A Study on Labor Productivity in the Ready Made Garments (RMG) Industry of Bangladesh

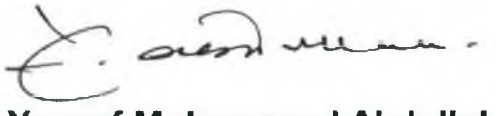
Thesis submitted
In partial fulfillment of the requirement for the
Degree of Doctor of Philosophy (PhD)
of the
University of Dhaka.

By
Abu Yousuf Mohammad Abdullah
Associate Professor
Institute of Business Administration (IBA)
University of Dhaka

Research Supervisor
Dr.M. Shamsul Haque
Professor
Institute of Business Administration (IBA)
University of Dhaka

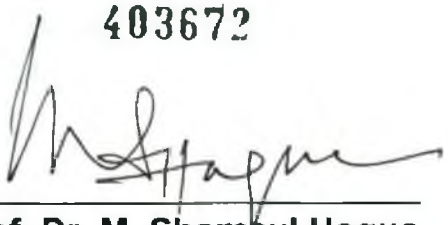
Declaration

I do hereby declare that the materials embodied in this thesis are original. It has neither been copied nor been submitted earlier in part or full for any other diploma or degree of the University of Dhaka or any other universities/institutions.



(Abu Yousuf Mohammad Abdullah)

Countersigned by the Supervisor



Prof. Dr. M. Shamsul Haque
Institute of Business Administration (IBA)
University of Dhaka

Table of Contents

ACKNOWLEDGEMENT

There is no denying the fact that a study like Labor Productivity was a very difficult task when no data from any dependable secondary source was available. My decision to choose this topic was influenced by the fact that it was a very important and extremely crucial arena of study owing to its ultimate importance for RMG growth of Bangladesh.

I strongly believe that Readymade Garments Sector of Bangladesh cannot go on with its onward march towards the future without seriously focusing on labor productivity.

Time hanged heavy with the study and it took almost four years of relentless effort along with the help and encouragement of various agencies, individuals and groups.

I sincerely record my thanks to all those without whose help this study could not be finalized.

I am grateful to the workers, employees and owners of many RMG factories.

I am also thankful to BGMEA, IBA, EPB, BIDS, CPD, WORLD BANK Library for permitting me to use their libraries, which was of great help.

Thanks are also due to my students both from MBA and BBA program of IBA who contributed a lot in collecting and collating data.

I would like to record my deep sense of gratitude and profound appreciation to my teacher, guide and also thesis supervisor, Dr. M. Shamsul Haque, Professor, Institute of Business Administration (IBA), University of Dhaka, for his untiring guidance and inspiration.

I am grateful to my friends especially Tareq Faisal Chowdhury, Md. Abdul Mumit, Md. Tawhid Reza and Sayed Md. Anwar Hossain who made significant contributions and encouraged me to complete the study.

Last but not the least, I am thankful to my wife Halima, son Zabir, daughters Labiba and Noorjahan for the sacrifice of their legitimate claim on my time.

In fine, I would record my sincerest gratitude to the Almighty Allah without whose infinite mercy I could not finalize my thesis.

Abu Yousuf Md. Abdullah

ABBREVIATIONS & ACRONYMS

ADB	:	Asian Development Bank
ADP	:	Annual Development Program
ASEAN	:	Association of South East Asian Nations
BGMEA	:	Bangladesh Garments Manufacturers and Exporters Association
BTMA	:	Bangladesh Textile Manufacturers Association
BKMEA	:	Bangladesh Knitwear Manufacturers and Exporters Association
BIDS	:	Bangladesh Institute of Development and Studies
BEPZA	:	Bangladesh Export Processing Zones Authority
BSEC	:	Bangladesh Steel Engineering Corporation
BSFIC	:	Bangladesh Sugar & Food Industries Corporation
BCIC	:	Bangladesh Chemical Industries Corporation
CMT	:	Cutting, Making and Trimming
CPD	:	Center for Policy Dialogues
CBW	:	Central Bounded Warehouse
CEPZ	:	Chittagong Export Processing Zones Authority
DEPZ	:	Dhaka Export Processing Zones Authority
DU	:	Dhaka University
EU	:	European Union
EIU	:	Economist Intelligence Unit
EPZ	:	Export Promotion Zone
EPB	:	Export Promotion Bureau
FBCCI	:	Federation of Bangladesh Chambers of Commerce and Industries
FDI	:	Foreign Direct Investment
GSP	:	Generalized System of Preference
GOB	:	Government of Bangladesh
GNI	:	Gross National Income
GDP	:	Gross Domestic Product
GNP	:	Gross National Product
GATT	:	General Agreement on Tariff and Trade
GTO	:	Gherzi Textile Organization

HR	:	Human Resources
IMF	:	International Monitory Fund
IBA	:	Institute of Business and Administration
ICT	:	Information and Communication Technology
ILO	:	International Labor Organization
L/C	:	Letter of Credit
LTV	:	"Labour - Embodied" Theory of Value
LTA	:	Long Term Agreement
LDC	:	Least Developed Countries
MFA	:	Multi Fiber Arrangement
MDG	:	Millennium Development Goal
NPO	:	National Productivity Organizations
NGO	:	Non Governmental Organization
OLS	:	Ordinary Least Squares
PIDS	:	Pakistan Institute of Development and Studies
PLC	:	Product Life Cycle
RMG	:	Ready Made Garments
SME	:	Small and Medium Enterprises
STA	:	Short Term Agreement
SEDF	:	South East Asia Development Fund
T&C	:	Textile and Clothing
TFP	:	Total Factor Productivity
TQM	:	Total Quality Management
UR	:	Uruguay Round
US	:	United States
UNDP	:	United Nations Development Program
UNCTAD	:	United Nations Conference on Trade and Development
VAT	:	Value Added Tax
VIF	:	Variance Inflation Factor
WTO	:	World Trade Organization
WB	:	World Bank

Title of the Thesis:

"A Study on Labor Productivity in the Ready - made Garments (RMG) industry of Bangladesh"

ABSTRACT

Background of the study:

From 1979 – 80 onwards, many garment factories were established for exporting to the US and European markets under private entrepreneurship. The volume was very small initially. By virtue of Generalized System of Preference (GSP) and protected quota systems, more and more garment products began to be exported in the US and EU markets from Bangladesh. Gradually and steadily this industry started to boom and earned almost 76% of the total export earning of Bangladesh. By the end of 2004-05 Bangladesh became the fourth largest exporter to the US market. RMG employs about two million workers, about 80% of whom are women.[1]

"Change is constant" as said by Peter Drucker. Technology, markets and competition continuously shape up the day-to-day economic activities around the globe.

[1] Annisul Huq, "The post 2005 Challenges!" BGMEA Publication, 2004.

So, has the change come up in the world upon the WTO signatories who will no longer enjoy protected quota in the US. However, as the quota system in the US market is phased out due to expiration of Multi Fiber Arrangement as agreed upon by the WTO signatory countries including Bangladesh. The time is so critical that Bangladesh has only a few choices left to cope up with this change given its capabilities. China is already taking over the US market with its increased supply of RMG products due to phase out of Multi Fiber Arrangement. Also, the strong backward linkage of the Chinese textile and clothing industry gives China its comparative advantage, which Bangladesh cannot enjoy. Moreover, abundant supply of skilled labor in China is a matter of concern towards the growth of Bangladeshi RMG industry. India and Pakistan and other few countries, with their strong backward linkage industries, are posing as strong competitors of Bangladesh. These countries are now breathing on Bangladesh's neck for the share of ready-made garments exports to the US and the EU markets.

Many studies have been done regarding formulating the survival strategies for the export-oriented ready-made garments factories in the post MFA era. Suggestions such as product diversification, market-diversification, backward – forward linkage etc have been made. However, very little results have been obtained through these recommendations. For example, the argument for backward linkage industry in Bangladesh in the textile and clothing sector is

not very strong as it imports most of the raw materials and machines. Also, within the given time period, Bangladesh has not been able to develop its backward linkage industry on time to cope up with the post MFA era. Similar problems lie in the forward integration. With little product diversification, Bangladesh has not been able to move into other markets besides the US, the EU and Canada.

Rationale for Improving the Workers' Productivity:

Among few choices, one is linked with a very significant resource that Bangladesh has the abundant supply of labor. Also, the labor charge is the cheapest in terms of hourly wage rate. So, if these workers are given proper and adequate training and certain work place environment are improved in order to enhance their productivity then this problem from the phase out of the MFA can be overcome. Again, Bangladesh can go for higher value added items, which will be higher revenue -earning sector. For that reason, it is very much essential to determine the key productivity dimensions of the Bangladeshi RMG laborers. There is very insignificant amount of formal studies in the productivity dimensions of the Bangladeshi RMG workers. Recent (May, 2006) labor unrest in the RMG sector in Dhaka region has raised important questions about working conditions of labor. The most crucial factor endowments for Bangladesh need be focused in studies for future growth.

This study will help determine the key productivity dimensions of the RMG workers of Bangladesh and also will find the crucial dimensions that have contributing effect on the productivity enhancement of the RMG employees of Bangladesh. The management of the RMG industry will be able to exercise and practice scientific management style as the study will have empirical evidence showing the crucial variables to emphasize in order to enhance the productivity of the workers. It seems to be the only way out for the survival and growth of the RMG industry in Bangladesh.

Objectives:

The Broad Objective: The broad objective of this study is to determine the key productivity dimension of the RMG employees of Bangladesh.

Specific Objectives:

a) To find out the major productivity dimensions, which have bearings on productivity enhancement in the RMG sector.

b) To measure the difference of inter - factory labor productivity in the RMG sector of Bangladesh

c) To find out the degree of relationship of the different productivity dimensions with the productivity of the workers.

d) To determine and recommend the strategies to improve the productivity of the RMG workers.

Methodology:

Factories for collection of required data were selected on random sample basis. A questionnaire was developed (as presented at Appendix-C) with 33 points/Variables pertaining to workers of Garments factories. Another open-ended questionnaire was also developed for collection of data from the management of the factories (page -214 of this thesis paper). At the time of survey (2005) there were 3,500 factories having 1.4 million workers were operating in Bangladesh. There were a substantial number of factories which work as subcontractors to the big units and they works seasonally when the demand for export is the maximum. The medium and large scale units which directly exports clusters around Dhaka and Chittagong city where there is an inherent advantage of exporting. As such factories in Dhaka and chittagong have been selected for the study. They possess the most representative characteristic of the population. As such, while selecting the units random sampling method has been adopted on convenience basis-Since the manual operation factors are predominant in the sub-sector. It was collected from the Garment factories that they receive most of their export orders during March-December. As such the period was selected for collector of Date. No formal Bengali version of the questionnaire was contrived because it was translated into Bengali verbally while collecting required data.

Primary Research:

Sixty garment factories of Dhaka and Chittagong city were visited to observe the workflow of the garments manufacturing units. However, the workers of thirty-nine key RMG factories have been interviewed. Around 600 workers and the concerned management personnel have been interviewed for gathering the relevant information and data through a questionnaire survey conducted during the period March, 2005 to December, 2005.

Actual data was collected by the researcher himself, research assistants and some selected students of BBA and MBA program from IBA who had connections with RMG factory owners. It is to be noted that at this fast growing stage of this industry, financial and operational data are not available. One might say that public disclosure is almost zero in the RMG sector. Hence, qualitative data on the opinion of employees were collected as to what they think as important variables regarding productivity in the RMG industry. The relevant data are analyzed using the required software such as SPSS, EXCEL etc. as per requirement of the study. The data obtained by interviewing the workers with structured questionnaire, are of qualitative ones. But, since the workers were asked to rank the feedback in terms of assigning some numbers (5 point Likert Scale), thus the data became quantified and hence those data were made logical and comparable while comparing with quantitative data on "Productivity".

To testify to the validity of the methodology adopted in this thesis, reference may be made to the study titled "Critical Success Factors for the Poultry Entrepreneurs in Bangladesh" by Prof. Nazrul Islam, Professor of Business Administration, University of Khulna, and others who had also recoursed to the similar methodology. In their study, both primary and secondary sources were used for collecting data. Entrepreneurs selected on a judgmental basis from all firms were interviewed with a structured questionnaire. Additional variables were identified from the literature for the success of the entrepreneurs that were used in the questionnaire. The respondents were asked to give their judgment against each of the variables (in a statement form) in a 5 point Likert scale (1 indicating strongly disagree and 5 indicating strongly agree). Secondary data were collected from the available research studies. Factor analysis has been conducted for reducing the large number of variables into explanatory factors. Using Varimox method (Orthogonal rotation), principal component analysis technique was used in factor analysis using the SPSS (Statistical Package for the Social Sciences).

Fifteen factors were identified as crucial for success in poultry business. These factors explained more than 80% of the variability of data. The results show that the entrepreneurial success of poultry business highly depends on sociopolitical orientation of the entrepreneurs. Achievement motivation, efficiency, commitment towards work, dynamism and self-confidence are

also found to be crucial for success in poultry farm operation. The other factors include profit seeking, flexibility, instant decision making capability, cooperation from the stakeholders, independence, knowledge of technology, continuous adjustment with environment, learning by experience, and enjoying work.

Thus, in this study, the comparisons were made between "Productivity" of workers with the different variables in "Paired Comparison" which was used in the "Hypotheses testing". The study is focused to find out the relationship between the productivity variables and its significance in enhancing the productivity of the RMG factory workers of Bangladesh. How the initial set of thirty-two variables that can influence total productivity is shown in this study. Sample factories were visited. Rigorous interviews have been taken to find out the impact of these variables on labor productivity. Applying various statistical tools the relationship of the individual variable and labor productivity was checked scrupulously. Nineteen main variables have been identified through the analysis, which plays a pivotal role in the determination of labor productivity.

Then the degree of the influence of the valuables has been determined through regression analysis in order to find out the major influencing variables. Details of the identification of variables and measurement of

reliability of survey instruments have been presented in the paragraph No. 5.1.1 to 5.7.

Secondary Research:

The libraries of International Labor Organization (ILO), World Bank, Bangladesh Garments Manufacturers and Exporters Association (BGMEA) were visited for collecting the relevant data regarding the labor productivity from the studies on the Bangladeshi Ready-made Garments sector. The relevant publications, journals and books that have been published from the Centre for Policy Dialogue (CPD) – a private think tank, and UNCTAD have also been consulted for the study.

Also, other relevant sources such as various research based journals; Internet etc. have been consulted for the study.

Significance of the study:

The RMG sector of Bangladesh is the most important sector to employ two million workers and earning a significant amount in export earning for the country, it is still an unexplored and unrehearsed industry in terms of systematic and scientific study. Besides contributing to the national income in Bangladesh, the RMG sector has brought about a very strong revolution about establishing the role of the women. The most important is the monetary freedom and thus helping to realize the dignity of labor for the

women working in the society. For the first time in the history of this nation that women have come out of their traditional role of simply being domestic labor under the dominance of men.

Many ancillary industries have grown up as a positive spillover of the growth of this industry in Bangladesh. Hence, it is very much important to study the productivity dimension of the Bangladeshi RMG workers and thus try to understand and contribute positively towards the survival and growth of the profitable sector of the country. Attaining Millennium Development Goal (MDG) by 2015 cannot be achieved without improvement of productivity in the RMG sector. There is no doubt that a lot depends on the systematic growth in the RMG sector of Bangladesh.

This work is one of the pioneering studies in the field as the work focuses on finding out the contributing productivity dimensions of the workers of the ready-made garments factories of Bangladesh.

With the identification of the contributing factors related to enhancing the workers productivity, the application of scientific management in the Bangladeshi RMG factories can be put to action, as the study will reveal the benefits that may not require increase in the monetary benefits given to the workers. Thus, both the management and the workers will be able to contribute positively towards creating additional values in the RMG sector.

- **Semi- Direct Influence:** Under which the specific productivity dimensions studied are:
  - Machine condition
  - Machine layout
  - Absenteeism (leave of absence)
  - Turnover (ease of quitting or the procedure of allowing the workers to leave)
  - Inventory control

- **HR Issues:** Under which the specific productivity dimensions studied are:
  - Performance appraisal
  - Recruitment policy
  - Training and development facility
  - Leave facilities
  - Medical benefits: (At the premise)
  - Medical benefits: (Off the premise)

- **Working Condition:** Under which the specific productivity dimensions studied are:
  - Working space
  - Cleanliness.
  - Restroom facility and condition
  - Lighting facility
  - Recreation facility (music)
  - Break time
  - Temperature control
  - Safety measures

- **Ethical Practices:** Under which the specific productivity dimensions studied are:
  - Penalty
  - Dismissal
  - Supervisors Behavior

Amongst all these variables, the relatively more important variables that have been identified under the study are shown here under (not in any order):

1. *Timely payment of Wage*
2. *Work load*
3. *Work environment (Working Space, Temperature Control)*
4. *Medical Benefits (on the premise- off-the premise)*
5. *Product design*
6. *Training*
7. *Lighting facilities*
8. *Supervisor's behavior*
9. *Cleanliness*
10. *Leave facilities*

In this study, six hundred labors have been interviewed through a questionnaire (Appendix-C) for data collection. Since the socio-economic background of the RMG workers, the nature of their works and the use of apparatuses are similar, so, this sample size is adequate to have normal distribution of responses to the questions asked to obtain their opinion on a five-point scale.

