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# Investment Climate in South- West Region of Bangladesh: A Study of the Manufacturing Sector

Mohammed Ziaul Haider, Ph.D.  
Khan Mehedi Hasan



Economic Research Group

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# **Investment Climate in South-West Region of Bangladesh: A Study of the Manufacturing Sector**

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# 1

## INTRODUCTION

### *1.1 Statement of the Research*

This study focuses on the manufacturing firms of the south-west region of Bangladesh. The firms that are engaged in production process using various types of inputs are defined as manufacturing firms in this study. Jute, fertilizer, paper, cement, plastic, furniture (both wood and steel), electronics, ice and brick are the main manufacturing firms operating in this region. In addition, the main processing firms here are firms engaged with food.

The industrial structure of the region has changed significantly over the time. Like many other places in Bangladesh, jute dominated the industrial sector of the region till the 1990s. However, large-scale jute firms have failed to play a leading role in the recent past. Agro processing firms, specifically small and medium-scale shrimp production and processing firms have almost captured the place of jute firms and are dominant in the region. However, some other small and medium sized plastic and furniture manufacturing firms are flourishing, whereas paper and jute firms are shrinking over time.

The manufacturing firms have been playing a significant role in employment creation, income generation, and empowerment of women and fulfilment of local demand in the area. Moreover, these firms are contributing to the national economy through export earnings. The contribution of the manufacturing firms has changed with time. The contribution has varied from time to time even for the same firm. Differences in firm's size, growth rate, productivity, profitability, capacity utilization, labor/capital intensiveness, workers' skill, managerial efficiency, ownership pattern, firm's age, technology level, infrastructure, government policy, access to input sources, domestic demand, export and many other factors have contributed to the changes in operational level of the manufacturing firms. Some of these factors act



as constraints in attracting new investment or in enhancing existing investment stock and even cause investment withdrawal in some cases. However, some factors stimulate investment or enhance it. In this study, an attempt has been made to quantify the changes and to trace out the reasons behind them, and finally to formulate policy measures for generating an environment that is friendlier to investment.

## ***1.2 Literature Review***

The investment climate is a broad term covering economic, social, political, industrial, business and many other aspects. World Bank (2005) defines the investment climate as the set of location specific factors shaping the opportunities and incentives for firms to invest productively, create jobs, and expand. Investment climate is the institutional, policy, and regulatory environment in which firms operate (Dollar et al., 2003a). Dollar et al. (2003b) characterizes the investment climate as having the following elements: infrastructure, domestic entry and exit barriers, skills and technology endowment, labor market flexibility, international integration, private sector participation, informal payments, tax burdens, court efficiency, and finance. Investment climate is the policy, institutional, and behavioral environment, both present and expected, that influences the returns, and risks associated with investment (Stern, 2002b). 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 (World Bank, 2003).

A better investment climate brings benefit to a society. World Bank (2005) finds that a good investment climate provides opportunities for people to improve their economic conditions. A good investment climate is one that is better for everyone in two dimensions: (i) it benefits society as a whole, not just firms, and (ii) it expands opportunities for all firms, not just large or influential firms (Stern, 2002b). Some investment climate improvements deliver broad benefits across society, such as, better macroeconomic stability and less corruption (World Bank, 2005). Dollar et al. (2003c) explain that investment climate measures such as

the strength of property rights, rule of law and level of corruption are also well correlated with growth.

World Bank (2005) describes that a good investment climate fosters productive private investment, the engine for growth and poverty reduction. Growth and poverty reduction is promoted by a good investment climate (Dollar et al., 2003d). BEI (2008) focuses that if adequate investment and attention are given to several sectors like tourism, pharmaceutical and bio manufacturing, which have high potential, it can contribute towards poverty alleviation and economic development. A more attractive investment climate could enhance market prospects for the rural non-farm incomes and employment that could help to reduce rural poverty (Stern, 2002a).

A good investment climate helps to improve infrastructure (Bergara et al., 1998; Henisz, 2002; Henisz and Bennet, 2001; Weder and Mirjam, 2000; and Zhang et al., 2002). World Bank (2005) highlights that public investment in infrastructure can improve the investment climate, and that the international development community has long been an important source of external financing for these investments. It is important to find a consistent pattern of relationships between the investment climate on one hand and firm productivity, factor prices, and growth rates, on the other (Dollar et al., 2003a).

A favorable investment climate helps in improving economic performance of a country. Several researchers highlight on the importance of the investment climate for economic growth and economic stability. World Bank (2004) mentions that the quality of the investment climate affects the performance of regional and national economies. World Bank (2005) emphasizes that investment underpins economic growth by bringing more inputs to the production process. Investment climate affects industrial growth and development (World Bank, 2004.). A more attractive investment climate could have stimulated faster growth (Stern, 2002a). World Bank (2005) adds that growth with a poor investment climate is possible, but unlikely to be sustained.

A favorable investment climate can ensure higher productivity of manufacturing firms. It also determines firms' decisions. A good investment climate provides opportunities and incentives for firms, from micro enterprises to multinationals, to invest productively, create jobs, and expand (World Bank, 2005). Firms in the best investment climate can be twice as productive as those in weaker environments (Dollar et al., 2003a). The foreign-invested firms tend to have higher productivity (Dollar et al., 2003c). World Bank (2004) finds that labor productivity and total factor productivity are much higher in a better investment climate. World Bank (2005) narrates that firms invest to make profits. World Bank (2005) also finds that a good investment climate is not just about generating profits for firms - if that is the goal, the focus could be limited to minimizing costs and risks. Improvements in the investment climate lead to higher productivity, factor returns, and growth (Dollar et al., 2003a). Improving investment climate conditions will disproportionately benefit the smallest firms (Hallward-Driemeier and Stone, 2004). In addition, Dollar et al. (2003c) explain that domestic firms are also more likely to export where the investment climate is good.

Stern (2002a) narrates that governance reforms are critical for both the investment climate and social inclusion. A country's general governance structure and business-government interactions are important components of the investment climate (Dollar et al., 2003d). BEI (2008) suggests that corporate governance will play a key role in enhancing the investment climate of Bangladesh. Smith and Hallward-Driemeier (2005) state that tax and regulation support a sound investment climate and protect broader social interests. In addition, Stern (2003) states that an investment climate is damaged by poor infrastructure and by problems of governance in many countries.

Several researchers focus on the effectiveness of investment. Dollar et al. (2003a) find that a better investment climate leads to both higher wages and higher returns to capital. They also add that investment climate is important for the level of productivity, wages, and profit rates, and for the growth rates of output, employment, and capital stock at the firm

level. In addition, Dollar et al. (2003c) find that an interaction of openness and sound investment climate creates a good environment for investment and production. Bangladesh has improved its access to education, and it is essential in creating a workforce with the skills and knowledge needed for a healthy investment climate (World Bank, 2003). Bangladesh can take actions to improve its investment climate; that is, it can change its institutions and policies in a way that will spur investment (Stern, 2002a).

A sound investment environment is desired by every society. The investment climate has a close link with the economic development of a country. It affects productivity, creates job opportunities and quickens the pace of economic growth. In recent years, the need to improvement the investment climate has received much attention in developing countries. However, most of the available research works address the issue from a general perspective. Some research works focus at the country or global level in describing the investment climate, and some other research works emphasize the importance of corporate governance for its improvement. A positive relation between physical infrastructural development and better investment climate is found in some research works. However, a consideration of the investment climate in any specific sector of an economy or any specific region of a country is hardly available. The features of the investment climate are not the same for different products and locations. This study attempts to fill that gap by addressing issues relevant to the investment climate in light of the manufacturing sector of the south-west region of Bangladesh.

This study considers the literatures on manufacturing firms from two important dimensions – (i) investment decisions related to manufacturing firms and (ii) performance of the manufacturing firms to discover the relationship between investment decisions and firm performance. Both dimensions incorporate various socio-economic indicators in analyzing manufacturing firms.

Wei et al. (2002) demonstrate that better performance of manufacturing firms require capital investments up to a certain level for utilizing economies of scale and function at full capacity. Bøckman et al. (2008)

also highlight on investment size for attaining optimal firm size. In addition, Bøckman et al. (2008) emphasize in timing of investment decisions. Similarly, Kim et al. (2008) place importance on timing on investment decisions through incorporating the idea of investment lags. Therefore, timing is an important factor in taking investment decisions. Other important aspects need to be considered in investment decisions are investment on R&D, technical progress and human capital formation (Al-Salman, 2008; Tsang et al., 2008; Almeida and Carneiro, 2009). Ratti et al. (2008) find that an increased concentration in the financial sector relaxes financial constraints on firm-level investment.

Several researchers consider productivity for analyzing performance of manufacturing firms. Entry and exit decisions of manufacturing firms, firm size, firm growth, sunk cost, managerial efficiency, global association, access to utility services, red tape and security system are associated with productivity of manufacturing firms. Fariñas and Ruano (2005) find that entry and exit decisions of manufacturing firms are systematically related to differences in their productivity level. Mahadevan and Kim (2003) find that the output growth in the South Korean manufacturing industries is increasingly productivity-driven. Fariñas and Ruano (2005) state that sunk costs are an important source of heterogeneity across firm productivity. Models of industry dynamics also predict lower productivity for firms operating in markets with a higher level of sunk entry costs (Hopenhayn, 1992). Fernandes (2008) finds a negative correlation among firm size and total factor productivity (TFP) while managerial quality and global integration are positively associated with TFP from a survey on the manufacturing firms of Bangladesh. Fernandes (2008) also states that firm TFP is reduced due to power supply problems, heavy bureaucracy, and presence of crime.

Technology level, R&D expenditure, ownership structure and financial strength are some other factors associated with productivity of manufacturing firms. Hasan (2002) finds a statistically significant impact of imported technologies on productivity of Indian manufacturing firms. Wakelin (2001) finds a positive and significant relationship between firm's own R&D expenditure and productivity growth. Bin (2008) finds

that inter-industry R&D spill over and foreign technology transfer make significant contributions to both labor productivity and the level of total factor productivity in Chinese manufacturing firms. Kim (2006) finds a positive relationship between family ownership concentration and productivity performance. However, Kim (2006) finds that high debt reliance is positively related to productivity performance for large business groups with entrenched family control. Wei et al. (2002) find that public firms are less profitable and less productive compared to domestic private, foreign owned or joint venture manufacturing firms of China. A closer monitoring, harder budget constraints, better employees and management result better performance in profitability and productivity of manufacturing firms.

The above literature review highlights on size, timing, destinations and sources in making investment decisions of manufacturing firms. Entry and exit decisions of manufacturing firms, firm size, firm growth, sunk cost, managerial efficiency, global association, access to utility services, red tape, security system, technology level, R&D expenditure, ownership structure and financial strength are considered to be the main factors connected to the performance of manufacturing firms. This study tries to understand the investment climate, investment decisions and performance of the manufacturing firms of the south-west region of Bangladesh in light of the above discussions.

### ***1.3 Key Research Questions***

This study critically analyzes the investment climate, investment decisions, and performance of the manufacturing firms of the south-west region of Bangladesh. Sources of investment, investment size, investment destination, returns from investment, ownership pattern, technology up-gradation, R&D expenditure, constraints and opportunities of investment decisions of the manufacturing firms of the south-west region of Bangladesh are the main factors included in this research. Specifically, this study addresses the following:

- The study attempts to classify the manufacturing firms based on firm's sizes. Capital investment, employed manpower, used raw

materials and utility consumption are the main indicators for defining a firm's size. The relationship between a firm's size and its performance is investigated.

- The study tries to identify the destinations (uses) of investments in manufacturing firms. It is assumed that land purchase/rent, license collection, firm infrastructure, machinery and equipment, raw material and salary & wage are the main destinations of firms' investments. The percentile share and changes in shares of investments over time in the destinations for various types of manufacturing firms are analyzed to grasp a wholesome idea about investment destinations.
- The operating profits of manufacturing firms have been critically analyzed. Year of establishment, product price, sales and cost related data of the manufacturing firms are considered to calculate and compare operating profit.
- The study tries to identify the main investment sources of the manufacturing firms. After the identification, the study tries to define the relationship between investment sources and firm performance. Firm growth, productivity, profitability and efficiency are the main indicators for measuring firm performance.
- Changes in investment for the last fourteen years (since 1995) are considered to evaluate the trend and differentials in the investment pattern for various types of manufacturing firms.
- The study also attempts to discover the relationship between ownership pattern and performance of manufacturing firms.
- Investment decisions and outcomes on technology up-gradation and R&D activities of the manufacturing firms are investigated based on the collected data to grasp the overall trend of investment in technology, and research and development. The impact of such changes on firm performance has been traced out.
- The study tries to trace out the existing constraints of new investment attraction and investment enhancement in the manufacturing firms. The constraints are ranked as per the survey findings. The study tries to recommend some policy

measures based on expert opinions and related theoretical knowledge for overcoming those constraints with the aim of creating an investment friendly environment. The existing opportunities for new investment attraction and investment enhancement in manufacturing firms of the region are also identified and ranked.

- Another important aspect of the research is to consider the relationship between investment decisions with inputs and outputs of manufacturing firms. The relationship of input availability, input sources and the destination of firms' outputs with expansion, growth and diversification of manufacturing firms are analyzed.
- Finally, based on the findings, the study tries to prioritize the actions that need to be taken in the near future for creating an investment friendly climate in the manufacturing sector of the south-west region of Bangladesh.

#### ***1.4 Conceptual Framework***

This study tries to assess the factors affecting investment in the manufacturing sector of the south-west region of Bangladesh. Infrastructure plays a vital role in attracting investment. The available infrastructure facilities in a particular region are almost similar for all the concerned firms. However, accessibility and use of those facilities widely vary across the firms, because, all the factors are not equally important for all.

The south-west region of Bangladesh is blessed with manufacturing firms posing diverse features in terms of products, source of inputs, location, output markets, firm size etc. This study tries to cover those widely varied manufacturing firms in assessing the factors affecting investment in the manufacturing sector.



## The Model

$$Y_s = f(X_s)$$

Here,  $Y_s$  = Performance of the manufacturing firms and  
 $X_s$  = Factors of investment in manufacturing firms

### Variables

#### Dependent Variables (Ys)

$Y_1$  = Sales Growth (2005-2008)  
 $Y_2$  = Changes in Investment (2005-2008)  
 $Y_3$  = Employment Growth (2005-2008)  
 $Y_4$  = Capacity Utilization Rate (2008)  
 $Y_5$  = Target Fulfillment Rate (2008)  
 $Y_6$  = Operating Profit to Sales Ratio (2008)

#### Independent Variables (Xs)

$X_1$  = Access to Input  
 $X_2$  = Technology Level  
 $X_3$  = Output Market  
 $X_4$  = Communication  
 $X_5$  = Physical Infrastructure  
 $X_6$  = Access to Finance  
 $X_7$  = Corruption  
 $X_8$  = Utility Services

This research addresses performance of the manufacturing firms as a proxy to ‘take investment decisions’. Due to differences in access to sources of input, technology, product market and required support services, firms’ performances also vary within a region. Therefore, this study considers access to input, technology, output markets, communication, physical infrastructure, access to finance, corruption and utility services as the main factors to assess the investment decisions of the manufacturing sector. Intra-region and intra-group (product wise) are the two important dimensions to detect the variations in the considered factors among the manufacturing firms.

### *1.5 Research Methods*

In this study, Khulna, Jessore, Satkhira and Bagerhat districts are considered as the south-west region of Bangladesh. All types of manufacturing units operating in this region are covered in this study. The firms are grouped in terms of size, product, location, technology level, firm age and other features.

The study uses both secondary and primary data. The published books, journals and reports related to the research topic are the main sources of the secondary data. The newspapers, especially the regional newspapers are also important sources of the secondary data. The annual and other types of reports of the concerned firms are collected and analyzed. Data from various government/private organizations of both regional and national level related to investment, product quantity and quality, product variety, product price, input availability, job creation, entrepreneurship development, technology level and other issues related to manufacturing firms are collected and analyzed.

A random sampling technique is used in selecting manufacturing firms for the primary data. This study considers BBS (2007c - 2007g)<sup>1</sup>, BBS (2007h - 2007l)<sup>2</sup>, database of local business forums and groups like Khulna City Corporation (KCC), Khulna Chamber of Commerce and Industry (KCCI), Khulna Development Authority (KDA), Tax Bhaban, product-wise exporter's associations, etc. to identify population of manufacturing firms in the south-west region of Bangladesh. The local sources provide only a partial scenario of particular areas or products. However, that local data describes the real practices of the manufacturing firms.

According to BBS (2007c - 2007g), there are 41,013 manufacturing units in this region (9,085 in Khulna, 14,424 in Jessore, 13,492 in Satkhira and 4,011 in Bagerhat). The BBS database was constructed in year 2001 for urban areas and in 2003 for rural areas respectively. The product and region wise sub-classification are available in the database, but a respective firm list is absent. In addition to formal organized units, the small and informal units are included in the database. The informal units are mostly unorganized and difficult to find out. Therefore, this study considers manufacturing units employing more than ten people as the true representatives of this sector.

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<sup>1</sup> National report and Zilla series of Economic Census 2001 & 2003. See References for details.

<sup>2</sup> Total Person Engaged (TPE) based various publications and volumes of 'Register of Establishment' of the manufacturing sector of Bangladesh. See References for details.

BBS (2007h – 2007l) provides detailed firm level data of the manufacturing sector of the region. The database, which is the latest available data source, is the updated version of the ‘Economic Census 2001 & 2003’ which incorporates firms employing more than ten people. However, the database is not complete. For example, the BBS database lists an existence of only five shrimp-processing firms in the region, but KCCI lists nineteen shrimp-processing firms only in Khulna district. A filed observation also finds the existence of a significant number of shrimp-processing firms in the region.

BBS (2007i - 2007l) incorporate a total number of 875 manufacturing units employing more than ten persons each in the region. Among these 875 units, brick and rice milling together comprise 57%, and are 36% and 21% respectively. In contrast, jute, fertilizer, matches, etc. important manufacturing sub-sectors are very few in numbers. Therefore, a unique proportionate stratified sampling procedure will over / under-estimate the sub-sectors in selecting firms for the survey.

This study follows a stratified sampling procedure in selecting 263 (30% of all firms) different types of manufacturing firms. Thirty brick and thirty rice milling firms are randomly selected from the 315 brick and 182 rice milling firms respectively. The available 7 jute (out of 7 to get special insight of those decaying firms) and 15 shrimp processing firms are considered as samples. Eighteen firms from 18 groups (containing less than 5 units each) are included in the sample. The remaining 163 (=  $263 - 30 - 30 - 7 - 15 - 18$ ) firms are proportionately selected from the rest of the 331 (=  $875 - 315 - 182 - 7 - 5 - 35$ ) manufacturing firms. The regional proportionate distribution in selecting firms is maintained.

During the data collection, the research team faced several difficulties including (i) not finding physical existence of some firms at the registered addresses, (ii) unwillingness of the firms to provide data and information, and (iii) difficulty in reaching some firms since they are located at remote/far/coastal regions. In addition, the team identified the necessity of subdividing the firms in several product groups. To ensure a sizeable number of sample firms in each product groups, the team increases the sample size from 263 to 375. Replacement of firms

(unavailable or unwilling to respond) with random incorporation of new firms are the main criteria for reshaping the sampling size. In summary, the team knocked 375 firms. After preliminary screening and dropping of firms which provided incomplete and/or inconsistent information, the team succeeded in utilizing 335 firms for this study.

Instead of strictly following the formal 2, 3 or 4-digit codes of industrial classification, this study exerts importance on products that are representative of the region. A strict persuasion of 2, 3 or 4-digit codes does not provide keen insight into the manufacturing units of the region. Hence, the study tries to define products following the Bangladesh Standard Industrial Classification (BSIC) codes but the digits do not follow unique nature. It follows 2, 3 and 4-digit codes simultaneously in applicable cases.

A formal questionnaire was prepared. The questionnaire covered all the necessary information to address the research questions of this study. The questionnaire was modified as per expert opinions. A pilot survey was carried out in 10 selected firms. After thorough analysis of the collected data from the pilot survey, some corrections and modifications in the questionnaire were carried out.

A group of graduate/senior students of Khulna University who are well informed about the culture, environment, transportation and all other related aspects of the region were recruited and trained for data collection. The project investigators and research assistants closely monitored the data collection stage. Special emphasis was given to avoid various kinds of bias and extract correct information from the respondents.

After completing the data collection stage, emphasis was given in editing and recoding the data for analyses. Descriptive statistics (including frequency tables, mean, median, etc.), graphical presentation of the findings, and regression analysis were used in this study to analyze the collected data and answer the research questions. The draft report was modified by incorporating expert opinions. Several research papers will

be drafted based on the findings of this study in the near future to publish in peer-reviewed journals.

### ***1.6 Organization of the Report***

This research report consists of seven chapters. Chapter 1 focuses on statement of the research, literature review, key research questions, conceptual framework, research methods, activity schedule and limitations of the research. Chapter 2 highlights on study area and investment climate of the study area. Chapter 3 provides a profile of the general aspects of manufacturing firms, products, location of sample firms, firm age, ownership pattern, sourcing of raw materials, firm size, seasonality and skill level. Chapter 4 discusses the product dimensions of manufacturing firms. This chapter deals with major product groups, performance of manufacturing firms, investment, energy consumption, input-output market, product price, sales pattern and cost structure of the manufacturing firms.

Chapter 5 discusses district wise distribution of firms, district wise performance, raw material markets, energy consumption and cost structure. Chapter 6 highlights the investment climate for manufacturing firms. It focuses on the physical infrastructure in the south-west region, input markets, output markets, financial services, utility services and miscellaneous issues to relate firm performance to the investment climate. Finally, Chapter 7 concludes the study providing some policy measures, suggestions, and recommendations for improving the investment climate. References are attached at the end of the paper. Some important data related to the research has been annexed.

### ***1.7 Limitation of the Study***

The main limitations of the study are:

- The respondents were often afraid of responding to the questions. They suspected that the research team may have direct or indirect connections with the tax office, other Government offices, or financing bodies.
- Getting access to some manufacturing firms required formalities, especially in Bangladesh Small and Cottage Industries Corporation (BSCIC) located at Jessore. Rush in operation and requirement of approval from head office/governing bodies are the main problems in getting access to the large firms.
- As the data were collected during the caretaker government's period, owners of some of the firms were reluctant in disclosing financial information.
- Some small-scale firm owners were reluctant to respond to the survey due to their time constraints. Some owners were also engaged in the core production process, and hence could not find time to respond to the survey questionnaire properly. In certain cases, for example at peak production times, it was even difficult for some owners to arrange a room to talk with the interviewer.
- Though the responders provided data on general information about their firms, they were hesitant in giving financial data like investment, cost, sales and price.
- Some manufacturing firms are situated in remote areas where survey personnel could not reach.
- The managers or persons-in-charge of some firms were not authorized to respond to the survey questionnaire without the permission of the firm owners.

# 2

## OVERVIEW

### *Introduction*

The south-west region of Bangladesh contains various natural resources and a large number of manufacturing firms are operating in the region. However, a wide variation in product coverage, product quality, sources of inputs, location, output destination, firm size, firm age, sales pattern, technology level, skill level, etc. are observed among the manufacturing firms of the region. Due to such variations, the firms' performances also vary across the region. This study will try to point out the investment climate under which diverse manufacturing firms are operating. Moreover, it will try to focus on the performance of the manufacturing firms in the south-west region of Bangladesh under the prevailing investment climate.

### *2.1 Study Area at a Glance*

This study covers Khulna, Jessore, Satkhira and Bagerhat districts of the south-west region of Bangladesh. The geographical characteristics of the region are quite different from other regions of Bangladesh. The districts have diversity in geography, demography, economy, transport and other characteristics. The total land area, administrative sub-districts, surrounded areas etc. are considered in describing geographic features of the region. Total population, population density, population growth rate, religion, gender and literacy rate are discussed as demographic features. Annual average temperature, average rainfall and soil conditions show the climatic, atmospheric and geological characteristics of the region. The value of land, main occupations, major manufactories, work force engaged in the manufacturing sector and in NGO activities are included as economic characteristics. The transportation and communication system comprise the total road length including both national and regional highways, waterways, railways and a number of land ports, seaport and airport. Table 2.1 and Figure 2.1 provide a summary about

the demography, weather, transport and economic features of the study area.

