance of Firms in Bogra**

Percentage of Index of Efficiency Performance	Number of Firms
10-70	1
70-90	0
90-93	8
93-96	16
96-100	5
Total	30

Source: Field Survey, 2008

**Figure 7.3: Performance of Firms in Bogra**



Source: Field Survey, 2008

The average efficiency performance of firms in Bogra (96%) is higher than those of firms in northern Bangladesh (93%) as a whole and Rajshahi (90%). Perhaps, higher efficiency performance in Bogra can be attributed to an environment of greater competitiveness and the availability of gas. Furthermore, Bogra is in a geographically

advantageous position since, compared to Rajshahi, it is closer to Dhaka and Chittagong, which are the main two industrially-advanced areas in Bangladesh and where demand for goods are higher than other regions. Absence of gas may be one of the reasons for low level of performance of firms in Rajshahi as gas facilitates business activities.

# 8

## SUMMARY AND CONCLUSIONS

1. This study assesses the investment climate in Northern Bangladesh, meaning the Rajshahi division.
2. Samples were drawn from Rajshahi (including Natore), Bogra and Rangpur. The first ICA (2003) did not include Rajshahi while the second one (2008) included only the metropolitan area of Rajshahi.
3. The top constraints for northern Bangladesh as a whole and for Rajshahi, Bogra, and Rangpur separately are reported in order of severity (% of firms perceiving an issue to be a major constraint).
4. The top five ICCs for northern Bangladesh as a whole are found to be inflation, price fluctuation, cost of finance, access to finance, and inadequate electricity. The ICCs perceived by the firms are monetary rather than physical.
5. The top five ICCs reported for Bogra are lack of electricity, price fluctuation, access to land, tax rate and price of land. Three constraints which were not significant for the whole of northern Bangladesh, namely – access to land, tax rate, and price of land, now appear in the list. This could be due to the comparatively advanced state of industrialization of firms in Bogra.
6. It is also found that firms in Bogra had a more pervasive perception of ICCs. While only six constraints are reported to be significant by 50% or more firms in Rajshahi, number of such constraints is twenty for Bogra.
7. The top five ICCs reported for Rangpur are inadequate electricity, Jamuna bridge toll, extortion, price fluctuation, and access to finance. Firms in Rangpur reported two constraints not reported by Bogra or northern Bangladesh as a whole among the top five: Jamuna bridge toll and extortion. Rangpur, being further away from the Jamuna bridge, spent a greater amount in transporting goods to eastern parts of Bangladesh. Because of higher transporting costs,

firms might have felt toll charge an extra burden and hence an important constraint.

8. The different results for the three zones highlight the importance of area-wise study and the need for zone specific policy menu.
9. The application of the stochastic frontier model, new in ICA, has enabled us to link ICCs with the efficiency performance of firms.
10. Policies for investment climate improvement should be area-specific and not same across the board. But, the ICCs that are found to be common should be uniformly dealt with.
11. Inadequate electricity is one constraint found in all the lists. At present, there is a wide gap of around 1000 MW between demand and supply, calling for immediate and sustained efforts in raising electricity production. This will help businesses to grow and operate smoothly.
12. Most of the firms, being small, are affected by price fluctuation.
13. Since most of the top constraints are financial in nature, the development of financial institutions in a manner that will help the small firms is of great importance.
14. There are some emerging constraints, such as extortion, which are growing in dimension and have to be taken care of. Although only Rangpur reported this as a major constraint, it is likely to be faced by other zones in the future if efforts are not made to control it by the government.
15. Result of our stochastic frontier analysis support the perceptions that most of the ICCs, such as inflation, price fluctuation, cost of finance, and lack of electricity have negative impact on efficiency performance of firms.
16. ICCs, which are not perceived today by the firms as significant constraints, may become prominent in the future when the state of industrialization advances. Policy makers may plan in advance regarding how to deal with these possible policy objective.

# 9

## FURTHER RESEARCH

Based on further areas of research work on the investment climate in Bangladesh can be suggested.

Severity of the investment climate constraints may vary from sector to sector. Therefore, further research work on the help formulate appropriate policies for individual sectors.

A comparison of the investment climate constraints of the northern region with those of Dhaka and Chittagong can the investment climate of the entire region.