From the study, it has been possible to:

a) Calculate the productivity of the RMG laborers and determine the more dominant variables influencing productivity.

b) Identify the critical variables of the labor productivity through (Hypotheses testing),

c) Rank those variables according to their degree of bearing on the productivity of the RMG workers (by Regression analysis), and

d) Compare the intra-factory labor productivities, the reasons for varying the productivity, and finally

e) Suggest ways to improve the laborers' productivity based on the findings of the research.

Thus, this study is very much relevant at the present time when there is rising competition in the markets for RMG products. Demand for changes in the management practices and quality of work environment has been made from all quarters after the recent labor unrest and heavy damage inflicted on many RMG factories in Dhaka region. It is also a very significant research work which will help contribute towards the enhancement of the productivity of the Bangladeshi RMG factories and provide strategic options for owners and the government.

Chapter 1

THE BACKGROUND OF THE BANGLADESH ECONOMY AND ITS INDUSTRIAL DEVELOPMENT

THIS CHAPTER INCLUDES

Chapter One

Background of the Bangladesh Economy and its Industrial Development

1.0 The Background of Industrial Development in Bangladesh

From ancient times Bengal (Bangladesh and West Bengal) had been a center of trade and commerce. Industries, those developed as early as the 5th century B.C includes textile, sugar, salt and metal works. In the 8th century trade link between Chittagong and the outside world started by the Arab traders. The '*Dhakai Muslin*' (a brand name of pre-colonial Bengal superfine textile, especially of Dhaka origin) earned worldwide fame as early as 325 B.C.[2]

The industrial development was limited to only few industries like textile, sugar, salt, jewelry, handicrafts etc. The industrial expansion and diversification were slow until the 17th century.

---

[2] Banglapedia (National Encyclopedia of Bangladesh). Asiatic Society of Bangladesh, Chief Editor: Sirajul Islam, Managing Editor: Sajahan Miah, First Published March-2003, Volume-05, Industry, British Period, P-262-263.

Bengal had witnessed a steady growth and expansion of manufacturing in the Mughal period. Foreign participation accelerated the industrial development through export and import. Along with the products made by Tantis (weavers), Sutradhars (carpenters), and Kumars (potters), fine textile products became profitable export items from the 17th century. Sugar and salt industries flourished to a great extent in that time as well.

1.0.1 British period:

Mahajans (money lenders) played an important role in financing production and trade of textiles. Though the East India Company started *Dadni* system for providing loans to weavers throughout Bengal, actually the indigenous textile started declining in the British period due to the enforcement of tariff and trade barriers for Indian textile to protect domestic industry in Britain.

The East India Company established silk industries in this subcontinent to promote the silk export to the outside world. The silk industry of India was concentrated mainly in Bengal. It received special attention from the British from the very beginning of their rule in India. The developments in shipbuilding, salt and sugar industries were also the main achievements of the British ruling period. Bengal became prominent in sugar industry towards the end of the 18th century.[3]

Source: [3] Banglapedia, Volume-05, Page-263-264.

1.0.2 Pakistan period:

After the partition of Bengal in 1947, East Pakistan was discriminated by the West Pakistani rulers. The industrial development in East Pakistan was completely stuck in the first phase (1947 to 1960) of the West Pakistan ruling era.

The industrial development policy taken by the government of Pakistan in the second phase (1960 to 1970) encouraged the manufacture of arms and ammunition, hydroelectric power, railway wagons, and telephone, telegraph and wireless exclusively in the state sector and it encouraged the private sector to come up with industrial ventures in all other sectors. The government created the Pakistan Industrial Development Corporation (PIDC) and Pakistan Industrial Finance Corporation to promote industrialization. PIDC made significant contributions in the establishment of industrial units in sectors such as jute, paperboard, cement, fertilizer, sugar, chemicals, textile, pharmaceuticals, light engineering and shipbuilding. The central government, however, followed a discriminatory policy. It favored West Pakistan in industrial development and drained resources from East Pakistan for the purpose.[4]

Despite all these impositions, however, some progress was made in industrialization in East Pakistan during the period between 1960 and 1970.

Source: [4] Banglapedia, Volume-05, Page-263-264.

Official sources of the government recorded that in 1970; there were 1,580 manufacturing units in East Pakistan that employed 206,058 persons. Their gross output was valued at Tk 3.636 billion and the value added amounted to Tk 1,708 billion. The share of the manufacturing sector in the GDP was 8.9% in 1970 as compared to 3.9% in 1950.

1.0.3 Bangladesh period:

The industry sector along with the whole economy was severely damaged during the War of Liberation in 1971. The public sector started in 1972 with 72 jute mills (with production capacity of 79,200 tons), 44 textile mills (13.4 million pounds), 15 sugar mills (169,000 tons), 2 fertilizer factories (446,000 tons), one steel mill (350,000 tons), one diesel engine unit (3,000) and one shipbuilding yard. The political imbalance in the newly liberalized country made the industrial development scenario even worse. Mills and factories in the public sector, however, soon became losing concerns largely because of mismanagement and leakage of resources.[5]

The government quickly reviewed its policy of dominating the public sector. After a series of adjustments and temporary changes in state policy, the

government finally adopted a new industrial policy in 1982, following which 1,076 state-owned enterprises were handed over to private owners.

Source: [5] Banglapedia, Volume - 05, Page - 264 - 266.

Small and cottage industries were the largest group of industries in Bangladesh and their numbers in 1984 was 932,200 units, of which 20.7% were in handlooms, 15.4% in Bamboo and Cane work, 8.1% in carpentry, 6.1% in products from jute and cotton yarn, 3.4% in pottery, 0.3% in oil crushing, 3.2% blacksmiths, 0.8% in bronze casting, and the rest in other types of crafts.

In 1984, Bangladesh had 58 textile mills with 6,000 looms and 1,025,000 spindles. The annual production of the mills was 106.2 million pounds of yarn and 63 million meters of cloth. Textile was a public sector dominated industry in Bangladesh, and like most other sectors, textile also incurred losses that amounted to Tk. 353.4 million in 1984.

Problems in the sector includes poor management as well as difficulties in developing skilled workers and shortage in supply of raw materials and power. Bangladesh had 70 jute mills with 23,700 spindles in 1984, but their production was less than 561,000 ton (figure of 1969), when the country had 55 jute mills with 21,508 spindles. The jute industry in the country has been declining in the face of competition from India and in a changing international situation, where jute goods are being replaced by cheap and durable plastic products.

Before 1985, the development of new industries like sulphuric acid, chemicals, paper, caustic soda, glass, fertilizer, ceramics, cement, steel and

engineering in Bangladesh was substantially slow. There were only two plants for production of sulphuric acid in the country in 1985 and their total production was 5,995 MT while the production of this important ingredient, which is used in industries like soap, paper, cast iron and steel, was 6,466 MT in 1970. Because of the availability of sand, salt and limestone in Bangladesh, the country is prospective in developing glass industry. Dhaka and Chittagong are two major centers for this industry. The automatic glass factory of Chittagong produced 12.9 million sq ft of sheet glass in 1985.

The fertilizer factories of Bangladesh produced a total of 808,660 MT in 1985, when 741,463 MT was urea, 9,634 MT ammonium sulphate, and 57,563 MT triple super phosphate. The total production of cement in the country in 1985 was 292,000 MT. The total production of paper in 1985 was about 75,000 MT. In 1985, Khulna had a newsprint mill with a production capacity of 55,000 MT and a hardboard mill that produced 1,621 sq meter of hardboard. Around this time, Bangladesh also had some mills for production of particleboards and partex. The country also achieved self-sufficiency in producing matches. The total production was 1.30 million gross boxes in 1985. That year Bangladesh had 8 sugar mills with a total annual production of 87,000 tons.[6]

Source: [6] Banglapedia, Volume – 05, Page – 265-266.

Industries like shipbuilding, automobiles (assembly), oil refinery, insulators and sanitary wares, telephone equipment, electrical goods, televisions (assembly), cigarette, and vegetable oil made notable development in Bangladesh in the mid 1980s. The country achieved a significant success in developing garment industry in this decade. The manufacturing sector showed some growth in the 1990s. The share of the manufacturing sector in the country's GDP rose to 11% in 1996. Investment in the sector was Tk 57.8 billion in 1997 as compared to Tk 22.5 billion in 1991. The share of the public sector in the total investment in the country's industries fell from 37.03% in 1991 to 8.63% in 1997.

The government in order to maintain the implementation of privatization program handed over public sector enterprises to private owners. At the same time, the government executed a program of rehabilitating industries identified as sick because of various reasons. A Privatization Commission was setup in mid 1990's headed by a Chairman with the rank of a cabinet minister.

The rehabilitation and the privatization program implemented by the Government in 1990s accelerated the overall industrial development through massive investment in the private sector. The fifth Five-Year Plan for the period 1997-2002 stipulated a total outlay of Tk 8.95 billion in industry

including Tk 1.39 billion in the private sector. In 2000, the total employment in industries was estimated at 0.6 million, of which the private sector employed 0.5 million.[7]

Investment in balancing, modernization and reconstruction, creation of new industrial estates and export processing zones, promotion of private investment, and attraction of foreign direct investment are the main industrialization efforts taken by the government during the 1990s. The industrial policies have always been modified to keep up with the trends of international market, recommendations of donor countries and agencies for liberalization of trade and investment and structural adjustment program. Almost at regular intervals after 1982, the government adopted new industrial policies with increased incentives for private investors from both home and abroad. These policies have some common features such as incentives to promote industrialization in rural and remote areas and to encourage entrepreneurs to use local raw materials, and the efforts towards development of a system that will result in the transfer of technology.
Although export of industrial goods was encouraged, not much was achieved other than the rapid growth of RMG sector.

[7] Banglapedia, Volume – 05, Page – 266-267.

1.1 Industrial Structure in Recent Years:

In the economy of Bangladesh, the contribution of the manufacturing sector is increasing day by day. In the 2004-2005 fiscal year, the contribution of manufacturing sector in the GDP of Bangladesh was 16.58% and that was 0.42% more than that of the previous year. The growth rate in the manufacturing sector in the fiscal year 2005-2006 was 8.43% that was 1.33% more than the previous year.[8] Development in the RMG and knitwear sector was the driving force of the overall growth rate increment. The RMG sector is included mostly in the medium and big industry, based on the number of people employed. The following table shows the growth rate in the manufacturing sector of Bangladesh from 1998-1999 to 2004-2005:

Table-1: Contribution of the manufacturing sector in GDP (In crore taka)

Industry	1998-99	1999-00	2000-01	2002-02	2002-03	2003-04	2004-05
Small & Cottage Industry	8184.9 (28%)	8659.3 (29%)	9267.4 (29%)	10699.6 (31%)	10780 (30%)	11496 (29%)	12405.9 (29%)
Medium & Big Industry	20803.3 (72%)	21708.6 (71%)	23130.2 (71%)	24194.1 (69%)	25708.8 (70%)	27572.2 (71%)	29956.8 (71%)
Total	28988.2	30367.9	32397.6	34174.2	36480.8	39068.8	42362.7

To cope up with the challenges of free market economy and globalization, industrial development in the private sector is very necessary. Small and medium enterprises (SME) are the sectors where Govt. assistance is essential

since these are the driving sectors in the economic development of a country. In the recent industrial development plan, Bangladesh Govt. has given priority in development of the SMEs of this country. Table-1 shows slight increase in contribution of small and cottage industries during the recent years.

This is an age of information and communication technology (ICT). The application of ICT in running industrial enterprises efficiently and profitably can ensure quality development of goods, make production cost-effective and ensure faster customer services. The latest annual development plan and the industrial plan 2005 indicate the necessity of ICT implementation in the industrial sector of Bangladesh. It is expected that use of ICT in the RMG sector will improve efficiency in the sector in the coming years.

1.2 Production in the Govt. Owned Industries:

In the fiscal year of 2004-2005 the annual production of the factories under Bangladesh Chemical Industries Corporation (BCIC) were 19.75 lac MT Urea, 1.90 lac MT TSP, 27,500 MT paper and 1.75 lac MT cement. The revenue income of BCIC increased by 13% and selling expense increased by 25% comparing to 1997-98. Total loss of managing BCIC increased from Tk 7.44 crore to Tk 153.14 crore (*Source: Bangladesh Economic Review June, 2005 Economic Adviser's wing, Finance Division, Ministry of Finance, GOB*).

[8] *Bangladesh Economic Review –June 2005, Economic Adviser's wing, Finance Division, Ministry of*

Now (June, 2005) only 10 mills of BTMC (Bangladesh Textile Mills Corporation) are in operation. Production decreased from 81.01 lac kg (1997-98) to 68.31 lac kg in 2004-2005. Net loss was Tk. 23.75crore in 2004-2005 fiscal year (Source: Bangladesh Economic Review-June, 2005, Ministry of Finance, GOB).

The targeted production of sugar by Bangladesh Sugar and Food Industries Corporation (BSFIC) was 1.06lac MT in 2004-2005. But the projected net operational loss was Tk 29.03 crore. Bangladesh Jute Mills Corporation is almost useless, operating with Govt. subsidy of Tk. 31.09 crore. Only 9 factories are operating under Bangladesh Steel and Engineering Corporation (BSEC). This organization is operating in profit. The net profit of this corporation was Tk. 14.19 crore in 2003 - 2004 (Source: Bangladesh Economic Review-June, 2005, Ministry of Finance, GOB).

Besides the above mentioned public sector corporations, the government also has monopoly over power generation and gas sector, until recently (June, 2006) fixed telephone, railways, sea and airports. Such commanding heights in the public sector are also noted for gross inefficiency and causing significant drainage of public resources that are met from fiscal measures and borrowing by the government. Future growth in the RMG sector's export will be largely dependent on how such infrastructural services are improved

---

Finance, GOB.

to international levels. Privatization of these sectors are being attempted to that end.

1.3 How the economy of Bangladesh is changing:

Agriculture has been the mainstay of the economy for a long period in the past. The main livelihood of Bangladeshi people was "Agriculture" till the early 1970s. Later by the virtue of government policy, there was a gradual shift from primary economic activities to secondary economic activities. So, it is no surprise that "Agricultural Industry" was the biggest in Bangladesh until the shift took place.

Table-2 shows the dynamics of the sectoral contribution and growth rates since 1979-80.

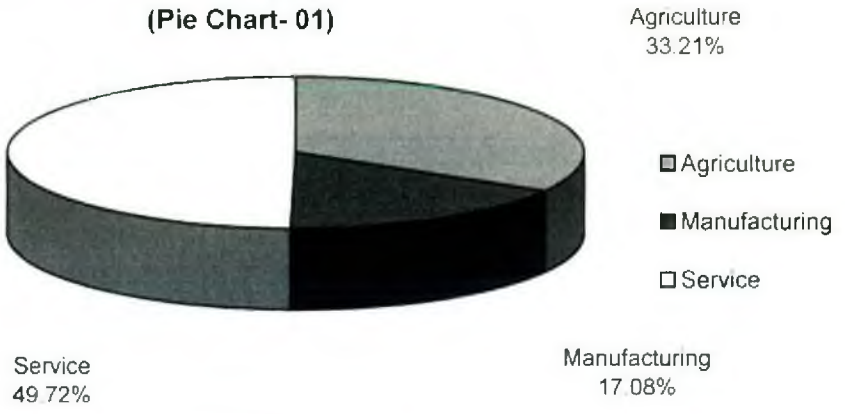
Table-2: Fixed price (Base Yr: 1995-96) National Contribution of the greater sectors and the growth trend

Contribution (%)						
Sector	1979-80	1984-85	1989-90	1994-95	1999-00	2004-05
Agriculture	33.21	31.46	29.52	26.02	25.58	21.91
Industry	17.08	18.70	20.78	24.28	25.70	28.44
Service	49.72	49.84	49.70	48.70	48.72	49.65
Total	100.00	100.00	100.00	100.00	100.00	100.00
Average increase (%)						
Sector	Fin. Yr 81-05	Fin. Yr 81-85	Fin.Yr.86-90	Fin. Yr 91-95	Fin. Yr 96-00	Fin. Yr 01-05
Agriculture	2.73	2.68	2.40	1.55	4.88	2.13
Industry	6.59	5.70	5.86	7.47	6.44	7.48
Service	4.42	3.83	3.58	4.15	4.81	5.73
Total GDP	4.48	3.72	3.74	4.39	5.21	5.32
Per-head GDP	2.63	1.54	1.50	2.36	3.83	3.91

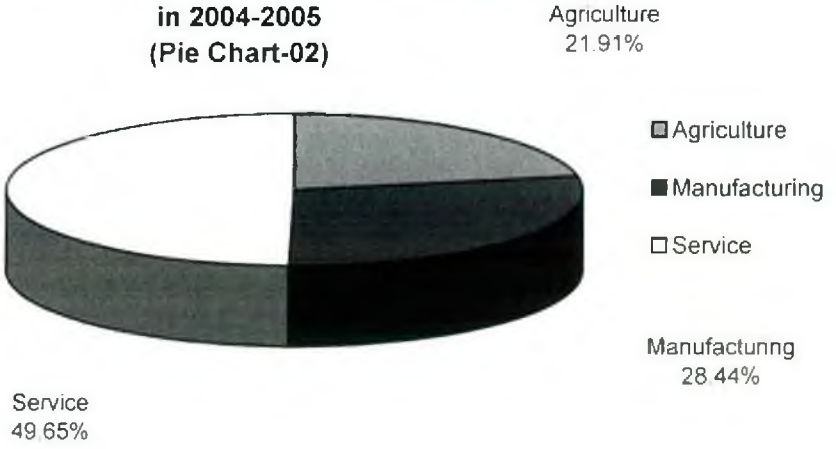
(Source: Bangladesh Economic Review-June, 2005, Economic Adviser's wing, Finance Division, Ministry of Finance, GOB).