**Table 2.1: Important Features of the Study Area**

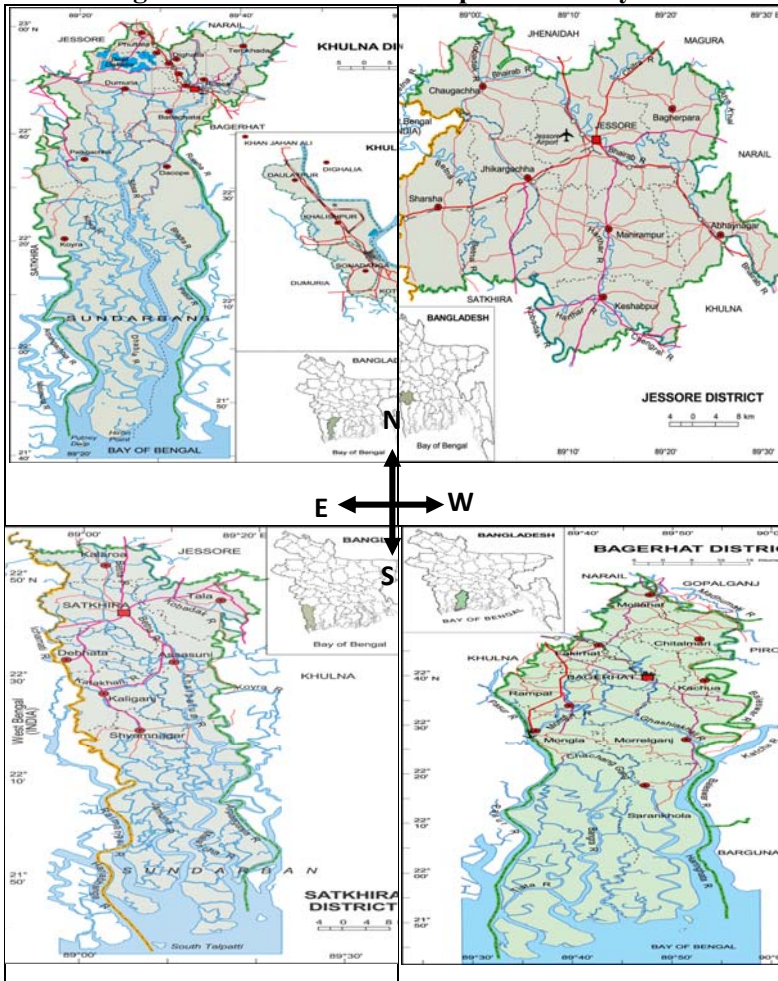
Features	Indicators		Districts			
			Khulna	Jessore	Satkhira	Bagerhat
Geography	Total area (sq. km)		4394.46	2570.42	3858.33	3959.11
	River		Rupsa-Pasur, Bhairab	Bhatia, Kapotakhho	Hariabhangna, Ichamati	Madhumati, Pasur, Mongla
	Bounded by		Bagerhat, Jessore, Satkhira	Khulna, Satkhira, Narail, Jhenaidah, India	Khulna, Jessore, India	Gopalganj, Barguna, Khulna, Pirojpur
	Administrative sub-districts		14	8	7	9
	Total land (hector)		384886	257505	372982	354743
Demography	Total population		2378971	2471554	1864704	1549031
	Density (per sq. km)		541	962	483	391
	Population growth rate (%)		1.70	1.61	1.56	0.79
	Religion	Muslim	73.49%	86.5%	78.08%	77.45%
		Hindu	25.74%	13.21%	21.45%	22.06%
	Gender	Male	51.87%	51.22%	50.54%	51.30%
		Female	48.13%	48.78%	49.46%	48.70%
Literacy rate (%)	Male	52	25.1	49.54	49.54	
	Female	35	41	33	34.33	
	Average	44	33.4	44.33	44.33	
Weather	Annual average temperature (°C)	Max.	35.5	37.1	35.5	33.5
		Min.	12.5	11.2	12.5	12.5
	Annual rainfall (mm)		1710	1537	1710	1710
Soil condition		Acid sulphate, peat, calcareous grey floodplain	Peat, non-calcareous dark grey floodplain	Acid sulphate, calcareous grey floodplain	Acid sulphate, calcareous dark grey floodplain	



Features	Indicators		Districts			
			Khulna	Jessore	Satkhira	Bagerhat
Transport	Road length (Km)	Total	375.77	327.17	227.90	405.36
		National highway	54.69	122.66	0.00	27.58
		Regional highway	34.87	60.11	23.88	103.19
		Feeder road	286.21	144.41	204.02	74.59
	Waterways (nautical miles)		470	70	164	3325.82 km
	Railways (Km)		36	48	-	24
	Ports (No.)	Air port	-	1	-	-
		Sea port	-	-	-	-
		Land port	-	1	1	-
	Economy	Main Occupation		Agriculture, fishing, industry, transport, service and others.	Agriculture commerce, service, industry, transport and others.	Agriculture, fishing, pisciculture, industry, transport, service and others.
Major Manufactories		Shipyards, steel mill, press mill, saw mill.	Textile mill, plastic factory, biscuit factory, ice factory.	Rice mill, ice factory, flour mill, oil mill, fish processing.	Ice factory, rice mill, wheat mill, cements industry.	
Manufacturing units (Numbers; as on 2003)		9085	14425	13492	4011	
Work force (as on 2003)		Total	220109	269831	158820	105616
		Manufacturing	42800	22272	8900	3813
NGOs		BRAC, CARE, Caritas	BRAC, ASA, Grameen Bank	BRAC, CARE, Grameen Bank	BRAC, ASA, Proshika	
Land value (Tk per 0.01 hectore)		Tk. 12000	----	Tk. 7000	Tk. 5000	

Source: Author compiled based on BBS (2007b); Asiatic Society of Bangladesh (2008); and Wikipedia (2009).

N.B.: All the information of Table 2.1 is as on year 2001, if not otherwise mentioned.

**Figure 2.1: District-wise Map of the Study Area**

Source: Asiatic Society of Bangladesh (2008)

## 2.2 Investment Climate of the Study Area

A good investment climate encourages the manufacturing firms of a region to invest productively, to create jobs, and to expand. It thus plays a central role in the growth and development of a region. The investment climate makes private investment more productive. It creates opportunities and jobs for people and expands the variety of goods and

services available. The physical infrastructure and finance markets are the basic components of the investment climate of a region.

### **2.2.1 Physical Infrastructure**

Physical infrastructure is the most supportive factor affecting the smoothness of operation of the manufacturing sector of an area. Necessary physical infrastructure is a key factor in the growth and performance of manufacturing firms. Physical infrastructure is important in collecting raw materials, mobility of labor, and distribution and marketing of output. It comprises roads and highways, seaports, land ports, airports, electricity, telecommunications, water supply system, sewerage system etc.

#### **2.2.1.1 Roads and Highways**

The road network has a potential role in industrialization. Without a good road network, manufacturing firms cannot collect raw materials and supply finished products properly. In the south-west region of Bangladesh, the main road network is Daulatdia-Faridpur-Magura-Jhenaidah-Jessore-Khulna-Mongla route. An overview of roads and highways in this region is shown in Table 2.2.

**Table 2.2: Roads and Highways in the South-West Region of Bangladesh**

<b>Road Name</b>	<b>From</b>	<b>To</b>	<b>Paved (Km)</b>	<b>Total</b>
Khulna-Jessore Road	Khulna	Jessore	59	59
Khulna-Mongla Road	Khulna	Mongla	45	45
Khulna-Satkhira Road	Khulna	Satkhira	69	69
Khulna-Bagerhat Road	Khulna	Bagerhat	33	33
Khulna-Phultala Road	Khulna	Phultala	24	24
Satkhira-Jessore Road	Satkhira	Jessore	68	68
Jessore-Jhenidah Road	Jessore	Jhenidah	46	46
Jessore-Benapole Road	Jessore	Benapole	38	38
Palbari-Daratana-Monihar-Moorli Road	Palbari	Moorli	7	7
Palbari-Board Office-Monihar Road	Palbari	Monihar	4	4

Road Name	From	To	Paved (Km)	Total
Kaligang-Khajura-Raypur-Bagherpara Road	Kaligang	Bagherpara	19	19
Manirampur-Nehalpur-Kapalia Road	Manirampur	Kapalia	20	20
Jessore-Magura Road	Jessore	Magura	44	44
Jessore-Narail Road	Jessore	Narail	45	45
Khulna-Razarhat-Chuknagar Road	Khulna	Chuknagar	30	30
Prembagh-Bahirhat-Paker Gati Road	Prembagh School	Paker Gati	6	6
Prembagh-Dakuria-Sundali Road	Prembagh	Sundali	17	17
Sutighata-Dakuria-Kuwada Road	Sutighata	Kuwada	13	13
Khulna-Dumuria Road	Khulna	Dumuria	16	16
Satkhira-Asashuni Road	Satkhira	Asashuni	25	25
Satkhira-Kolaroa Road	Satkhira	Kolaroa	15	15
Satkhira-Tala Road	Satkhira	Tala	40	40
Satkhira-Debhata Road	Satkhira	Debhata	15	15
Satkhira-Kaligang Road	Satkhira	Kaligang	33	33
Satkhira-Shamnagar Road	Satkhira	Shamnagar	65	65
Satkhira-Munshigang Road	Satkhira	Munshigang	65	65
Atharomile-Tala Road	Atharomile	Tala	10	10
Kulla-Dargahpur Road	Kulla	Dargahpur	10	10
Dargahpur-Ramnagar Road	Dargahpur	Ramnagar	3	3
Ipagacha-Thampur Huzur Bari Road	Ipagacha	Thampur Huzur Bari	10	10
Sangitar Moar-Kamalnagar Road	Sangitar Moar	Kamalnagar	5	5
Asashuni-Dargahpur Road	Asashuni	Dargahpur	3	3
Asashuni-Nalta Road	Asashuni	Nalta	30	30
Asashuni-Manikkhali Road	Asashuni	Manikkhali	1	1
Manikkhali-Jamalnagar	Manikkhali	Jamalnagar	2	2

Road				
Kachua-Mesherdangi Road	Kachua	Mesherdangi	3	3
Taralig Bridge-Kaligang Road	Taralig Bridge	Kaligang	7	7
Kaligang-Vadrokhali Road	Kaligang	Vadrokhali	5	5
Shitolpur-Kaligang Road	Shitolpur	Kaligang	3	3
Patkhelghata-Magura Pirbari Road	Patkhelghata	Magura Pirbari	5	5
Kadamtola-Boikali Road	Kadamtola	Boikali Border	25	25
Chaltar Moar-Bangdaho Bazaar Road	Chaltar Moar	Bangdaho Bazaar	12	12
Keshabpur-Betgram-Tala Road	Keshabpur	Tala	34	34
Keshabpur-Sharoshkathi-Kalaroa Road	Keshabpur	Kalaroa	11	11
Manirampur-Jhikargachha Road	Manirampur	Jhikargachha	16	16
Churamankathi-Chaugachha Road	Churamankathi	Chaugachha	16	16
Sadhinata-Swarani Road (Jessore Cant.)	Jessore Cant.	Jessore Cant.	1	1
Bagherpara Link Road	Bagherpara	Bagherpara	4	4
Madanpur College-Trimohoni Bazar Road	Madanpur	Trimohoni	20	20
Narayanpur Bridge	Narayanpur	Narayanpur	0.11	0.11
Manirampur-Nehalpur Kapalia Road	Manirampur	Kapalia	0.04	0.04

Source: Author compiled based on BRTA (2008) and field observations.

### 2.2.1.2 Mongla Seaport

Mongla seaport is located in the Bagerhat district. It was formerly located at Chalna, about 11 miles (18 km) upstream on the Pusur river, but since 1954 it is located 48 km south of Khulna city. The port is situated at the confluence of the Pashur river and the Mongla river. It lies about 62 miles (100 km) north of the Bay of Bengal and is connected to

the major inland river ports. The port's main export items are jute, leather, tobacco, frozen fish, and shrimp. The major import items are grain, cement, fertilizer, coal, and wood pulp.

### Revenue and Expenditure of Mongla Seaport

Mongla seaport is the second largest revenue earning port of Bangladesh. Near the beginning of the current decade, Mongla port was able to generate profits. But in the fiscal year 2006-07 and 2007-08, the port experienced net losses. The reasons behind the loss are mainly labor strikes and the lack of maintenance/ restoration of port infrastructure. Table 2.3 represents the revenue and expenditure of Mongla port from year 2002 to 2008.

**Table 2.3: Revenue & Expenditure of Mongla Port**

Year	Revenue (Million Tk.)	Expenditure (Million Tk.)	Net Profit / Loss (Million Tk.)
2002-03	558.850	508.031	50.819
2003-04	519.835	473.621	46.214
2004-05	454.799	460.394	(-)5.595
2005-06	472.452	450.119	22.333
2006-07	434.147	464.000	(-) 29.853
2007-08	402.768	429.085	(-) 26.317

Source: Mongla Port Authority (2009).

### Volume of Trade

Based on ship, container and cargo statements of Mongla port, the total import was highest in the fiscal year 2001-02 and the lowest in 2007-08. Total export crossed the 300 thousand metric ton benchmark during 2001-2004. However, export has been decreasing drastically since 2005. The price hike of exportable products, unrest at the port including labor strikes account for the situation. The total amount of export and import also declined in the year 2007-08 compared to previous years. The numbers of ships arriving and departing to and from the port were the highest in the fiscal year 2004-05. However, the number has been decreasing since 2005 and it was the lowest in the year 2007-08. The

recorded data shows only 128 arrivals and 126 departures in year 2007-08.

### **Operational Indicator**

The turnaround time of vessels, number of containers and conventional cargo throughput per ship day, equipment availability, waiting time of ships, service time of ships, berth occupancy etc. are the main operational indicators of a seaport. During the fiscal year 2006-07, Mongla port could achieve its targets, but in 2007-08, its achievement fell behind in terms of the turnaround vessel per day indicator. The conventional cargo increases in 2007-08 (800 M. ton) compared to the previous year. The number of containers, conventional cargo, equipment availability, waiting and service time of ships per day and berth occupancy has declined in year 2007-08 compared to that of 2006-07. These data indicate that the performance of Mongla port has declined over time.

#### ***2.2.1.3 Benapole Land Port***

Benapole is situated on the Bangladesh-India border under the **Sharsha** upazilla in the district of **Jessore**. Its development started with the setting up of Benapole Customs station after the independence of **Pakistan** in **1947**. Urbanization of Benapole started in 1990s along the **Grand Trunk Road** from the border towards the Sharsha upazilla headquarter. Benapole is the Side of the **Petrapole**-Benapole border heck post between **Bangladesh** and India. It is the largest Land Customs station of the country. A large number of people travel between Bangladesh and India through Benapole Customs station every day.

The Bangladesh Land Port Authority (BLPA) is weighing the importance of this port compared to other Land Customs (LC) stations. Geographically, Benapole is a strategic point for cross-border trade between India and Bangladesh. The volume of trade through this port between the two countries has been increasing over time. According to the Land Port Authority, about 90 percent of the total imported items from India come through Benapole land port. Primarily, Benapole land port was an LC station and gradually it turned into a customs division

and later into a customs house due to its importance. Currently, 143 staff members including 9 officials and 134 workers are working in the Benapole land port. The income from Benapole land port was around Tk. 500 crore in 1996-97 period, which has increased to Tk. 850 crore recently. The Indian Government has also prioritized export to Bangladesh through Benapole-Petrapole border, which is attractive to Indian exporters for its cheap service and low equipment charges. Besides, some goods receive duty exemption advantage in this land port. Asian Development Bank (ADB) is working to sort out improvement areas in the immigration and customs of the land port and also studying the feasibility of Benapole-Petropole border as a corridor of transit in the South Asian region.

### 2.2.2 Electricity

Electricity is the one of the basic requirements needed to run manufacturing firms. The supply and demand of electricity varies from area to area. Major electricity suppliers in this region are – Central Khulna, Goal Para, Bagerhat, Mongla, Jessore, Satkhira, Noapara, Pally Biddut etc. However, there is a huge gap in regional as well as national demand and supply of electricity. In addition, the unsmooth electricity supply hinders the growth of the manufacturing sector. Table 2.4 lists the electricity production in Khulna.

**Table 2.4: Electricity Production in Khulna**

Plant	Year	Capacity (M.W.)	Actual Production (M.W.)	Daily/ Monthly
Khulna Biddut Kendra	2008	170	60	Daily
	2007	226	88	Daily
	2006	226	143	Daily
	2005	226	168	Daily
	2004	226	168	Daily
Aggreko	2008	42	40	Daily

Source: West Zone Power Distribution Company Limited (2008)

### 2.2.3 Financial Infrastructure

The banking system of the south-west region of Bangladesh includes nationalized, private and foreign commercial banks. Bangladesh Bank is



the central bank of the economy entrusted with the responsibilities of formulating the monetary policy of the government, and with the supervision of all commercial banks operating throughout the country. In recent years, banking policy has changed greatly. The government has been encouraging the private sector to come forward in establishing banks and other financial institutions for overall economic development.

Sonali, Agrani, Janata and Rupali are the state-owned commercial banks operating in this region. These banks have branches at divisional, district, thana and even union or village level. However, the respondents claim that the services provided by the public limited banks are not satisfactory and therefore are not conducive to a better investment climate. In contrast, The City bank, United Commercial bank, NCC bank, Standard bank, Standard Chartered bank, Prime bank, One bank, National bank, IFIC bank, South East bank, EXIM bank, Eastern bank, Dutch Bangla bank, BRAC bank, Social Investment bank, Mercantile bank, Mutual Trust bank, Shahjalal bank, Jamuna bank, First Security bank, Bank Asia, Islami bank Bangladesh, Al-Arafah Islami bank, Arab Bangladesh bank, Pubali bank, Uttara bank, etc. are the main privately-owned banks running in the region. The services of these banks are better than that of state-owned commercial banks. However, the numbers of branches of such banks are insufficient to properly support the manufacturing firms of the region. Bangladesh Krishi bank, Rajshahi Krishi Unnayan bank, Bangladesh Shilpa bank, Bangladesh Shilpa Rin Sangtha, BSIC bank, Bangladesh Somobay bank and Grameen bank are some other financial institutions operating in the region and providing loans to the industrial sector.

Insurance companies play a supporting role for the development of the manufacturing sector. Both the public and private life insurance companies as well as other insurance businesses are operating in the region. However, the poor economic condition of the workers in the manufacturing sector and the lack of consciousness of the people about the benefits of insurance are obstacles in the mass practice of insurance schemes.

### **2.2.4 NGOs**

Some NGOs support the development of the manufacturing sector in the study area, affecting the investment climate positively. It is observed that NGOs are supporting the formation of small scale manufacturing firms (i.e. handicrafts) through providing finance. They also work for skill development of the workers. In addition, they help the small scale firms for setting up distribution channels. Similarly, they are contributing to improve physical infrastructures like roads, educational institutions, etc.

### **2.3 Manufacturing Sector of the Study Area**

As the region is blessed with diverse natural resources, manufacturing firms of this region are also diverse. Jute, fertilizer, paper, cement, plastic, furniture, electronics, ice and brick are the main manufacturing firms operating in this region. In addition, shrimp are the main processing firms of this region. The industrial structure of the region has changed significantly over time. Like in many other places of Bangladesh, jute was dominant in the industrial sector of the region till the 1990s. However, large scale jute firms failed to continue leading. Currently, shrimp processing firms are dominating the industrial sector here. However, some other types of firms, mostly small and medium scale ones are growing fast.

Among the product categories, the major ones are baked goods, brick, iron & steel, wood, wooden furniture, mud tiles, rice and coconut oil. The mud tiles and wood firms are significant in numbers. The wood firms are dominant in Khulna and Satkhira districts because most of the wood traders collect wood from the nearby Sundarbans forest and after processing they supply the wood to furniture makers. The mud tiles making business occupies a good number in Satkhira district. The brick fields are profitable businesses mostly situated in Jessore. The paper, book & printing firms are available in considerable numbers in the urban areas of Khulna, Jessore, Satkhira and Bagerhat districts. Due to plenty of coconut trees in the coastal areas, coconut oil firms have also grown up in a significant number in this region. The coconut and mustard oil firms are mainly concentrated in Bagerhat.

Certain industries have not expanded due to natural and infrastructural bottlenecks such as tobacco, ship building, salt, coke, oven and cement industries. As shrimps are cultivated largely in Khulna, Bagerhat and Satkhira districts, the shrimp processing firms have grown up in these districts. Some industries like dairy, fertilizer, chemical, oxygen, ice factory, button, plastic etc. are also included in the manufacturing sector of the south-west region but these are not in significant numbers.

### ***Summary***

This chapter tries to give an overview of the study area. The study area is the south-west coastal belt of Bangladesh. The region is endowed with diverse natural resources and various forms of physical infrastructures. Some of those infrastructures are stricken with maintenance and other problems. Upgrading those infrastructures and establishing new ones is vital to making the investment climate in the region more favorable. Similarly, the region suffers from the lack of smooth electricity supply, unavailability of gas, and inadequate financial facilities. An improvement in these respects will upgrade the investment climate of the region and hence improve the performance of the existing manufacturing firms. Furthermore, new investors will be encouraged to invest in this region.

# 3

## GENERAL ASPECTS OF MANUFACTURING FIRMS

### *Introduction*

The south-west region of Bangladesh comprises manufacturing firms of diverse characteristics. Product variety, firm size, firm age, ownership pattern, employment level, financing, raw material sourcing pattern, market coverage, export orientation, product quality and technology level are the main factors generating diversity of firms. This study endorses such diversity through analyzing firm-level primary data of manufacturing sector. Moreover, the study tries to identify possible reasons behind the wide diversity. Socioeconomic, political, historical, geographical, environmental and infrastructural factors contribute to that diversity.

In addressing performance of manufacturing firms, six important performance measures are considered: (i) sales growth, (ii) changes in investment, (iii) employment growth, (iv) capacity utilization rate, (v) target fulfillment rate, and (vi) operating profit to sales ratio. This study defines ‘sales growth’ as the average of percentile growth in sales (value) of a firm in two or more successive years. Similarly, the study defines ‘employment growth’ as the average of percentile growth in total employment of a firm in two or more successive years. The average of net change(s) in investment of a firm is treated as ‘change in investment’. This study defines ‘capacity utilization rate’ as the ratio between ‘utilized capacity’ and ‘installed capacity’, ‘target fulfillment rate’ as the ratio between ‘targeted production’ and ‘actual production’, and ‘operating profit to sales ratio’ as the ratio between operating profit and sales of firms in a year.

In measuring sales growth, the firms established in year 2008 are not considered due to unavailability of sales growth data. One-year sales growth (2007-2008) for the firms that were established in 2007, two-year sales growth (2006-2008) for those that were established in 2006 and

three-year sales growth (2005-2008) for those that were established in 2005 or earlier are considered in this study. The same concept is applied for changes in investment and employment growth measurement. The capacity utilization rate, target fulfillment rate and operating profit to sales ratio are pertinent to the year 2008 only.

### ***3.1 Product***

The study finds that hundreds of products are manufactured by the manufacturing firms of the south-west region of Bangladesh. A total of 335 sample firms are selected to generate a clear picture about the investment climate of the manufacturing sector of the region. The study segregates the firms into nine major groups, namely, Bakery (G1), Brick (G2), Iron & Steel (G3), Coconut oil (G4), Paper, Book & Printing (G5), Rice Milling (G6), Mud Tiles (G7), Wood Processing (G8) and Wooden Furniture (G9). Instead of strictly following the so called 2, 3 or 4 digit industrial product classifications, the study considers the products directly to make the analysis more realistic and practical. The survey covers a significant number of firms from each group (see Table A3.1 of Annex). The brick manufacturing firms receive the highest position followed by the bakery, iron & steel and wood processing firms in the sample list.

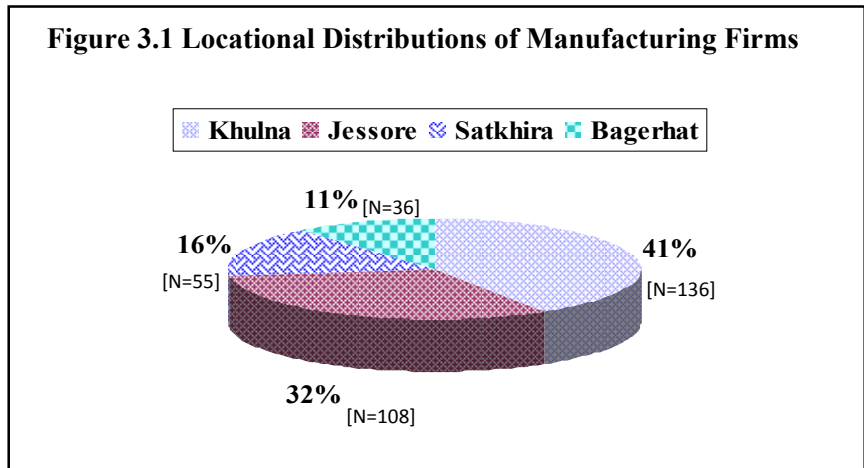
Cement, fertilizer, jute, salt, fish processing, ship building, ice factory, electronics, food processing, tobacco, textile, handicraft, etc. are some of the other firms operating in the region. All these firms (75 firms) are included in G10 group. Some of these miscellaneous firms are giants (for example, cement, fertilizer, jute, etc.) while some others are very small in size (for example, handicrafts, electronics etc.). However, the total number of such operating firms of each category is minimal in this region. Therefore, this study incorporates all these firms in G10.

This study investigates the larger firms of the region in addressing the manufacturing sector. However, there are a small number of such firms in the region, and there are difficulties in getting access to relevant information about these firms. The large firms are contributing a lot to employment generation, local demand fulfillment and export earnings of

the region. The exclusion of those firms from this survey will make the study incomplete and the findings of the survey will be biased. Therefore, the study tries to address those firms from all possible important aspects.

### 3.2 Location of Sample Firms

Among the 335 firms that have been surveyed, 136 firms are located in the Khulna district, 108 in Jessore, 55 in Satkhira and 36 in Bagerhat (see Figure 3.1). The sampling distribution across districts matches the population distribution of manufacturing firms in the region. Khulna is the divisional city and various types of manufacturing firms are concentrated there. Jessore is the second largest district in the region consisting of various types of manufacturing activities. The number of manufacturing firms operating in Satkhira and Bagerhat districts is smaller than that of the two other districts.



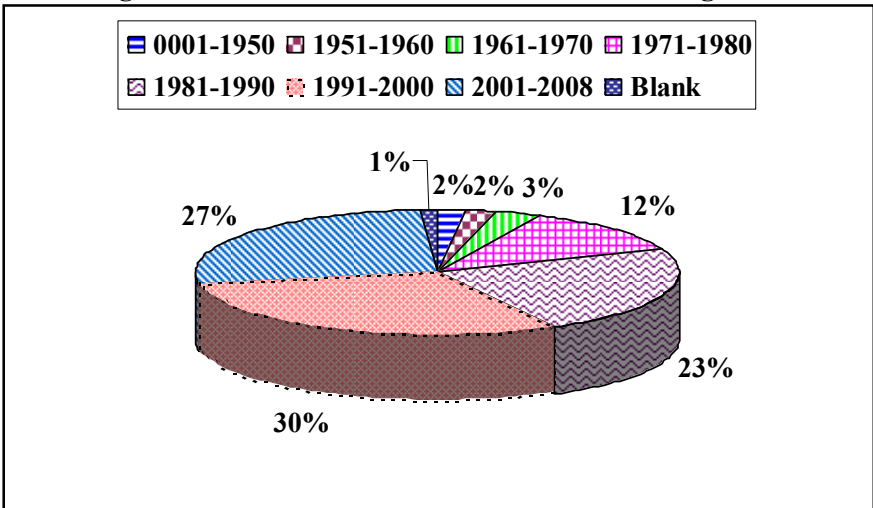
Source: Field Survey (2008-09).

### 3.3 Firm Age

The south-west region of Bangladesh is blessed with various natural resources. Different types of manufacturing firms have grown up in the region over time. A few firms that were established before the year 1970 are in existence even today. The ages of the surveyed manufacturing

firms varies widely and are between 1 and 109 years. The oldest firm was established in year 1900, whereas, the newest one in year 2008. Among the 335 manufacturing firms, more than one-fourths can be treated as comparatively newer firms that were established in the current decade (2001-2008). About 80% of the sample firms were established in 1980s and onward (see Figure 3.2). The comparatively older firms mainly deal with the non-mechanized traditional products like handicrafts and mud tiles. However, products handled by newer firms such as fertilizer, steel and printing involve the use of technologically advanced machinery.

**Figure 3.2: Establishment Year of Manufacturing Firms**

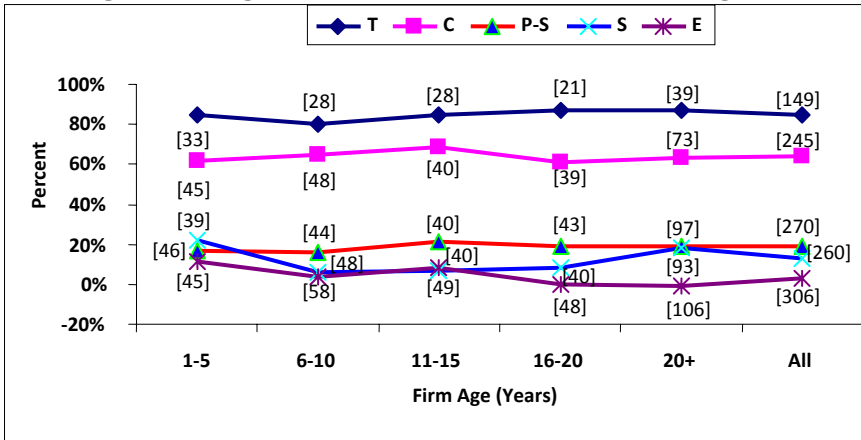


Source: Field Survey (2008-09).