Investment climate assessments should be treated as a continuous process and should be conducted after regular intervals. In a foreword to the World Bank sponsored study, *Investment Climate around the World*, Stern (2003: p.xii) wrote,

*“The value of investment climate assessment lies not merely in a one time cross-country look at relative condition, but also in repeating such assessment over time. Consistent measurement of conditions over time should provide an invaluable guidepost to the ongoing efforts of developing countries to strengthen their policy and institutional conditions for private-led growth”.*

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# APPENDIX 1

## Top Five Investment Climate Indicators

### Appendix 1.1: Top five investment climate constraints for Northern Bangladesh

Number	Constraints	Perception (%)
1.	Price fluctuation	80
2.	Cost of finance	74
3.	Lack of electricity	71
4.	Access to finance	66
5.	Inflation	65

Source: Field Survey, 2008

### Appendix 1.2: Top five investment climate constraints for Rajshahi

Number	Constraints	Perception (%)
1.	Inflation	96
2.	Price fluctuation	94
3.	Cost of finance	92
4.	Access to finance	70
5.	Lack of electricity	56

Source: Field Survey, 2008

### Appendix 1.3: Top five investment climate constraints for Bogra

Number	Constraints	Perception (%)
1.	Price of land	83
2.	Tax rate	90
3.	Access to land	93
4.	Lack of electricity	100
5.	Price fluctuation	100

### Appendix 1.4: Top five investment climate constraints for Rangpur

Number	Constraints	Perception (%)
1.	Lack of electricity	67
2.	Jamuna Bridge toll	63
3.	Extortion	57
4.	Access to finance	43
5.	Price of land	37

Source: Field Survey, 2008

## APPENDIX 2

### Category-wise Constraints of Investment Climate

<b>Appendix 2.1: Macroeconomic Indicators of Investment Climate (as a whole)</b>	
Macroeconomic Indicators	Percentage of Firms
Price fluctuation	80
Cost of finance	74
Inflation	65
Price of land	35
Foreign exchange depreciation	21
Foreign exchange availability	17

Source: Field Survey, 2008

<b>Appendix 2.2: Governance and Institutions related Indicators (as a whole)</b>	
Institutions and Governance Indicators	Percentage of Firms
Tax rate	53
Customs and trade regulations	36
Skill and education	36
Policy uncertainty	36
Tax administration	33
Corruption	31
Business licensing	27
Informal payment	23
Legal system	21
Labour regulation	21
Bureaucratic red tape	20
Crime, theft and disorder	18

Source: Field Survey, 2008

<b>Appendix 2.3: Infrastructure related Indicators (as a whole)</b>	
<b>Infrastructural Indicators</b>	<b>Percentage of Firms</b>
Lack of electricity	71
Access to finance	66
transportation	46
Access to land	35
Jamuna bridge toll	29
Extortion	22
Telecommunication	11

<b>Appendix 2.4: Macroeconomic Indicator (Bogra)</b>	
<b>Investment Climate Indicators</b>	<b>Percentage of Firms</b>
Price fluctuation	100
Cost of finance	83
Price of land	83
Inflation	67
Foreign exchange depreciation	63
Foreign exchange availability	53

Source: Field Survey, 2008

<b>Appendix 2.5: Institutions and Governance related Indicators (Bogra)</b>	
<b>Institutions and Governance Indicators</b>	<b>Percentage of Firms</b>
Tax rate	90
Tax administration	73
Skill and education	70
Customs and trade regulations	67
Legal system	63
Policy uncertainty	60
Business licensing	60
Labour regulation	57
Bureaucratic red tape	57
Crime, theft and disorder	50
Informal payment	43

**Appendix 2.5: Institutions and Governance related Indicators  
(Bogra)**

<b>Institutions and Governance Indicators</b>	<b>Percentage of Firms</b>
Corruption	40

Source: Field Survey, 2008

**Appendix 2.6: Infrastructure related Indicators (Bogra)**

<b>Infrastructural Indicators</b>	<b>Percentage of Firms</b>
Lack of electricity	100
Access to land	93
Access to finance	83
Transportation	73
Telecommunication	30
Extortion	23
Jamuna bridge toll	17

Source: Field Survey, 2008

**Appendix 2.7: Macroeconomic Indicators (Rajshahi)**

<b>Macroeconomic Indicators</b>	<b>Percentage of Firms</b>
Inflation	96
Price fluctuation	94
Cost of finance	92
Price of land	4
Foreign exchange availability	2
Foreign Exchange depreciation	2

Source: Field Survey, 2008

**Appendix 2.8: Institutions and Governance related Indicators  
(Rajshahi)**

<b>Institutions and Governance Indicators</b>	<b>Percentage of Firms</b>
Tax rate	48
Policy uncertainty	38
Corruption	34
Customs and trade regulations	32
Skills and education	20

<b>Appendix 2.8: Institutions and Governance related Indicators (Rajshahi)</b>	
<b>Institutions and Governance Indicators</b>	<b>Percentage of Firms</b>
Tax administration	20
Informal payment	14
Business licensing	12
Bureaucratic red tape	4
Crime, theft and disorder	2
Labour regulation	2
Legal system	0