It is evident from the table that the contribution from the "Agriculture" sector has been declining and the contributions from the "Manufacturing" and the "Service" sectors are on the rise. It will be worthwhile to notice that the significant growth in the industry has ultimately helped to increase the contribution in the service sector. As a result, growth rate in GDP and per capita GDP increased from 4.39% and 2.36% in 1994-95 to 5.32% and 3.91% respectively in 2004-05. The lower rate of growth in GDP per head was due to growth in population that averaged close to 1 .7% per year. In 2004-05, the total population was 140 million. The total area of the country (including the area under inland water) is 147570 sq. km of which almost two third is covered by three large rivers, namely, the Ganga, The Jamuna and The Meghna. Thus it can be well inferred that Bangladeshi economy is gradually shifting from agrarian economy to a more manufacturing and service oriented economy, although the transitions have been rather very slow, for various reasons, of which political instability and poor governance have been identified as major constraints for faster growth rate in the economy of Bangladesh.

Contributions of various sectors in the GDP in 1979-1980 (Pie Chart- 01)



Contributions of various sectors in the GDP in 2004-2005 (Pie Chart-02)



Source: Bangladesh Economic Review -2005, Economic Advisers wing Finance division, Ministry of Finance, GOB.

Pie chart 1 and 2 shows the exact contributions of various sectors in the GDP of Bangladesh in 1979-80 and 2004-05 respectively. It is clearly understandable that how the dependence on the agricultural sector was reduced in this period.

On further scrutiny, the main driving force behind this significant contribution of the manufacturing sector can easily be identified. The growth of the ready-

made garment industry that started taking place in the early 1980s had given rise to the significant contributions in the economy of Bangladesh. It may be noted that the high rate of RMG has spread effects in the growth of some other industries, such as, pharmaceuticals, tobacco, drinks as the workers in RMG consume more and more products of such industries with rising income. Further to mention that the banking and insurance also grew rapidly to finance investment, export and import of the RMG sector. It was reported that of the 20% or so value added by the RMG sector, 5.5% was shared by the banks, insurance and other services, such as, ports and shipping. Whereas the entire labor force in the RMG sector obtained 7.5% only of the value added and the owners got the rest 7%. *(Source: Dr. N.C. Nath, Research Fellow, BIDS, Article: External Competitiveness of Ready made Garments Industry of Bangladesh: Analysis of status and strategies).*

Recent labor unrest (September, 2006) in the RMG factories in Dhaka region have opened discussion as to giving a higher share of the value added to the labor force, as the present sharing is criticized as unfair to the labor after 20 years of profitable growth in the RMG sector.

Table-3: The industrial index (base year: 1988-89 = 100)

	1995-96	1996-97	1997-98	1998-99	1999-00	2000-2001	2001-02	2002-03	2003-04
1.General Index	173.50	179.30	195.94	204.17	214.31	228.43	238.75	254.45	265.78
2.Food, Drinks and Tobacco:									
a.Fish	169.43	167.53	121.25	129.47	185.18	192.97	201.28	166.73	215.18
b.Palm oil	58.55	49.79	51.54	49.55	59.30	59.66	60.13	61.85	71.83
c.Bakery Items	156.28	152.08	184.47	197.18	207.30	238.06	270.16	273.45	312.04
d.Sugar	167.75	123.33	151.71	139.08	112.49	89.16	186.23	161.69	108.59
e.Tea	123.64	127.83	128.60	105.11	121.57	127.68	134.36	130.40	134.99
f.Drinks	147.49	140.07	155.49	163.23	196.36	251.40	293.63	312.57	322.48
g.Tobacco,Cigarette	115.15	132.03	141.17	138.82	140.06	142.82	144.69	159.70	160.24
3.Clothes:									
a.Jute	79.46	80.13	80.59	72.19	66.42	66.78	69.04	62.80	55.94
b.Cotton	85.16	84.13	96.45	92.38	98.07	102.50	110.60	118.06	144.76
c.RMG	439.98	507.17	644.89	710.61	766.32	811.67	770.28	804.94	890.77
4.Paper:	96.11	78.78	53.58	69.85	64.16	59.70	47.11	35.26	33.74
5.Chemicals									
a. Fertiliser	140.63	110.89	127.03	112.55	119.11	129.71	109.70	141.60	137.55
b.Pesticide	54.37	39.30	47.99	56.63	56.48	55.35	53.46	23.52	—
c.Match stick	83.88	78.45	80.21	73.61	76.05	78.93	79.93	81.63	83.04
d.Pharmaceutical	282.56	314.73	309.09	312.59	318.00	352.66	418.39	470.21	489.33
6.Cement	123.87	117.47	157.80	277.55	399.39	486.18	502.78	510.40	522.32
7.Iron and Steel	37.71	31.84	26.21	18.72	—	—	—	—	—
8.Natural Gas	170.28	167.27	180.14	186.68	213.16	239.42	251.22	270.06	287.36

Source: GOB, Statistical Pocket Book, Bangladesh Bureau of Statistics (BBS) 2003, Table – 6.01, Page – 221.

Table-3 shows the industrial index of Bangladesh and production in various industries of this country taking 1988-89s production equal to 100.

During the period under review, the compound industry growth rate was around 5.45% whereas the compound growth rate of the RMG sector was around 9.22%. This shows that the total growth of the whole industrial sector has been the result of the rapid growth of the RMG sector.

If we look at the compound growth rates of the industry index and compare it with the RMG index, then we can observe that the growth rate of the RMG sector has indeed been a remarkable one. Almost 75% to 80% export earning comes from the export of the ready-made garments. So, this industry is really the backbone of the Bangladeshi economy.

1.4 *Macro Economic Condition of Bangladesh*

In the 1960s and 1970s, Bangladesh was one of the poorest and most densely populated countries in the world. It had a very large pool of labor force and was lacking in non-energy minerals and other natural resources *(Source: Economist Intelligence Unit - EIU, 1996).*

From 1965 to 1980, GNP per capita contracted by 0.3% per annum. 88% of the labor force worked in subsistence agriculture. Adult literacy was only 24% of the population, and life expectancy at birth was a mere 39.6 years *(Source: UNDP, 1997).*

Every year flood and other natural disasters create a deteriorating impact on the macro economic condition of Bangladesh. The growth of industrial development was hampered by those natural calamities. Major flooding took place in 1974, 1987, 1998 and 2004. Cyclonic storms and tidal waves from the sea caused severe damage to lives and properties in 1970, 1984, 1991

and in 1998. Political unrest and bad management quality of Govt. and the employers have always created negative impact on the investment and other industrial development.

Corruption is one of the major factors that always kept foreign investors away from investing in Bangladesh. Corruption has been spread in each and every part of the society. Industrial sector is not free from the bad influence of corruption. Transparency International Bangladesh (TIB) identified Bangladesh as the number one corrupt country for the last five years (2000-01-2005-2006) based on its Corruption Perception Index computed for the purpose. In fact, it is one of the major problems for the development of the industrial sector in the third world country. Terrorism and weakness in law enforcement are the crisis of Bangladesh, which always discourages the FDI (Foreign Direct Investment) inflow in this country.

The growth rate of the gross domestic product (GDP) of Bangladesh in the year 2003-2004 was 6.27%, which was the highest GDP growth rate recorded as ever for Bangladesh. This high GDP growth rate was achieved due to the high growth in agriculture, industry and service sectors. Per capita GDP and the national income (annual) has reached to US$ 445 and US$ 470 respectively. (Source: Bangladesh Economic Review, 2005 Table – 2.3, Page - 15).

The inflation rate was quite high in 2003-04 and 2004-05 due to the price hike of fuel in the international market. In 2005, rate of inflation was about 6.32%. The rate increased to over 7% in March 2006.

Table-4: GDP, GNI, Per Capita GDP, Per Capita GNI in current Market Price

Subject	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
GDP (Crore BDT)	237087	253546	273201	300580	332973	368476
GNI (Crore BDT)	245799	262388	285743	317163	351526	389866
Population(Crore)	12.81	12.99	13.16	13.34	13.52	13.70
Per Capita GDP (US$)	368	362	361	389	418	445
Per Capita GNI (US$)	381	374	378	411	440	470

Source: Bangladesh Economic Review, June, 2005, Table 2.1, Page – 13.

Table-4 shows growth of GDP, GNI, per capita GDP and per capita GNI from the year 1999-00 to 2004-05 and the data of this table indicate secularly increasing trend in per capita GNI and per capita GDP.

National rate of investment increased to 24.43% in which the private sector's investment was 18.53%. The dollar value of foreign direct investment (FDI) in 2004 was 652.50 million dollar, which was 47.8% more than that invested in 2003. Table-5 shows how the total investment rate has been rising from 2000-01 to 2004-05. Table-5 also shows the comparison of Govt. investment rate and private investment rate. One can observe the opposite trend in the

rate of investment in the public and private sector. The rate of investment in the private sector increased from 13.53% in 1995 - 96 to 18.53% in 2004-05. The rate of investment in the public sector has declined during the corresponding period. This indicates a healthy trend because the public sector investment is largely made with political considerations having huge amount of wastage and inefficiency.

Table-5: Rate of Investment as percentage of GDP.

Fiscal Year	Total Investment	Govt. Investment	Private Investment
1995-96	19.99	6.42	13.53
2000-01	23.09	7.25	15.84
2001-02	23.15	6.37	16.78
2002-03	23.41	6.20	17.21
2003-04	24.02	6.19	17.83
2004-05	24.43	5.90	18.53

Source: Bangladesh Bureau of Statistics, GOB.

The growth rate in export has increased by 12.5% in July 2004 - March 2005 when the amount of increase was US$ 6097. Today, almost 75% to 80% export earnings come from the export of the ready-made garments. (*Source: Bangladesh Economic Review, 2005*). Thus, this industry is now the driving force in the economy of Bangladesh. It is now important that we are going to discuss various aspects of the growth of the RMG sector in Bangladesh in the next chapter.

Summary of Chapter One

The Bangladeshi economy has been mainly an agrarian one from the time immemorial. The natural factor endowment such as the rich alluvial soil from three large rivers has contributed towards the growth of the agrarian economy.

However, at the same time, we can see that the expertise of the people of this part of the Asian region was also in textile sector. This expertise is so ancient that it goes back as far as 5th century B.C. There was once a famous brand of special cloth named *'Dhakai Muslin'*, *which* earned its name and fame around the globe by virtue of its fine texture and super soft and smooth quality.

The industrial diversification was not very wide and different types of industries in Bangladesh flourished as per the requirements of the rulers in this part of the country.

The British rulers encouraged the weavers for the growth of textile industry by providing loans. The East India Company founded the silk industry. Some other sectors such as shipbuilding, salt and sugar industries were also the contribution of the British rule in this part of the then Indian Subcontinent.

The Pakistan period saw the establishment of arms and ammunition, hydroelectric power, railway wagons industries. However, despite discriminatory development policy, there was an insufficient amount of contribution toward the whole Pakistani economy from the then East Pakistan whose resources was often depleted towards the development of the West Pakistani industries. The Pakistani period, however, saw the establishment of large manufacturing enterprises in the public sector, such as paper, cement, fertilizer and sugar industries.

It is during the Bangladesh period that the economy of this country began to turnaround despite the devastating liberation war. However, due to political chaos, the industrial units in Bangladesh suffered acutely after the liberation war. Mismanagement coupled with lack of proper utilization of resources led to shut down of many big factories. Still, jute followed by textile sectors, remained more contributing sectors in the Bangladesh economy. The government policies at different times have made the development of industrial sector possible. Thus, we observe the growth of the industrial sector from the period 1979-80 to 2004-2005 along with a decline in the agricultural economy. The fast growth in the RMG sector has made significant contribution in this transition since the mid 1980s, and there is scope for further expansion of the RMG sector in the post MFA regime given the inherent competitive advantage demonstrated by the RMG sector. The next chapter takes up the textile and RMG sector more in detail.

Chapter 2

History of the Textile and RMG industries in Bangladesh and the MFA impact

This chapter includes

Chapter Two

History of the Textile and RMG industries in Bangladesh and the MFA Impact

2.0 History of Textile and RMG Industries in Bangladesh

Textile is the oldest industry of the world for cloth ranks second to food in the consumption bundle of mankind. The concept of 'textile Chain' includes the ginning of fiber, spinning yarn, weaving fabrics and operations like dyeing, processing, printing, finishing the fabric, and finally making the Readymade Garment (RMG). All these operations taken together are sometimes described as an integrated single industrial complex on the other hand, these individual operation are also often considered separate industries. Therefore, the textile and garment manufacturing are considered two separate industries as well.

The importance of textile may be understood from the fact that according to GATT Secretariat in 1994, the most important product category in industrial exports for the 88 developing countries participating in the Uruguay Round was textiles and clothing.

Textile Industry is the largest manufacturing sub-sector in the industrial sector of Bangladesh. It provides employment of about 4 million people,

including 1.8 million workers in the RMG sector. RMG accounts for 5% of GDP, 40% of manufacturing value addition, and 77% of total foreign exchange earning.

The industry has grown to 3,800 registered companies. it earned US$ 4.86 billion in 2000-2001, US$ 4.5 billion in 2001-2002, and US$ 4.9 billion in 2002-2003 through exports. RMG is projected that Bangladesh RMG industries will be able to achieve US$ 10 billion earnings by 2007 from exports. Source: Export Promotion Bureom (EPB) December, 2005, and Prof. Mustafizur Rahman, Keynote Presentation: Export oriented knitwear Sector of Bangladesh: Challenges in us Earning current momentum in post-MFA Global Market, Seminar organized by BKMEA, September, 2004.

Some of the important factors of growth are depicted in the following Table-6 and 7.

Table-6: Development in the textile industry since 1994

Description	Year	
	1994	2004
Spindle Capacity	1.4 million	4.2 million
Export using Local Fabric	Negligible	16% of the export US$ 2.2 billion
Value addition on Knit & Woven Fabric	25%	75%
Lead Time	16 weeks	4 weeks

Source: Opportunities in the Bangladesh Textile Industry for Investment from USA, BTMA Presentation to Harry K. Thomas, the then US Ambassador in Bangladesh.

QUOTA ADVANTAGES:

Until 1985, Bangladesh enjoyed quota-free status. However, within a short period of time the USA and large importers imposed quotas in 1986. But the quota system has been an advantage rather than disadvantage for Bangladesh. Because of large quotas, Bangladesh enjoys a privileged access to the US and several other market. The competitors of Bangladesh faced quota much earlier than Bangladesh did. Quota restrictions constrained their (competitors) competitiveness. The availability of cheap and easily travelable labour facilitated the growth and development of these sub-sector in Bangladesh. The causative factors behind reduction of lead time, inter alia, are sub-contractions to the indigenous small garments factories, increase in supply of locally produced yeans, fabrics and other ancillary supplies, improvement in the working conditions of the factories and increase in salary of the workers.

It may be pointed out that reduction of lead time in order processing by 80% is a remarkable achievement by the RMG industry management.

Table-7: Quota Utilization Position Statement

Year	Average Rate of Utilization
1997	85.87%
1998	90.00%
1999	93.80%
2000	99.00%
2001	99.00%

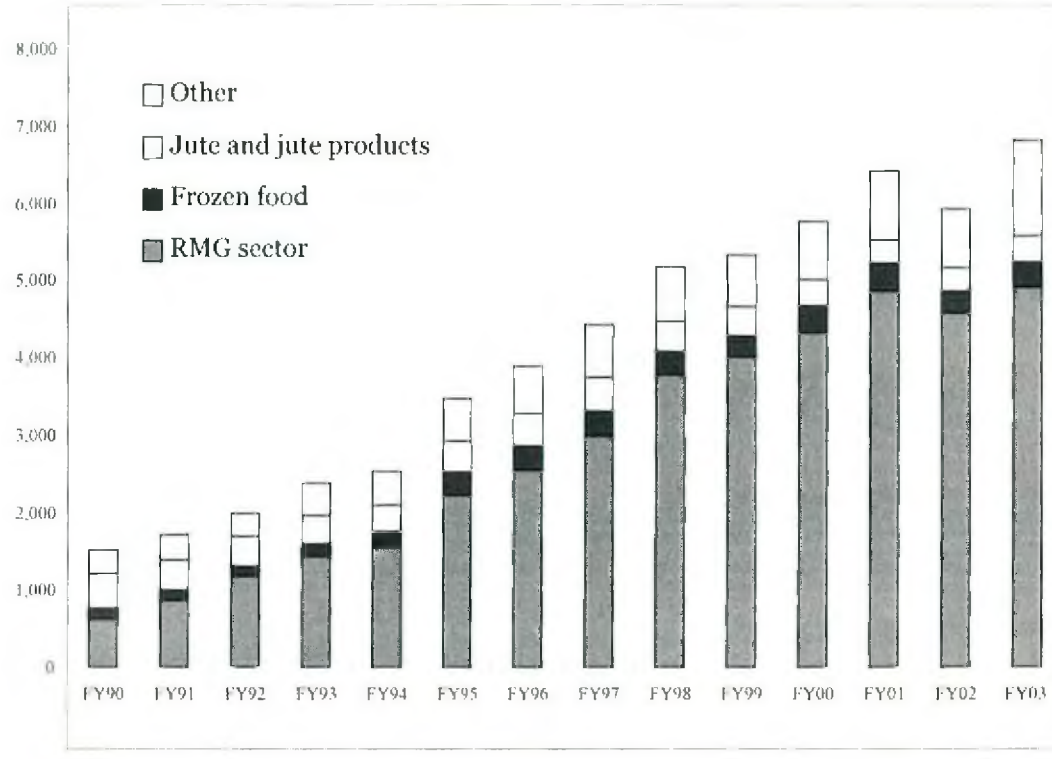
Source: Bangladesh Institute of Development Studies (BIDS).