Performance level of the firms varies according to ages of the firms. The sales growth rate of the manufacturing firms is almost a U-shaped curve with respect to firm's age. The recently established (1-5 years) and matured (more than 20 years) firms experience higher sales growth over the mid-aged (6-20 years) firms (see Figure 3.3). The sales growth of newer firms increases at an increasing rate over time and they gradually tend to maturity. The mid-aged group comprises a significant number of loss making firms. Those loosing concerns cannot quit operation because of invested capital, part of which is sunk. In contrast, maturity,

experience and skill level partly explain the better performance of the older firms.

**Figure 3.3: Age-wise Performance of Manufacturing Firms**



Source: Field Survey (2008-09)

N.B.: T stands for 'Target fulfillment rate', C for 'Capacity utilization rate', P-S for 'Operating profit to sales ratio', S for 'Sales growth' and E for 'Employment growth'.

[The numbers in the parenthesis] indicate sample size (N).

The employment growth rate is higher for the newer firms compared to aged counterparts. The obsolete equipment and technique hinders the expansion of older firms whereas modern techniques help the newer firms to expand through recruiting employees and staffs. The survey even finds negative employment growth rates for some of the older firms. Access to technology partly explains such variation in recruitment policy of the firms.

Although sales and employment growth rates are higher for the newer firms, the older firms have higher operating profit to sales ratio. The older firms are able to minimize costs with the aim of higher profit. The study finds that the older firms' long run relationship with forward and backward linkage entities and comparatively efficient management due to either experience or recruitment of skilled manpower are the two main reasons for better performances in operating profit to sales ratio - an ultimate objective of all sorts of firms.



Approximately one-third of the installed capacities of the firms are unutilized. The local (Khulna region) output market is narrow in size and the available physical infrastructures do not support the selling of products outside the region or the country in a mass volume. The quality of the manufactured products is also lower compared to the benchmark required for crossing the national boundary and a good portion of the installed machineries of the firms in the region are obsolete. All these factors limit the capacity utilization rate of the firms.

The target fulfillment rate of the surveyed firms is more than 80% on average. Lower demand of products confines the manufacturers to fix the target within their capacity, and ultimately it results in high scores in the target fulfillment rate criteria. Employee turnover, disturbance of machines, business climate factors (including infrastructure, utility and political stability) and impact of seasonality on production explain the unattained target.

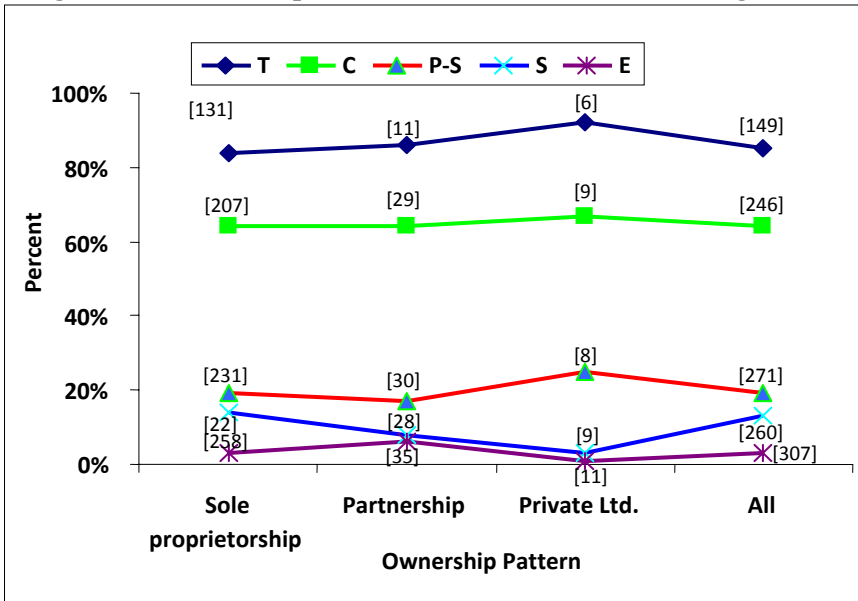
### **3.4 Ownership Pattern**

The ownership pattern influences performances of manufacturing firms. This study considers four types of ownership patterns: sole proprietorship, partnership, private limited and public limited company. Sole proprietorships dominate the manufacturing sector of the south-west region of Bangladesh (see Table 3.1). However, partnership type firms are also gradually flourishing in the region. About a half of the partnership firms comprise of two partners, with the highest number of partners in the surveyed partnership firms being six. The miscellaneous group includes a few number of sole proprietorship firms.

**Table 3.1: Ownership Pattern of Manufacturing Firms**

<b>Ownership Pattern</b>	<b>Number of Firms</b>	<b>Percentage</b>
Sole Proprietorship	284	85%
Partnership	36	11%
Public Limited	1	0%
Private Limited	12	4%
Others	2	1%
<b>Total</b>	<b>335</b>	<b>100%</b>

Source: Field Survey (2008-09).

**Figure 3.4: Ownership vs. Performance of Manufacturing Firms.**

Source: Field Survey (2008-09)

N.B.: T stands for 'Target fulfillment rate', C for 'Capacity utilization rate', P-S for 'Operating profit to sales ratio', S for 'Sales growth' and E for 'Employment growth'.

This figure excludes the 'public limited' and 'other' firms because of their insignificant numbers in the total.

[The numbers in the parenthesis] indicate sample size (N).

Figure 3.4 demonstrates that the target fulfilment and capacity utilization rates are comparatively higher for all sorts of firms. The field observation indicates that the private limited firms are more cautious and efficient in recruiting employees, which results in comparatively lower employment growth rate.

The operating profit to sales ratio is higher than the sales growth for all sorts of firms. It is highest for the private limited firms, whereas, sales growth is the lowest for the said group. Sales growth of the sole proprietorship and partnership firms are higher than that of private limited firms. However, the sole proprietorship and partnership firms fail to maintain the position in earning profit. Such a scenario signals the

relative efficiency and expertise of the private limited firms in handling sales, cost, profit and other financial activities.

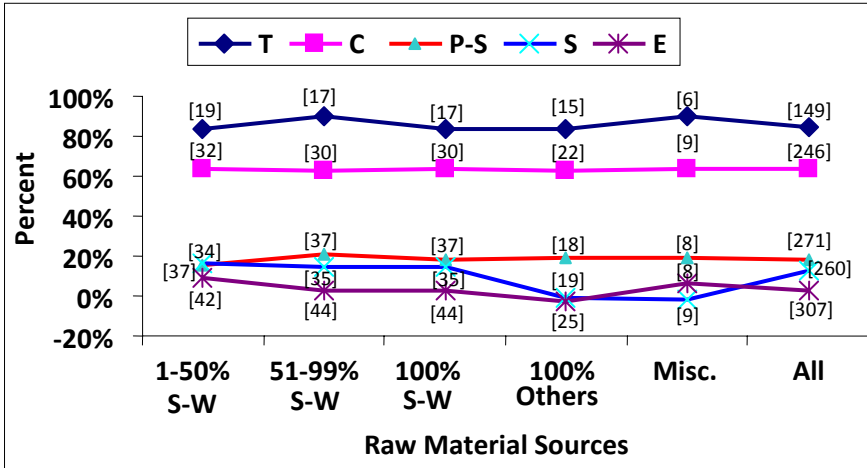
The changes in investment are large in private limited firms. In sole proprietorship business, this is lower than private limited but higher than partnership business.

### ***3.5 Sourcing of Raw Materials***

Source of raw materials is a key factor affecting the performances of manufacturing firms. The Figure 3.5 demonstrates that manufacturing firms that wholly rely on locally produced raw materials face lower changes in investment, lower employment growth and lower target fulfillment rate. However, they experience a higher sales growth compared to the firms which use raw material from outside of the region.

The survey findings indicate that a wider horizon of source of raw materials is positively related to operating profit to sales ratio and negatively related to sales growth rate (with some exceptions). This trend indicates the necessity to expand sources of raw material of the manufacturing firms for attaining higher profit - the ultimate objective of a business entity.

**Figure 3.5: Raw Material Source vs. Performance of Manufacturing Firms**



Source: Field Survey (2008-09).

N.B.: T stands for ‘Target fulfillment rate’, C for ‘Capacity utilization rate’, P-S for ‘Operating profit to sales ratio’, S for ‘Sales growth’ and E for ‘Employment growth’.

‘S-W’ stands for ‘South and West part of Padma and Meghna River’, ‘N-W’ for ‘North-West region of Bangladesh – Rajshahi Division’ and ‘Others’ stand for other regions not included in S-W and N-W.

This figure excludes ‘N-W’ as the criterion contains only one sample.

[The numbers in the parenthesis] indicate sample size (N).

### 3.6.1 Firm Size (by Employment)

Employment size, production volume, sales volume, investment size and factory area are the main tools used to measure firm size. This study divides surveyed manufacturing firms into four broader groups based on employment size. Firms employing 1-5 people, 6-20 people, 21-50 people, and more than 50 people are grouped as  $E_1$ ,  $E_2$ ,  $E_3$ , and  $E_4$ , respectively (see Table 3.2). Surveyed data indicates that firms dealing with iron & steel, wooden furniture and printing & press mostly belong to  $E_1$  group. In contrast firms dealing with baked goods, coconut oil, rice milling, mud tiles, wood processing and wooden furniture mostly belong

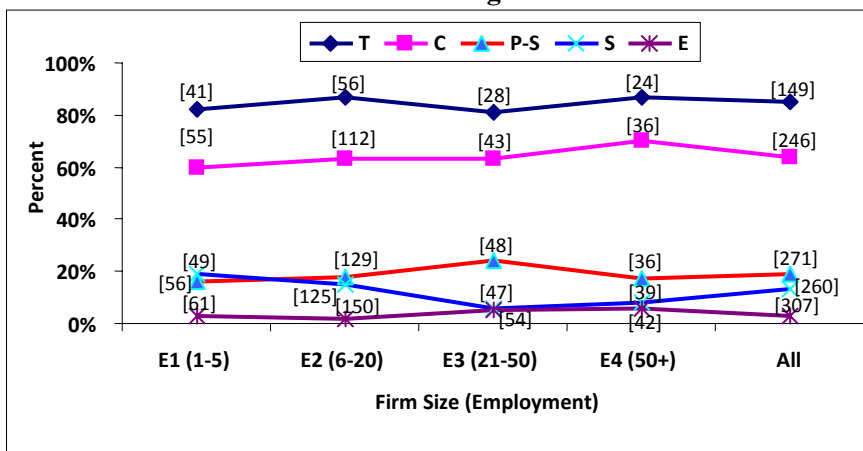
to E<sub>2</sub> and E<sub>3</sub> groups. Firms producing bricks, cement, fertilizer, etc. belong to E<sub>4</sub> group.

**Table 3.2: Employment in Manufacturing Firms**

Employment Size	Group	Number of Firms	Percent of Total
1-5	E <sub>1</sub>	75	22
6-10	E <sub>2</sub>	90	27
11-20		70	21
21-30	E <sub>3</sub>	35	11
31-50		20	6
51-100	E <sub>4</sub>	18	5
101-500		26	8
500+		1	0
Total		335	100

Source: Field Survey (2008-09)

**Figure 3.6: Firm Size (Employment) vs. Performance of Manufacturing Firms**



Source: Field Survey (2008-09).

N.B.: T stands for 'Target fulfillment rate', C for 'Capacity utilization rate', P-S for 'Operating profit to sales ratio', S for 'Sales growth' and E for 'Employment growth'.

Firms employing 1-5 people are grouped in E<sub>1</sub>, 6-20 in E<sub>2</sub>, 21-50 in E<sub>3</sub> and more than 50 in E<sub>4</sub> groups.

[The numbers in the parenthesis] indicate sample size (N).

More than one-fifth of the surveyed firms belong to E<sub>1</sub> group and employ 1-5 employees. About half of the firms belong to E<sub>2</sub> group and employ

between 6 and 20 people, and the rest of the firms employ more than 20 employees (see Figure 3.6). The number of male workers is significantly higher than the number of female workers in the manufacturing firms. The survey finds that female workers are mainly engaged in handicraft, rice milling and coconut oil firms. In contrast, brick, iron & steel, wooden furniture etc. are male dominated firms.

The small firms are experiencing a higher sales growth than the large firms. However, the operating profit to sales ratio is the highest for the mid-sized (having 21-50 employees) firms (see Figure 3.6). The larger firms are able to achieve internal and external economies that ultimately results in lower average costs and higher profit. Such a trend signals the urge to increase firm size. The comparatively large sized firms are employing more people due to their capacity, product and market coverage, and future plan for extension. On the other hand, the smaller sized firms also recruit more with a hope of sustaining in the business. However, the mid-sized firms are a bit reluctant in recruiting new employees.

Investment data show a strong positive relationship between firm size and increase in investment. The target fulfillment and capacity utilization rate are almost similar for all the groups.

### ***3.6.2 Firm Size (by Sales Volume)***

This study divides manufacturing firms into three broad groups based on yearly sales. Firms with yearly sales of Tk. 1 - 500,000 belong to group  $S_1$ , Tk. 500,001 - 2,000,000 in group  $S_2$ , and more than Tk. 2,000,000 in group  $S_3$ . This study defines  $S_1$ ,  $S_2$  and  $S_3$ , as small, medium and large sized firms from yearly sales volume perspective. The surveyed data indicates that mud tiles firms mostly fall in  $S_1$  group comprising yearly sales of Tk. 1 - 500,000. In contrast, bakery, brick, coconut oil and rice milling firms are comparatively large in size, which occupies a large share in  $S_2$  and  $S_3$  groups. Wooden furniture manufacturing firms are incorporated in both  $S_1$  and  $S_2$  groups. The miscellaneous group incorporates all sorts of firms. According to the yearly sales data of year

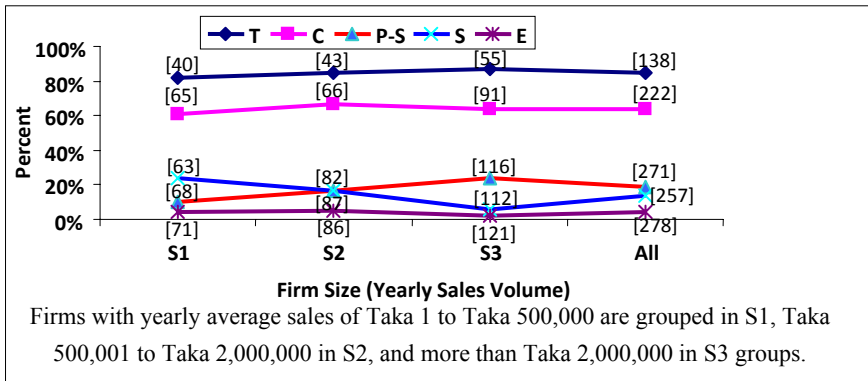
2008, the S<sub>1</sub> and S<sub>2</sub> groups comprise of around one-fourth of the total surveyed firms and the rest half belong to S<sub>3</sub> group (see Table 3.3).

**Table 3.3: Yearly Sales of Manufacturing Firms**

Sales of Year 2008 (Tk.)	Group	Number of Firms	Percent of Total
1-100,000	S <sub>1</sub>	4	1
100,001-200,000		19	6
200,001-500,000		55	17
500,001-1,000,000	S <sub>2</sub>	44	13
1,000,001-2,000,000		43	13
2,000,001-5,000,000	S <sub>3</sub>	43	13
5,000,001-10,000,000		21	6
10,000,001 <sup>+</sup>		58	17
Not responded		48	14
Total		335	100

Source: Field Survey (2008-09).

**Figure 3.7: Firm Size (Sales Wise) vs. Performance of Manufacturing Firms**



Source: Field Survey (2008-09)

N.B.: T stands for ‘Target fulfillment rate’, C for ‘Capacity utilization rate’, P-S for ‘Operating profit to sales ratio’, S for ‘Sales growth’ and E for ‘Employment growth’. [The numbers in the parenthesis] indicate sample size (N).

The comparatively smaller firms (S<sub>1</sub> and S<sub>2</sub>) have higher sales growth than that of the larger firms (S<sub>3</sub>). However, the larger firms’ operating profit to sales ratio is higher than that of the small and medium-sized firms. In the case of the larger firms, the operating profit to sales ratio is much higher than the average operating profit to sales ratio of all firms

(see Figure 3.7). The increase in sales alone is not sufficient for a firm to sustain in competition; rather, an increase in profit mostly determines its existence and expansion. The larger firms are more efficient in handling the sales and profit.

Figure 3.7 indicates that the larger (from sales volume perspective) firms are reluctant in recruiting more, while Figure 3.6 indicates that the larger (from employment level perspective) firms recruit more. This gives the message that accruing high sales volume or sales growth alone does not give any concrete message regarding firm size and firm performance. The cost structure and other aspects of firms attract attention in explaining the overall performance of manufacturing firms.

### 3.7 Seasonality

The firms whose full swing operation doesn't exceed 8 months in a year are treated as seasonal ( $R_1$ ) firms in this study. The firms operating more than 8 months in a year are defined as regular ( $R_2$ ) firms. About one-third of the surveyed firms are seasonal in nature (see Table 3.4). Brick, mud tile and rice milling are three main sub-sectors comprised with a significant portion of seasonal firms. The uncertainty generated from such seasonality threatens income, employment, production and profit of the concerned people.

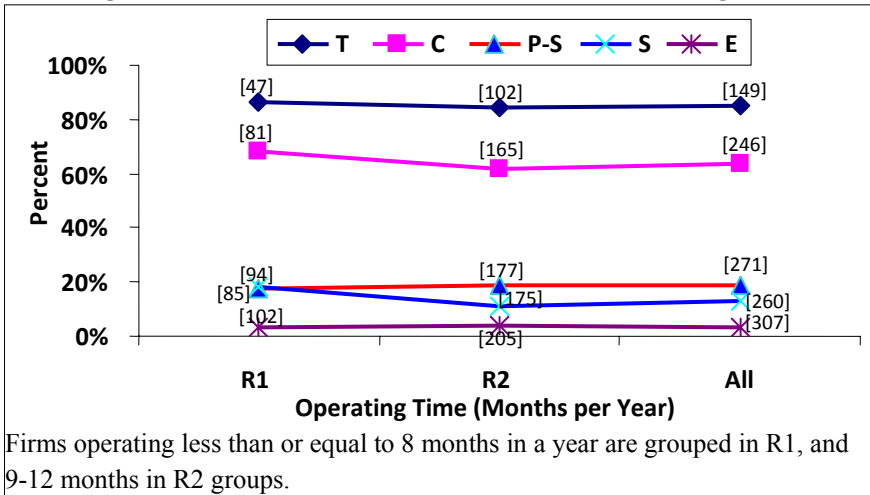
**Table 3.4: Full Swing Operation of Manufacturing Firms**

Firms	Months/Year	Number of Firms	Percentage
$R_1$ (Seasonal)	1-5	14	4%
	6-8	92	27%
$R_2$ (Regular)	9-10	42	13%
	11-12	187	56%
	Total	335	100%

Source: Field Survey (2008-09).

Figure 3.8 describes the impact of seasonality on performances of manufacturing firms. The sales growth of seasonal manufacturing firms ( $R_1$ ) is higher than that of regular firms ( $R_2$ ). The capacity utilization rate and target fulfillment rate of the seasonal firms ( $R_1$ ) are greater than that of regular firms ( $R_2$ ).



**Figure 3.8: Performance of Seasonal Manufacturing Firms**

N.B.: T stands for 'Target fulfillment rate', C for 'Capacity utilization rate', P-S for 'Operating profit to sales ratio', S for 'Sales growth' and E for 'Employment growth'. [The numbers in the parenthesis] indicate sample size (N).

The changes in investment are higher for regular firms. The seasonal firms initiate business with comparatively large investment, and get back the return and even capital (to some extent) at the end of the year. As a result, they get the opportunity to reinvest in the subsequent periods, and hence their changes in investment are lower. Similarly, the employment growth rate of the regular firms is higher than that of seasonal firms. However, the operating profit to sales ratio is almost similar for both the groups (see Figure 3.8). Such findings indicate that the seasonal firms remain in competition in line with the regular firms through adjusting production, employment and other business activities. Such adjustment capability is a special feature of the regional raw-material-dependent manufacturing firms operating in this region.

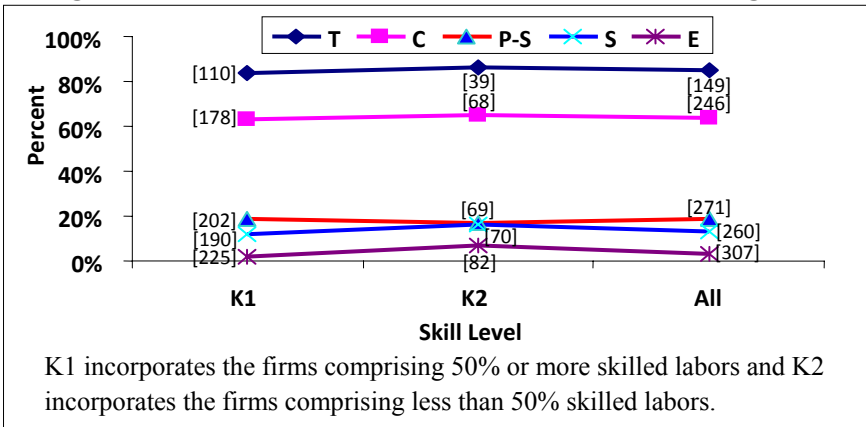
### 3.8 Skill Level

Skilled manpower is imperative for ensuring good performance of firms. The diverse characteristics of manufacturing firms require different levels of skill. This study treats a worker as skilled if he can operate at

least two-third of the machineries used in the manufacturing process of the concerned firms. It divides the firms into two groups:  $K_1$  and  $K_2$ . The  $K_1$  group firms have 50% or more skilled labor and the  $K_2$  group firms have less than 50% skilled labor. Approximately three-fourths of the surveyed firms belong to  $K_1$  group, and the rest belong to  $K_2$  group.

The average changes in investment of the  $K_1$  group are higher than that of the  $K_2$  group. The sales growth rate and employment growth rate are higher for the  $K_2$  group. In general, it is comparatively easy to collect and employ manpower for the  $K_2$  group as they mostly handle unskilled labor. However, the operating profit to sales ratio of the  $K_1$  group is higher than that of the  $K_2$  group (see Figure 3.9). The scenario signals that level of skill has a direct positive impact on the performance of manufacturing firms.

**Figure 3.9: Skill Level vs. Performance of Manufacturing Firms**



Source: Field Survey (2008-09).

N.B.:T stands for ‘Target fulfillment rate’, C for ‘Capacity utilization rate’, P-S for ‘Operating profit to sales ratio’, S for ‘Sales growth’ and E for ‘Employment growth’. [The numbers in the parenthesis] indicate sample size (N).

### 3.9 Business Initiation

The amount of fixed assets at the inception period of the manufacturing firms varies significantly across the firms. About one-fourth of the manufacturing firms initiated business with a capital of less than or equal

to ( $\leq$ ) Tk. 100,000. Almost half of the manufacturing firms' fixed assets in the establishment year are Tk. 0.1 to 1 million (see Table 3.5). A small number of large manufacturing firms with more than Tk. 10 million worth of fixed assets at the inception period are also found in the survey. In summary, majority (more than 80%) of the firms are either small or medium sized firm with respect to fixed assets and these firms dominate the manufacturing sector of the region.

**Table 3.5: Fixed Assets of Manufacturing Firms in Establishment Year**

Fixed Asset at Inception Period (Tk.)	Number of Firms	Percentage
1-50,000	55	16%
50,001-100,000	27	8%
100,001-200,000	63	19%
200,001-500,000	75	22%
500,001-1,000,000	27	8%
1,000,001-10,000,000	40	12%
10,000,000 <sup>+</sup>	16	5%
Not responded	32	10%
Total	335	100%

Source: Field Survey (2008-09).

### **3.10 Business Financing**

Bank and non-bank loans are the main financial sources of the manufacturing firms of the region. Approximately one-third of the manufacturing firms directly depend on banking or other financial institutions for financing business. The remaining two-third firms denied disclosing financial sources. The annual interest rate of the loans taken by the firms varies from 10% to 22.5% (Field Survey, 2008-09).

### **3.11 Export Orientation**

Only one-tenth of the surveyed firms have full or partial orientation to export markets. Mud tiles and processed shrimp are the two main exportable products of this region. Coconut oil, cement, handicraft etc. are some other exporting firms of this region. The contribution of

manufacturing sector to export earnings of the region is not significant and a major share of the earnings is generated from the agro industries like shrimp or mud tiles (Field Survey, 2008-09).

### ***Summary***

This chapter describes general aspects of the manufacturing firms. In the south-west region of Bangladesh, manufacturing firms have diverse characteristics. This diversity arises due to variety of products, firm size, ownership pattern, technology, sources of raw material and so on. The main manufacturing firms covered by this study are bakery, brick, iron & steel, coconut oil, printing press, rice milling, mud tiles, wood processing, wood furniture etc. The surveyed manufacturing firms are located in four districts: Khulna, Jessore, Satkhira and Bagerhat. The numbers of manufacturing firms operating in Khulna and Jessore districts are larger than the number of manufacturing firms operating in Satkhira and Bagerhat districts.

The sole proprietorship type of firms dominate manufacturing sector of the south-west region of Bangladesh. The private limited firms are more cautious and efficient in recruiting people. Similarly, they are more efficient and expert in dealing with sales, cost, profit and other financial activities.

About 80% of the sample firms have been established in last three decades. The older firms deal with mainly non-mechanized traditional products like handicrafts and mud tiles. However, newer firms handle mainly mechanized products like fertilizer, steel, printing etc. Though the sales and employment growth rates are higher for the newer firms, the older firms have a higher operating profit to sales ratio.

A wide source of raw materials is positively related to the operating profit to sales ratio and negatively related with the sales growth rate. This trend indicates the necessity of expanding raw material sources for attaining higher profit - the ultimate objective of a business entity.

Employment and sales volume patterns are considered to determine the size of the firms. The smaller firms dominate the manufacturing sector of

the south-west region. More than one-fifth of the surveyed firms employ 1-5 employees on an average and about a half of the firms employ 6-20 people, and the rest of the firms employ more than 20 people. The smaller firms experience a higher sales growth but a lower operating profit to sales ratio. The larger firms (from employment perspective) employ more employees.

Approximately, one-fourth of the surveyed firms have yearly sales of Tk. 1 - 500,000, other one-fourth of the firms have yearly sales of Tk. 500,001 - 2,000,000, and the remaining firms have yearly sales of Tk. 2,000,000<sup>+</sup>. The smaller firms experience a higher sales growth but a lower operating profit to sales ratio in comparison to the larger firms. Therefore, accruing a high sales volume or sales growth alone does not give any concrete message regarding firm size and performance. The cost structure and other aspects of firms attract attention in explaining the overall performance of manufacturing firms.

The sales growth, capacity utilization rate and target fulfilment rate of seasonal manufacturing firms are higher than that of the regular firms. The regular firms take the lead role in terms of changes in investment. The adversity of seasonality does not exclude the seasonal firms from competing with regular firms, as indicated by similar operating profit to sales ratios for the groups.