<b>Appendix 2.9: Infrastructure related Indicators of investment climate (Rajshahi)</b>	
<b>Infrastructural Indicators</b>	<b>Percentage of Firms</b>
Access to finance	70
Lack of electricity	56
Transportation	38
Jamuna bridge toll	16
Access to land	2
Extortion	0
Telecommunication	0

Source: Field Survey, 2008

<b>Appendix 2.10: Macroeconomic Indicators (Rangpur)</b>	
<b>Macroeconomic Indicators</b>	<b>Percentage of Firms</b>
Price of land	37
Price fluctuation	37
Cost of finance	33
Foreign exchange depreciation	10
Inflation	10
Foreign exchange availability	7

Source: Field Survey, 2008

<b>Appendix 2.11: Institutions and Governance related indicators (Rangpur)</b>	
<b>Institutions and Governance Indicators</b>	<b>Percentage of Firms</b>
Skills and education	30
Tax rate	23
Business licensing	20
Labour regulation	17
Informal payment	17
Corruption	17
Legal system	13
Crime, theft and disorder	13
Tax administration	13
Customs and trade regulations	13
Bureaucratic red tape	10
Policy uncertainty	10

Source: Field Survey, 2008

<b>Appendix 2.12: Infrastructure related indicators (Rangpur)</b>	
<b>Infrastructural Indicators</b>	<b>Percentage of Firms</b>
Lack of electricity	67
Jamuna bridge toll	63
Extortion	57
Access to finance	43
Transportation	33
Access to land	30
Telecommunication	10

Source: Field Survey, 2008

## APPENDIX 3

### Classification of Firms Surveyed according to Sectors and Area

<b>Appendix 3.1: Numbers of Firms Surveyed by Sectors</b>	
<b>Type of Industries</b>	<b>Number</b>
Cold storage	3
Dairy	5
Engineering	22
Food	31
Furniture	9
Jute mills	1
Jewellery	2
Medicine	5
Nursery	1
Plastic	3
Poultry	1
Shoes	12
Textile	8
Other	7
Total	110

Source: Field Survey, 2008

<b>Appendix 3.2: Number of Firms Surveyed within and outside BSCIC</b>			
<b>Districts</b>	<b>Within BSCIC</b>	<b>Outside BSCIC</b>	<b>Total</b>
Rajshahi (including Natore)	14	36	50
Bogra	8	22	30
Rangpur	10	20	30
Total	32	78	110

Source: Field Survey, 2008

**Appendix Table 5.1: Comparison of Results of this Study with First ICA and Second ICA**

	Second ICA (2008)						
First ICA (2003)	Metropolitan			Non-metropolitan			Our Study (2009)
Indicators	Perception (%)	Indicators	Perception (%)	Indicators	Perception (%)	Indicators	Perception (%)
Lack of electricity	72	Lack of electricity	78	Low level of demand for goods and services	41	Price fluctuation	80
Corruption	57	Political instability	73	Macro-instability (Rising inflationary pressure)	31	Cost of finance	74
Tax administration	51	Corruption	55	Seasonal inaccessibility of roads	19	Lack of electricity	71
Cost of finance	50	Access to land	45	Cost finance	19	Access to finance	66
Economic policy uncertainty	45	Access to finance	42	Lack of electricity	17	Inflation	65
Customs and trade	43	Policy uncertainty	30	Road quality	8	Tax rate	53
Access to finance	42			Political instability	8	Transportation	46
						Skill and Education	36
						Policy uncertainty	36
						Customs and trade regulations	36
						Price of land	35
						Access to land	35
						Tax administration	33

	Second ICA (2008)						
First ICA (2003)	Metropolitan		Non-metropolitan		Our Study (2009)		
Indicators	Perception (%)	Indicators	Perception (%)	Indicators	Perception (%)	Indicators	Perception (%)
						Corruption	31
						Jamuna bridge toll	29
						Business or trade licenses	27
						Informal Payment	23
						Extortion	22
						Legal system	21
						Labour regulation	21
						Foreign exchange depreciation	21
						Bureaucratic red tape	20
						Crime, theft and disorder	18
						Foreign exchange availability	17
						Telecommunication	11

Source: Field Survey, 2008

## About this series ...

The papers published as part of this series were produced under the pilot Investment Climate Research Program (ICRP), implemented by ERG and BMB Mott MacDonald and supported by the Bangladesh Investment Climate Fund (BICF). BICF is managed by IFC, in partnership with the U.K. Department for International Development and the European Union. Details about the program can be found at [www.ergonline.org/ifc/](http://www.ergonline.org/ifc/).

The objective of the Investment Climate Research Program is to stimulate independent, innovative research by Bangladeshi academics and professionals on investment climate issues pertaining to Bangladesh.

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