From 2000, Bangladesh has been fully utilizing its quotas and expanding exports to non-quota areas. This indicated that previously quota ensured a protected market but now it is having a restrictive impact on RMG export. Also, the relevant information about quota performance is given in Appendix B.

For many decades Bangladesh relied heavily on its exports of raw jute and jute products. However, with the constant threat of serious flooding that could instantly destroy crops and declining jute fiber prices, and a significant decrease in world demand, the contribution of the jute sector to the economy's ability to grow and develop has deteriorated *(Source: Spinager, 1986)*. Thus attention turned to the role of the textile manufacturing sector in driving the much needed export oriented growth. The major export earning share to total ratio is compared in the following graph.

Figure 1: Bangladesh: Export Performance

(in millions of U.S. dollars)



Sources: Government of Bangladesh, Export Promotion Bureau, Export trade statistics of several years.

In 1978, less than twelve garment companies existed. By 1985, with the help of Korean investment, there were 450 companies in operation and 300 another were in the pipeline. A total of 140,000 workers were employed with a capacity of three million pieces of garments a year (Source: Spinager, 1987). The industry earned US$ 116 billion in 1985, and contributed to 12% of total national export earnings (*Source: World Bank, 1995*). While the exports of raw jute grew by only 2.6% between 1984 and 1985, the exports of garments grew by a spectacular 71.3% (*Source: EIU, 1986*).

2.1 *The Evolution:*

The apparel industry all over the world grew with economic and social development. As the rich countries went for outsourcing, the export oriented apparel industry grew in the developing and the least developed countries. The RMG industry in Bangladesh started in the late seventies as 100% export oriented industry (*Hafiz G. A. Siddiqi, The Readymade Garments Industry of Bangladesh, The University Press Ltd. 2004, Page – 7).*

During 1998-99 to 2004-2005, the total RMG export is about 75 % of total export earnings of Bangladesh. The share of clothing has increased significantly from a mere 3.9% of total export in the 1980s to about 75% in 2004-2005. From a small apparel exporter in 1980, Bangladesh became the 18th largest exporter of apparel in the world in 1997. (*Islam S.2001*) The following table depicts the evolution from a small beginning in 1984 to the current scenario in 2005.

Table-8: Bangladesh RMG Exports as Percentage of Total Exports: 1983 – 2005

YEAR	APPAREL EXPORTS	TOTAL EXPORTS	% OF APPAREL TO TOTAL EXPORTS
1983 – 84	31.6	811.0	3.9 %
1984 – 85	116.2	934.4	12.4 %
1985 – 86	131.5	819.2	16.1 %
1986 – 87	298.7	1076.6	27.7 %
1987 – 88	433.9	1231.2	35.2 %
1988 – 89	471.1	1291.6	36.5 %
1989 – 90	624.2	1923.7	32.5 %
1990 – 91	866.8	1717.6	50.5 %
1991 – 92	1182.6	1993.9	59.3 %
1992 – 93	1445.0	2382.9	60.6 %
1993 – 94	1555.8	2533.9	61.4 %
1994 – 95	2228.4	3472.6	64.1 %
1995 – 96	2547.1	3882.4	65.6 %
1996 – 97	3001.3	4418.3	67.9 %
1997 – 98	3781.9	5161.2	73.3 %
1998 – 99	4020.0	5312.9	75.7 %
1999 – 2000	4349.4	5752.2	75.6 %
2000 – 2001	4859.83	6467.7	75.14%
2001 – 2002	4583.75	5986.35	76.57%
2002 – 2003	4912.09	6548.58	75.01%
2003 – 2004	5686.09	7602.74	74.79%
2004 – 2005	6417.64	8654.94	74.15 %

Source: Govt. of Bangladesh, Export Promotion Bureau. (All figures in US $ millions)

It may be observed from Table-8 that the 100% export oriented RMG industry experienced phenomenal growth during the last 15 years. In 1978, there were only nine export-oriented garments manufacturing units, which generated export earnings of hardly one million dollar. Some of these units were very small and produced garments for both domestic and export markets. Four such small and old units were Reaz Garments, Paris Garments, Jewel Garments and Baishakhi Garments. Reaz Garments, the pioneer, was

established in 1960 as a small tailoring outfit, named Reaz Store in Dhaka. It served only domestic markets for about 15 years. In 1973 it changed its name to Reaz Garments Ltd. It expanded its operations into export market by selling 10,000 (Source: Hafiz G.A. Siddiqi The Readymade Garment Industry of Bangladesh, the University Press Ltd, Dhaka, 2004,) pieces of men's shirts worth French Franc 13 million to a Paris based firm in 1978. It was the first direct export of garments from Bangladesh. Desh Garments Ltd, the first non equity joint venture project in the garment industry was established in 1979. Desh Garments Ltd had technical and marketing collaboration with Daewoo Corporation of South Korea. It was also the first 100% export-oriented company. It had about 120 operators including 3 women trained in South Korea and with these trained workers it started its production in early 1980. Another South Korean Firm, Young Ones Corporation formed the first equity joint-venture garment factory with a Bangladeshi firm, Trexim Ltd. in 1980. Bangladeshi partners contributed 51% of the equity of the new firm, named Young Ones Bangladesh. It exported its first consignment of padded and non-padded jackets to Sweden in December 1980. Foreign direct investment poured in from many other countries such as Hong Kong, Singapore, Malaysia and Sri Lanka. While foreign buyers from Europe, USA and Canada lifted RMGs through their buying offices in Dhaka.

Table -9: Bangladesh's Export of RMG in the US Market

Year	Export (US $ million)	Growth of exports earnings (%)	Market Share (%) in terms of value	Export of quantity (million SMEs)	Growth of Quantity (%)	Market Share in terms of Quantity (%)
1990	438		1.57	220		1.80
1994	927	21.1	2.32	487		2.82
1995	1115	20.28	2.54	603	23.82	3.29
1996	1178	5.65	2.57	625	3.65	3.28
1997	1498	27.16	2.77	765	22.40	3.34
1998	1695	13.15	2.81	866	13.20	3.34
1999	1754	3.48	2.75	911	5.20	3.18
2000	2205	25.71	3.08	1131	24.15	3.44
2001	2205	0.00	3.14	1169	3.36	3.56
2002	1990	-9.75	2.76	1150	-1.63	3.00
2003	1938	-2.56	2.50	1110	-3.48	2.63

Note: In the US market the quantity is measured by square meter equivalents (SMEs)

Source: Computed on the basis of the published information by ITCB.

Table-9 above mainly describes Bangladesh's export of RMG in the US market in terms of volume and value for the period: 1990–2003. It also shows growth of export earnings and market share in terms of value, growth of export quantity and market share in terms of quantity. The table depicts that export of RMG in the US market registered a growth both in terms of value and quantity during 1990–2001. However, earnings from this sub – sector declined during 2002–2003. It is gathered from the RMG units that the following reasons were primarily responsible for this decline:

a) Some emerging economies having labor-intensive technology like Vietnam made inroads to US markets.
b) The US importers were critical about the working environment in the factory premises of Bangladesh including wages of workers, leisure time, sanitation etc.
c) Employment of child labor in the industry discouraged the importers to buy from Bangladesh. However, these factors have been taken care of by the Bangladesh entrepreneurs and the growth of export to US market has been gradually improving.

Within a short period, Bangladeshi entrepreneurs became familiar with the world apparel markets and marketing systems. They acquired the expertise of mobilizing resources to establish export-oriented RMG industries. Foreign buyers found Bangladesh an increasingly attractive sourcing place. To take advantage of this cheap source, foreign buyers extended, in many cases, suppliers' credit under special arrangements. In some cases, local banks provided part of the equity capital. The problem of working capital was largely solved with the introduction of back-to-back letter of credit, which also facilitated import of quality fabric, the basic raw material of the industry.

Till the end of 1982, there were only 47 garment manufacturing units. The breakthrough occurred in 1984-85, when the number of garment factories increased to 587. The number of RMG factories shot up to around 2,900 in 1999. Bangladesh is year (2005) one of the 12 largest apparel exporters of the world, the sixth largest supplier in the US market and the fifth largest supplier of T-shirts in the EU market. The main markets for Bangladeshi garments are EU, US and Canada. The 15 countries of the European Union, in total, account for 51% of Bangladeshi apparel exports year. The second largest market is the USA to which about 45% of Bangladeshi apparels are exported. A little over 2% is exported to Canada and the rest to other countries (Hafiz G. A. Siddiqi, The Readymade Garments Industry of Bangladesh, The University Press Ltd., Dhaka – 2004).

Table-10: Bangladesh's Exports of RMG in the EU Market

Year	Export (US $ million)	Growth of exports earnings (%)	Market Share (%) in terms of value	Export of quantity (tons)	Growth in Quantity (%)	Market Share in terms of Quantity (%)
1990	402	-	0.94	132050	-	3.19
1994	1026	-	1.89	198803	-	3.58
1995	1380	34.50	2.27	220112	10.72	4.12
1996	1570	13.77	2.51	247667	12.52	4.43
1997	1771	12.80	2.73	248942	0.51	3.97
1998	1951	10.16	2.90	286652	15.15	4.35
1999	1995	2.26	3.05	314011	9.54	4.56
2000	2446	22.61	3.71	329431	4.91	4.37
2001	2611	6.75	3.75	358308	8.77	3.57
2002	2694	3.18	3.69	376437	5.06	4.31

Note: The quantity is measured in terms of tons. '-' indicates non-availability of data

Source: United Nations Development Programmed, Dhaka Bangladesh, Consultant Report, January 5, 2005, Page - 68.

The industry has grown during the 1990s roughly at the rate of 22%. In the past, until 1980, jute and jute goods topped the list of merchandises exported from Bangladesh. Jute contributed more than 50% of the total export earning. By late 1980s, RMG exports replaced jute and jute goods and became the number one in terms of exports.

Alongside the growing prospects of export of RMG from Bangladesh, we must not lose sight of the fact that the industry is beset with some genuine problems. A major weakness of the Bangladesh RMG industry is that it operates under complete control of the buyers. Right from its inception, it operates on the CMT basis. Due to inadequacy of the backward linkage industries, it still greatly depends on the imported raw materials. For these reasons, Bangladesh has to depend on only two major markets and export only a limited number of product categories. Serious lack of forward linkage forces this industry to continue to depend on the dictates of the buyers. Underdeveloped nature of the necessary infrastructures including road transport, telecommunication and port facilities creates some retarding impact. Besides, rudimentary application of ICT and inefficient port management limit its ability to respond quickly to market changes. Bangladesh has one of the longest lead – time that discourages the buyers to source their merchandises from Bangladesh. More importantly, absence of good governance that increases the cost of doing business in Bangladesh stands out as a major weakness of Bangladesh. *(Hafiz G.A. Siddiqi – The Readymade Garments Industry of Bangladesh, the University Press Ltd., Dhaka, 2004).*

2.2 *Prime Contributing Factors for the phenomenal Growth of RMG Sector:*

2.2.1 Entrepreneurial Skills:

The entrepreneurial history of the RMG sector of Bangladesh started when Reaz Garments began its operation as a small tailoring outfit. In the shown track of Reaz Garments Ltd. numbers of Garment came into their operation in 1970s.

In 1984 when France and the UK granted MFA quotas to Bangladesh and later when the US did likewise, thousands of entrepreneurs came into the industry.

In 2005 there were more than 4000 RMG factories in Bangladesh. The entrepreneurs of this sector are much more talented, smart, well educated and courageous in comparison with the entrepreneurs of the other sectors in the country.

Almost 50% of the RMG entrepreneurs are Masters degree holders, and about 30% are bachelor degree holders. (*Source: Preparatory Assistance Projects on Sustainable Employment Policy Options in the Post-MFA Era, June 30, 2005).*

But the strange thing is that almost 86% of these entrepreneurs did not receive any RMG related training before joining the RMG enterprises. But

these entrepreneurs are so talented that they quickly found out the opportunity in the global apparel market. They also identified the strength of the internal assets, such as, hugely available cheap labor forces, Inherited sewing capability of women labors etc.

One must note that, of the new breed of entrepreneurs, a significant number is female. More than 4% of the entrepreneurs are female. Comparing to the female participants in the other sectors as entrepreneurs and considering the socio-economical background of Bangladesh, 4% female entrepreneurs is a significant figure (Source: Preparatory Assistance Projects on Sustainable Employment Policy Options in the Post-MFA Era, June 30, 2005).

These new generations of entrepreneurs are destined to shape up the future of Bangladesh. Many of the entrepreneurs, who started their career with garments, later get into other industries. Some of them have become manufacturers of threads, buttons, zippers, and packing materials. Some have gone for backward linkages by diversifying into spinning, weaving, dyeing and or finishing operations. Some had gone to businesses that are not directly related to RMG. More encouraging aspect is that some of these entrepreneurs have invested in foreign countries and export RMG from there. One such firm is Sunman group of Bangladesh that has gone to Combodia and established a RMG factory under join venture arrangement with local

partners employing 1000 workers. Some of the entrepreneurs even set up their factories in Vietnam and Kenya as well.

What it finally means is that the RMG industry mobilized a new breed of entrepreneurs who have acquired the capacity to work as a powerful engine and utilized it for the growth and development of the country. It may be noted that the educated persons are more interested in this sector as has been reflected in Table-11.

Table-11: Educational Profile of RMG Entrepreneurs

No: of Firms	Entrepreneur's Level of Education			Entrepreneur's having no previous Experience	Entrepreneur's having experience
	H.S.C (in no's)	Graduation (in no's)	Masters (in no's)		
39	8(20%)	12(30%)	19(50%)	34(86%)	5(14%)

Source :Information collected from the companies visited for the productivity Analysis. (Figures in the parenthesis Indicate percentage)

It may be observed from Table-11 that out of 39 principal entrepreneurs of 39 firms visited, 19 persons are master degree holders, 12 persons are bachelor degree holders and only 8 persons read up to H.S.C. level. This bears an eloquent testimonial to the fact that highly educated persons are

interested in building their career and fortune through RMG sector. The astounding rapidity with which this sector grew in the last few years and the high rate of value addition may be the causative factors for inviting the highly educated people in the arena of RMG business.

The huge success of this industry reflects the ability of the entrepreneurs in Bangladesh to recognize where its comparative advantage lay -i.e. where the factor intensity (unskilled labor intensive) aligned perfectly with the relative factor supplies of the economy *(Source: Spinager, The WTO, ATC and Textile and clothing in a global perspective, what's in it for Bangladesh? Center for Policy Dialogue, paper & page-3-10).*

2.2.2 Cheap and Efficient Labors:

In more than 4000 operating units almost 2 million workforces are working. Another 0.917 million workers (In FY 2003-2004) are indirectly employed in the RMG industry. The most significant strength of Bangladesh in its development in the RMG sector is its hugely available cheap labor force. The average hourly wage rate of RMG industry worker in Bangladesh (US$ 0.25) is far less than its main competitors like India (US $0.60), Pakistan (US$ 0.40), Sri Lanka (US$ 0.45), and China (US$ 0.35). In the ASEAN countries, the wage rate is much higher. *(Source: The Economist, October 1-7, 1994 and*

"ITC: Textile and clothing: An Introduction to Quality Requirements in Selected Market" ITC/UNCTAD/GATT, Geneva, 1994).

Although these abundant labor forces are very cheap, they are very much competitive in terms of productivity. Table-22 (on page 112) shows the unit labor cost and productivity. From table-22, it can be observed that the unit labor cost (US$/shirt) of Bangladesh is less than the countries like India, Pakistan, Vietnam but the productivity (shirt/worker) of these workers of Bangladesh is highly compatible.

More than 80% of all the labor forces working in the RMG sector are women. All of these women are from very poor families. Basically, Bangladesh is a male dominated country like most other third world countries. Most men do not want women to work outside. The important point is that men justify women's work not for the sake of the women's personal well being, but for the well-being of the family. However, the overall socioeconomic scenario of Bangladesh is changing nowadays. Courageous women workforces are contributing to the transformation of this socioeconomic culture of Bangladesh. Needless to overemphasize that the employment opportunities created by the RMG industry has gone a long way towards employment of women and poverty alleviation. The women working in this industry are better off economically. Before such employment, these women were below the internationally recognized poverty line. Participation in gainful employment

has empowered some 1.2 million working women economically (Hafiz G.A. Siddiqi, The Readymade Garment Industry of Bangladesh). The economic empowerment has improved the status of women in the family. They now can participate in decision making with their male counterparts. Gaining power to make decisions or gaining some freedom of choice is the most significant achievement in the life of a woman in Bangladesh.