This study also finds a direct and positive impact of employee skill on performance of manufacturing firms. It finds that, a large amount of fixed capital is required to initiate manufacturing firms. The firms require institutional loan for mitigating yearly expenditures. As the number of export oriented firms in the south-west region is few, the contribution to export earnings of the manufacturing firms located in this region is low.

# 4

## PRODUCT DIMENSION OF MANUFACTURING FIRMS

### *Introduction*

This study examines ten major product dimensions of manufacturing firms of the south-west region of Bangladesh. The dimensions are Baked products (G1), Brick (G2), Iron & Steel (G3), Coconut oil (G4), Paper, Book & Printing (G5), Rice Milling (G6), Mud tiles (G7), Wood Processing (G8), Wooden Furniture (G9) and Miscellaneous (G10). Yearly sales growth rate, yearly changes in investment, yearly employment growth rate, capacity utilization rate, target fulfilment rate and operating profit to sales ratio of each product dimension are considered to measure performance. In addition, fixed asset, machineries investment, energy consumption, input-output market, product price, sales pattern and cost structure of manufacturing firms are considered in this section for a product-wise analysis of the manufacturing sector.

### *4.1 Major Product Groups*

#### **G1: Bakery**

The bakery items are very popular in urban areas. There are many bakeries in the region and those are running successfully. The quality of output needs to be in line of the standard set by the Bangladesh Standard and Testing Institute (BSTI). Currently, a large number of people are engaged in the bakery business, but their wages are very low.

#### **G2: Brick**

Brick field businesses are highly labor intensive in nature. Wood and coal are used as fuel for burning bricks. Most of the brick fields are unregistered. Electricity is not used in brick fields and they pollute the environment. Some problems related to brick manufacturing are high price of fuel like coal, high transport cost in fuel collection, inadequate

labor supply, inadequate access to finance (loan), long production time needed for bricks and inadequate government assistance.

### **G3: Iron & Steel**

This type of manufacturing firm is small in size. Iron and steel are the main raw materials used in these firms. They are engaged in producing windows, doors, gates etc. According to the field survey, the iron & steel firms are small in size. Few workers are engaged in each firm. Manufacturers collect their required finance from various NGOs and banks.

### **G4: Coconut oil**

Coconut oil firms are mainly machine based manufacturing plants and use coconut as the main raw material. The number of workers depends on the size of firm and it varies from firm to firm. As the firms use power driven machines, regular electricity supply is essential. The shortage in electricity supply creates losses in business. Due to the lack of proper management, some firms face losses. Some manufacturers are switching to other businesses.

### **G5: Paper, Book & Printing**

Paper, book & printing presses are a popular business. These are usually found in urban areas. Various types of advertisements are published from the presses in peak periods like in election seasons. But the manufacturers have complained about the frequent fluctuations of raw material availability and its high price which reduces their profits significantly.

### **G6: Rice Milling**

A significant number of surveyed rice mills reported that their current rice milling business is not profitable. Imported rice negatively affects rice milling business in this region. This business requires huge machinery investment. Therefore, manufacturers have to depend on institutional loans. Due to the presence of middlemen, mill owners do not get their actual return. Some owners are now switching to other businesses. The major problems faced by rice milling firms are:

inadequate supply of raw materials, difficulties on the way of collecting raw materials, high fluctuation in product and factor prices, negative impact of imported rice, lack of cooperation of the Government, and frequent storage checking and bounding the mill owners to pay bribe to persons of various organizations such as BSTI, tax office, etc.

### **G7: Mud tiles**

Mud tiles manufacturing is a profitable business in the south-west region of Bangladesh. This business has grown up mainly in Satkhira district because of availability of raw materials. Some villages of Kalaroa upazilla in Satkhira named Murarikathi, Sripatipur, Mirjapur, Opapur, Bamonkhali, Saroshkathi, Goalhator, Helatola, Tajulpur, Jhaudanga are playing important roles for manufacturing mud tiles. Manufactured mud tiles are sold in both domestic and export markets. Export organizations like Karra Export, Orno Export Ltd., Kalaoroo Tiling Ltd. are contributing to manage the export. Mud tiles are mainly exported through the Mongla sea port. Soil, sand and color are the main raw materials for producing mud tiles. This color is collected from Chittagonj Hill Tracts. Frames are used to give structure and then pressed by a machine (not power driven). About 8-15 people are engaged in a single mud tiles farm. 500-1500 pieces of mud tiles are produced per day in a moderately large firm.

The producers are not satisfied with the profit from the business. They claim that the price of raw material is increasing. It costs about Tk. 4 to make 1 piece mud tiles. The general producers claim that they don't get a good payment and a large amount of mud tiles are rejected for minor defects. Lack of skilled labor is a threat for this potential business. Some other problems are: lack of capital, lack of modern technology, etc.

### **G8: Wood Processing**

Most of the wood processing firms run their business in a small scale. Raw material of the business is a bit scarce currently. They do not get raw material (wood log) according to their demand. Many respondents opined that currently the business is not so profitable. A good number of manufacturers wish to expand their business in volume. Many wood



processing firm owners have other businesses on the side such as hotels, iron & steel etc. They wish for easy loans at low interest rate to run and expand their business. The backdated and insufficient machineries are some other problems faced by the wood processing firms.

### **G9: Wooden Furniture**

This business is generally small in size, sales and profit. The investment requirement in wooden furniture firms is low. The production, market share and productivity of the labor are also low. Wood processing firms meet the raw material demand of these firms. The most common types of furniture produced are beds, chairs, tables, showcases, dressing tables, sofas and so on. The most common material for making furniture is wood, but other materials, such as particle board, melamine board, metal and stone, are also used. Furniture designs have reflected the fashion of every era from ancient times to the present modern age. A wide variety of old and new styles influences current design.

### **G10: Miscellaneous**

Besides the above mentioned nine types of manufacturing firms, some other important firms operating in the region are cement, fertilizer, grain milling, fish processing, plastic, jute, textile, ship building, salt, jewellery, electronics, dairy products, ice, match, handicraft, etc.

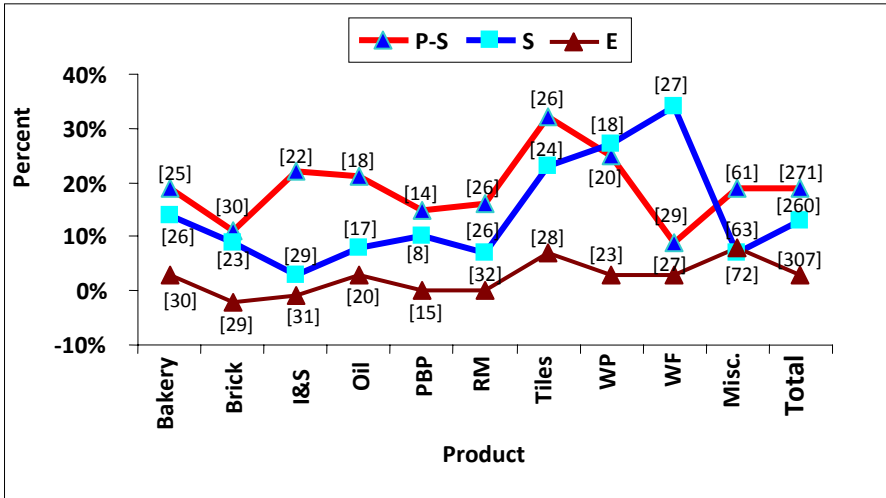
Source Field Survey, 2009

## ***4.2 Performance of Manufacturing Firms***

The surveyed data indicate that the sales growth rate is the highest in the wood related business. Wooden furniture occupies the highest rate of yearly sales growth rate at 34% followed by wood processing scoring a 27% growth rate during 2005-2008 time periods (see Figure 4.1). Alternatively, iron & steel occupies the lowest sales growth rate (only 3%). The sales of iron and wood are moving in the opposite direction over time. Two causes are likely to be liable. First one is comparatively cheaper price of wood after hurricane SIDR in the south-west region. Another cause is price hike of iron that made iron-made goods costly. Given that wood and iron & steel substitutes to some extent, some

consumers have been diverting towards wood from iron in making home furniture.

**Figure 4.1: Product Wise Performance: Employment, Sales and Profit Perspectives**



Source: Field Survey (2008-09).

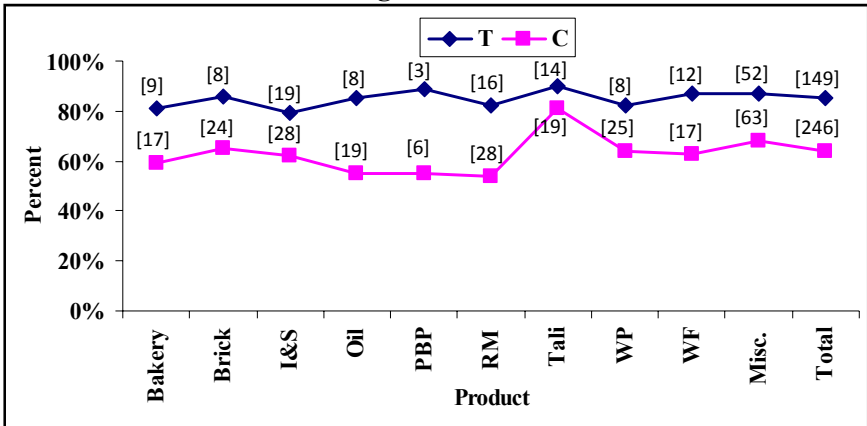
N.B.: P-S stands for 'Operating profit to sales ratio', S for 'Sales growth' and E for 'Employment growth'. 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'. [The numbers in the parenthesis] indicate sample size (N).

The average operating profit to sales ratio for all products is 19%. The lowest ratio belongs to wooden furniture, only 9% (see Figure 4.1). Mud tiles have been performing well scoring the highest. A higher capacity and target fulfilment rates helped the mud tiles firms to achieve such a score.

Yearly employment growth rate (from 2005-08) is the highest in the case of mud tiles (see Figure 4.1). The sequential expansion of mud tiles business over time claims more production and employment in this sector. Brick, iron & steel, and printing press experienced negative employment growth rate. The seasonality concept of brick firms, price

hike of iron and computer shops being set up as alternative to printing presses explain why these firms might be shrinking.

**Figure 4.2: Product Wise Performance: Capacity Utilization and Target Fulfillment**



Source: Field Survey (2008-09).

N.B.: T stands for 'Target fulfillment rate' and C for 'Capacity utilization rate'. 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'.

[The numbers in the parenthesis] indicate sample size (N).

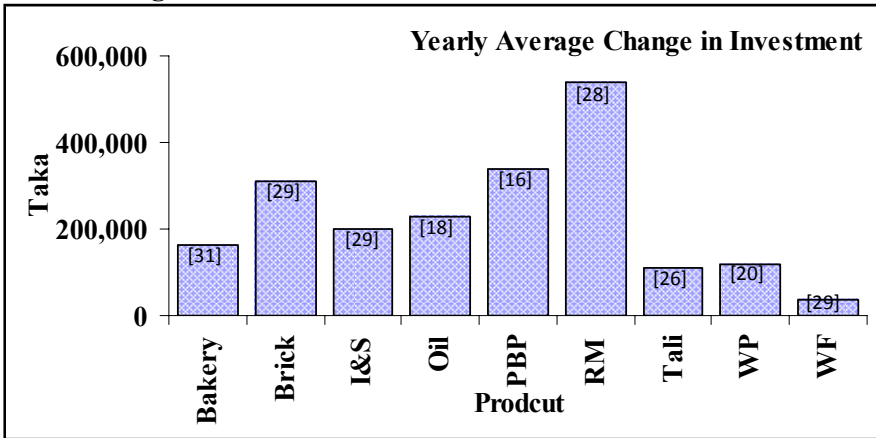
The capacity utilization rate is about 64% for all sorts of firms (see Figure 4.2). The mud tiles firms hold the highest position in utilizing capacities scoring 81% followed by brick (65%). The limited use of machineries in mud tiles manufacturing firms makes the task of measuring its capacity difficult. The burners' capacity and possible number of burning in a season are considered in this study to measure the capacity of mud tiles firms. The tiles firms have turned out to be more export oriented over time and have experienced sales growth in both domestic and international markets. Therefore, the mud tiles firms are smartly utilizing capacities by employing more labors.

In contrast, rice milling, coconut oil and printing press firms are running at under capacity. Housewives, the main customers of coconut oil, often prefer containerized and branded coconut oil instead of locally available

one. Anti-counterfeit movement by the government has also reduced coconut oil production in the Bagerhat BSCIC area. The demand for printing press products is reduced due to the availability of computer-aided printing facilities in the region. Visiting cards, writing pads and pay slips are now supplied by computer shops at cheaper rates. Various laws imposed by the election commission regarding posters have also lessened the volume of business of the printing press which causes a low capacity utilization rate.

The mud tiles and printing press firms are highly committed to fulfilling targets. Most of the surveyed mud tiles and printing press firms have been performing better (see Figure 4.2). Since most of the firms are producing less than its capacity, firms target fulfillment rate is comfortably higher. Iron & steel, bakery and wood processing firms are less efficient in fulfilling targets. The variation in raw material availability and input prices is the main factor causing lower target fulfillment of iron & steel and wood processing firms.

Average change in yearly investment is about Tk. 1,065,280 for all firms. Product wise analysis indicates the lowest change in yearly investment has been in firms producing wooden furniture (see Figure 4.3). This is partially explained by availability of cheaper wood. In the wood business, there is an opportunity of recurring investment. If business runs smoothly, operating profits of one year can be reused as investment for the next year. On the contrary, rice milling firms shows the highest changes in yearly investment. High prices of rice in the last two years might explain why more investment funds have entered this business. Printing presses also show higher changes in yearly investment. The respondents opined that they have been investing more to develop new products and to upgrade the technology so that they can compete better with alternative suppliers such as newly-established computer shops.

**Figure 4.3: Product Wise Performance: Investment**

Source: Field Survey (2008-09).

N.B.: 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'.

[The numbers in the parenthesis] indicate sample size (N).

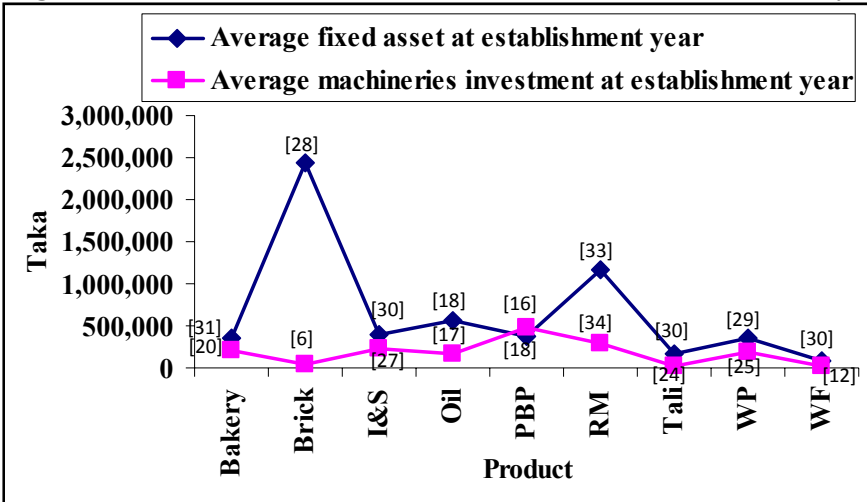
### **4.3 Investment**

The investment in fixed assets at the establishment year varies across firms. The data indicates that brick firms require the largest volume of investment in fixed assets, which is mostly a large area of land needed for operation. The fixed asset requirement for rice milling firms is also high. In bakery, iron & steel, coconut oil, printing press, mud tiles and wood processing firms, fixed assets investments are almost identical in value which takes the mid-level position from investment requirement perspective. Only wooden furniture firms require a small amount of investment in fixed assets (see Figure 4.4).

In the year of establishment, different firms invest differently in machinery as well. Bakery, iron & steel, coconut oil, printing press, rice milling and wood processing firms require large investments in machinery, since they are engaged in machine-based production. But investment in machinery is comparatively lower in mud tiles, brick and

wooden furniture, as heavy and costly machines are not required in the production process.

**Figure 4.4: Investment at Establishment Year: Product Wise Analysis**



Source: Field Survey (2008-09).

N.B.: 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'.

[The numbers in the parenthesis] indicate sample size (N).

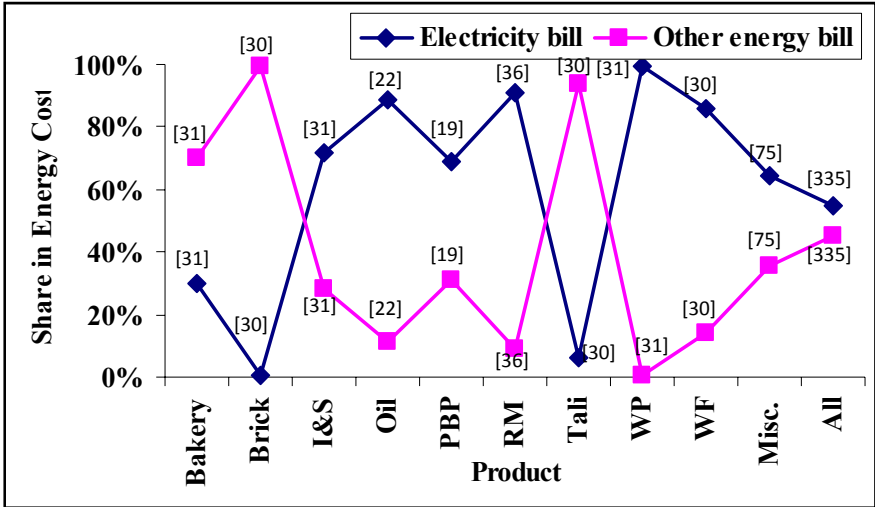
The brick and rice milling firms are highly labor intensive firms. In contrast, iron & steel, printing press and wood processing firms of the study area are capital intensive in nature. The coconut oil firms are in-between the two types. The wooden furniture making firms are exceptional in the sense that one can initiate this business with lower fixed asset and machinery investments.

#### 4.4 Energy Consumption

Most of the operating firms in this region use electricity in their core production process. The wood processing, rice milling and coconut oil firms are highly dependent on electricity for energy. In the absence of gas supply, electricity is the main source of energy. However, the brick and mud tiles firms have less electricity consumption compared to

others. It would be very costly to burn brick and mud tiles by using electricity. These firms use wood, coal etc. as alternate energy sources to burn the product (see Figure 4.5).

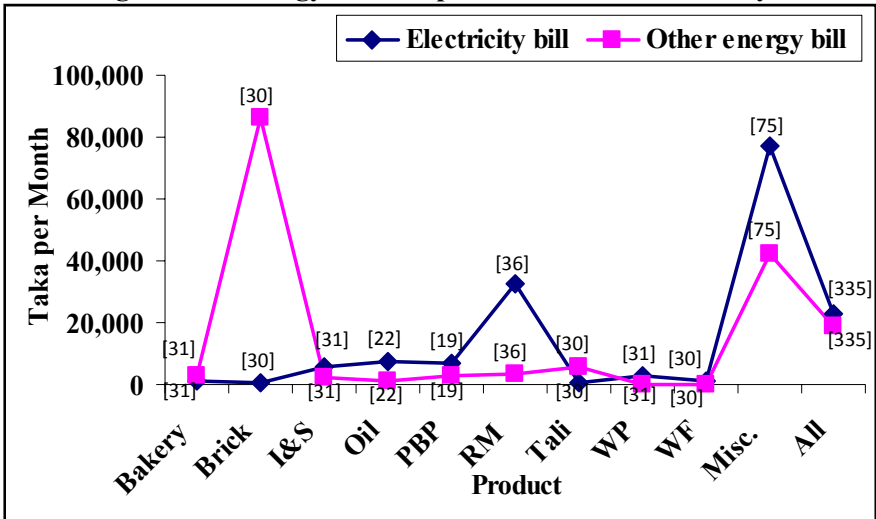
**Figure 4.5: Energy Cost: Product Wise Analysis**



Source: Field Survey (2008-09).

N.B.: 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'.

[The numbers in the parenthesis] indicate sample size (N).

**Figure 4.6: Energy Consumption: Product Wise Analysis**

Source: Field Survey (2008-09).

N.B.: 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'.

[The numbers in the parenthesis] indicate sample size (N).

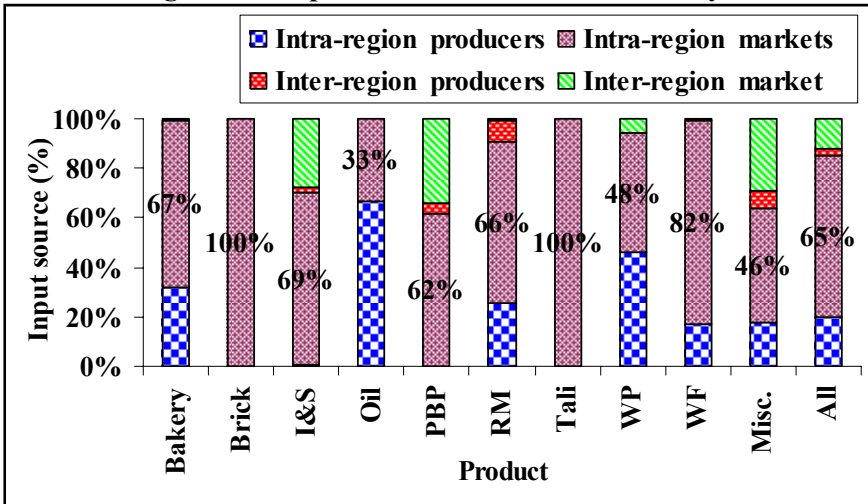
According to survey findings, the miscellaneous group is the largest consumer of electricity, which can be explained by the inclusion of fertilizer, cement and shrimp processing firms in the group. Among the nine products, rice milling is consuming the highest amount of electricity after the miscellaneous group. In contrast, brick firms are spending a huge amount of money per month in buying wood and other alternatives of source of energy (see Figure 4.6).

#### 4.5 Input-Output Market

Figure 4.7 shows possible input sources of the surveyed firms. The brick and mud tiles producers collect all of their raw material, the sole raw material being soil; from within the region (see Figure 4.7).



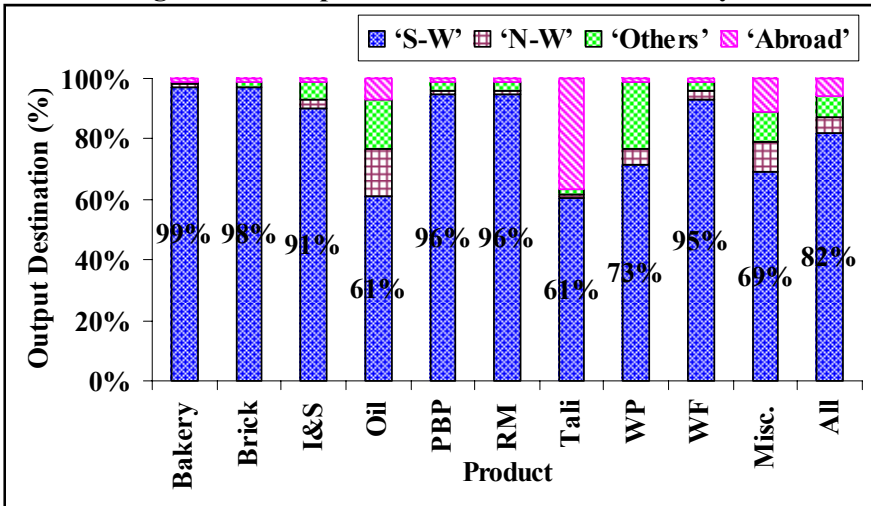
Figure 4.7: Input Market: Product Wise Analysis



Source: Field Survey (2008-09).

N.B.: 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'.

As a whole, the firms collect around 85% of their raw materials either directly from intra-region producers or intra-region marketplaces. The iron & steel and printing press firms collect approximately one-third of their raw materials from other regions. This is due to unavailability of the desired quantity and quality of inputs. This implies that the input sources of the manufacturing firms are highly concentrated in the very region.

**Figure 4.8: Output Market: Product Wise Analysis**

Source: Field Survey (2008-09).

N.B.: 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'.

'S-W' stands for 'South and West part of Padma and Meghna River', 'N-W' for 'North-West region of Bangladesh – Rajshahi Division' and 'Others' stand for other regions not included in S-W and N-W.

The product destinations of the surveyed manufacturing firms are also highly focused on local market places (see Figure 4.8). For example, bakery, brick, printing press, rice milling, wooden furniture and iron & steel firms sell more than 90% of their manufactured products to regional customers. High transportation cost of selling products to distant places partly explains the skewed selling pattern. The limitations of the existing infrastructure in terms of ability to export or to sell to other regions of the country bind the manufacturers in selling to regional customers. The product nature, especially short shelf life of food products, heavy weight of soil, wood and iron based products and low quality of printing firms also partly explain the skewed selling pattern.

More than one-third of the products manufactured by mud tiles and coconut oil firms are sold outside of the region. The mud tiles firms are

increasingly penetrating foreign markets, while, the coconut oil firms are trying to enter markets of the other regions. According to the respondents' opinion, those firms are trying to maintain and upgrade quality, to attract new customers and new markets, to establish brand names and to compete at national and global levels.

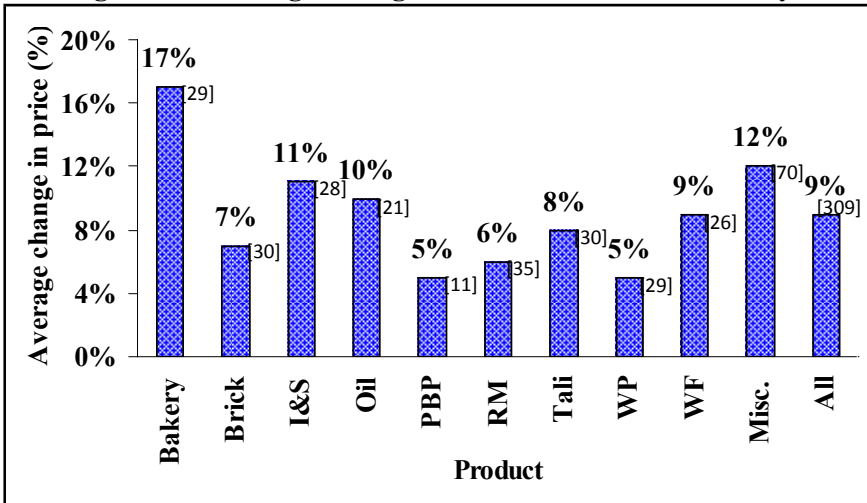
The study recognizes that product up gradation and quality assurance are two prime tasks ahead of the manufacturing firms of the region to become more competitive, to expand and to earn more profits.

#### ***4.6 Product Price***

Figure 4.9 shows the yearly average changes in price (from year 2005 to 2008). Data for four years have been analyzed to measure price fluctuation. The prices of products have increased over time, with the yearly average price rise between 5% and 17% (see Figure 4.9). The bakery products have the highest increase in yearly average price. Increasing demand over time and suppliers' initiatives for quality maintenance and improvement results in higher price of bakery products.