At present (2005), there are approximately 1.65 million women workers working directly in the RMG industry of Bangladesh. Following are the reasons why women workers are coming to work in the RMG sector:

1. Poverty
2. To get the acceptance in the family and in the society
3. To become economically independent
4. To obtain the social recognition
5. Sewing is an inherited capability for the women of Bangladesh

It was found that the labor productivity of the female workers is somewhat higher than that of the productivity of their male counterpart. Important reasons behind the high productivity of the women workers are:

Obedience:

Females in Bangladesh have always been considered as the burden in the society. Only recently, the females have started to receive education and proper guidance to become independent and start on their own. Due to all these years of oppression women have naturally become obedient and followers of the powerful member in the household. Because of this obedience, women can work better in the RMG sector. As the management of a garments factory has mentioned that the male workers are difficult to keep under control whereas the female workers are obedient and work as they are told.

Patience

Women are the more patients of the two sexes. Due to their patience, they can work on repetitive works and are not tired as easily as men are.

High learning capacity

The learning capacity of female workers is higher than that of male workers. (Source: Muhammed Muqtada, Andre a M. Singh, Mahammed Ali Rashid, Bangladesh Economic and Social challenges of Globalization, the University Press Limited. Dhaka.) That is why female workers are preferred to male workers while recruiting labors in the garments factories. Female workers

can quickly absorb the repetitive works and do it perfectly. Given their past oppressive condition and to have a better future women are more motivated to learn quickly.

Traditionally used to sewing

Traditionally women are used to sewing and tailoring work in the households. In our country, even in schools young girls are trained to do sewing and knitting in Home Economics. Since they are used to sewing from almost childhood it is easy for the female workers to obtain these works in the garments factories. It takes lesser time for female workers than for male workers to get hold of the job. This is inherited from their mothers. This was confirmed by Mr. Kyhak S. Goon, Chairman of Young One, a Korean giant in RMG in Bangladesh. He said a young girl fresh from village in Bangladesh could make straight stitches after six days of practice on a sewing machine, which a girl in China takes three to four months to do.

Mental Alertness

Mentally women tend to be alert and careful while working. As found from various studies, women can concentrate on multiple works at a time whereas men can only concentrate on one single work. So, women are distracted less and thus they work carefully and with less defects.

Visual Acuity

It could be learnt from the factory management during sample survey that Compared to men, women are more sharp and keen in delicate work like sewing and tailoring. Since, female workers possess more patience and concentration by nature they can work in garments in a finer way compared to men. This is another advantage of women worker in the garments fields.

Adjusting Ability

The adjusting capability of women is very high. In Bangladesh, female has to face oppression in various stages of life and thus they become stronger and can cope with even in an uncertain situation. This is why women workers do not usually leave the job as a garments worker and keep practicing their expertise and increasing the competitive advantage of Bangladesh RMG sector.

Stability and Focus

The stability rate is higher for women workers as compared to male workers. Women workers are focused on what they are doing and thus their defection rate is lower than male workers. The female workers are stable and not prone to adventure and thus they rarely change their working zone.

2.2.3 Quota:

The rapid expansion of Bangladesh garment exports was mainly due to the preferential treatment given by the EU under the Generalized System of Preference (GSP) scheme and also because of the substantial quotas made available in the US market along with imposition of quota restrictions by the MFA on its main competitors, mainly India and China *(CPD Report No. 38)*. The following table shows the rate of increase in garments export from Bangladesh:

Table-12: Garments export data (value in Million. US$)

Year	Export in Million US$	Y-O-Y Growth Rate (%)
1990-91	866.82	
1991-92	1182.57	36.43
1992-93	1445.02	22.19
1993-94	1555.79	7.67
1994-95	2228.35	43.23
1995-96	2547.13	14.31
1996-97	3001.25	17.83
1997-98	3781.94	26.01
1998-99	4019.98	6.29
1999-00	4349.41	08.19
2000-01	4859.83	11.74
2001-02	4583.75	-5.68
2002-03	4912.09	7.16
2003-04	5686.09	15.76
2004-05	6417.67	12.87
Average Growth Rate		16

Source: Export Promotion Bureau (EPB), GOB.

Among many other reasons, which are responsible for the phenomenal growth of the Ready-made Garments industry, two of the main reasons can be:

- Relocation of manufacturing RMG units in South Asia from other Asian countries like Korea, Sri Lanka, Singapore and Hong Kong including larger neighbors within the region mainly due to availability of quotas for exporting to the US and the EU markets.
- Low wages and labor cost (Table-13) and the ease of entry and exit policies for operating the hundred percent export-oriented RMG factories in the South Asian countries such as Bangladesh.

Table-13: Labor costs in selected countries (in US $ / hour)

Labor costs in selected countries (in US $ / hour)		
Countries	**1991**	**1993**
Bangladesh	NA	0.16
India	0.25	0.27
Pakistan	0.24	0.27
Sri Lanka	0.39	0.35
China	0.24	0.25
Indonesia	0.18	0.28
Thailand	0.59	0.71
Italy	13.5	NA
Uk	7.99	NA
Us	6.77	NA

Source: Moore 1997

The South Asian countries like Bangladesh, Nepal, Sri Lanka lack more in terms of natural endowments. The prime reason for the development of the

RMG industry in these regions is mainly due to the availability of "Quota" especially during the pre- Multi Fiber Agreement (MFA) era.

Because of the quota restrictions during the MFA, the South Asian countries that had used up their quota, initially established RMG units in other Asian countries like Bangladesh, Sri Lanka, Nepal, because these countries were not able to fully utilize their available quota. Table-14 below shows the quota based exports of garments from South Asia during the MFA period. It may be observed that Bangladesh achieved highest percentage of exports (95%) under quota, followed by Pakistan (90%) and Nepal (80%).

Table-14: Quota based exports of garment from South Asia:

In Percentage

Countries	Quota-based exports
Bangladesh	95
India	73
Nepal	80
Pakistan	90
Sri Lanka	62

Source: Garment Industry In South Asia Rags or Riches? ILO, New Delhi

The evolution of the Ready-made Garments industry of Bangladesh remains incomplete without some highlights on the Multi Fiber Agreement (MFA). The next section presents a discussion on MFA and its aftermath.

2.2.4 Multi-Fiber Arrangement (MFA)

The MFA was approved by the General agreement on Tariff and trade (GATT) in 1974 to regulate most of the world trade in textile and clothing. The primary objective of GATT was to institute a system of non – discriminatory free trade based on negotiated range of tariff structures. As per decision in the Uruguay Round, MFA was abolished from 1st January, 2005.

Taking advantage of MFA quotas, Bangladesh's export of apparel items, popularly known as readymade garments (RONG) in the country has flourished. Almost an unknown commodity in the 1970s and early 1980's RMG exports rose to its position of prominence within a short span of time. The growth of clothing export of Bangladesh was largely attributed to the reserved market status in North America under the MFA and to a generous Generalized System of preference (GSP) facility that allowed duty-free and quota – free market access for T & C products of LDCS to the European Union.

2.2.4.1 Background of the MFA

Till the conclusion of Uruguay Round multilateral trade negotiations, international Trade in Textile and Clothing (T & C) was outside the ambit of

the GATT rules. Developed countries were able to obtain special concessions in the various rounds of GATT. It allowed them to significantly restrict entry of T&C from the developing countries in their markets.

The argument most often put forward was that low cost supplies from the developing countries would lead to market disruption, and undermine the viability of the domestic textile industries of the developed countries.

This exclusion to the GATT rule, obtained through considerable pressure on other GATT members, was in effect a critical move. It deflected the growth trajectory of the sector in which many developing countries enjoyed a *natural comparative advantage*. As is supported by accumulated evidences, manufacturing of T&C has been classically the *mother lode industry* for many developed countries. History of economic development supports this position as after food, clothing has been the next important demand by consumers and source of employment for large number of workers.

The four phases of fifty years of restrictive practices in global trade in T&C has been chronologically depicted in Table-15:

Table-15: Fifty Years of Restrictive Trade in Textiles/Apparels

- Immediate Post-Second WW II Period: Voluntary Export Restraint
- 1961 Short Term Arrangements (STA)
- 1962 Long Term Arrangements (LTA)
- 1974-1994: Multi-Fiber Agreement (MFA)
- At the conclusion of Uruguay Round-1995
  - First Extension-1977
  - Second Extension-1982
  - Third Extension-1986
  - Fourth Extension-1991
  - Number of members-44
  - Countries Maintaining QR-4 (USA, Canada, EU and Norway)

Source: IMF report on RMG misleading: BTMA, Jul 21, 2004, The New Nation

Curiously, at the time of putting in place Long Term Arrangement (LTA) in 1962 the USA's import penetration rate in textile and clothing was only 6% and 2% respectively. Spinager (1998) rightly observed that, such low level could trigger such a massive response is perhaps surprising. But it is indicative of the protectionist attitude the developed countries have traditionally maintained with respect to their textile and clothing sector.

Competition has always been intense in the T&C sector. In this sector, low wage, inferior technology and mass production had given the developing countries an edge over important segments of the global market. Enforcement of the MFA, with its important quotas injected an important element of distortion in the global trade in T&C.

More developing countries appeared in the global scenario as producers of T&C. It was of major concern to the industrialized countries also as exporters. The developed countries thought it prudent to go for a comprehensive package of restraints in the form of quotas on imports. If earlier restraints were limited mainly to cotton textiles, the new restraint attempted to bring within its jurisdiction of restrictions virtually all types of T&C.

The main point was that the exporting countries could capture the rents originating from the restricted supplies. Though in return they had to agree to accept the quantitative limits dictated to them under bilateral quota agreements.

This framework, a classic example of *managed trade*, which popularly came to be known by its acronym, the MFA. It was put into effect in 1974. Initially it was negotiated for a period of four years. Later the MFA came to dominate the global trade in T&C for about two decades. Between the period of 1974-1994, trade in T&C had mostly been negotiated bilaterally by governments through rules articulated in the MFA.

As stated in MFA preamble, the MFA attempted to reconcile the following objectives:

(a) Reduction in the proliferation of restrictive measures in textiles products, and

(b) Avoidance of disruptive effects in individual markets in both importing and exporting countries.

It is sometimes argued that the MFA at least brought the restrictive measures in trade in T&C within an agreed and predictable framework. It has tried to *reconcile two conflicting objectives* as stated in its preamble. In fact, the MFA provided a multilateral umbrella under which Governments of the developed countries could restrict imports of T&C. It threatened their domestic interest, which, in essence, manifested *GATT illegal*. A synopsis of various deviations of the MFA from the GATT rules is presented in Table-16.

Table-16: Departure of MFA from GATT Rules

GATT	MFA
GATT allows safeguard actions, which are applied equally against imports from all sources.	MFA allowed restrictions that affect only one supplying country.
Recourse to safeguard actions required compensation to be made by the importer in favor of the exporter.	No compensation was provided for the supplying country.

Source: IMF report on GATT: Aug 11, 1994, The Bangladesh observer

The 1986 Protocol of Extension made the MFA more restrictive with extension of restraints covering imports of non-cotton fibers. It also brought within the ambit of all the relevant players (MFA also included a non-GATT member, China). As of 1993, 44 countries were members of MFA. Eight of

these countries were categorized as 'importers', while the others were categorized as 'exporters' subject to bilateral restraint agreements. Four developed countries, viz., USA, EU, Canada and Norway were maintaining quotas on imports of T&C at the time of signing of the Uruguay Round.

Table-17: Bilateral Restraint Agreements Applied Under the MFA (November 1994) (In Number)

Exporter	Importer					
	United States	Canada	European Union	Norway	Finland	Austria
Developing Economies Of which:	28	21	15	13	7	6
Least Developed Economies	2	2	0	0	0	0
Transition Economies	4	4	0	4	0	0

Source: GATT Secretariat 1994

At the time of signing of the UR, the USA maintained quotas on imports from 47 countries, 37 of which were WTO members. Canada maintained quotas on apparel exports from 37 countries; the EU maintained 209 quotas for exports from 21 countries.

Quota restrictions imposed by the USA varied with respect to exporting countries, product group and specific categories within the product groups. The quota items constituted, with 1990 as the base year, 61.9% of US imports of T&C and 59.1% of EU imports of T&C.

The growth of export along with the percentage of share of RMG and knitwear in export of Bangladesh is reflected in Table-18:

Table-18: Export Growth and Percentage of Share of RMG and Knitwear in Bangladesh's Export up to 2004-2005:

Year	RMG	Knitwear	Total of RMG	Yearly growth rate in %	Total export of Bangladesh	% Share of RMG & Knitwear
1986-87	298.67	-	298.67	(+)127.16	1073.77	27.82
1987-88	433	-	433.92	(+) 45.28	1231.20	35.24
1988-89	471.09	-	471.09	(+) 8.57	1291.56	36.47
1989-90	609.32	14.84	624.16	(+) 32.49	1523.71	40.96
1990-91	735.62	131.20	866.82	(+) 38.88	1717.55	50.47
1991-92	1064.00	117.57	1182.57	(+) 36.43	1993.92	59.31
1992-93	1240.48	204.55	1445.03	(+) 22.19	2382.89	60.64
1993-94	1291.65	264.14	1555.79	(+) 7.66	2533.90	61.40
1994-95	1835.09	393.26	2228.35	(+) 43.23	3472.57	64.17
1995-96	1948.81	598.32	2547.13	(+) 14.31	3882.42	65.61
1996-97	2237.95	763.30	3001.25	(+) 17.82	4418.28	67.92
1997-98	2843.33	940.31	3783.64	(+) 26.07	5161.20	73.31
1998-99	2984.74	1035.36	4020.10	(+) 6.25	5312.86	75.67
1999-00	3081.19	1268.22	4349.41	(+) 8.19	5752.42	75.61
2000-01	3364.32	1495.51	4859.83	(+) 11.73	6463.39	75.14
2001-02	3124.82	1458.93	4583.75	(-) 5.68	5986.35	76.57
2002-03	3258.27	1653.82	4912.09	(+) 7.09	6548.58	75.01
2003-04	3538.07	2148.02	5686.09	(+) 15.09	7602.74	74.79
2004-05	3598.20	2819.47	6417.67	(+) 12.86	8654.98	74.15

Source: Ministry of Textiles EPB and BGMEA sources.

As the Table-18 shows, Bangladesh was one of the two LDC members of the GATT exporting of T&C, which was subject to quota in both the US and Canadian markets. Number of categories under quota for Bangladesh was 21 in the US[9] and 10 in Canada. *Imports under quota accounted for about 70 percent of Bangladesh's export to the US and Canadian market.* Bangladesh's apparel did not face quota restriction in the European market.

It is to be noted here that the MFA and countries such as Japan governed not all trade in T&C. Switzerland did not take resort to quotas. However, all major importers had import quotas in place and developed countries negotiated MFA-type restrictions even with non-MFA members. Thus, the muscle power, vested in the MFA in terms of its capacity to regulate the global trade in T&C, was quite substantial.

[9] Number of categories under quota was actually 31. Number of restricted categories would be 21 if merged quotas were considered.

2.2.4.2 The Dismantling of the MFA

Even within the restrictive regime of the MFA the growth in the share of the developing countries underpinned by their comparative advantages, could not be kept under check. However, the developing countries were keen to liberalize trade in T&C.

Structural shifts are observed, which the global T&C market has undergone since mid 1960s. Between 1973 and mid-1990s, the rules of the game were setup under MFA provisions. The share of developing countries belonging to the top 13 exporters of T&C in the global trade registered an increase from 18.7% to 31.3%. Between 1973 and 1996 the share of developing countries in Textile trade increased from 13.7 per cent to 30.4 per cent. On the other hand, in case of clothing, the share in the Textile trade grew from 29 per cent to 37 per cent. During this period increase in the share for textile and clothing were from 13.7 percent to 30.4 percent and from 29.0 percent to 32.0 percent[10] respectively.

Many developing countries including some of the Least Developed Countries (LDC s) started to make a foothold in the markets of developed countries. The MFA was increasingly perceived as a stumbling block to the fullest realization of the potentials of the developing countries as exporters of T&C. Dismantling

[10] The peak share (37 per cent) had been in 1996.

of the MFA became a common demand by many developing countries during the Uruguay Round (UR) negotiations.

The developed countries also realized the problems with MFA. They considered it as a temporary measure and were in effect a deviation from the GATT principles. It was not sustainable from a long-term perspective. There were also other pressing issues, which influenced the negotiating position of the developed countries on the MFA in the course of the UR.

It was being increasingly realized by the developed countries that in exchange for inclusion of new issues such as trade in services and intellectual property rights, which many developing countries were very reluctant to concede, concrete commitments were not made by the developed countries in terms of liberalizing global trade in T&C.

The result of the negotiations in the trade in T&C was finally articulated in the ATC negotiated during the UR. Ministers in Punta del Este carried negotiation in the area of T&C with the following objectives:

> *"Negotiations in the area of textiles and clothing shall aim to formulate modalities that would permit the eventual integration of this sector into GATT on the basis of strengthened GATT rules and disciplines, thereby also contributing to the objective of further liberalization of trade".*

The ATC was expected to be a principal source of benefit for developing countries from the Uruguay Round. In fact, the WTO's Annual Report for 1998 went on to state that more than one third of the total benefits from the Round was expected to be derived from liberalization of textile and clothing. The central objective of the ATC was to phase out the restrictions under MFA in a multi-stage process. In the end, it was negotiated that the MFA would be integrated in the WTO through a phased procedure that would cover ten years[11].

The GATT Secretariat in its projections made in 1994 envisaged a phenomenal growth in world trade in textiles and apparel once the restraining rein of the MFA was phased out. Annual growth rate was projected to rise from 1.2 per cent to 4.3 per cent *for textile*, and 4.1 per cent to 8.6 per cent *for apparels* by the year 2005.

As Table19 on the next page shows, global trade in textiles and apparel together was expected to rise from approximately $199.5 billion in 1992 (base year) to $289.2 billion, if not to $469.9 billion by 2005. The table further indicates that the global trade in apparel was expected to rise from around $105.6 billion (in 1992) to $178.9 billion and may be to $307.9

[11] Under the Special and Differential (S&D) clauses of the UR, developing countries and LDCs were allowed flexibility in implementing the various agreements over periods ranging from 3-8 years.

billion by 2005. The expected growth of textiles was from $93.9 billion to between $110.3 billion and $162.0 billion over the same period.

Table19: Expected Annual Growth Rate of World Trade in Textiles and Clothing (1992-2005)

Projections	1992 (Billion $)	2005 (Billion $)	Growth Rate (% Change)	Annual Growth Rate During 1992-2005 (%)
Version 1				
Textiles	93.9	110.3	17.5	1.2
Clothing	105.6	178.9	69.4	4.1
Total	199.5	289.2	45.0	2.9
Version 2				
Textiles	93.9	111.4	18.6	1.3
Clothing	105.6	197.6	87.1	4.9
Total	199.5	309.0	54.9	3.4
Version 3				
Textiles	93.9	162.0	72.5	4.3
Clothing	105.6	307.9	191.6	8.6
Total	199.5	469.9	135.5	6.8

Source: GATT (1994).

To sum up, the evolution of the RMG industry in Bangladesh has been the result of both external and internal factors. So, in order to understand these factors, it is vital to study the factors separately.

2.3 Evolution: External Factors

External factors can be summed up as:

- The preferential treatment afforded by the Europe under the GSP scheme.
- Substantial quotas made available in the US market.
- Above two facilities are coupled with imposition of quota restriction by the MFA on its main competitors, mainly India and China.

2.4 Evolution: Internal Factors

Although above mentioned quota facilities acted as a major catalyst for the growth, there are number of local initiatives both in the private and public sectors. Those again came from the following two different sources:

- **Private Initiative:** Domestic entrepreneurial initiative backed up by abundant supply of cheap labor.
- **Government Support:** Various Government policies were put into action to give financial support to the local industry.

Some of the policy supports are:

- Duty drawback facilities
- Tax holiday
- Cash assistance
- Income tax rebate facilities
- Zero tariff on machinery inputs
- Rebate on freight and power rate
- Bonded warehouse facilities
- Provision of import under back to back L/C
- Credit at confessional rate
- Export credit guarantee scheme
- Retention of foreign exchange earned by the exporters etc.

Summary of Chapter Two

The more contributing of the sectors in the industry sector has been the "RMG". Two main reasons can be sighted for the phenomenal growth: exogenous and endogenous.

As for the exogenous reasons, preferential treatments by the Europe under the GSP scheme, the availability of quota in the US market coupled with the restriction made by the MFA on Bangladesh's two main competitors, India and China, have contributed towards the establishment of the RMG sector in Bangladesh.

As for the endogenous reasons, the prime contributor towards the phenomenal development of this industry had been the entrepreneurs themselves. The dexterity, the willingness to take the challenges, the foresight of a big market, and utilization of cheaper available labor and the hardworking nature of the local entrepreneurs had led to the growth of the RMG sector of Bangladesh.

Another more important endogenous reason for the growth of the RMG sector in Bangladesh is the availability of cheap labor. The labor in Bangladesh has unique characteristics such as they are: obedient, patient,

easily trainable, have natural expertise in sewing, strong mental alertness etc. Bangladesh must take positive steps to utilize its cheap labor forces.

Now, the RMG is the main driving force in industrialization in Bangladesh amongst all other sectors. The cheap and efficient labor forces mainly support this industry. It is now very much obvious and imperative to increase the productivity of this easily trainable labor force. Therefore, it seems to be important to discuss the rationale for the increase of the labor productivity of the RMG workers in the post MFA era in an additional chapter. The next chapter three of the thesis paper discusses it in greater detail.

Chapter 3

LABOR PRODUCTIVITY AND INTERNATIONAL TRADE THEORY

THIS CHAPTER INCLUDES

Chapter Three

Labor Productivity and International Trade Theory

3.0 The Rationale

The post Multi Fiber Arrangement (MFA) era will bring ample opportunities for the export of ready-made garment apparels from around the world. The countries that can produce the garments and deliver very fast at competitive price will ultimately enjoy sustainable growth in the stiff competitive world.

Before the phasing out of MFA, the export depended on:

- Quota
- Price
- Quality and
- Compliance

But today, after the MFA phase out, the competition structure will be in terms of:

- Faster delivery (shorter lead-time)
- Competitive price.

The questions of 'Quality' and 'Compliance' are two major factors, presence of which is taken for granted by the foreign importers. Foreign buyers

realizing their profit opportunities have been directly involved in improving quality and compliance. For instance, a large German buyer Otto Group has engaged systain, a German consultancy firm to monitor compliance in association with a local consultancy firm named SEBA Limited.

So, in the post MFA period, significant determining factors for the survival and growth of the export oriented RMG industries are going to be "Shorter Lead-time", and products at "Competitive" price.

From Table-20 in the next page, it can be observed that Bangladesh can deliver its exportable RMG products within 90 (ninety) days at the current optimum level but it is not always possible.

Table- 20: Typical Lead Time Components

Bangladesh	Days Taken After Preceding Step	
Components	Optimal	Non-Optimal
Producer Receives LC	0	0
Raw Materials Supplier Receives B/B LC	4	6
Raw Materials Supplier Produces and Ships Goods	15	30
Raw Materials Sails and Reaches Chittagong Port	21	30
Port Clearance & Inland Transportation	5	9
Garments Produced and Shipped	20	30
Finished Goods Sails and Reaches Buyer	25	30
Total Lead Time	**90**	**135**

Source: RDTI cell, BGMEA

On the other hand, the competing countries' lead-time is less than 90 (ninety) days, as shown in Table-21 below:

Table-21: Lead Time in Other Countries

Countries	Lead Time (Days)
Mexico	15 - 20
Italy	15 - 20
Vietnam	60 - 90
Cambodia	60 - 90
India	60 - 90
Pakistan	60 - 90
China	60 - 90
Sri Lanka	90 +

Source: BGMEA

It may be noted that the efficient competing countries already have lead times around 60 (sixty) days. So, in order to remain competitive in the global market Bangladesh has to reduce the lead time.

Bangladesh does not have a strong backward linkage industry for quicker supply of raw materials for the production of export oriented RMG factories. 80% raw materials for the export oriented RMG products have to be imported. It is a time consuming process. It takes long clearing hours in the Chittagong Port due to inefficient procedure. Besides, number of days taken for the shipped raw materials to reach the port is also longer due to distance.

Establishment of Central Bonded Warehouses (CBW) could have been a solution to quick availability of the imported raw materials for the production of exportable RMG items. However, in 2004, the Government of People's

Republic of Bangladesh has declined to this proposal of BGMEA being pressurized by the local BTMA. GOB feared that there might be leakage of the raw materials in market from the CBWs. It will ultimately make the current local fabric, yarn, and thread producers uncompetitive.

Does this mean that there is no way to become competitive in the global market?

As observed, Bangladesh can compete mainly in the low value added items as the country lacks in own supply of raw materials (poor backward linkage industry). The heavy dependency of Bangladeshi RMG product on the import and usage of foreign raw materials make the whole industry extremely vulnerable towards being competitive globally.

However, from among all crises that our export oriented RMG sector faces, there is one great boon that our country is endowed with, i.e. the availability of large pool of cheap labor and a large pool of new entrepreneurs. Foreign investors are also leading the RMG sector to better technology and design.

Bangladesh can and must reap the benefit of the availability of cheap labor supply. The average hourly wage rate of RMG industry worker in Bangladesh

(US$0.23) is much less than that of its main competitors like India (US$ 0.56), Pakistan (US$ 0.46), Sri Lanka (US$ 0.39) and China (US$ 0.35).

Although these abundant labor forces are very cheap, they are much competitive in terms of productivity. More than 80% of the labor forces working in the RMG sector are women. The mundane characteristics of these women labor forces, inter alia, are the following:

1. Hard working
2. Obedient
3. Patient and painstaking
4. High learning capacity
5. Traditionally accustomed to sewing.
6. High mental alertness
7. Visual acuity
8. Adjusting ability
9. Stability and focus.

Although the skill of the available labor force is not very high but in a study undertaken by Gherzi Textile Organization (GTO), Zurich, Switzerland (2003), a consultancy consortium of international repute, to provide consultancy services in the field of textile industry, it revealed that these workers can be

imparted with relevant skills and knowledge required for their works very easily.

The different International Trade Theories can be sighted in order to understand the importance of the RMG labor force of Bangladesh.

3.1 Trade Theories and the RMG Labor force of Bangladesh

The labor supply of Bangladesh RMG workers can be explained vividly in terms of different trade theories.

3.1.1 Absolute Advantage Theory:

In 1776, Adam Smith argued in his book *"The Wealth of Nations"* that countries differ in their ability to produce goods efficiently. During his time, by virtue of their superior manufacturing process, the English were the world's most efficient manufacturer in textiles. On the other hand, due to the combinations of favorable climate, good soils, and accumulated expertise, the French had the world's most efficient wine industry.

It may be put in this way; the English had an *absolute advantage* in the production of textiles while the French had an *absolute advantage* in the production of wine. Thus, a country has an absolute advantage in producing a product when it is more efficient than any other country producing it.

In case of Ready-made Garments industry of Bangladesh, there is no such "*Absolute Advantage*". Bangladesh does not have its own supply of RMG raw materials. Even the degree of backward integration is not at all helpful as the total contribution of this backward linkage industry is only 20%, the rest 80% is procured through importing the raw materials from abroad.

But still, we do see the growth of Ready-made Garment industry despite having no absolute advantage at all.

The phenomenal growth of this industry is due mainly to the abundance of supply of labor force. This phenomenon of abundant supply of cheap labor force can be explained under the theory of "*Comparative Advantage*".

3.1.2 Comparative Advantage Theory:

David Ricardo propounded the theory of "Comparative Advantage". He articulated and rigorously formulated the "Classical" system of political economy. The legacy of Ricardo dominated economic thinking throughout the 19th Century.

For Ricardo, the appropriate theory was the "labor-embodied" theory of value or LTV, i.e. the argument that the relative "natural" prices of commodities are determined by the relative hours of labor expended in their production.

On foreign trade, Ricardo set forth his famous theory of *comparative advantage*. Using his famous example of two nations (Portugal and England) and two commodities (wine and cloth), Ricardo argued that trade would be beneficial even if Portugal held an *absolute* cost advantage over England in both commodities. Ricardo's argument was that there are gains from trade if each nation specializes completely in the production of the good in which it has a "comparative" cost advantage in producing, and then trades with the other nation for the other good. It may be noticed that the differences in initial position mean that the labor theory of value is not assumed to hold across countries – as it should be, Ricardo argued, because factors, particularly labor, are not mobile across borders. As far as growth is concerned, foreign trade may promote further accumulation and growth if wage goods (not luxuries) are imported at a lower price than they cost domestically – thereby leading to a lowering of the real wage and a rise in profits. But the main effect, Ricardo noted, is that overall income levels would rise in both nations.

With his 1817 treaties, Ricardo took Economics to an unprecedented degree of theoretical sophistication. He formalized the Classical system more clearly and consistently before anyone else had done. For his efforts, he acquired a substantial following in Great Britain and elsewhere – what became known as the "Classical" or "Ricardian" School. His system, however, was improved very little by his disciples. Perhaps only John Stuart Mill (1848) and Karl Marx (1867-94) added insights of any weight.

David Ricardo took Adam Smith's theory one step further by what might happen when one country has an absolute advantage in production of all the goods. (*Hollander, 1979*)

In 1817, in the book titled Principles of Political Economy, Ricardo showed that such was not the case. Ricardo's theory of *Comparative Advantage* proved that, it makes sense for a country to specialize in the production of those goods that it produces more efficiently and to buy the goods that it produces less efficiently from other countries, even if it could produce them more efficiently itself (*Ricardo, 1817* Principles of Political Economy).

Thus we see that, despite the US and the UK having absolute advantage in the production of the quality threads, clothes, and even other related raw materials, still we see that international trade is taking place between the US, UK, who holds absolute advantage with Least Developed Countries (LDC) like Bangladesh.

The Comparative Advantage theory of David Ricardo explains this. The international trade in Ready-made Garment takes place between the developed countries and the least developed countries as each of the countries has different domestic exchange ratios. These differences of the domestic exchange ratios are undoubtedly due to the reason of mode of productions. The LDC s, especially Bangladesh where there is cheap labor force available, contribute greatly towards the difference of the domestic exchange ratios between the developed and the least developed countries.

Now, in order to understand the reason behind having international trade between the developed and the least developed countries, it is very much required to refer to The Heckscher – Ohlin theory.

3.1.3 Heckscher – Ohlin Theory:

This is a significant theory as suggested by two authors, Eli Filip Heckscher, and Bertil Ohlin.

Eli Filip Heckscher *(Stockholm November 24, 1879 to Stockholm December 23, 1952)* was a Swedish political economist and economic historian.

Heckscher is best known for a model explaining patterns in international trade that he developed with Bertil Ohiin.

Bertil Ohlin *(April 23, 1899 to August 3, 1979)*, was a Swedish economist and 1977 Nobel memorial laureate. His name lives on in the standard mathematical model of international free trade.

In 1930 Ohlin succeeded Eli Heckscher, his teacher, as a professor of Economics, at the Stockholm School of Economics. In 1933, Olin published a work that made him world renowned, *Interregional and International Trade*. In this Ohlin built an economic theory of international trade from earlier work by Heckscher and his own doctoral thesis. It is now known as the Heckscher-Ohlin model, the standard model economists use to debate trade theory. The model was a break through because it showed how comparative advantage might relate to general features of a country's capital and labor. And the way how these features might change through time is shown here. The model provided a basic for later work on the effects of protection on real wages. It has been fruitful in producing predictions and analysis. Ohlin himself used the model to derive the Heckscher-Ohlin theorem that nations would specialize in industries most able to utilize their mix of national resources efficiently.

The Heckscher – Ohlin theory predicts that countries will export those goods that make intensive use of those factors that are locally abundant, while importing goods that make intensive use of the factors that are locally scarce. Thus the Heckscher – Ohlin theory attempts to explain the pattern of

international trade that is observed in the world economy. Unlike Ricardo's theory, however, the Heckscher – Ohlin theory argues that the pattern of international trade is determined by differences in factor endowments, rather than differences in productivity.

Another theory which encompasses Heckscher - Ohlin's theory in a more encompassing way is "Porter's Diamond theory".

3.1.4 Porter's Diamond Theory:

According to Michael Porter of Harvard University, USA, four broad attributes of a nation shape the environment in which local firms compete. These attributes promote or impede the creation of competitive advantage.

The attributes that Porter mentioned are:

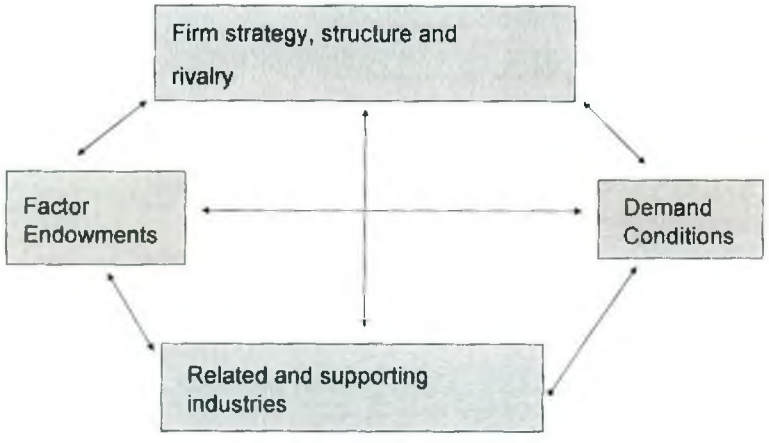
* Factor Endowments: A nation's position in factors of production such as skilled labor or the infrastructure necessary to compete in a given industry.

* *Demand Conditions:* The nature of home demand for the industry's product or service.

* *Related and Supporting Industries:* The presence or absence in a nation of supplier industries and related industries that are internationally competitive.

* *Firm Strategy, Structure and Rivalry:* The conditions in the nation governing how companies are created, organized, and managed and the nature of domestic rivalry.