The printing, wood processing and rice milling firms experience comparatively slower increase in average prices. The downturn of printing business and easy availability of wood due to SIDR are the main factors behind the low price rise of the output of these businesses. However, the trend of rice milling is somewhat contradictory to the reality. Rice price is increasing much more in retail markets compared to the price rise at the manufacturing level shown in Figure 4.9. This implies that there has been a sharper increase in transport and other post-manufacture elements that affects costs, but a further more targeted research work is needed to fully understand the issues pertinent to this.

The iron & steel, coconut oil, mud tiles and wooden furniture firms experience around 10% yearly increase in price. These firms are capable of raising prices of their products if they can expand their sales to new market and upgrade quality. Moreover, the fluctuation in raw material availability and subsequent change in price of raw materials also partly explains the price fluctuations.

**Figure 4.9: Average Change in Price: Product Wise Analysis**

Source: Field Survey (2008-09).

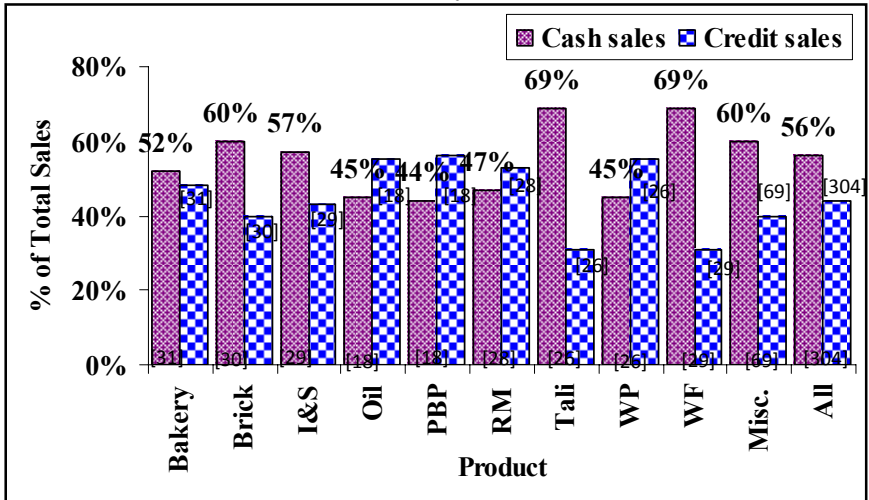
N.B.: 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'.

[The numbers in the parenthesis] indicate sample size (N).

#### **4.7 Sales Pattern**

Both cash and credit sales are prevailing across the firms of the region (see Figure 4.10), but cash sales are most common. Mud tiles and wooden furniture firms sell more than two-thirds of their total yearly quantity in cash and this is the highest amongst all type of firms. This is mainly because of the expansionary trend of tiles business and of the order-based nature and one-on-one dealing of customers by wooden furniture producing firms. The brick and iron & steel firms sell more than 50% of their total sale amount in cash. The one-on-one dealing with the final users of the products is the main reason of the dominance of cash sales in these businesses.

**Figure 4.10: Sales Pattern of Manufacturing Firms: Product Wise Analysis**



Source: Field Survey (2008-09).

N.B.: 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'.

[The numbers in the parenthesis] indicate sample size (N).

Printing press, coconut oil, wood processing and rice milling firms sell less than 50% of their total yearly sales in cash, meaning that the majority of their sales are on credit. Printing presses are struggling to remain in competition, and are offering credit sales in order to attract customers. The coconut oil firms are selling the products in credit to capture more market shares in both domestic and export markets. Rice milling and wood processing are businesses characterized by trade credit, meaning that distributors buy the goods mostly on credit terms and pay their debts after selling them. This implies a greater burden of working capital on the manufacturer than the distributor.

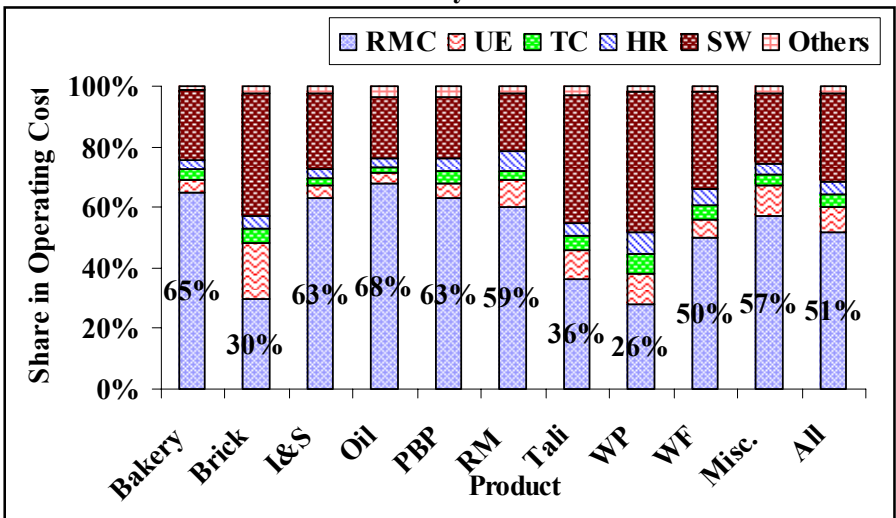
#### **4.8 Cost Structure**

Figure 4.11 illustrates the cost structure of the manufacturing firms of the south-west region of Bangladesh. On an average, the firms spend 51% of their total operating cost in purchasing raw materials. The rate is the

highest for coconut oil firms followed by bakery. The other extremes are brick and mud tiles firms that spend around one-third of their total operating cost in purchasing soil, the cheap but main raw material. The wood processing firms sometimes only sell services, which explain the smaller share of raw materials in total operating cost for the group.

Salary & wage comprise a larger share in total operating cost for wood processing, brick and mud tiles firms. As the main raw material (soil) of brick and mud tiles firms is comparatively cheap, salary & wage occupy a larger share in total operating cost of the firms. In addition, for very small sized mud tiles and wood processing firms, salary & wage occupy an even larger share as the total cost and investment figures are comparatively smaller. The share of salary & wage in total operating cost is the lowest for rice milling firms because of abundance female workers, who have no other employment opportunities and therefore can be paid poorly.

**Figure 4.11: Cost Structure of Manufacturing Firms: Product Wise Analysis**



Source: Field Survey (2008-09).

N.B.: 'I&S' stands for 'Iron & Steel'; 'Oil' for 'Coconut Oil'; 'PBP' for 'Paper, Book & Printing'; 'RM' for 'Rice milling'; 'Tali' for 'Mud Tiles'; 'WP' for 'Wood Processing'; and 'WF' for 'Wooden Furniture'.

'RMC' stands for 'Raw material cost'; 'UE' for 'Utility Expenses'; 'TC' for 'Transport cost'; 'HR' for 'House rent'; and 'SW' for 'Salary & wage'.

#### ***4.9 Performance of Miscellaneous Firms***

Khulna used to be considered as an industrial city even in the recent past. Jute firms were dominant in the region. But the scenario has changed significantly over time. The joint impact of corruption of the jute firm leaders and management, negligence of government, and intense international competition in global markets have forced almost all jute firms of Khulna region into closure. Along with jute firms, related firms and markets have been affected by this change.

Labor who have been residing in Khulna for a long time have low geographical mobility, as they are bound by various forms of social and institutional ties. For example, enrolment in educational institutions, marriage in the locality, relatives living in the locality, ownership of immovable assets, etc. As there is little or no other employment opportunity for such a large group of unemployed labor force in Khulna, the scenario is becoming worse over time. The authority hasn't paid due benefit to the labors. With the intention and hope of receiving financial benefits, labors are still concentrated in this region. This has caused an economic cost and social burden. Capacity in terms of physical infrastructure and human resource is remaining unused. Alternative use of this capacity is an important issue to be discussed in the national context. This research attempted to address the issue but could not do so because of lack of access to information and closure of firms. Moreover, the scope of the study also poses limits in addressing all the aspects. Therefore, a separate and independent effort with sufficient logistics is essential to measure the cost and to prescribe policy to revitalize the jute sector.

A notable change in the industry structure of the south-west region of Bangladesh has been observed in last two decades. After the collapse of jute firms and paper mills, capital-intensive large firms like cement, fertilizer, fish processing have risen. Production of jute, newsprint, coconut, wooden furniture etc. was based on regional raw materials.

Among the currently running dominant firms, only shrimp processing firms are highly dependent on indigenous raw materials. The others depend on raw materials of other regions. The expansion of service sector is another remarkable fact of the region. A further study is needed to explore the role and contribution of the service sector.

There has been a shift towards shrimp cultivation from agricultural production in Khulna, Satkhira and Bagerhat districts in the last two decades. Salinity and high profit margin of shrimp business are the main two proponents of this change. This affects rice cultivation negatively. In assessing the trade-off between rice and shrimp cultivation, which is a controversial issue in the region, a separate effort and study is needed. There are some firms, which purchase, process and export shrimp. The number of such firms is tiny. However, they exert influences on the regional economy because of their large volume in employment, investment and sales. This study knocked shrimp processing firms but failed to access their information properly due to various limitations.

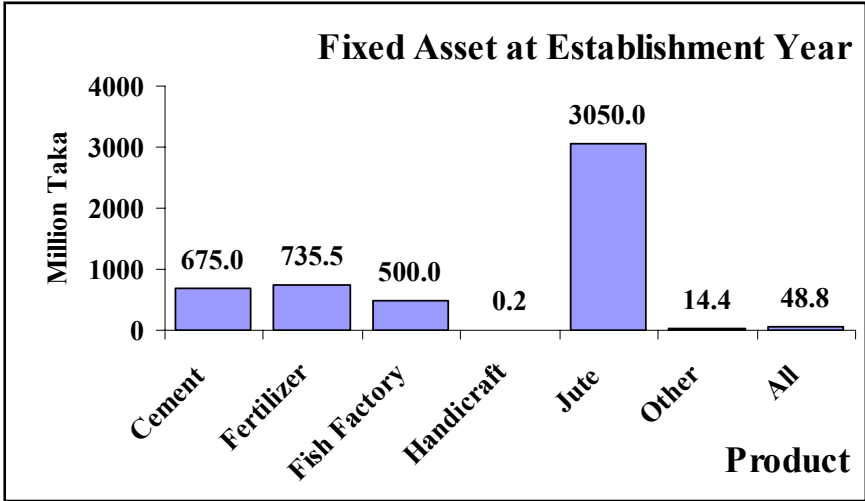
This study specially focused on 9 product groups (bakery, brick, iron & steel, coconut oil, paper, book & printing, rice milling, mud tiles, wood processing and wooden furniture). The rationale behind emphasizing special attention to these groups is having representative number in the sample size, which is a better approach in extracting a general picture of the concerned products' markets. There are some firms, which are insignificant in numbers in the sample as well as in the region. But, they are playing a significant role in the regional economy in terms of employment, sales and investment (see Figure 4.12 and 4.13). The jute, fertilizer, shrimp processing, cement etc. fall in this category. This study knocked these firms because of their influence in the regional economy.

The average changes in investment for the larger firms (i.e. fertilizer, fish factory, jute) are far higher than that of other firms. For handicrafts, the average changes in investment are very low. The other performance measures (i.e. target fulfillment rate, capacity utilization rate, operating profit to sales ratio etc.) widely vary across the firms of the miscellaneous group. A remarkable aspect is that the cement firms have the highest operating profit to sales ratio despite negative sales growth.

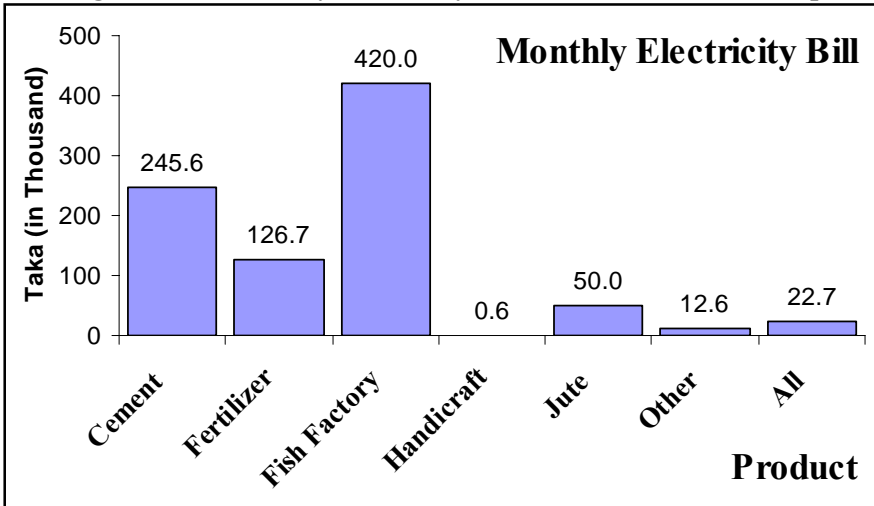


This finding signals comparatively better performance of cement firms. Technical problems with machinery reduce the production and sales of the cement firms. However, price hike and higher managerial efficiency affects the operating profit to sales ratio of the cement firms positively.

**Figure 4.12: Fixed Asset at Establishment Year of Miscellaneous Group**



Source: Field Survey (2008-09).

**Figure 4.13: Monthly Electricity Bill of Miscellaneous Group**

Source: Field Survey (2008-09).

These outliers comprise huge fixed asset at the establishment year, part of which is investment in machinery. Except handicrafts, all other firms possess high fixed asset cost at the establishment year than that of other firms. Among all, jute firms comprise the highest amount of investment in fixed assets at the establishment year (see Figure 4.12).

Similarly, these outliers have higher consumption of electricity and other sources of energy in comparison with that of all other firms. Fish factories are consuming the highest amount of electricity among all the firms. Since shrimp is perishable in nature, shrimp firms have to consume a large amount of electricity for keeping shrimp frozen.

In collecting raw materials, these outliers mostly concentrate on local markets. Firms producing cement and fertilizer are exceptions who collect raw materials from inter-regional producers and markets.

The raw materials comprise the lowest share in operating costs for handicraft businesses. All other firms of the miscellaneous group are spending a high proportion of operating cost in acquiring raw materials.

Aesthetic appeal, fashion sense, etc. surpass the material value in handicraft business.

The shrimp processing firms of the region are completely export oriented. These firms don't sell in the domestic market as they receive higher prices in export markets, such as the European Union. A major portion of processed jute also goes to the international market. Firms producing handicrafts and cement are diverged to regional, domestic and foreign markets.

This study investigates miscellaneous firms from different perspectives to generate a clear picture about their performances. However, the number of firms covered by this study for each sub-group of the miscellaneous group is very few. Therefore, conclusions based on the data of only a few firms would be biased. Moreover, the data collection team often failed to obtain the information of miscellaneous group fully due to their giant size, the administrative and procedural complexities in getting access, lack of time of respondents, reluctance in sharing price and other financial data, and misconstruing the survey team as undercover tax or BSTI office personnel. Therefore, further study is needed to address the firms of the miscellaneous group.

#### ***4.10 Case Study***

##### **Case Study 01: Jahid Biscuit Factory**

Jahid Biscuit Factory is situated in Tulshidanga, about 2 kilometers away from Kolaroa *pourashava*. The factory is not very large and its physical infrastructure is not so good. Mr. Jahid Hossain, the owner of the firm is not satisfied by the performance of his firm. He has a large debt burden, and says that the price of raw material is high. According to him, the business environment for him has deteriorated over time. He plans to introduce a Chanachur (snack made from lentil) factory in the near future. He fears that he will face difficulty in buying machinery and in expanding the area of the factory.

Source: Field Survey (2008-09).

### **Case Study 02: Madhumati Printing Press**

Madhumati Printing Press was established in 1986. It is located in Khulna *sadar* and mainly prints book, magazines, etc. It purchases paper and ink from the local market and Dhaka, and has to pay in cash. Sometimes due to shortage of paper and ink, the firm has to buy the raw materials at higher prices. Production of the firm depends on customer orders. The firm prints approximately 50,000 rims paper per week. A press printing machine was purchased in the year 1996 at the cost of Tk. 500,000. Currently, there are two such machines in the firm. The firm has borrowed Tk. 1 million (Tk. 1,000,000) at 16% interest in year 2008 from Islami Bank. The owner of the firm has endorsed the business as profitable. So, he wants to expand the firm in future by taking loan.

Source: Field Survey (2008-09).

### **Case Study 03: Badal Tali MFG.**

Badal Tali MFG. is situated at Murarikathi, about 3 km away from Kalaroa *pouroshova*. Badal Pal has engaged himself in this business following his ancestors. He is producing export quality mud tiles for exporting Italy and other European countries. He occupies the largest business area in Pal Para and is happy with his level of profitability. However, he is worried about unavailability and price hike of wood, mud and other raw materials. He feels that gas availability will help to expand business and manufacturing activities in the region.

Source: Field Survey (2008-09).

### **Case Study 04: Bangladesh Saw Mill**

Bangladesh Saw Mill, located in Khulna *sadar*, was established and registered with the City Corporation in 1989. The firm collects wood, the only required raw material from local sources and from Laksam. It produces only sized-wood and sales it mainly in local market places. The price of the product varies due to the variation in the quality and size of the product. For example, the price of one cubic feet (CFT) sized wood of Shegun timber is Tk. 4,000 to 4,500, Mehuguni wood is Tk. 2,700 per CFT, and price of other woods vary between Tk. 200 and Tk. 1,500. The firm has only one machine which was set up in the very year of

establishment year at the cost of Tk. 300,000. Powdered wood, the by-product of the saw mill, is sold to be used as cooking fuel. The owner has taken a loan of Tk. 1 million (Tk. 1,000,000) from Agrani bank at 16% interest and, in light of profitability, he wants to expand the business with further loans.

Source: Field Survey (2008-09).

### **Case Study 05: Unique Furniture**

Unique Furniture was established in 1975, located in Khulna. The firm usually purchases wood on credit, and it produces various types of home and office appliances such as cabinets, bedsteads, tables and chairs. It makes 25 categories of products, with prices varying from product to product based on design and quality. The owner of the firm does not wish to expand the business since profitability is low.

Source: Field Survey (2008-09).

### **Summary**

This study considers bakery, brick, iron & steel, coconut oil, rice milling, wooden furniture, etc. products individually to investigate the performance of the manufacturing sector of the south-west region of Bangladesh. Surveyed data indicates that sales of wood products have been gradually rising whereas sales share of iron & steel products has been falling over time due to changes in input availability and price. From a profit viewpoint, mud tiles firms take the top position, since they are able to export and maintain product quality. Mud tiles firms' chronological expansion also puts them at the top in terms of employment. However, seasonality and strong competition from substitute products cause low, even negative employment growth rates in brick, iron & steel, and printing press businesses.

The mud tiles firms also hold the top position from the perspective of capacity utilization, which is largely because they do not use a lot of machines. In contrast, rice milling, coconut oil and printing press firms are experiencing low capacity utilization rates due to low demand caused by inferior product quality and availability of substitutes. The mud tiles and printing press firms target fulfillment rates are also higher due to

their commitment to customers and fear of losing market share. However, variation in raw material availability and input price constraints iron & steel and wood processing firms from fulfilling their targets. The rice milling and printing press firms invest the highest amount as they face price hike of inputs and fear of being driven out of the market. The wooden furniture firms have experienced the lowest changes in yearly investment due to easy availability of cheap wood in the SIDR affected region.

The investment data indicate that brick and rice milling firms require large fixed investments to start business whereas wooden furniture firms do not. Bakery, iron & steel, coconut oil, printing press, mud tiles and wood processing firms stay in the mid-level position from investment requirement perspective to initiate business. Machine based firms like bakery, iron & steel, coconut oil, printing press, rice milling and wood processing firms need more investment in purchasing machinery whereas mud tiles, brick and wooden furniture do not require it as much.

Electricity is the main source of energy for the manufacturing firms of the region. Wood, coal, etc. are used in the brick and mud tiles firms as alternate energy sources. The respondents mentioned that reliable gas supply is the most urgent need of the region irrespective of firm size, product coverage, firm age and location of manufacturers.

The input source of the manufacturing firms is highly skewed towards the regional market with some exceptions such as iron & steel and printing press firms. Around 85% of the needed raw materials are procured from regional producers or market places. The product destination of the surveyed manufacturing firms is also skewed towards the local market. Only the coconut oil and mud tiles firms are trying to cross the regional boundary. The study recognizes that product upgradation and quality assurance are the main tasks ahead of the manufacturing firms of the region to compete. An improvement of the investment climate will help the firms to expand, to cross regional boundary and to earn more profits.

Both supply and demand side factors are responsible for changes in prices of products. The bakery firms experienced the highest change in price, while printing, wood processing and rice milling firms experienced comparatively slower increase of average prices. Product quality and quantity, availability and price of inputs, preferences of customers, fierce competition, and SIDR are the main factors affecting change in prices.

Cash sales dominate the selling pattern of the manufacturing firms of the region, the main reason behind it being one-on-one dealing with final users of the products. Mud tiles and furniture firms are two examples of cash-sale dominated firms. Printing press, coconut oil, wood processing and rice milling are examples of firms which usually sell on credit.

On an average, firms spend 51% of their total operating cost in purchasing raw materials. The rate is the highest for coconut oil firms followed by bakery firms. The brick, mud tiles and wood processing firms spend less for procuring raw materials. Salary & wage carry the second largest share of total operating costs. The brick, mud tiles and wood processing firms spend more for paying salary & wage. The firms, being small and labor-intensive, spend a sizable amount of their operating costs in salary & wage. The share of salary & wage in total operating cost is the lowest for rice milling firms because of abundance of female workers who are ready to work at very low wage.

# 5

## REGIONAL ASPECTS OF MANUFACTURING FIRMS

### *Introduction*

Among the 335 firms, 136 firms are located in Khulna, 108 firms in Jessore, 55 firms in Satkhira and 36 firms in Bagerhat district. The study attempts to trace out unique characteristics and regional advantages/disadvantages of the manufacturing firms located in the various districts of the south-west region of Bangladesh.

### *5.1 District Wise Performance of Manufacturing Firms*

The study finds that the yearly average sales growth of firms located in Jessore district is the highest (19%) followed by the firms of Satkhira district (see Figure 5.1). Some large-scale firms like fertilizer producers have pushed average sales up in Jessore and wide-scale expansion in exports of mud tiles has fastened sales growth in Satkhira. Sales in Bagerhat and Khulna districts are showing a slow positive growth over time. Bagerhat district is dominated by coconut oil firms whose sales growth is low. Unavailability of raw materials and anti-counterfeit movement has dampened the sales performance of coconut oil firms.

However, the employment growth rate hasn't kept its pace with sales growth. The employment growth rate for all districts on average is only 3%. The growth rate is the highest for the firms of Khulna district. Bagerhat shows negative employment growth, mostly because of SIDR and poor growth in sales of coconut oil producing firms.

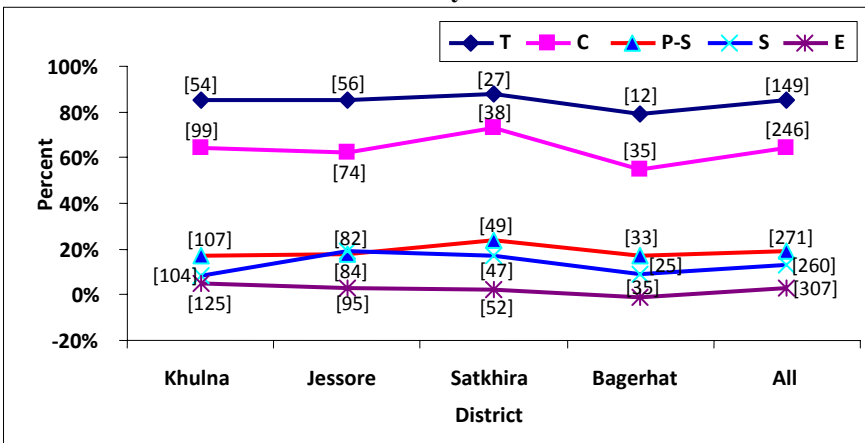
The operating profit to sales ratio shows a consistent trend over the region. Satkhira has been performing well as most of the mud tiles firms are located in this district. The mud tiles firms comprise more than 50% of the total firms in Satkhira. The firms of Bagerhat, Khulna and Jessore are showing comparatively lower performance in the operating profit to sales ratio.



The firms of Satkhira hold the top position in using existing capacities, while those of Bagerhat failed to do so. Since most of the coconut oil firms of Bagerhat failed to earn profits, a large portion of their production capacities are being closed permanently or temporarily and their performance is worsening. Target fulfillment rates are sufficiently high for all the districts. The firms of Satkhira are showing the best performance, fulfilling 88% of targets. Again, firms of Bagerhat are worst in meeting their targets.

The yearly average change in investment of all the 335 sample firms of the study is Tk. 1,065,280. It is highest for the firms of Jessore district. Large investments by two fertilizer, one cement and one grain milling firms pushed the total investment figure of the district to the top.

**Figure 5.1: Performance of Manufacturing Firms: District Wise Analysis**



Source: Field Survey (2008-09).

N.B.: T stands for 'Target fulfillment rate', C for 'Capacity utilization rate', P-S for 'Operating profit to sales ratio', S for 'Sales growth' and E for 'Employment growth'. [The numbers in the parenthesis] indicate sample size (N).

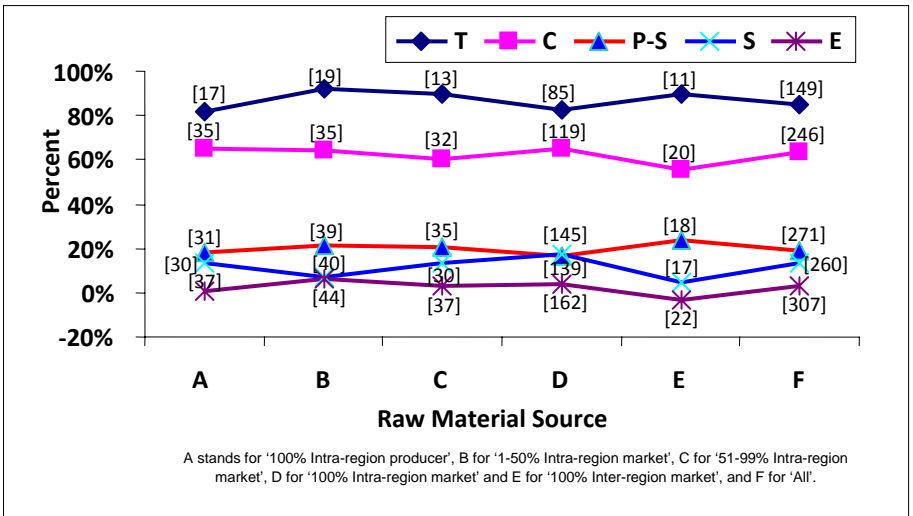
In summary, the firms of Satkhira have performed better in almost all the performance measures that have been considered in this study. The mud tiles firms have contributed the most to the better performance of Satkhira district. In contrast, the firms of Bagerhat have performed worst.