Porter's Diamond Theory



Source: Adapted from Charles W. L. Hill, "International Business competing in the Global Marketplace pg - 141.

Porter's argument is that the degree to which a nation is likely to obtain international success in any particular industry is a function of the combined impact of factor endowments, domestic demand conditions, related and

supporting industries, and domestic rivalry. According to Michael Porter, the presence of all the four components is usually required for this "diamond" to positively impact competitive performance (despite some exceptions). Porter contends that government can influence each of the four components of the diamond either positively or negatively. Factor endowments can be affected by subsidies, policies toward capital markets, policies toward education, and the like. Government can shape domestic demand through local product standards or with regulations that mandate or influence buyer needs. Government policy can also influence supporting and related industries through regulation and influence firm rivalry through such devices as capital market regulation, tax policy, and antitrust laws.

In a research article *"Factor Endowments, Trade Direction, and Growth Performances of the Americas and East Asia in the Nineteenth and Twentieth Centuries"* by Hongyi Harry Lai (1998), University of California at Los Angeles, the writer suggested how an LDC can be benefited from the trade done with a developed country.

According to his findings, the LDCs trading more with the leading economy than do the other LDCs will grow faster. This is so because of three positive effects of trade.

Firstly, trade cannot only expand production and increase national income, but can also generate dynamic change in comparative advantage. Heckscher, Ohlin and Adam Smith suggested that after trade, a country shifted its under-used yet abundant resources into the production of goods. It then used the surplus of these goods to exchange with other countries for goods made of scarce factors at home. Thus trade led to more efficient use of resources and higher national income. Romer suggested that with trade, firms could specialize in production of intermediate inputs, resulting in less expensive intermediate inputs and hence faster economic growth. Finally, a country can become industrialized by upgrading its comparative advantage from resource-intensive exports, to unskilled labor-intensive exports, to skilled labor-intensive exports, to capital-intensive exports, and to knowledge-intensive exports.

Second, trade with the leading economy also yields positive externalities. Developing countries can learn from the technological innovation, entrepreneurship, and management of the dominant economy. They also need to do so to increase its trade. In addition, growth of the exporting and supporting sectors creates employment. Meanwhile, re-investment of gains from trade helps capital accumulation and preparation of elements crucial for growth such as infrastructure, technology, and human capital.

Third, trade with the leading economy induces a developing country to adopt less distortionary policy and reduce rent-seeking activities. In order to promote exports, a developing country would have to accept international prices and exchange rates, minimize export subsidies, and encouraging cost-minimization and quality-control.

In case of the phenomenal growth of Bangladeshi RMG units, one of the diamonds of Michael Porter can be attributed, which is the "Factor Endowments".

Now, as for factor endowments, Bangladesh does not at all have any significant favorable climatic condition for obtaining quality fiber. Also, given the time period of twenty five years, no significant backward linkage industry has been established. In total, only twenty percent of the total requirement for the production of the exportable Ready-made Garments can be met from the local supply. The rest of the required amount of the supply has to be imported. This is why the Ready-made Garments industry of Bangladesh cannot have any "Competitive Advantage".

However, Bangladesh is having what is called "Comparative Advantage". This comparative advantage comes from what may be considered a blessing of God. It can also be termed as "Factor Endowments", which is, the supply of cheap, abundant labor force.

The abundant supply of cheap labor force is basically a boon for the phenomenal growth of Bangladeshi Ready-made Garments Industry.

The Readymade Garment Industry is necessarily a labor-intensive industry. There is of course not much scope for full automation, as the very nature of the design-changing job requires the touch of human hands. In that way, Bangladesh is blessed with abundant supply of cheap labor force.

The product life cycle theory of international trade will help gain a deeper insight as to what are the chances of Bangladeshi export oriented ready-made garments industry as far as its resource endowments are concerned. But before that, it is required to discuss the theory itself.

3.1.5 The Product Life Cycle Theory of International Trade:

The product life cycle theory of international trade has been found to be a useful model for explaining and predicting trade patterns of many manufacturers. It also explained multinational expansions of manufacturing subsidiaries, that is, it has been useful in explaining certain types of foreign direct investment (*Vernon, 1966; Vernon and Wells, 1986, pp. 80-85*).

According to the product life cycle concept, many manufacturing goods such as electronic products and office machinery undergo a trade cycle.

During this process, which can be described in various stages, the innovator country is initially an exporter, and then loses its competitive advantage vis-à-vis its trading partners, and may eventually become an importer of the commodity. This is the definite case in case of the Bangladeshi Ready-made Garments export.

The introduction stage of the trade cycle begins when an innovator establishes a technological breakthrough in the production of a manufactured item. This country initially has an international technology gap in its favor, and is typically a high-income, developed economy. At the start, the relatively small local market for the product and technological uncertainties imply that mass production is not feasible. During the trade

cycle's next stage, the innovator manufacturer begins to export its product to foreign markets. These markets are likely to be the countries having similar tastes and income levels. The manufacturer finds that during this stage of growth and expansion, its market becomes large enough to support mass-production operations and the sorting out of inefficient production techniques. This means that increasing amounts can be supplied to the world markets.

Now, the very similar situation is prevailing in case of Bangladeshi ready-made garments industry. The very nature of this industry is "Labor Intensive". The workers of Bangladesh have learned with little training the art of producing exportable quality garment wears. Now, the developed countries are having their required garments being sewn from here. The cost of producing the exportable wears in Bangladesh is relatively far cheaper than in any LDC. This is the reason why our part of the LDC is being one of the major exporters of ready-made garments in the US and UK markets.

The nature of our RMG market can be discussed under the concept of "Product Life Cycle Theory". It is observed that the technology of producing the garments is very much commonplace. The workers in Bangladesh have the expertise to stitch the desired style of ready-made garments with little

training. This has made Bangladesh appear as a very significant RMG exporter. Bangladesh is currently the fourth largest exporter in the US market.

The product life cycle of export oriented RMG in Bangladesh is going to have a prolonged tenure. The reason being, first of all Bangladesh is currently competing in the low-end products. This means that Bangladesh or rather, the RMG workers, have already obtained the expertise in producing the low-end export oriented RMG products. Bangladesh is prevented from going into producing the high-end products due to the following reasons:

- Lack of proper infrastructural facilities. This has caused in greater lead time as loading and unloading is very time consuming. This is so, because of absence of adequate number of cranes in the ports, requirements of "Speed Money" (corruption) during loading and unloading, and lack of proper law enforcement in the port areas.
- Lack of proper and adequate training is another major factor which is currently preventing these RMG workforces from learning the know-how necessary for the production of high-end RMG products. Purchasing of high-tech, automatic design machines can be done under the private initiative but the governments should complement this endeavor of the investors by establishing proper training institutes for the RMG employees. In a research done under South-

East Asia Development Fund (SEDF), it had been observed that due to proper training that had been imparted to the Bangladeshi RMG workers working in the EPZs, the productivity of the workers are twenty percent (20%) higher. Where as the productivity of the RMG employees working in non-EPZ RMG factories are on an average 20 % less productive. The reason is not mainly due to the installation of highly technologically advanced machines as observed in the research. Rather, it was the training imparted to the workers that helped them to become more prudent and productive. Thus, it is very much required that with government initiative training centers should be established to impart proper training to the RMG workers to increase their productivity.

- Lack of strong backward linkage industry is another strong factor why our RMG industry cannot go into higher-end RMG product manufacturing. Because almost eighty percent (80%) of the raw materials have to be purchased from the west, the lead time often suffers as it gives very little manufacturing time to the RMG factory operators.

The problem of lack of strong backward linkage industry can be overcome by having regional integration with our neighboring countries. For example, India is willing to export its quality fabric and/or yarn to Bangladesh with which Bangladesh can profitably produce RMG for export to US, UK and Canada market. in fact, Bangladesh does not need to invest anymore in developing its backward linkage industry. So far, Bangladesh has invested very big amount of sum given as loans by the Asian Development Bank in different times. But the result is not at all satisfactory given the time frame of twenty-five years. The investment has resulted in development of a sick textile mills industry which can meet at best twenty percent (20%) of the total demand from production. As Bangladesh has no natural advantage in producing cotton and no indigenous source of chemical for dyeing, so having a strong backward linkage industry is not at all feasible.

Rather, Bangladeshi RMG industry could have been much benefited if the loan amount were invested in the accessory making and establishing the packaging industry.

If Bangladesh agrees to import the raw materials from India and not keep on investing any further in the textile industry, Bangladesh will greatly benefit from lower cost of production and short lead time.

Thus, the growth of RMG life cycle in Bangladesh will in fact be prolonged. As India, China, Pakistan and Sri Lanka are mainly producing the higher-end

RMG supplies, the lower end product orders are sure to be flooded in Bangladesh. Also, as there is abundant supply of cheap labor force here in Bangladesh, if it goes for high-end RMG production, the more trained and experienced labors can get their places in the high-end production and the less trained workers can get their place in the low-end products. Thus, the unique situation of a country with its only natural endowments – abundant supply of cheap labor – the product life cycle of the RMG industry is going to prolong.

This is why it is a matter of great significance that these workers are valued, studied and taken due care of in order to enhance their productivity. This will ultimately help sustain the growth of the RMG industry in Bangladesh. These workers are really unique in characteristics. It will be very much relevant to make a review of their socio-economic background in order to understand their psychology so that proper emphasis can be given to enhance their productivity.

3.1.6 Socio-Economic Background:

The supply of the Ready-made Garments labor comes mainly from the socially and economically disadvantaged segment of the population. Of the total percentage of the RMG workers, about 90% of the garments factory workers are female. These females come from not only socially deprived groups but also from economically marginal groups.

The females in Bangladesh have remained under veils and under the supremacy of men from time immemorial. The expected and the ascribed roles of the females in Bangladesh have been to carryout the orders of the males who are the head of the houses. These males can be her father, her husband, and even her brothers. The females are to perform all the household duties. Since Bangladesh economy is characterized mainly as "Agrarian" economy, these females in the villages have to also help their men in firming, husking, and storing the grains (mainly paddy, pulses etc.). It is a pay less job for the females. They are not at all paid for performing these jobs. On the other hand, these females have to perform all the household chores ranging from preparing food for the joint family (where they live with the in-laws), maintaining their mud houses, rearing chicken, ducks, goats and cows, to looking after their children. The females do not get any significant help from the males in these jobs. The roles of the males end with managing money and food for the families at best.

Even if we look at the eating habits of the females, we see great anomalies. The females cook and wait for the males to eat first which is considered as a custom in Bangladesh. During dining, the females usually air the males with a hand made fan that is designed by them in their leisure period. After the males have finished with their meals, the females then get to eat whatever is left over. Usually, the males have the better portion of the cooked chicken, fish, meat etc. The females are often obliged to go without protein (fish, meat or egg) as the males have eaten the fixed supply that is laid before them. They just finish eating with lentils and some vegetables.

These socio-economically marginal people come in thousands to the capital city in search of jobs every year. There are various reasons for their migration to Dhaka in search of jobs. Among the several reasons are, they come to Dhaka for job as their husbands leave them and do not keep any connections with them due to many reasons one of which is "Polygamy". The males often get married and have more than one female partner without asking the permission of their previous wives or without divorcing them.

Even in the marriage, the women are not given any economic freedom whatsoever. When the women earn by working as maids, their earnings are often forcefully taken away by their husbands.

Thus, from their very own household, these females are deprived. They come to Dhaka, to work in ready-made garment factories as workers. They used to

works as house maids before the development of the RMG industry but due to physical abuse, this deprived section of the population has chosen working in the RMG factories as a means to earn.

Since these women come from very deprived section of the social class, they are very easily adaptable to the RMG factory environment. They are not aware of their rights to have wage on time, higher wage, clean working environment, supply of hygienic drinking water. All through their lives, they have lived in crammed quarters in mud houses or tin roofed houses. Here in Dhaka, they dwell in slum areas with the minimum provision of amenities for healthy life. Their dwelling places are usually filthy, near some garbage dumps or beside some fallow land. The water supply is not adequate. These people have to come to their workplaces on foot or by hanging on the bus handles in local, crowded buses.

On the other hand the positive virtues that these workers possess are that

- Their inherited skills that they obtain from their mothers, grandmothers make them very adept in any stitching works. Bangladeshi "*Nakhshi Katha*" embroidered quilts are known for their artistic stitches all around the world. Even when these workers need training, the supervisors usually find these women very easy to train as they have natural capabilities in grasping the art. Production of the world famous finest cloth- "Muslin" for the regal families in this part of

the sub-continent and later for the British Royal family by the Bangladeshi people is world famous and renowned world wide.

- Since these women are used to sacrifice so much from their very childhood, their compromising nature is praiseworthy. These workers usually complain very less for a decent wage. Rather they are happy with the amount they usually get. Their demand is not very high for more money.

- The tenacity of working patience is relatively higher in the ready-made garments workers in Bangladesh. These workers can work with great patience under the pressure of meeting the dead line of shipment without raising any complaints.

- The RMG workers, especially the women workers, usually prefer to socialize and mingle with their colleagues. So, they do not want to switch their workplace as readily as the men workers. Thus, they are more loyal in the job. Hence, the female workers of the RMG factories are proving to be the most significant and a great factor endowment.

The following table shows unit labor cost and productivity of Bangladesh and its competing countries.

Table-22: Unit Labor Costs and productivity

Country	Unit Labor Cost (US$/shirt)	Wages (US$/year)	Productivity (Shirt/Worker)
Bangladesh	0.11	290	2536
India	0.26	668	2592
Pakistan	0.43	1343	3100
Sri Lanka	0.79	570	719
Vietnam	0.20	N/a	n/a

Source: World Bank (2000)

It can be observed from the above table that the productivity of our labor force is not very low compared to the relative cost per unit labor and wages relative to other countries'. However, in order to increase the productivity of the RMG workers of Bangladesh, it is required to impart proper training to the laborers. The government and the owners have to take initiatives in order to impart the required technical skills to the RMG workers who can show improved performance and thus will help sustain the growth and the contribution of this sector.

It should be mentioned that during the last week of June, 2006, massive workers unrest and violence erupted in the RMG sector in and around Dhaka including DEPZ. Major demand by workers was higher pay and better working conditions. The fact that minimum wage remained constant at Tk. 950 per month since 1992 to 2000 when inflation averaged at 5% - 6% per year. This table shows the extent to which real wage actually declined over the whole

period. It seems GOB and the RMG sector ignored the plight of workers for a long time.

At this point one is tempted to speculate what gains could have been achieved in higher productivity if wages were kept in step with inflation in the past years.

The following table shows the minimum wage paid to the workers in Bangladesh.

Table-23: Minimum wage in different period (1973-2000)

Year	Recommended Wage in current price	Implemented wage in current price	Consumers' (workers') cost of living index(1969-70 = 100)	Real wage
1969-70		125	100	100
1973	150	155	168	73.80
1977	270	270	419	51.55
19 85	630	560	941	47.60
1992	1500	950	1449	52.45
2000	–	950	1973	38.52

Source: Wage Commission Report, 1992, GOB, 2001.

Since it is observed that the supply of workers for the Ready-made Garments factories is abundant and also, the cost of labor is very cheap, it is very much essential to emphasize the increase of the workers' productivity. This is the reason why it is required to study the productivity dimensions of these RMG factories so that their productivity can be increased, and utilize the comparative advantage to maximum, thus helping to sustain the growth of export-oriented ready-made garments industry of Bangladesh.

Summary of Chapter Three

The Ready-made Garments sector of Bangladesh is the most contributing of the sectors in terms of GDP. It brings about the 76-80% of the total foreign earnings. This sector is undoubtedly the most important sector on which the economy of Bangladesh stands. But the phase out of the Multi Fiber Agreement has now led to the unavailability of quota for Bangladeshi RMG products in the US markets. This has now threatened the sheer existence of many RMG factories. Also, since Bangladesh is into producing the mid-range RMG products, it requires no big capital investments in machineries. So, full automation is unnecessary. Also, the very nature of RMG production requires human touch, which is another big reason for not investing in machineries.

This only calls for developing the human force in the RMG sector. This is a must at this stage. Because, Bangladesh has no strong backward linkage industry, no modern freight forwarding system and not so modern infrastructure. The only input where the emphasis can be given is in the development of the RMG workers to increase their productivity.

Now, why develop the workers?

The reasons can be explained both theoretically and practically. As for the theoretical part, many purposeful theories are there to support the fact that

the natural endowment of Bangladesh is the availability of cheap and efficient labor. And so, this endowment must be emphasized to increase the workers' productivity.

The practical reasons that can be given in order to improve the RMG labors' productivity are that, these labors are efficient, easily available; they have natural, inherited expertise in sewing and cutting; have very high level of perseverance and great tenacity of working under pressure to meet dead lines. The socio-economic background of these workers explains why their living standard is so low and hence their expectation is low. There could have been significant gains in productivity of the workers if their real wages were maintained during the last decade. It seems the RMG owners applied the primitive method of capital accumulation, which needs to be changed now for the better for all concerned. Thus these workers can be easily motivated and trained in order to increase their productivity. And, if their productivity is increased, then only, it can be very much possible for the Bangladeshi RMG to sustain and flourish in the post-MFA era.