The coconut oil firms are mostly responsible for the said scenario. The firms of Khulna and Jessore stand in between the two extremes.

**5.2 Raw Material Market**

The firms which collect raw materials from within the region experience comparatively higher growth rate in yearly sales compared to others (see Figure 5.2). However, the operating profit to sales ratios of these firms are the lowest. The analysis indicates that, the broader the horizon of raw material source, the higher the operating profit to sales ratio of a firm. Such a trend advocates the crossing of regional boundaries for collecting raw materials.

**Figure 5.2: Raw Material Market vs. Performance of Manufacturing Firms**



Source: Field Survey (2008-09)

N.B.:T stands for 'Target fulfillment rate', C for 'Capacity utilization rate', P-S for 'Operating profit to sales ratio', S for 'Sales growth' and E for 'Employment growth'. [The numbers in the parenthesis] indicate sample size (N).

The capacity utilization rate has an inverse relationship with the dispersion of input sources, and, in contrast, the target fulfillment rate has a direct relationship. The findings indicate that the firms those collect raw materials from distant places are more cautious and organized in

placing orders and collecting raw materials on time. However, they still often fail to collect the required amount of raw materials, and suffer from low capacity utilization. This stresses the necessity of improving the physical infrastructure, especially roads, bridges and transportation systems for collecting raw materials from an overall broader horizon with the hope of increasing profit and capacity utilization rate.

### 5.3 Energy Consumption

The firms of Satkhira hold the lowest position from a monthly electricity consumption viewpoint (see Table 5.1). The district is comprised with mud tiles, brick and handicraft producing firms. These firms consume comparatively less electricity. However, the brick and mud tiles making firms spend large amounts of money for other energy sources like wood and coal.

The electricity and other energy consumption rates of the firms of Jessore district are much higher compared to other districts. Firms' size, product nature, and production technology mostly affect the level of energy consumption. The respondents of the district claim that power failures hinder their production process and business operation, and sometimes even force them to switch from electricity to alternate sources of energy. Similarly, they endorse the necessity of gas supply for smoothening the production process and for reducing costs.

**Table 5.1: Energy Consumption: District Wise Analysis**

Energy Consumption District	Electricity Bill (Tk. per Month)	Number of Firms	Other Energy Bill (Tk. per Month)	Number of Firms
Khulna	21,298	[136]	19,020	[136]
Jessore	36,302	[108]	27,477	[108]
Satkhira	4,788	[55]	9,425	[55]
Bagerhat	14,883	[36]	6,150	[36]
<b>Total</b>	<b>22,735</b>	<b>[335]</b>	<b>18,788</b>	<b>[335]</b>

Source: Field Survey (2008-09).

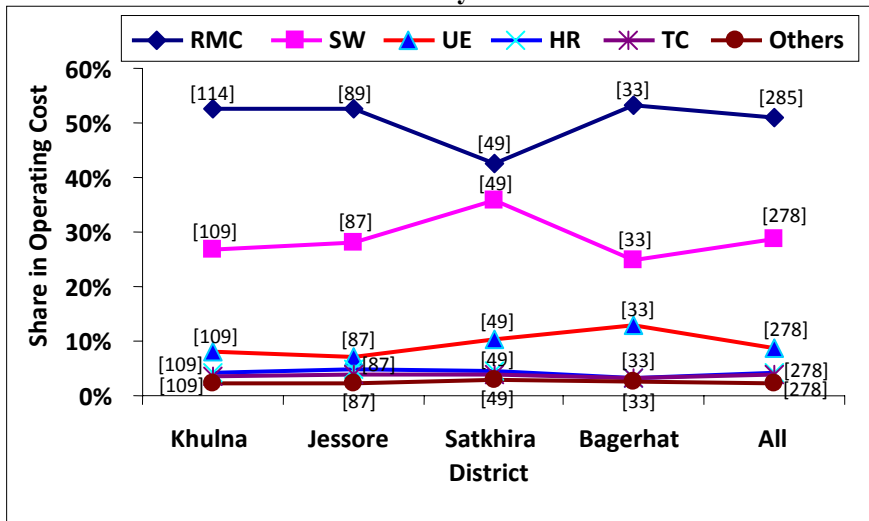
N.B.: [The numbers in the parenthesis] indicate sample size (N).

### 5.4 Cost Structure

The share of raw materials in total operating cost is the lowest for firms of Satkhira (see Figure 5.3), which is due to the dominance of mud tiles

firms. The share is almost the same for the rest of the three districts. Salary & wage expenditures of the firms of Satkhira district comprise a higher share in total operating cost in comparison to other districts as well. The mud tiles firms of the district are comprised with mostly labors that happen to be family members and are smaller in size from employment perspective. However, easy availability of raw materials, a labor-intensive production process and less utility consumption causes the salary & wage expenditure of the firms to hold the top position in the operating cost of the mud tiles firms.

**Figure 5.3: Cost Structure of Manufacturing Firms: District Wise Analysis**



Source: Field Survey (2008-09).

N.B.: ‘RMC’ stands for ‘Raw material cost’; ‘UE’ for ‘Utility Expenses’; ‘TC’ for ‘Transport cost’; ‘HR’ for ‘House rent’; and ‘SW’ for ‘Salary & wage’.

[The numbers in the parenthesis] indicate sample size (N).

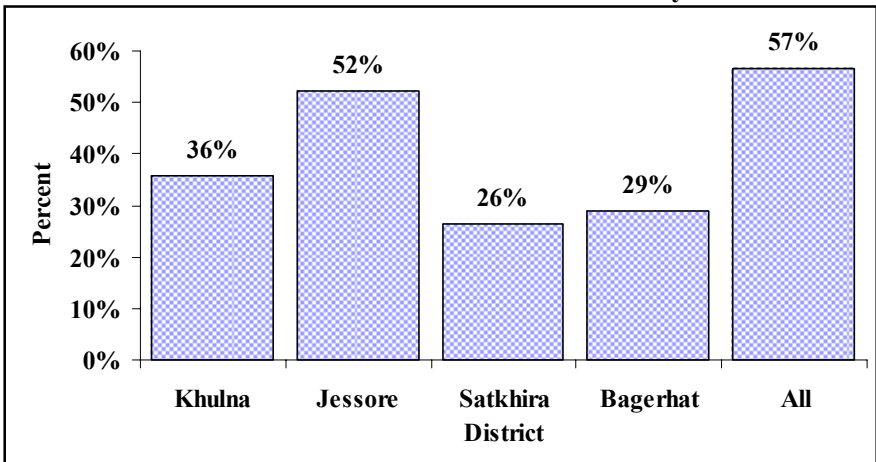
The share of utility expenses in total operating cost is the highest for the firms of Bagerhat district. The dependency of coconut oil firms on electricity as an energy source makes this share so significant. The respondents believe that access to gas will make it easier for businesses to operate. The shares of transportation cost, house rent and other

expenses in total operating cost are almost similar for all the four districts.

### 5.5 Investment

The average investment in fixed assets, and in machinery at the establishment year are the lowest for the firms of Satkhira district. On the other hand, both investments are the highest for the firms of Jessore district. The ratio of machinery investment to total investment at the establishment year also produces a similar picture (see Figure 5.4). The ratio is the highest for Jessore (52%) and the lowest for Satkhira district (26%). The existence of labor-intensive mud tiles firms in Satkhira district and highly capital-intensive large firms (i.e. fertilizer, cement, etc.) in Jessore district explain the differences in investment.

**Figure 5.4: Share of Machinery Investment in Total Investment at Establishment Year: District Wise Analysis**



Source: Field Survey (2008-09).

N.B.: [The numbers in the parenthesis] indicate sample size (N).

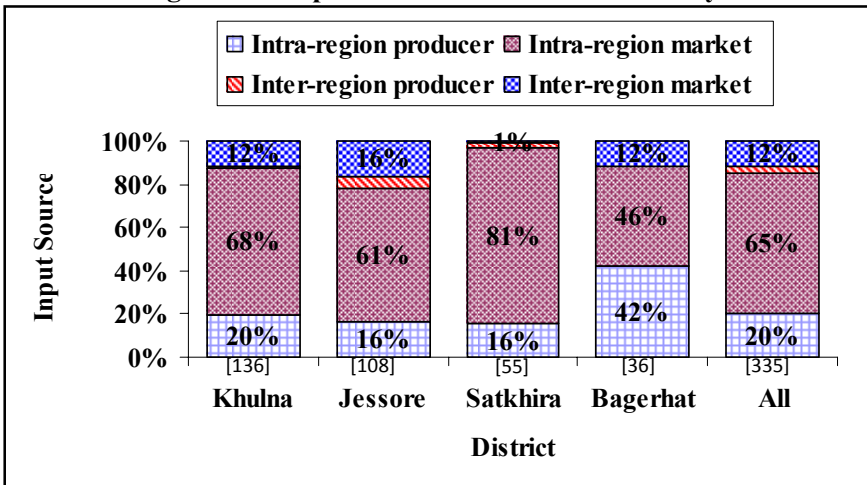
### 5.6 Input-Output Market

The firms of Bagerhat collect the highest percentage (42%) of raw material from within the region (see Figure 5.5). The coconut oil firms of Bagerhat collect a large portion of the needed raw material directly from the coconut producers. The firms of Satkhira also mostly depend on

intra-region markets for raw materials. Due to the nature of the products of the firms, they seldom need to go outside the region for collecting raw materials.

The firms of Jessore procure the highest amount of raw materials from outside their own region followed by firms of Khulna and Bagerhat districts. The nature of the product, availability of raw material, location and competition force them to search for the cheapest raw material source of a certain quality and quantity. However, on an average, the firms of the south-west region collect more than 85% of the required raw material from intra-region producers and markets.

**Figure 5.5: Input Market: District Wise Analysis**



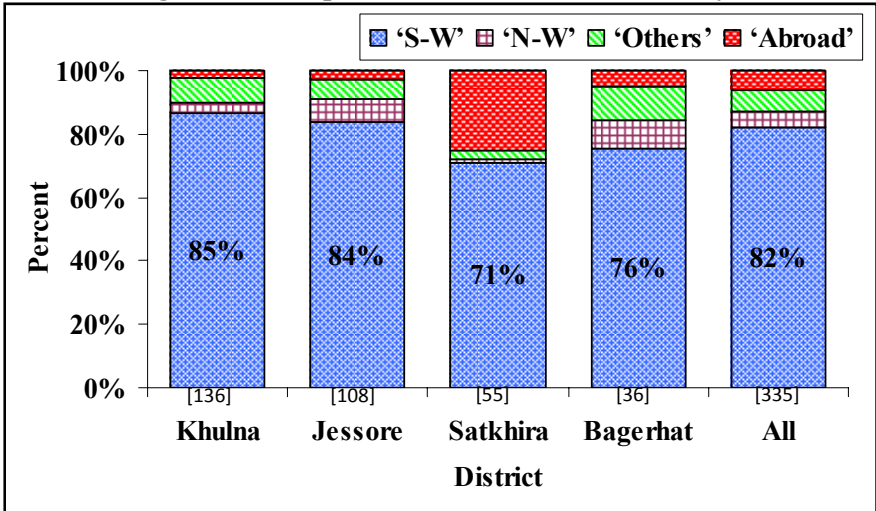
Source: Field Survey (2008-09).

[The numbers in the parenthesis] indicate sample size (N).

The output destinations of the firms in the region are also highly concentrated within the region. The firms of Khulna and Jessore sell more than 80% of their products to regional market places (see Figure 5.6). They have limited access to markets of other regions of the country. In contrast, the firms of Satkhira and Bagerhat have been trying to penetrate markets beyond their own region and even those that are foreign. The firms (mostly mud tiles) of Satkhira export about one-fourth

of their products. The firms (mostly coconut oil) of Bagerhat are selling about one-fifth of their output to other regions of the country.

**Figure 5.6: Output Market: District Wise Analysis**



Source: Field Survey (2008-09).

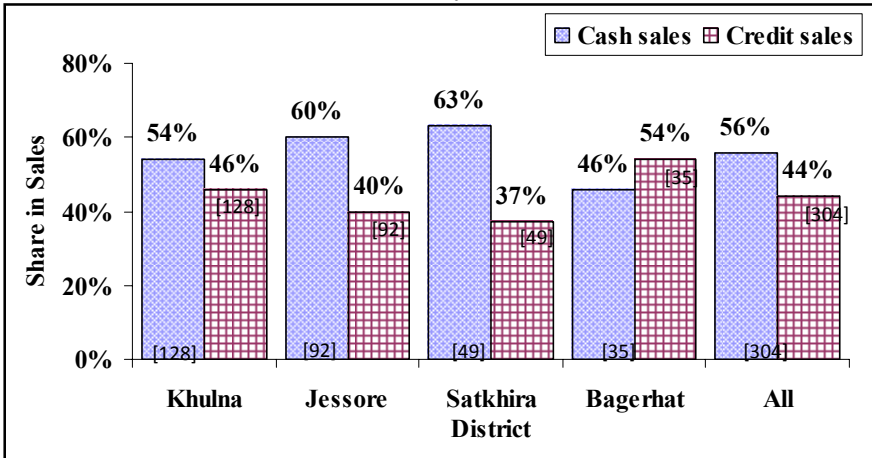
N.B.: 'S-W' stands for 'South and West part of Padma and Meghna River', 'N-W' stands for 'North-West region of Bangladesh – Rajshahi Division', and 'Others' stand for other regions not included in S-W and N-W.

[The numbers in the parenthesis] indicate sample size (N).

### **5.7 Sales Pattern**

Cash sales dominate the transaction pattern of the firms of all districts except Bagerhat (see Figure 5.7). On an average, firms sell 56% of their sales in cash and 44% in credit. Some respondents said that credit culture makes it difficult for them to do business. However, existing conditions and the level of competition compels businesses to continue under the said unfavorable situation. It should be noted that a large number of firms of the region are small in size in terms of employment, sales volume and investment. Credit sales create extra burden for the small firms to sustain and continue business.

**Figure 5.7: Sales Pattern of Manufacturing Firms: District Wise Analysis**



Source: Field Survey (2008-09).

N.B.: [The numbers in the parenthesis] indicate sample size (N).

## Summary

This chapter highlights the regional aspects of manufacturing firms of the south-west region of Bangladesh. A majority of the manufacturing firms operating in this region are located in Khulna and Jessore districts.

The firms of Jessore district consume a lot of electricity, while the firms of Satkhira district don't. Due to fluctuation in electricity supply, some firms are switching or planning to switch to alternate energy sources which are expensive. Therefore, making electricity supply reliable and providing access to gas are the two main steps to be taken for improving the investment climate of the region, which will ultimately improve the performance of the firms.

As a percentage of total operating costs, the share of raw materials is the lowest and share of salary & wage is the highest for the firms of Satkhira district. This is mainly due to the fact that the mud tiles firms of the district use cheap raw materials, and its major expenditure is salary & wage. The share of utility expense in total operating cost is the highest for the firms of Bagerhat district, explained by the dependency of coconut oil firms on electricity for energy.



The average investment in fixed asset in the year of establishment and the average investment in machinery in the year of establishment are both lowest for the firms of Satkhira district and the highest for the firms of Jessore district. The ratio of machinery investment to total investment in the year of establishment also provides a similar picture. The existence of labor-intensive mud tiles firms in Satkhira and capital-intensive large firms in Jessore explain the above scenario.

The firms of Bagerhat collect the highest percentage (42%) of total required raw materials from within their region. The coconut oil firms of Bagerhat collect a large portion of the needed raw material directly from the coconut producers. The firms of Jessore procure the highest amount of raw materials from outside the region followed by firms of Khulna and Bagerhat districts. On an average, the firms of the region collect more than 85% of the required raw material from within the region. However, the analysis indicates that, the broader the horizon of raw material source, the lower the yearly sales growth rate and the higher the operating profit to sales ratio. Such a trend advocates in favor of a firm to diversify its sources of raw materials to include those that are beyond the regional boundary.

The output market of the region is also highly concentrated within the regional boundary. The firms of Khulna and Jessore sell more than 80% of their products to regional markets. In contrast, the firms of Satkhira and Bagerhat are trying to penetrate markets beyond their region and even those that are foreign. Another interesting feature of the sales pattern is the dominance of cash selling among the firms of all districts except those in Bagerhat.

The firms of Satkhira are performing better in all important performance measures, such as operating profit to sales ratio, target fulfillment rate and capacity utilization rate by the virtue of mud tiles firms. In contrast, the firms of Bagerhat are performing the worst due to the failure of coconut oil firms.

## **INVESTMENT CLIMATE FOR MANUFACTURING FIRMS**

### ***Introduction***

A favorable investment climate is imperative for improving the performance of manufacturing firms. This study considers physical infrastructure, input market, output market, financial services, utility services etc. to investigate the investment climate of the region. Finally, the study tries to relate the performance of the manufacturing firms with the investment climate.

### ***6.1 Physical Infrastructure and Firm Performance***

Mongla seaport, Benapole & Vomra land port, Aricha-Daulotdia ferry, Khulna-Jessore highway, Khanjahan Ali bridge, Mauwa ferry and Chittagong seaport are the main infrastructures included representative components of the investment climate. Sales growth, changes in investment, employment growth, capacity utilization rate, target fulfillment rate and operating profit to sales ratio are the main performance measures.

Physical infrastructure plays an influential role in attracting investment. The existence and conditions of broad infrastructures like roads, ports, financial institutions, and utilities are the main concerns of investors before deciding where to invest. However, all of the firms operating in a region do not need all infrastructure facilities equally. The degree of use depends on the nature of the product and market (both input and output) coverage. For example, the overall inadequacy of Mongla seaport is a burning issue as the region is highly affected by it. However, this study finds that more than 85% of the surveyed firms neither use Mongla seaport for collecting raw material nor for selling products. The physical condition of the seaport partly explains the scenario. An improvement in the facilities provided by the port will positively contribute to the regional and national economy. Table 6.1 summarizes the frequency of infrastructure usage by the firms and provides an idea about the level of importance of each infrastructural resource.

**Table 6.1: Frequency of Infrastructure Usage in South-West Region**

Infrastructure Use	a	b	c	d	e	f	g	h	i
Frequently	31	10	81	201	110	14	3	27	38
Sometimes	8	8	52	46	65	40	4	13	33
Rarely	5	12	35	41	70	44	10	12	41
Never	291	305	167	47	90	237	318	283	223
Total	335	335	335	335	335	335	335	335	335

Source: Field Survey (2008-09).

N.B.: Numbers indicate firm numbers.

a: Mongla sea port;

b: Benapole & Vomra land ports;

c: Aricha-Daulotdia ferry;

d: Khulna-Jessore highway;

e: Khanjahan Ali bridge;

f: Mauwa ferry;

g: Jessore airport;

h: Chittagonj sea port;

i: Lalon Shah bridge.

This study tries to study the relationship between infrastructure facilities and firms' performance. Linear regression analysis indicates that operating profit to sales ratio and changes in investment have positive and statistically significant relationships with the use of Mongla seaport (see Table 6.2). Similar positive and statistically significant relationships are found in the following cases: use of Benapole & Vomra land ports with changes in investment; use of Aricha-Daulotdia ferry with changes in investment and operating profit to sales ratio; use of Khulna-Jessore highway with operating profit to sales ratio and target fulfillment rate; Khanjahan Ali bridge with operating profit to sales ratio; Mauwa ferry with capacity utilization rate and changes in investment; Chittagong seaport with operating profit to sales ratio and changes in investment; and Lalon Shah bridge with changes in investment. Relationships between infrastructure and some other performance variables are also positive, but they are not statistically significant.

The findings indicate that the investment decisions of firms are highly dependent on the availability of physical infrastructure. Similarly, the operating profit to sales ratio of the manufacturing firms also depends on availability of infrastructural facilities. The improvement of other performance measures also depends on the same variable. Therefore,

improving infrastructure facilities for the overall improvement and expansion of the manufacturing sector of this region deserves attention.

**Table 6.2: Physical Infrastructure and Firm Performance: Regression Results**

<b>Performance Measuring Indicators (Y)</b>	<b>Infrastructure Facilities (X)</b>	<b>Standardized Coefficient (<math>\beta_1</math>)</b>	<b>p value</b>
Operating Profit to Sales Ratio (N=270)	Mongla sea port	0.339	0.000
Changes in Investment (N=290)		0.264	0.000
Changes in Investment (N=290)	Benapole & Vomra land port	0.149	0.011
Operating Profit to Sales Ratio (N=271)	Aricha-Daulotdia ferry	0.122	0.045
Changes in Investment (N=290)		0.146	0.013
Operating Profit to Sales Ratio (N=271)	Khulna-Jessore highway	0.179	0.003
Target Fulfillment Rate (N=149)		0.167	0.042
Operating Profit to Sales Ratio (N=271)	Khanjahan Ali bridge	0.152	0.012
Capacity Utilization Rate (N=246)	Mauwa ferry	0.146	0.022
Changes in Investment (N=290)		0.173	0.003
Operating Profit to Sales Ratio (N=271)	Chittagong sea port	0.206	0.001
Changes in Investment (N=290)		0.370	0.000
Changes in Investment (N=290)	Lalon Shah bridge	0.200	0.001

Source: Field Survey (2008-09).

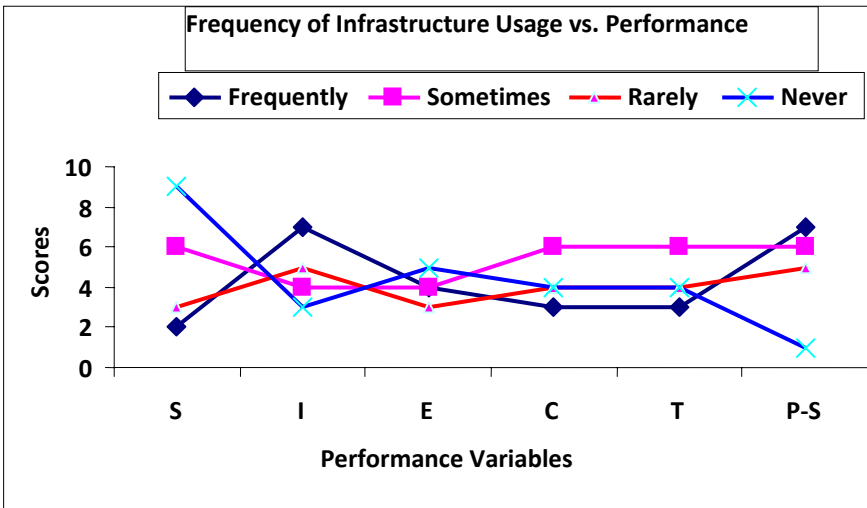
N.B.: Regression equation:  $Y = \beta_0 + \beta_1 X$

The performances of manufacturing firms vary widely for differences in frequencies of infrastructure usage (see Table A6.1 and A6.2 of Annex). For example, the operating profit to sales ratio (Y6) and changes in investment (Y2) increase with the increase in number of frequencies of

using infrastructures. No other variables (Y1, Y3, Y4, Y5) possess any specific relationship with the frequency levels (frequently, rarely, sometimes and never) of usage of physical infrastructure.

Figure 6.1 demonstrates that the firms that use infrastructural resources frequently have the lowest score in sales growth but the highest score in operating profit to sales ratio. The scenario is the reverse for firms that never use the infrastructure. Such a trend clearly demonstrates the necessity of improving the infrastructure in the hope of improving the operating profit to sales ratio – one of the main objectives of a firm.

**Figure 6.1: Infrastructure Use vs. Performance of Manufacturing Firms**



Source: Field Survey (2008-09).

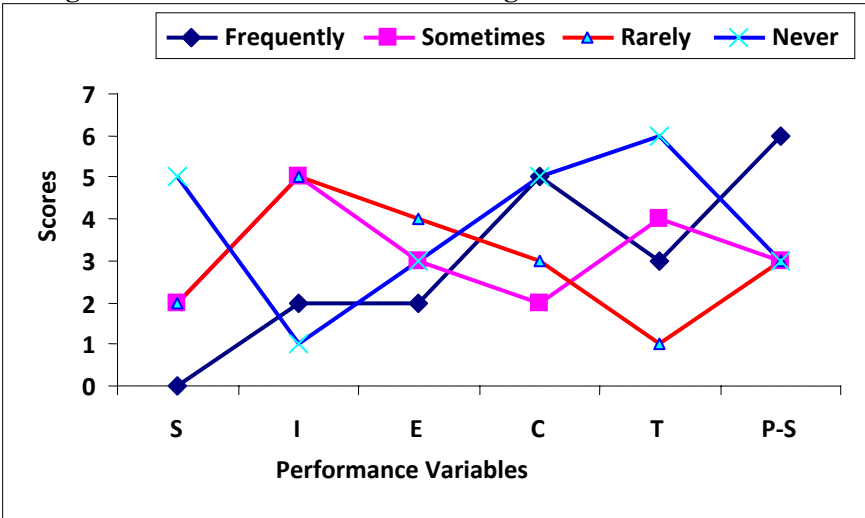
N.B.: T stands for ‘Target fulfillment rate’, C for ‘Capacity utilization rate’, P-S for ‘Operating profit to sales ratio’, S for ‘Sales growth’ and E for ‘Employment growth’.

The scores of vertical axis indicate the number of infrastructures in which the mean value of the performance measuring indicators (S, I, E, C, T and P-S) of the infrastructure users firms at a particular frequency is greater than the average of all frequency level user firms.

For Table A6.2 of Annex, it is assumed that higher frequency of incidents (like visit of BSTI personnel, tax personnel, electricity office personnel, natural calamity, bureaucratic complexities, etc.) mentioned in

the table exerts a negative impact on performance variables (Y's). The analysis finds that the sales growth rate increases for a decrease in the occurrence of such incidents. The rate is the lowest for firms facing the incidents frequently and the highest for the firms never facing the incidents (see Figure 6.2).

**Figure 6.2: Performance Constraining Incidents vs. Performance**



Source: Field Survey (2008-09).

N.B.: T stands for 'Target fulfillment rate', C for 'Capacity utilization rate', P-S for 'Operating profit to sales ratio', S for 'Sales growth' and E for 'Employment growth'.

The scores of vertical axis indicate the number of constraints in which the mean value of the performance measuring indicators (S, I, E, C, T and P-S) of the constraint facing firms at a particular frequency is greater than the average of all frequency level facing firms.

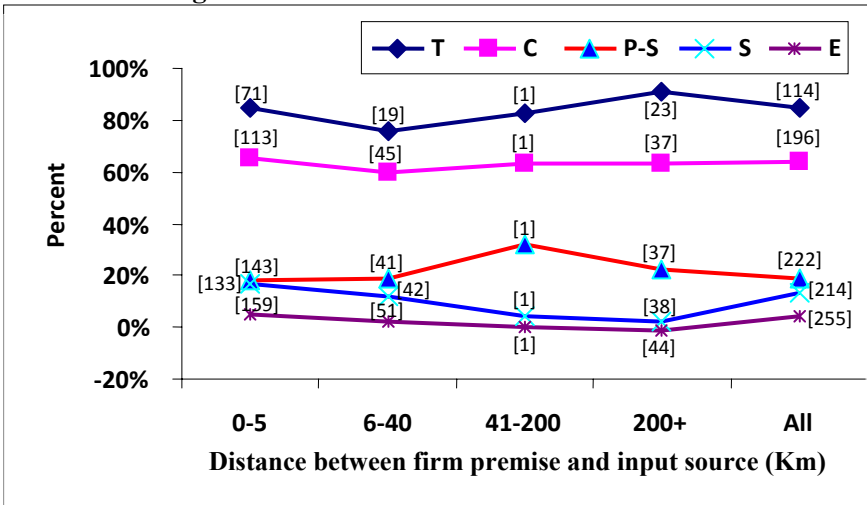
In summary, the firms which are using the infrastructure frequently or sometimes are performing better than the firms which are using the infrastructure rarely or never. Therefore, the availability of infrastructure is important for the better performance of a firm. Though some costs will be incurred in using infrastructure facilities, the firms will be able to broaden their horizons in terms of their factor and product markets, a trait that will benefit them. In addition, frequent visits of BSTI personnel,

tax personnel, electricity office personnel, etc. exert negative impact on the performance measures of a firm.

**6.2 Input Market**

The physical distance between source of raw material and the firms’ location significantly affects the sales growth rate of manufacturing firms, since transportation costs are directly proportional to distance. Figure 6.3 explains that the longer the distance, the lower the sales and employment growth rates of the firms. The distance affects negatively the performance of the firms.

**Figure 6.3: Distance Wise Firm Performance**



Source: Field Survey (2008-09)

N.B.: T stands for ‘Target fulfillment rate’, C for ‘Capacity utilization rate’, P-S for ‘Operating profit to sales ratio’, S for ‘Sales growth’ and E for ‘Employment growth’. [The numbers in the parenthesis] indicate sample size (N).

The sales growth rate is the highest for the firms who collect raw materials from nearby sources and the rate is the lowest for the firms who collecting raw materials from far away ( $\geq 200$  km) (see Figure 6.3). There is no unique relationship between the distance and capacity utilization as all the firms have similar capacity utilization rates. The most notable scenario is that, in spite of having very poor sales growth,

operating profit to sales ratio is higher for the firms collecting raw materials from distant places. This provides the insight that improvement of physical infrastructure can make firms more profitable that collect raw materials from distant places.

**Table 6.3: Input Source vs. Performance**

Performance Measuring Indicators (Y)	Input Sources (X)	Standardized Coefficient ( $\beta_1$ )	p value
Changes in Investment ( N= 290)	Intra-region markets	-0.188	0.001
Operating Profit to Sales Ratio (N=271)		-0.132	0.030
Changes in Investment (N= 290)	Inter-region markets	0.279	0.000
Operating Profit to Sales Ratio (N=271)		0.123	0.043

Source: Field Survey (2008-09).

N.B.: Regression equation:  $Y = \beta_0 + \beta_1 X$

The linear regression results indicate that the changes in investment and operating profit to sales ratio are significantly decreased with an increase of raw materials sourced from intra-region markets. However, the relationships are reverse for those that collect most of their raw materials from outside the region (see Table 6.3 and Table A6.3 of Annex). The result indicates that as the percentage of raw materials bought from within the region increases, the performance of the firms decrease and this relationship is statistically significant. Such a result supports the diversification of raw material sources, which cannot be done easily without improvement in physical infrastructure.

### 6.3 Output Market

The output market of this region is highly confined to the southern and western parts of the Padma and Meghna rivers. Only a few firms of the region (e.g. mud tiles, shrimp processing etc.) have access to foreign markets. Some products cross the region boundary and access markets of the other regions across the country, for instance, cement, fertilizer, poultry and fish feed firms. Except these, all other products are sold mostly within the region. Therefore, the product market is narrow from a geographical viewpoint.



There are some firms which produce only one product, and some other firms produce a range of products of different qualities. The findings indicate that both product specialization and diversification are practiced by the surveyed firms. More than one-third of the surveyed firms produce only one product (see Table 6.4) such as rice, brick, coconut oil, etc. In contrast, some firms produce more than ten products simultaneously, such as bakery, furniture and iron & steel firms.

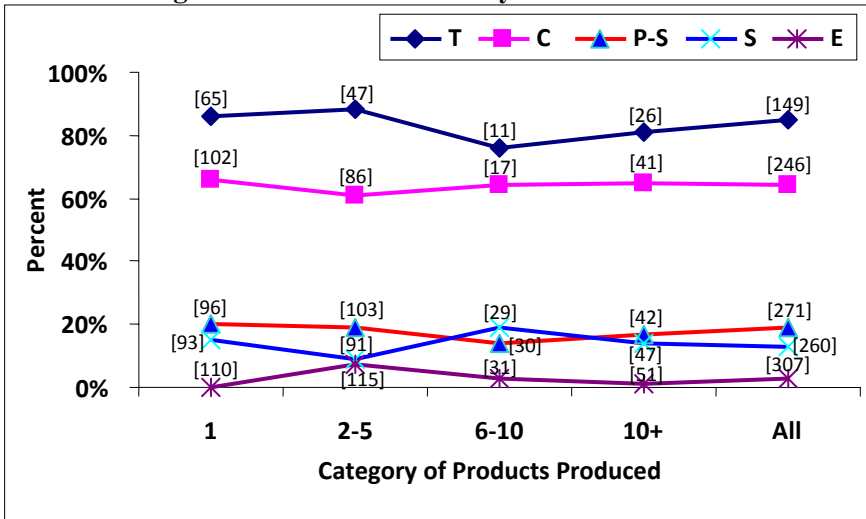
**Table 6.4: Product Diversity**

Category of Products	Number of Firms	Percent
1	122	36
2	54	16
3	34	10
4	25	8
5	13	4
6	8	2
7	8	2
8	6	2
10	10	3
10+	55	17
Total	335	100

Source: Field Survey (2008-09).

Sales growth does not have any specific relationship with the number of products produced (see Figure 6.4). Employment growth is the lowest for firms producing one product. Operating profit to sales ratio is almost consistent across all groups. In short, no significant or strong relationship is found between product concentration and firm performance among the surveyed manufacturing firms.

Linear regression results indicate a negative relationship between the number of products manufactured and the operating profit to sales ratio. The relationship with other performance measures is also negative, though not statistically significant (see Table A6.4 of Annex). The results advocate for product specialization instead of diversification.

**Figure 6.4: Product Diversity vs. Performance**

Source: Field Survey (2008-09).

N.B.: T stands for 'Target fulfillment rate', C for 'Capacity utilization rate', P-S for 'Operating profit to sales ratio', S for 'Sales growth' and E for 'Employment growth'.

The study considers performance measure as dependent variable and regress it on product destination as an explanatory variable. A change in investment and operating profit to sales ratio have a negative relationship with the firms that are selling their products to the southern and western part of Padma and Meghna rivers. A change in investment, employment growth rate and operating profit to sales ratio have a positive relationship with the firms that sell to the north-west region of Bangladesh. A change in investment has a positive relationship with the firms that sell products to other regions of Bangladesh. Operating profit to sales ratio has a positive relationship with the firms that sell products abroad (see Table A6.5 of Annex). The results speak in favor of crossing regional and national boundaries.

The regression results find a statistically significant positive relationship between full swing operation of a firm and operating profit to sales ratio (see Table A6.6 of Annex). The higher the number of months in a year a firm remains in operation, performance measures increase. The results

also find that the changes in investment and operating profit to sales ratio of the firms increase for an increase in firm size from sales volume perspective (see Table A6.7 of Annex).

### **Financial Services**

Financial security is an important factor in establishing manufacturing firms. The firms have to borrow money from institutional and non-institutional sources to bear capital expenditure such as purchasing fixed assets like land, buildings and machineries. Purchase of raw materials, salary & wage expenditures, utility bills, etc. create a need for working capital. Availability of financial services can help manufacturers to continue and expand production activities.

Manufacturers apply for loans from banks and other financial institutions. About 15% percent of the surveyed manufacturing firms had to wait for 1-20 days, 7% of the firms had to wait for 21-40 days, 3% firms had to wait for 41-60 days, and 3% firms had to wait for more than 80 days for getting loan. It should be noted that majority of the firms (72%) deny to respond loan related questions. However, their activities and operation volume make it appear that they depend on loans to run the business. The insight here is that they fail to meet the terms and conditions of the taken loans, and do not wish to disclose that they are loan recipients since they manage the situation informally through paying bribes.

The rate of interest varies from bank to bank. The firms want to get loans at low rates and in favorable terms and conditions. However, they often fail to get such opportunities. Around 12% of the firms get loans at 11-15% yearly interest, and 7% firms get loans at 16-20% interest. A larger number of firms did not disclose their loan interest rates. Therefore, addressing the constraints in getting loans and counselling firms for timely payment of loans are important. The financial institutions, government and concerned parties need to take initiatives for improving access to financial services.

### 6.5 Utility Services

Availability of utility services ensures better performance of manufacturing firms. Electricity supply, gas, and water supply are needed as inputs of firms. If electricity supply is smooth, it becomes easier to continue production. This will lead to increase in production volume. On the other hand, power failure hampers production activities and causes loss in labor hours.

**Table 6.5: Power Failure per Day (Hour)**

Power Failure (Hour per Day)	Number of Firms	Percent
2	57	17
3	128	38
4	100	30
5	39	12
5+	11	3
<b>Total</b>	<b>335</b>	<b>100</b>

Source: Field Survey (2008-09).

**Table 6.6: Energy Sources**

Energy Source Use	Unit	Electricity	Diesel	Coal	Charcoal	Gas	Others <sup>3</sup>
Use	Number of firms	335	98	23	6	20	119
No response		0	237	312	329	315	216
Total		335	335	335	335	335	335

Source: Field Survey (2008-09).

The analysis indicates that about three-fourths of the firms face between 2 and 4 hour long power failure per day (see Table 6.5). As a result of this, the hardest hit is the firms who are highly electricity-dependent. The demand-supply scenario of electricity in the region indicates that a big push from the supply side is needed. Due to unavailability and irregular electricity supply, some firms have resorted to alternate energy sources like wood, coal etc. (see Table 6.6). The findings also indicate that using alternate energy sources are expensive and this is causing costs of production to rise.

<sup>3</sup> Here, 'others' mainly include 'wood'.

## ***6.6 Miscellaneous Issues***

Frequent visits of electricity personnel significantly hindered the target fulfillment rate and capacity utilization rate of the firms (see Table A6.8 of Annex). Disconnection of electricity supply due to unpaid electricity bills often constrained target fulfillment rate and capacity utilization rate of the firms. Linear regression results also show that the age of a firm has negative relationship with its employment generation rate.

## ***6.7 Multiple Regression Results***

This study considers six important measures to evaluate the performance of manufacturing firms operating in the south-west region of Bangladesh. These are (i) sales growth (Y1), (ii) changes in investment (Y2), (iii) employment growth (Y3), (iv) capacity utilization rate (Y4), (v) target fulfillment rate (Y5), and (vi) operating profit to sales ratio (Y6). Among the measures, the operating profit to sales ratio is the most significant one for the firms to sustain in business, to expand and to earn profits. The efforts of the firms in all other measures are finally reflected in the operating profit to sales ratio. Therefore, this study attempts to run multiple regressions to identify the factors that mostly contribute to a firm's profit.

This study assumes that the input market, product market, technology level, infrastructure use, utility services, corruption and miscellaneous issues influence the operating profit to sales ratio ( $Y_1$ ) of a firm. The distance between factory premise and raw material sources ( $X_1$ ) and number of raw material suppliers ( $X_2$ ) are considered as representative indicators of the input market. The category of products manufactured ( $X_3$ ) and number of full-swing operational months in a year ( $X_4$ ) represents the output market. The number of computers available in the firm ( $X_5$ ) and the percentage of mobile phone users among the firm employees ( $X_6$ ) describe the technology level of the firm. The Mongla seaport ( $X_7$ ), Aricha-Daulotdia ferry ( $X_8$ ) and Khulna-Jessore highway ( $X_9$ ) are considered to represent the use of physical infrastructure by the manufacturing firms. The frequency of the visit of BSTI personnel ( $X_{10}$ ), visit of tax personnel ( $X_{11}$ ) and visit of electricity office personnel ( $X_{12}$ )

are used to measure the corruption level faced by the firms. The monthly utility expenditure ( $X_{13}$ ), monthly electricity bill ( $X_{14}$ ) and power failure per day ( $X_{15}$ ) are considered to measure the influence of utility services on firm performance. The employment level ( $X_{16}$ ), firm age ( $X_{17}$ ) and ownership pattern ( $X_{18}$ ) are considered as miscellaneous factors influencing the operating profit to sales ratio of manufacturing firms.

The backward multiple regression results exclude all the indicators except  $X_3$ ,  $X_4$ ,  $X_7$ , and  $X_{11}$  from the final significant model. The category of products manufactured ( $X_3$ ), number of full-swing operational months in a year ( $X_4$ ), use of Mongla seaport ( $X_7$ ) and visit of tax personnel ( $X_{11}$ ) have statistically significant impact on the operating profit to sales ratio ( $Y_6$ ) of firms (see Table 6.7). The firms those are dealing with fewer categories of products are experiencing a higher operating profit to sales ratio and the relationship is statistically significant. More specifically, for including every new product in the production process, the operating profit to sales ratio is decreased by 20.9%. The firms those are operating more months in a year are experiencing a higher operating profit to sales ratio and the relationship is statistically significant. For an increase of one month of full-swing (in a year) operation, the operating profit to sales ratio is increased by 25.5%.

The firms those are using Mongla port are experiencing a higher operating profit to sales ratio and the relationship is statistically significant. That is, for a shift of using Mongla port from one state of frequency to another state (say, from never using to rarely; from rarely to sometimes, or from sometimes to frequently), the operating profit to sales ratio is increased by 29.3%. The firms those are facing frequent visit by tax personnel are experiencing a lower operating profit to sales ratio. For an increase in visiting the tax personnel from one state of frequency to another state (say, from never using to rarely; from rarely to sometimes, or from sometimes to frequently), the operating profit to sales ratio is decreased by 11.4%.

**Table 6.7: Multiple Regressing Results for Operating Profit to Sales Ratio**

Measures	Indicators		Std. Error	Standardized Coefficients ( $\beta$ )	t value	p value
		(Constant)	.065		3.257	0.001
Output market	Product category	$X_3$	.004	-0.209	-3.189	0.002
	Full swing operation (Months per year)	$X_4$	.004	0.255	3.732	0.000
Infrastructure	Mongla sea port	$X_7$	.010	0.293	-4.696	0.000
Corruption	Visit of tax personnel	$X_{11}$	.010	-0.114	1.752	0.081
The model: $Y_6 = \beta_0 + \beta_3 X_3 + \beta_4 X_4 + \beta_7 X_7 + \beta_{11} X_{11}$ ;					$R^2 = 0.181$	

Source: Author's calculation based on surveyed data.

The analysis clearly demonstrates that product specialization, regularity in the production process, use of physical infrastructures and anti-corruption movement contribute to higher performance of manufacturing firms. Therefore, it can be concluded that an improvement in investment climate that takes into account improving the Mongla seaport and removing corruption will significantly contribute to increase the operating profit to sales ratio (i.e. performance) of the manufacturing firms of the south-west region of Bangladesh.

### **Summary**

The investment climate is an important issue for the manufacturing firms. This study tries to find out the relationship between firm performance and the investment climate. The physical infrastructures, input markets, output markets, financial services, utility services etc. characterize the investment climate of a region.

Mongla seaport, Benapole & Vomra land port, Aricha-Daulotdia ferry, Khulna-Jessore highway, Khanjahan Ali bridge, Mauwa ferry and Chittagong seaport are the main infrastructures considered in this study.

The study surprisingly finds that a significant number of the surveyed firms do not use the infrastructures.

The study finds a statistically-significant, positive relationship between the use of infrastructure and performance of manufacturing firms. For example, the operating profit to sales ratio of the firms increases for an increase in the frequency of using Mongla seaport and other infrastructures. The scenario is the reverse for firms never using these infrastructures. Therefore, the improvement of Mongla seaport and other infrastructures would make the investment climate friendlier and would improve firm performance.

The study finds that the performance of manufacturing firms falls with an increase in dependency on regional markets for sources of raw materials. Although, the sales growth rate is the highest for the firms collecting raw materials from nearby, the operating profit to sales ratio is higher for the firms collecting raw materials from distant places. The firms collecting raw materials from inter-region markets are performing better compared to the firms that are collecting raw materials from intra-region markets.

The output market of the manufacturing firms is narrow and mostly limited to the regional boundary with some exceptions. The analysis suggests that firms should ideally cross regional and national boundaries to increase profitability. The results also advocate for product specialization instead of diversification.

The firms often fail to meet the terms and conditions of the loan agreements, and 'manage' the situation informally through bribing officials. Power failure is a common problem faced by the manufacturing firms of the region, which can only be addressed by making the supply of electricity adequate and reliable.

The operating profit to sales ratio is the most significant measure for the firms to sustain in business, to expand and to earn profit. The regression results indicate that product specialization, regularity in the production process, frequent use of physical infrastructures and anti-corruption movement is likely to augment the operating profit to sales ratio of firms.



# 7

## CONCLUDING REMARKS

This study focuses on the performance of manufacturing firms of the south-west region of Bangladesh under the prevailing investment climate. The study also tries to make recommendations which can improve the investment climate and consequentially improve performance of firms.

The study considers firms of Khulna, Jessore, Satkhira and Bagerhat districts as respondents. The manufacturing firms of the south-west region of Bangladesh possess diverse characteristics in terms of product variety, firms' size, ownership patterns, technology, sources of raw material and output destinations. This study investigates 335 sample manufacturing firms of the region. Bakery, brick, iron & steel, coconut oil, printing, rice milling, mud tiles, wood processing and wooden furniture are the main manufacturing firms operating in the region.

This study considers physical infrastructures, financial services, utility services and dispersion of input and output markets as the main elements of the investment climate. A seaport (Mongla), an airport (Jessore), two land ports (Benapole and Vomra), roads, railways and bridges are the main physical infrastructures available in this region. Availability of financial services, electricity, gas, indigenous raw materials and some region-specific products are some other points that affect the investment climate of the south-west region of Bangladesh.

Sales growth, change in investment, employment growth, capacity utilization rate, target fulfillment rate and operating profit to sales ratio have been considered in this study as the prime measures of performance. Firms' age, firms' size, ownership patterns and seasonality in production are features used to classify firms.

About 80% of the sample firms were established in the 1980s and onward. Though the sales and employment growth rates are higher for the newer firms, the older firms have a higher operating profit to sales

ratio. Manufacturing firms operating in this region are mostly small and medium in size. The smaller firms experienced a higher sales growth but a lower operating profit to sales ratio. The manufacturing sector of the region is dominated by the sole proprietorships. The private limited firms are more cautious and efficient in recruiting people. Similarly, they are more efficient and expert in dealing with sales, cost, profit and other financial activities. Sales growth, capacity utilization rate and target fulfillment rate of seasonal manufacturing firms are higher than that of the regular firms.

This study classifies firms according to the product they produce. Firm performance varies significantly among different product groups. The production process, investment pattern, machinery investment, employee engagement, availability of raw materials etc. are the main areas of difference. From a performance viewpoint, the mud tiles firms occupy the top position followed by bakery and wooden furniture firms. Proper utilization of capacities, high rate of target fulfillment, high operating profit to sales ratio, export orientation, low levels of machinery investment requirement, low rate of electricity consumption and availability of raw materials are the key factors behind the success of mud tiles firms.

This study finds that only a few firms of the region are export oriented and only the coconut oil and mud tiles firms are trying to cross the regional boundary for selling products. Analyses indicate a direct and positive impact of employee's skill on performance of manufacturing firms of this region. Male employees dominate the manufacturing process of the firms.

Price fluctuation, large machinery investment, high energy consumption, high operating costs and lack of capacity utilization are the main causes for the unsatisfactory performance of rice milling, coconut oil, iron & steel and printing firms. The raw material cost occupies the largest share of total operating cost in coconut oil firms followed by bakery firms. For the mud tiles and brick firms, the share is very low. The machine or fuel dependent firms like rice milling, bakery, coconut oil, brick, mud tiles etc. have to incur a huge cost for energy. Gas supply, supply of

electricity and availability of alternate energy sources need to be improved for improving the performance of firms. A big push from the supply side is needed to overcome the adversities in utility supply.

This study also considers the region firms are located in as another important dimension in assessing performance. A majority of the manufacturing firms operating in the region are located in Khulna and Jessore districts. The firms of Jessore district invest the most and consume the most energy. The employment growth rate is the highest in Khulna and the lowest in Bagerhat district.

The firms of Satkhira take the top position from sales growth, capacity utilization rate, target fulfillment rate and operating profit to sales ratio viewpoints. Export orientation, low capital requirement, low machinery requirement and easy access to raw materials of the mud tiles firms are the main reasons for better performance of firms in Satkhira. In contrast, a majority of the firms located in Bagerhat are coconut oil firms, and they are not performing well in the region. Therefore, the overall performance of the firms located in Bagerhat is not good.

The firms of Khulna and Jessore sell more than 80% of their products to regional markets. In contrast, the firms of Satkhira and Bagerhat are trying to penetrate markets beyond regional and even national borders. However, buying raw material and selling products within their own region is the dominating trend prevailing among the manufacturing firms of the south-west region of Bangladesh. Though the sales growth rates of such transactions are satisfactory, these firms face a lower level of profitability compared to firms dealing with markets outside the regions. A massive improvement in infrastructure is needed to encourage firms to widen their dispersion of input and output markets.

The frequency of using certain infrastructures has a direct positive relationship with firm performance irrespective of the product and location. Firms that have used these infrastructures frequently have the lowest score in terms of sales growth but the highest score in terms of operating profit to sales ratio. The scenario is the reverse for firms that never use these infrastructures. Therefore, improvement of infrastructure

is crucial for the improvement of the investment climate. Similarly, arrangement of easy access to finance and energy will improve firm performance.

This study finds that some specific products like mud tiles in Satkhira are doing well due to some region-specific advantages. Maintenance and acceleration of those region-specific advantages are important for the overall development of the manufacturing sector of this region. In addition, investment climate enhancement initiatives such as infrastructure development, smooth supply of utilities and easy access to finance would enable firms to sell beyond the country's boundary.

The product type and firms' locations are the two main dimensions considered in this study to assess the performance of the manufacturing firms operating in the south-west region of Bangladesh and to trace out the relationship between their performance and the investment climate. This study mainly considers the small and medium scale firms. Therefore, large firms such as those producing fertilizer, cement or jute remain in the sidelines of this study. The need to properly represent the small and medium firms which are the mainstream and difficulty in getting access to information of large firms are two main reasons for not considering large firms properly in this study. Research regarding the large firm is an important future extension that should be considered.

This study concentrates only on the manufacturing sector. However, service organizations and agro-firms remain outside the purview of this research paper. Therefore, to generate a wholesome picture about the region's investment climate, a future more-exhaustive study is needed. Moreover, this study considers only the south-west region of Bangladesh. For comparing these findings with other regions, further work should be carried out in other regions of Bangladesh.

## REFERENCES

- Almeida, R. and Carneiro, P. 2009. The Return to Firm Investments in Human Capital. *Labour Economics*, 16(1): 97-106.
- Al-Salman, M.H. 2008. Measuring the Technological Change and Productivity in Food, Textile and Chemical Industries in Kuwait (1992–2002). *Telematics and Informatics*, 25(4): 237-245.
- Asiatic Society of Bangladesh 2008. Banglapedia 2008 Edited Version, Asiatic Society of Bangladesh, Dhaka.
- BBS 2007a. Report on Bangladesh Census of Manufacturing Industries (CMI) 2001-2002. Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007b. 2006 Statistical Yearbook of Bangladesh. 26<sup>th</sup> Edition, Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007c. Economic Census 2001 & 2003 - National Report. Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007d. Economic Census 2001 & 2003 - Zila Series, Zila: Khulna. Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007e. Economic Census 2001 & 2003 - Zila Series, Zila: Jessore. Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007f. Economic Census 2001 & 2003 - Zila Series, Zila: Satkhira. Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007g. Economic Census 2001 & 2003 - Zila Series, Zila: Bagerhat. Bangladesh Bureau of Statistics (BBS), Planning Division,

- Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007h. Register of Establishment, Size: TPE 50-99 & 100+ (updated up to December, 2005) Sector: Manufacturing. Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007i. Register of Establishment, Size: TPE 10+ (updated up to December, 2005) Sector: Manufacturing, Volume - I. Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007j. Register of Establishment, Size: TPE 10-49 (updated up to December, 2005) Sector: Manufacturing, Volume - II. Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007k. Register of Establishment, Size: TPE 10+ (updated up to December, 2005) Sector: Manufacturing, Volume - III. Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BBS 2007l. Register of Establishment, Size: TPE 10+ (updated up to December, 2005) Sector: Manufacturing, Volume - IV. Bangladesh Bureau of Statistics (BBS), Planning Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- BEI 2008. Roundtable on Bottlenecks to FDI in Bangladesh: How Best to Improve the Investment Climate. Roundtable Report, Bangladesh Enterprise Institute (BEI) and United Nations Development Program (UNDP), Dhaka.
- Bergara, M.E., Henisz, W.J. and Spiller, P.T. 1998. Political Institutions and Electric Utility Investment: A Cross - Nation Analysis. *California Management Review* 40(2): 18–35.
- Bin, G. 2008. Technology Acquisition Channels and Industry Performance: An Industry -Level Analysis of Chinese Large- and Medium-Size Manufacturing Enterprises. *Research Policy*, 37(2): 194-209.
- Bøckman, T., Fleten, S.E., Juliussen, E., Langhammer, H.J., and Revdal, I. 2008. Investment Timing and Optimal Capacity Choice for Small Hydropower Projects. *European Journal of Operational Research*, 190(1): 255-267.

- BRTA 2008. Infrastructure Data of the Region. Bangladesh Road Transport Authority (BRTA), Khulna.
- Dollar, D., Hallward-Driemeier, M., and Mengistae, T. 2003a. Investment Climate and Firm Performance in Developing Economies. World Bank Publication, Washington D.C.
- Dollar, D., Shi, A., Wang, S., and L. Xu, C. 2003b. Improving City Competitiveness through the Investment Climate: Ranking 23 Chinese Cities. World Bank Publication, Washington D.C.
- Dollar, D., Hallward-Driemeier, M., and Mengistae, T. 2003c. Investment Climate, Infrastructure and Trade: A Comparison of Latin America and Asia. World Bank Publication, Washington D.C.
- Dollar, D., Hallward-Driemeier, M., Shi, A., Wallsten, S., Wang, S., and Xu, L.C. 2003d. Improving the Investment Climate in China. World Bank Publication, Washington D.C.
- Fariñas, J.C. and Ruano, S. 2005. Firm Productivity, Heterogeneity, Sunk Costs and Market Selection. *International Journal of Industrial Organization*, 23(7-8): 505-534.
- Fernandes, A.M. 2008. Firm Productivity in Bangladesh Manufacturing Industries. *World Development*, 36(10): 1725-1744.
- Hallward-Driemeier, M., and Stone, A. 2004. The Investment Climate for Informal Firms. Background Paper for the World Development Report (WDR) 2005.
- Hasan, R. 2002. The Impact of Imported and Domestic Technologies on the Productivity of Firms: Panel Data Evidence from Indian Manufacturing Firms. *Journal of Development Economics*, 69(1): 23-49.
- Henisz, W.J. 2002. The Institutional Environment for Infrastructure Investment. *Industrial and Corporate Change*, 11(2): 355-89.
- Henisz, W.J., and Bennet, A.Z. 2001. The Institutional Environment for Telecommunications Investment. *Journal of Economics & Management Strategy*, 10(1): 123-47.
- Hopenhayn, H. 1992. Entry, Exit and Firm Dynamics in Long Run Equilibrium. *Econometrica*, 60(5): 1127-1150.
- Kim, E. 2006. The Impact of Family Ownership and Capital Structures on Productivity Performance of Korean Manufacturing Firms:

- Corporate Governance and the “Chaebol Problem”. *Journal of the Japanese and International Economics*, 20(2): 209-233.
- Kim, K.H., Hwang, S.T., Oh, H.S., and Lee, D.J. 2008. The Impact of Investment Lags on Investment Decision. *European Journal of Operational Research*, 190(3): 696-707.
- Mahadevan, R. and Kim, S. 2003. Is Output Growth of Korean Manufacturing Firms Productivity-Driven?. *Journal of Asian Economics*, 14(4): 669-678.
- Mongla Port Authority 2009. The Official Web-site of Mongla Port Authority, Bangladesh. Available at <http://www.monglaport.gov.bd/rev.htm>; Retrieved on March 20, 2009.
- Ratti, R.A., Lee, S., and Seol, Y. 2008. Bank Concentration and Financial Constraints on Firm-Level Investment in Europe. *Journal of Banking & Finance*, 32(12): 2684-2694.
- Smith, W., and Hallward-Driemeie, M. 2005. Understanding the Investment Climate. *Finance & Development*. 42(1): 40-43.
- Stern, N. 2002a. The Investment Climate, Governance, and Inclusion in Bangladesh. Public Lecture Organized by Bangladesh Economic Association, Dhaka.
- Stern, N.H. 2002b. A Strategy for Development. World Bank, Washington D.C.
- Stern, N. 2003. The Investment Climate, Governance, and Inclusion in Nepal. Keynote Address in Nepal Economic Association, Katmandu.
- Tsang, E.W.K., Yip, P.S.L., and Toh, M.H. 2008. The Impact of R&D on Value Added for Domestic and Foreign Firms in a Newly Industrialized Economy. *International Business Review*, 17(4): 423-441.
- Wakelin, K. 2001. Productivity Growth and R&D Expenditure in UK Manufacturing Firms. *Research Policy*, 30(7): 1079-1070.
- Weder, B. and Schiffer, M. 2000. Catastrophic Political Risk versus Creeping Expropriation: A Cross-Country Analysis of Risks in Private Infrastructure Financing in Emerging Markets. Project Report for World Bank, Washington D.C.



- Wei, Z., Varela, O., and Hassan, M.K. 2002. Ownership and Performance in Chinese Manufacturing Industry. *Journal of Multinational Financial Management*, 12(1): 61-78.
- West Zone Power Distribution Company Limited 2008. Power Sector Data of Khulna Region. West Zone Power Distribution Company Limited, Khulna.
- Wikipedia 2009. On-line Documentary Resource, Wikipedia, The Free Encyclopedia. Available at [http://en.wikipedia.org/wiki/Main\\_Page](http://en.wikipedia.org/wiki/Main_Page); Retrieved on March 20, 2009.
- World Bank 2003. Improving the Investment Climate in Bangladesh: An Investment Climate Assessment Based on an Enterprise Survey Carried out by the Bangladesh Enterprise Institute and the World Bank. Washington D.C.
- World Bank 2004. Investment Climate Assessment: India: Investment Climate and Manufacturing Industry. World Bank Publication, Washington D.C.
- World Bank 2005. World Development Report - A Better Investment Climate for Everyone. World Bank and Oxford University Press, New York.
- Zhang, Y., Parker, D. and Kirkpatrick, C. 2002. Electricity Sector Reform in Developing Countries: An Econometric Assessment of the Effects of Privatization, Competition, and Regulation. Institute for Development Policy and Management Working Paper 13, Centre on Regulation and Competition, University of Manchester, Manchester.

# APPENDIX 1

**Table A3.1: Overview on Sample Manufacturing Firms of the Study Area**

Criteria	Particulars	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	All
Firm age	0-8 years	6	8	11	8	2	5	9	5	10	28	92
	8+ years	25	22	20	14	17	31	21	26	20	47	243
Firm size (Employed number of persons; Year 2008)	E <sub>1</sub> (1-5)	2	8	17	3	9	6	0	5	12	13	75
	E <sub>2</sub> (6-20)	20	3	8	13	6	20	23	24	17	26	160
	E <sub>3</sub> (20+)	9	19	6	6	4	10	7	2	1	36	100
Firm size (Yearly sales in Taka; Year 2008)	S <sub>1</sub> (0-500,000)	4	10	14	3	3	4	5	9	15	11	78
	S <sub>2</sub> (500,001-2,000,000)	11	1	5	3	5	7	14	7	14	20	87
	S <sub>3</sub> (2,000,000+)	16	19	12	12	7	15	7	4	1	29	122
District-wise	Khulna district	19	6	23	4	8	16	0	22	21	17	136
	Jessore district	5	10	6	3	11	15	0	8	7	43	108
	Satkhira district	4	3	1	0	0	5	30	1	2	9	55
	Bagerhat district	3	11	1	15	0	0	0	0	0	6	36
Skill of workers	K <sub>1</sub> (comprising 50% or more skilled labor)	20	24	26	15	15	31	24	22	16	50	243
	K <sub>2</sub> (comprising less than 50% skilled labor)	11	6	5	7	4	5	6	9	14	25	92
Ownership	Sole proprietorship	29	25	30	20	19	28	26	26	28	53	284
	Others	2	5	1	2	0	8	4	5	2	22	51
Working hour (Hours per day)	8 hours or less	1	1	1	1	5	4	0	10	1	5	29
	9 to 12 hours	14	25	25	17	9	26	27	20	26	48	237
	More than 12 hours	16	4	5	4	5	6	3	1	3	22	69
Generator use	User	11	11	6	0	19	1	0	0	7	43	98
	Non-user	20	19	25	22	0	35	30	31	23	32	237
Export	Export oriented firms	0	0	0	3	0	0	16	0	0	12	31
	Non-exporting firms	31	30	31	19	19	36	14	31	30	63	304
Yearly operation	R <sub>1</sub> : Seasonal firms	0	29	0	6	3	13	30	2	1	22	106
	R <sub>2</sub> : Regular firms	31	1	31	16	16	23	0	29	29	53	229
Bank loan	Loan taking firms	14	10	9	5	10	13	10	11	8	22	112
	Not taking / Not responded firms	17	20	22	17	9	23	20	20	22	53	223
Bribe	Paying firms	13	2	1	3	2	5	2	1	1	8	38
	Non-paying firms	1	0	0	7	0	3	2	0	1	2	16
	Not responded firms	17	28	30	12	17	28	26	30	28	65	281
Total	Number of firms	<b>31</b>	<b>30</b>	<b>31</b>	<b>22</b>	<b>19</b>	<b>36</b>	<b>30</b>	<b>31</b>	<b>30</b>	<b>75</b>	<b>335</b>

Source: Field Survey (2008-09).

N.B.: The numerical numbers indicate number of firms in corresponding categories. G1 stands for 'Bakery', G2 for 'Brick', G3 for 'Iron & Steel', G4 for 'Coconut Oil', G5 for 'Paper, Book & Printing', G6 for 'Rice Milling', G7 for 'Mud Tiles', G8 for 'Wood Processing', G9 for 'Wooden Furniture' and G10 for 'Miscellaneous' firms.

Table A6.1: Firm Performance at a Glance

I	Frequently						Sometimes						Rarely						Never					
	Y1	Y2	Y3	Y4	Y5	Y6	Y1	Y2	Y3	Y4	Y5	Y6	Y1	Y2	Y3	Y4	Y5	Y6	Y1	Y2	Y3	Y4	Y5	Y6
a	Δ	Δ	Δ	*	*	*	Δ	Δ	Δ	Δ	*	*	Δ	*	Δ	Δ	*	Δ	Δ	Δ	*	Δ	*	*
b	*	Δ	*	Δ	Δ	Δ	Δ	Δ	*	Δ	Δ	Δ	*	*	*	Δ	Δ	Δ	Δ	Δ	*	Δ	*	*
c	*	Δ	Δ	*	*	Δ	Δ	*	*	*	*	Δ	Δ	Δ	*	*	Δ	*	Δ	Δ	*	*	*	Δ
d	*	Δ	Δ	*	*	Δ	Δ	*	*	Δ	Δ	*	*	*	Δ	Δ	Δ	*	Δ	Δ	*	*	Δ	*
e	*	Δ	Δ	*	Δ	Δ	Δ	*	*	Δ	Δ	*	*	Δ	*	*	*	*	Δ	*	Δ	Δ	Δ	*
f	*	*	*	*	*	*	*	Δ	Δ	*	Δ	Δ	Δ	Δ	*	*	*	Δ	Δ	Δ	*	*	Δ	Δ
g	*	*	*	Δ	-	Δ	*	*	Δ	*	*	Δ	*	*	*	*	*	*	Δ	Δ	Δ	Δ	Δ	*
h	*	Δ	*	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	*	Δ	*	Δ	Δ	Δ	Δ	Δ	*	Δ	*	*
i	Δ	Δ	*	*	Δ	Δ	*	*	*	Δ	Δ	Δ	*	Δ	Δ	*	*	Δ	Δ	Δ	*	*	Δ	*
TΔ	2	7	4	3	3	7	6	4	4	6	6	6	3	5	3	4	4	5	9	3	5	4	4	1

Source: Field Survey (2008-09).

N.B.:

I: Infrastructure; TΔ : Total number of 'Δ'.				
Δ : When mean value of Y's in certain frequency of using particular infrastructure is higher than that of total mean value.				
* : When mean value of Y's in certain frequency of using particular infrastructure is lower than that of total mean value.				
Y1: Average Sales Growth;		Y2: Average Changes in Investment;		Y3: Average Employment Growth;
Y4 : Capacity Utilization Rate;		Y5: Target Fulfillment Rate;		
Y6: Operating Profit to Sales Ratio.				
a: Mongla seaport;		b: Benapole & Vomra land ports;		c: Aricha-Daulotdia ferry;
d: Khulna-Jessore highway;				
e: Khanjahan Ali bridge;		f: Mauwa ferry;		g: Jessore airport;
h: Chittagong seaport;		i: Lalon Shah bridge.		

**Table A6.2: Performance Constraining Incidents vs. Performance**

I	Frequently						Sometimes						Rarely						Never					
	Y1	Y2	Y3	Y4	Y5	Y6	Y1	Y2	Y3	Y4	Y5	Y6	Y1	Y2	Y3	Y4	Y5	Y6	Y1	Y2	Y3	Y4	Y5	Y6
j	*	*	Δ	Δ	Δ	Δ	*	Δ	*	*	Δ	*	*	Δ	*	Δ	*	*	Δ	*	*	Δ	Δ	*
k	*	Δ	Δ	Δ	Δ	Δ	Δ	*	*	*	*	*	Δ	*	Δ	*	*	*	*	*	Δ	Δ	Δ	Δ
l	*	*	*	*	*	Δ	Δ	Δ	Δ	*	*	*	*	*	Δ	Δ	*	*	*	*	*	Δ	Δ	Δ
m	*	Δ	*	Δ	Δ	Δ	*	*	Δ	Δ	*	*	Δ	Δ	Δ	*	Δ	Δ	Δ	*	*	*	Δ	*
n	*	*	*	Δ	*	*	*	Δ	*	*	Δ	Δ	*	Δ	*	*	*	*	Δ	Δ	Δ	Δ	Δ	*
o	*	*	*	*	*	Δ	*	Δ	*	*	Δ	Δ	*	Δ	Δ	Δ	*	Δ	Δ	*	*	Δ	Δ	*
p	*	*	*	Δ	*	Δ	*	Δ	Δ	Δ	Δ	Δ	*	Δ	*	*	*	Δ	Δ	*	Δ	*	*	*
TΔ	0	2	2	5	3	6	2	5	3	2	4	3	2	5	4	3	1	3	5	1	3	5	6	3

Source: Field Survey (2008-09).

**N.B.:**

I: Infrastructure; TΔ : Total number of 'Δ'.			
Δ : When mean value of Y's in certain frequency of using particular infrastructure is higher than that of total mean value.			
* : When mean value of Y's in certain frequency of using particular infrastructure is lower than that of total mean value.			
Y1: Average Sales Growth;	Y2: Average Changes in Investment;	Y3: Average Employment Growth;	Y4 : Capacity Utilization Rate;
Y5: Target Fulfillment Rate;	Y6: Operating Profit to Sales Ratio.		
j: Visit of BSTI personnel;	k: Visit of tax personnel;	l: Visit of electricity office personnel;	m: Impact of natural disaster on your business;
n: Disturbance of local 'mastans';	o: Loss for slow response of government offices;	p: Informal cost incurred for getting quicker service from government offices.	

**Table A6.3: Input Sources and Firm Performance: Regression Results**

<b>Performance Measuring Indicators (Y)</b>	<b>Infrastructure Facilities (X)</b>	<b>Standardized Coefficient (<math>\beta_i</math>)</b>	<b>p value</b>
Average Sales Growth (N=260)	Intra-region producers	-0.014	0.820
Average Changes in Investment (N= 290)		-0.005	0.935
Average Employment Growth (N=307)		0.020	0.730
Capacity Utilization Rate (N=246)		-0.011	0.868
Target Fulfillment Rate (N=149)		0.017	0.840
Operating Profit to Sales Ratio (N=271)		0.041	0.505
Average Sales Growth (N=260)	Intra-region markets	0.101	0.105
Average Changes in Investment (N= 290)		-0.188	0.001
Average Employment Growth (N=307)		0.058	0.308
Capacity Utilization Rate (N=246)		0.029	0.645
Target Fulfillment Rate (N=149)		-0.121	0.140
Operating Profit to Sales Ratio (N=271)		-0.132	0.030
Average Sales Growth (N=260)	Inter-region producers	-0.118	0.058
Average Changes in Investment (N= 290)		-0.006	0.917
Average Employment Growth (N=307)		-0.014	0.811
Capacity Utilization Rate (N=246)		0.047	0.467
Target Fulfillment Rate (N=149)		0.021	0.796
Operating Profit to Sales Ratio (N=271)		0.045	0.458
Average Sales Growth (N=260)	Inter-region markets	-0.078	0.207
Average Changes in Investment (N= 290)		0.279	0.000
Average Employment Growth (N=307)		-0.102	0.073
Capacity Utilization Rate		-0.050	0.438

Performance Measuring Indicators (Y)	Infrastructure Facilities (X)	Standardized Coefficient ( $\beta_1$ )	p value
(N=246)			
Target Fulfillment Rate (N=149)		0.146	0.077
Operating Profit to Sales Ratio (N=271)		0.123	0.043

Source: Field Survey (2008-09).

N.B.: Regression equation:  $Y = \beta_0 + \beta_1 X$

**Table A6.4: Product Category and Firm Performance: Regression Results**

Performance Measuring Indicators (Y)	Product Category (X)	Standardized Coefficient ( $\beta_1$ )	p value
Average Sales Growth (N=213)	Category of the products manufactured	-0.001	0.992
Average Changes in Investment (N=238)		-0.116	0.075
Average Employment Growth (N=256)		0.036	0.565
Capacity Utilization Rate (N=205)		-0.049	0.485
Target Fulfillment Rate (N=123)		-0.029	0.751
Operating Profit to Sales Ratio (N=229)		-0.168	0.011

Source: Field Survey (2008-09).

N.B.: Regression equation:  $Y = \beta_0 + \beta_1 X$

**Table A6.5: Product Destination and Firm Performance: Regression Results**

Performance Measuring Indicators (Y)	Product Destination (X)	Standardized Coefficient ( $\beta_1$ )	p value
Average Sales Growth (N=260)	Domestic South and West part of Padma and Meghna River	0.067	0.279
Average Changes in Investment (N=290)		-0.283	0.000
Average Employment Growth (N=307)		-0.035	0.542
Capacity Utilization Rate (N=246)		-0.107	0.093
Target Fulfillment Rate (N=149)		-0.094	0.257
Operating Profit to Sales Ratio		-0.356	0.000

(N=271)			
Average Sales Growth (N=260)	Domestic North-West Region -Rajshahi division	-0.013	0.830
Average Changes in Investment (N=290)		0.341	0.000
Average Employment Growth (N=307)		0.113	0.049
Capacity Utilization Rate (N=246)		0.002	0.979
Target Fulfillment Rate (N=149)		0.024	0.768
Operating Profit to Sales Ratio (N=271)		0.170	0.005
Average Sales Growth (N=260)	Domestic Other Regions	-0.043	0.494
Average Changes in Investment (N=290)		0.128	0.029
Average Employment Growth (N=307)		-0.012	0.837
Capacity Utilization Rate (N=246)		0.091	0.157
Target Fulfillment Rate (N=149)		0.018	0.829
Operating Profit to Sales Ratio (N=271)		0.088	0.149
Average Sales Growth (N=260)	Abroad	-0.055	0.375
Average Changes in Investment (N=290)		0.089	0.133
Average Employment Growth (N=307)		-0.012	0.832
Capacity Utilization Rate (N=246)		0.088	0.168
Target Fulfillment Rate (N=149)		0.109	0.186
Operating Profit to Sales Ratio (N=271)		0.339	0.000

Source: Field Survey (2008-09).

N.B.: Regression equation:  $Y = \beta_0 + \beta_1 X$

**Table A6.6: Operational Months and Firm Performance: Regression Results**

Performance Measuring Indicators (Y)	Operational Months (X)	Standardized Coefficient ( $\beta_1$ )	p value
Average Sales Growth (N=260)	Full swing operation in a year	-0.039	0.535
Average Changes in Investment (N=289)		0.022	0.710
Average Employment Growth (N=307)		0.727	0.468
Capacity Utilization Rate (N=246)		-0.135	0.035

Target Fulfillment Rate (N=149)		-0.039	0.634
Operating Profit to Sales Ratio (N=271)		0.119	0.050

Source: Field Survey (2008-09).

N.B.: Regression equation:  $Y = \beta_0 + \beta_1X$

**Table A6.7: Yearly Sales and Firm Performance: Regression Results**

Performance Measuring Indicators (Y)	Yearly Sales (X)	Standardized Coefficient (R)	p value
Average Sales Growth (N=257)	Total yearly sales in Year 2008	-0.005	0.930
Average Changes in Investment (N=)		0.569	0.000
Average Employment Growth		-0.033	0.583
Capacity Utilization Rate (N=222)		0.005	0.941
Target Fulfillment Rate (N=138)		0.136	0.113
Operating Profit to Sales Ratio		0.205	0.001

Source: Field Survey (2008-09).

N.B.: Regression equation:  $Y = \beta_0 + \beta_1X$

**Table A6.8: Incidents and Firm Performance: Regression Results**

Performance Measuring Indicators	Incidents	St. Coefficient	p value
Average Sales Growth (N=260)	Visit of BSTI Personnel	-0.112	0.072
Average Changes in Investment (N=)		0.106	0.073
Average Employment Growth		0.063	0.268
Capacity Utilization Rate (N=246)		0.006	0.924
Target Fulfillment Rate (N=149)		0.066	0.424
Operating Profit to Sales Ratio		0.022	0.718
Average Sales Growth (N=260)	Visit of tax Personnel	-0.030	0.628
Average Changes in Investment (N=)		0.084	0.152
Average Employment Growth		0.015	0.790
Capacity Utilization Rate (N=246)		0.043	0.505
Target Fulfillment Rate (N=149)		0.048	0.565
Operating Profit to Sales Ratio		-0.064	0.294
Average Sales Growth (N=260)	Visit of electricity office personnel	-0.009	0.883
Average Changes in Investment (N=)		0.073	0.215
Average Employment Growth		-0.000	0.998
Capacity Utilization Rate (N=246)		-0.192	0.002
Target Fulfillment Rate (N=149)		-0.209	0.010
Operating Profit to Sales Ratio		-0.045	0.457
Average Sales Growth (N=260)	Impact of natural	-0.065	0.294
Average Changes in Investment (N=)		0.022	0.715
Average Employment Growth		0.032	0.577



Capacity Utilization Rate (N=246)	disaster on	0.069	0.283
Target Fulfillment Rate (N=149)	your	-0.053	0.522
Operating Profit to Sales Ratio	business	-0.027	0.659
Average Sales Growth (N=260)	Disturbance of local 'Mastans'	-0.038	0.543
Average Changes in Investment (N=		-0.057	0.330
Average Employment Growth		-0.053	0.356
Capacity Utilization Rate (N=246)		-0.045	0.487
Target Fulfillment Rate (N=149)		-0.017	0.839
Operating Profit to Sales Ratio		0.092	0.129
Average Sales Growth (N=260)	Loss for slow response of Government offices	-0.093	0.133
Average Changes in Investment (N=		0.186	0.001
Average Employment Growth		-0.015	0.793
Capacity Utilization Rate (N=246)		-0.044	0.490
Target Fulfillment Rate (N=149)		-0.010	0.905
Operating Profit to Sales Ratio		0.048	0.432
Average Sales Growth (N=260)	Informal cost incurred for getting quicker services from	-0.069	0.270
Average Changes in Investment (N=		0.108	0.062
Average Employment Growth		-0.029	0.612
Capacity Utilization Rate (N=246)		0.037	0.560
Target Fulfillment Rate (N=149)		0.041	0.624
Operating Profit to Sales Ratio		0.231	0.000

Source: Field Survey (2008-09). N.B.: [Regression equation:  $Y = \beta_0 + \beta_1 X$ ]

## APPENDIX 2

### Definitions

Symbols	Explanation
<b>E<sub>1</sub></b>	Firms employing up to 5 employees (in year 2008).
<b>E<sub>2</sub></b>	Firms employing 6-20 employees (in year 2008).
<b>E<sub>3</sub></b>	Firms employing 21-50 employees (in year 2008).
<b>E<sub>4</sub></b>	Firms employing 50 <sup>+</sup> employees (in year 2008).
<b>S<sub>1</sub></b>	Firms with yearly sales of Tk. 1 - 500,000 (in year 2008).
<b>S<sub>2</sub></b>	Firms with yearly sales of Tk. 500,001 - 2,000,000 (in year 2008).
<b>S<sub>3</sub></b>	Firms with yearly sales of Tk. 2,000,000 <sup>+</sup> (in year 2008).
<b>R<sub>1</sub></b>	If the full swing operation of a firm doesn't exceed 8 months in a year, it is treated as a firm of group <b>R<sub>1</sub></b> where <b>R<sub>1</sub></b> is used as a synonymous of seasonal firms.
<b>R<sub>2</sub></b>	If the full swing operation of a firm exceeds 8 months in a year, it is considered as a firm of group <b>R<sub>2</sub></b> where <b>R<sub>2</sub></b> is used as a synonymous of regular firms.
<b>K<sub>1</sub></b>	If a firm possesses more than or equal to 50% skilled labor under the definition of skilled worker, then it is considered as a firm of group <b>K<sub>1</sub></b> where <b>K<sub>1</sub></b> is used as a synonymous of skilled firms.
<b>K<sub>2</sub></b>	If a firm possesses less than 50% skilled labor then it is treated as a firm of group <b>K<sub>2</sub></b> where <b>K<sub>2</sub></b> is used as a synonymous of unskilled firms.
<b>S-W</b>	South and West part of Padma and Meghna Rivers.
<b>N-W</b>	North-West region of Bangladesh – Rajshahi Division.

<b>PBP</b>	Paper, Book & Printing Firm
<b>RM</b>	Rice Milling Firm
<b>WP</b>	Wood Processing Firm
<b>I&amp;S</b>	Iron & Steel Firm
<b>RMC</b>	Raw Material Cost
<b>UE</b>	Utility Expenses
<b>TC</b>	Transport Cost
<b>HR</b>	House Rent
<b>SW</b>	Salary & Wage

### Terms

<b>Terms</b>	<b>Explanation</b>
Old firm	Firms that are established on or before year 2000.
New firm	Firms that are established after year 2000.
Export Oriented Firm	Firm which exports at least one type of good is treated as an export oriented firm.
Sales Growth (S)	The average of percentile growth in sales of a firm in two or more successive years during 2005-2008 is defined as 'sales growth'.
Change in Investment (I)	The average of net change(s) in investment of a firm during 2005-2008 is treated as 'change in investment'.
Employment Growth (E)	The average of percentile growth in employment of a firm in two or more successive years during 2005-2008 is defined as 'employment growth'.

Capacity Utilization Rate (C)	The ratio between utilized capacity and installed capacity of a firm (of year 2008).
Target Fulfillment Rate (T)	The ratio between targeted production and actual production of a firm (of year 2008).
Operation Profit to Sales Ratio (P-S)	The ratio between operating profit and sales of a firm (of year 2008).
Skilled Worker	A worker who can operate at least two-third of the machineries to continue the manufacturing process of a firm is treated as a skilled worker.

### **Acronyms**

°C	Degree Celsius
Cant.	Cantonment
CFT	Cubic Feet
e.g.	For Example
etc.	Etcetera
i.e.	That is
Incd.	Incidents
Inf.	Infrastructure
Km	Kilometer
Ltd.	Limited
Max.	Maximum
M. ton	Metric ton
M.W.	Mega Watt
Min.	Minimum

Misc.	Miscellaneous
mm	Mili Meter
No. / Nos.	Number
sq. km	Square Kilometer
Std. Error	Standard Error
Tk.	Taka
vs.	Versus

### Abbreviations

ADB	Asian Development Bank
ASA	Association for Social Advancement
BBS	Bangladesh Bureau of Statistics
BEI	Bangladesh Enterprise Institute
BICF	Bangladesh Investment Climate Fund
BIWTC	Bangladesh Inland Water Transport Corporation
BLPA	Bangladesh Land Port Authority
BRAC	Bangladesh Rural Advancement Committee
BRTA	Bangladesh Road Transport Authority
BSCIC	Bangladesh Small and Cottage Industries Corporation
BSIC	Bangladesh Standard Industrial Classification
BSTI	Bangladesh Standard and Testing Institute
CARE	Cooperative for Assistance and Relief Everywhere
CMI	Census of Manufacturing Industries
DFID	Department For International Development
EC	European Commission

ERG	Economic Research Group
EXIM	Export Import
FDI	Foreign Direct Investment
IFC	International Finance Corporation
IFIC	International Finance Investment & Commerce
KCC	Khulna City Corporation
KCCI	Khulna Chamber of Commerce and Industries
KDA	Khulna Development Authority
LC	Land Customs
NCC	National Credit and Commerce
NGO	Non Government Organization
R&D	Research and Development
SGP	Small Grants Program
TFP	Total Factor Productivity
TPE	Total Person Engaged
UNDP	United Nations Development Program
WDR	World Development Report

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