Thus it is now, required to discuss the approaches to measure the labor productivity of the RMG workers. The next chapter (chapter 4) of the thesis paper discusses in details the appropriate approaches towards measuring the productivity of the RMG workers.

Chapter 4

PRODUCTIVITY: MEASURING APPROACHES AND SIGNIFICANCE

THIS CHAPTER INCLUDES

Chapter Four

Productivity: Measuring Approaches And Significance

4.1 Productivity:

Productivity growth has received greater attention from economists and policy makers in Asia in the 1990s. This is partly due to the work of Alwyn Young (1992, 1995) and Paul Krugman (1994). They argued that economic growth in Asia is driven by the accumulation of the inputs in the production process rather than by increases in productivity. In other words they, in particular Krugman, believes that the Asian economic miracle is largely attributable to an increase in the quantity and not the quality of the factors of production. Further analysis and evidence showed that as countries become more developed and move closer to the limits of factor accumulation, they rely more and more on increasing productivity to sustain the economic growth process. In fact, some studies (such as *Rao and Owyong 1997*) indicate that this process of productivity growth is already occurring in the more developed economies in the region. Nonetheless, policy makers and economists alike have begun to recognize more fully the importance of technology and productivity in economic growth. In order to facilitate this

process of understanding the movements in productivity and designing the right policies to enhance it, it is critical to be able to first get a handle on what exactly productivity is and how to measure it.

Productivity is output expressed as a ratio of input. Productivity means doing things right at the least possible cost in the least possible time with the highest possible quality. In other words, it is an index that measures output (goods and services) relative to the input (labor, material, energy and other resources) used to produce them.

Productivity is the key to the survival of any manufacturing enterprise in business. Low productivity manifests in terms of failure to meet deadlines while above-average productivity reduces production time of garments and helps to increase fashion and design content. Hence, productivity is essential in building relationships with customers which can in turn lead to repeat orders and hence growth in business.

Productivity, in a strict economic sense, is defined as follows:

Productivity = Output/Input

A productivity ratio can be compared for a single operation, a department, an organization or an entire country. In business organizations productivity ratios are used for planning workforce requirement, scheduling equipment,

financial analysis and other important tasks. Productivity has important implications for business organizations. It is a measure of how well input or resources are utilized to create the desired output. The higher the ratio, the greater the productivity is, the lesser the cost of product would be. However, measuring "input" is more complicated. Economists usually refer to the input as "factors" of production, the most basic of which are labor and capital (A third factor, land, is not generally treated as a input in productivity measurement). Productivity can be calculated using each factor separately or by combining the factors into a composite measure of total input. With the two inputs, three different productivity measures can be calculated:

(1) *Labor productivity*: which is output divided by the labor input,

(2) *Capital productivity:* which is output divided by total capital inputs, and

(3) *Total factor productivity:* which is output divided by the combination of both the labor and capital units used in production.

This last measure is also occasionally referred to as *multi factor productivity*. The topic "Total Factor Productivity" has also been discussed hereinafter.

4.1.1 Productivity in Bangladesh:

Unlike the progressing countries of Asia, Bangladesh could not put much importance on its productivity yet. With exception of few cases, our productivity is not satisfactory in comparison with that of the neighboring countries competing with us.

In view of the magnitude of its importance, the issue of competitiveness has been a focal point for discussion during the post-MFA period. It may deserve mention here that in a study by DU teachers, it was observed that "in most cases competitiveness in the global markets was no longer limited to technical and economic standards, but involves social standards, especially labour standards and environmental issues. In this context, the concept of 'decent work' introduced by ILO has received a lot of attention" (*Khandaker, Razzak and Ahmed*). Generally, decent work is expected to have positive effect on labour productivity and the productivity gains could offset the cost raising effects. However, the aforesaid study concludes that in the RMG industry the share of labour cost in total product value chain is not substantial and hence improved productivity may not contribute significantly to competitive gains. For this reason, the authors suggested a dominant role for the government in ensuring decent work.

Against such pessimism it can be said that in a situation as faced by the RMG industry in Bangladesh, we have to fight with whatever little strength we have. Hence, effort to gain in labour productivity through decent works and other measures cannot be underrated.

A study by the World Bank on productivity advantage of FDI firms in the RMG industry found that FDI firms are on an average 20% more productive than domestic firms. Moreover, there is statistical evidence suggesting that additional productivity occurring in FDI firms is to such an extent that the other domestic firms may reap the benefit following productivity increase in FDI firms. Based on such findings, the study recommended more open FDI policy for the Bangladesh garment sector (*Hiauo Looi Kee*).

However, it may be worthwhile to present some statistical information obtained by the researcher in this study as it is perhaps the only attempt to estimate production functions based on firm level data directly in this sector.

$$Y_{it}=A_{it}L_{it}^{aL}M_{it}^{aM}K_{it}^{ak}$$

$$lnY_{it}=lnA_{it}+aL\,lnL_{it}+aM\,lnM_{it}+ak\,ln\,K_{it}$$

Where 'I' and 't' are the indexes for firm and year. In log, output, Y, is linearly related to labor, L. materials, M. and capital stock, K. Any part of Y that are not explained by the three factors of production are attributed to productivity, A, which varies by firms and years. In other words, if we regress in Y on inL,

lnM and lnK using ordinary least squares (OLS) estimation, the regression errors are the firm's productivity, lnA.

After several corrections to the OLS regression of output on labour, material and capital the following results were obtained. "The consistent coefficients for labour and materials are 0.25 and 0.72, respectively" and the modified "estimated coefficient for capital is 0.02". All these coefficients were statistically significant and the sum of the coefficient for labour, materials and capital equaled one, the study noted. Hence, the production function in the garment industry was found to be of constant return to scale.

Comparing firm productivity across all firms in all sub sectors and locations, the study gave some interesting insights in terms of relative productivity of firms. On average, knitwear firms were found to be most productive. An average knitwear firm has had 10% higher productivity than a woven firm, and was 17% more productive than a sweater firm. Location wise productivity of knitwear in DEPZ had the highest rate, followed by firms in Dhaka, CEPZ and Chittagong. It may also be noted that in the MFA-Phase out stage, the knitwear industry attained fast growth over woven and sweater factories. The question naturally follows: Is it due to higher investment in machines or simpler production processes or both?

This, in other words indicates that firm productivity as measured by the total factor productivity (TFP) did not explain the level of output at which the contribution of inputs equals or tends to zero.

There are many reasons for such poor performance. The most influential is the lacking in the infrastructure.

But the most critical is the attitude towards the improvement. Productivity cannot be improved to the international level by correcting one or two steps in the production process. However, it is the team approach and group leadership that can pay. The productivity of Singapore port of Toyota of Japan may be cited as an example. It is no wonder that Bangladesh may not be a excellent producer of many products or commodities. But in case of some specific products, she can be simply world's best. Corruption and mismanagement in Bangladesh are the other factors behind every terrible performance.

Bangladesh does have abundant cheap labors. Bangladeshi workers are reputed worldwide as good hand. They are easily trainable, adaptable and flexible to changes of working conditions and are hard working. But, in our country we see a different picture in most of the cases.

To overcome these situations, leaders and managers should emphasize on productivity issues. Continuous improvement of workers and working process are the ultimate way of becoming an excellent producer. Long term strategic objectives should be set to obtain the competitive advantage for the RMG industry.

4.2 Productivity Measurement Approaches:

4.2.1 Total Factor Productivity:

Simply defined, total factor productivity is the weighted average productivity of all inputs, where the weights to these inputs are their shares in the total cost of production. Suppose for the moment that output is measured in some physical unit, say tons. Then TFP is measured, as the ratio of output *Y* to aggregated input *X*:

$$\mathrm{TFP} = \frac{Y}{X}$$

(1)

Since there are multiple inputs, *X* has to be computed by aggregation. Using the definition of Divisia indexes, the growth rate of the aggregated input is equal to the weighted sum of the individual inputs' growth rates:

$$\frac{dX}{X} = \sum_{i=1}^{I} v_i \frac{dx_i}{x_i}$$

(2)

Where x_i is quantity of input i and v_i is the weight assigned to input i.

$$v_i = \frac{\text{Unit cost of input } i \times \text{Units of input } i \text{ employed}}{\text{Total expenditures for all inputs}}$$

(3)

Consider that instead of having just a single type of output, there are multiple outputs. Using Divisia indexes again, it therefore follows that

$$\frac{dY}{Y} = \sum_{i=1}^{J} w_j \frac{dy_j}{y_j}$$

(4)

Where y_j is the quantity of the jth output produced, with the weight w_j being the share of total revenue contributed by the jth output. Combining (2) and (4) leads to the following expression for TFP growth.

$$\hat{TFP} = \sum_{j} w_j \hat{y}_j - \sum_{i} v_i \hat{x}_i$$

(5)

Where the hats represent growth rates and the weights are functions of the relevant prices and quantities:

$$w_j = \frac{q_j y_j}{\Sigma_j q_j y_j} \quad \text{and} \quad v_i = \frac{p_i x_i}{\Sigma_i p_i x_i}$$

(6)

Where q_j and p_i are the prices of the jth output and ith input, respectively. The firm is assumed to maximize profits subject to the constraint of the production technology, which is given by

$$(y_1, \ldots, y_j) = F(x_1, \ldots, x_i)$$

(7)

where profits are given as follows.

$$\pi = \sum q_j y_j - \sum p_i x_i$$

(8)

If the production technology follows constant returns to scale, then

$$\sum_j q_j y_j = \sum_i p_i x_i$$

(9)

Totally differentiating the last equation with respect to time and dividing both sides by the corresponding total value yields

$$\sum_j w_j[\hat{q}_j + \hat{y}_j] = \sum_i v_i[\hat{p}_i + \hat{x}_i]$$

(10)

Equation (5) implies that the rate of growth of TFP is equal to the aggregate growth rate of output minus the aggregate growth rate of inputs. In addition when (10) is used, it may be shown that

$$\hat{TFP} = \sum_i v_i.\hat{p}_i - \sum_j w_j.\hat{q}_j$$

(11)

Which is to say that the rate of TFP growth is equal to the average rate of growth of input prices less the average rate of growth of output prices.

4.2.1.1 Relationship among TFP Growth, Output Growth, and Labor Productivity Growth

For small changes in a variable the rate of change from one time period *t* to *t* + 1 is closely approximated by the corresponding difference in logarithms. Thus, for any variable *Z*,

$$\hat{Z} = \frac{Z_{t+1} - Z_t}{Z_t} \approx \ln Z_{t+1} - \ln Z_t$$

(12)

Given this useful result, we can reformulate our measure of TFP in (5) by replacing all growth rates by the corresponding log differences. It follows that the growth rate of TFP is

$$\hat{TFP}_t = \ln TFP_t - \ln TFP_{t-1} = \sum_i \bar{v}_{i,t} (\ln(Y_t/x_{i,t}) - \ln(Y_{t-1}/x_{i,t-1}))$$

(13)

Where, average expenditure share $\bar{v}_{i,t} = 0.5(v_{i,t} + v_{i,t-1})$. In this form it becomes clear that the growth of total factor productivity is the weighted sum of the growth rates of all single factor productivities. Put another way, output growth is equal to the sum of the TFP growth rate and the growth rate of the average input.

$$\hat{Y}_t = \sum_i \bar{v}_{i,t}\hat{x}_{i,t} + \hat{TFP}_t$$

14)

Finally, the growth rate of the productivity of any input can be expressed in terms of the rates of growth of the ratios of all other inputs to that input, and the growth of TFP. For the case of labor productivity, this implies that

$$\begin{aligned}\text{Growth rate of labor productivity} &= (\ln Y_t - \ln x_{l,t}) - (\ln Y_{t-1} - \ln x_{l,t-1}) \\ &= (\ln Y_t - \ln Y_{t-1}) - (\ln x_{l,t} - \ln x_{l,t-1}) \\ &= \sum_{i \neq l} \bar{v}_{i,t}\hat{x}_{i,t} - (1 - v_l)\hat{x}_{l,t} + \hat{TFP}_t \\ &= \sum_{i \neq l} \bar{v}_{i,t}(\hat{x}_{i,t} - \hat{x}_{l,t}) + \hat{TFP}_t\end{aligned}$$

(15)

Where, the second last equality follows from (14) and the last equality uses.

$$1 - \bar{V}_{l,t} = \Sigma_{i \neq l} \bar{V}_{l,t}.$$

4.2.1.2 Presence of a Non-variable Factor

We now relax the assumptions of instantaneous adjustment of all inputs. It is assumed that there is one quasi-fixed factor, whose adjustment is hindered by adjustment costs or institutional factors. This quasi-fixed factor is usually taken to be capital. Hence the firm's problem is to minimize the variable cost of producing output (y_1. . . y_j) subject to the fixed prices of the variable inputs as well as the fixed capital input $\bar{k}$.

Mathematically this is expressed as

$$\min VC = f(x_1, \ldots, x_l, k; y_1, \ldots, y_j)$$

$$\text{subject to } \sum_j q_j y_j \geq \sum_i p_i x_i \quad \text{and} \quad \partial(VC)/\partial y_j \leq q_j$$

Where the first constraint implies that total variable cost must be met or exceeded by total revenues, with the second requiring that price must exceed marginal cost. The shadow price to the quasi-fixed input is

$$p_k = \frac{\Sigma_j q_j y_j - \Sigma_i p_i x_i}{\bar{k}} \geq 0 \qquad (16)$$

Hence this implies that in the short run when the capital input is often fixed, TFP is measured by

$$\hat{TFP} = \sum_i w_i \hat{y}_i - \sum_i v_i \hat{x}_i - v_k \bar{k}$$

$$\text{where } v_k = p_k \bar{k} \Big/ \left(\sum_i p_i x_i + p_k \bar{k} \right)$$

(17)

4.2.1.3 Extension to the Economy Level

At the level of the economy, we can think of an aggregate production function, which for the moment is assumed to follow the Cobb-Douglas form:

$$\log Y_t = \alpha + \beta \log K_t + (1 - \beta) \log L_t + \log u_t$$

(18)

Where, the Cobb-Douglas assumption is taken to be a first approximation to a potentially much more complex relationship. Differentiating the above expression with respect to time yields

$$\hat{Y}_t = \beta \hat{K}_t + \gamma \hat{L}_t + \hat{TFP}_t$$

(19)

The parameters β and γ represent the share of total input cost in the Cobb-Douglas formulation, which is in accordance with the weights that were used earlier in the article. Measures of total factor productivity may then be obtained by deducting the input growth rates from output growth. This

approach to decompose the total growth of output in the economy into its different potential factors is called growth accounting. These factors are to explain output movements; what is left unexplained (often called the residual) is considered as total factor productivity.

To see more clearly the implicit restrictions of the simple Cobb Douglas production function, consider a production function of the general form $Y_t = f(x_1,t, \ldots, x_{I,t},t)$, where the time trend variable t may be thought of as a proxy for total factor productivity growth.

We can then write

$$\frac{dY}{dt} = \sum_{i=1}^{I} \frac{\partial f}{\partial x_i}\frac{dx_i}{dt} + \frac{\partial f}{\partial t}$$

(20)

Dividing both sides by Y, and recognizing that $\partial f/\partial x_i$ is by definition the marginal product of factor i (MP_i), we get

$$\hat{\text{TFP}} = \frac{\partial Y/\partial t}{Y} = \frac{dY/dt}{Y} - \sum_i \frac{MP_i.x_i}{Y}\cdot\frac{dx_i/dt}{x_i}$$

$$= \hat{Y} - \sum_i \frac{MP_i.x_i}{Y}\hat{x}_i$$

21)

Assuming perfect competition, the values of the marginal products equal factor prices, i.e., $P.MP_i = p_i$, where P is the output price and p_i is the price of input i. The last expression can therefore be written as

$$\hat{TFP} = \hat{Y} - \sum_i \frac{p_i x_i}{PY} \hat{x}_i$$

(22)

Where, the weights of the input growth rates are the ratios of input payments to total revenues. These weights will be equal to the share of total input costs if we assume constant returns to scale, in which case $P.Y = \Sigma_i p_i x_i$. Given this and by restricting the number of inputs to capital and labor, the last equation (22) reduces to the Cobb-Douglas form in equation (19).

4.2.2 Measurement of Capital and Other Inputs

The data for generating measures of productivity growth should include as many outputs and inputs of the firms as possible in order to reflect all production and costs. Output is usually measured as an aggregate of all types of production activities. The categories of inputs generally identified are capital, labor, energy, non-energy intermediate materials, and sometimes purchased services. Inputs such as land and inventories are often included in the measure of capital. The two potentially most problematic issues that arise in data construction involve the measurement of capital and

aggregation. Aggregation is a problem because capital is clearly not homogeneous. As regard to its measurement and the construction of a capital series, it is also problematic since it requires rethinking the idea of current input use. As a durable input the services from the available stock of capital, and the rental or user prices of these services, are relevant values for the construction of productivity growth measures, and neither of these is readily observable. Developing capital measures also requires consideration of what types of inputs should be included as components of the capital stock, which is sometimes unclear.

Measurement of Output

Output measurement for a single-output firm is fairly straightforward, since for a single output there is only one type of unit involved, say the number of pairs of shoes or tons of steel. In this case, therefore, an average price per pair or ton can generally be specified in dollars as total sales divided by the quantity of the output, and thus quantity and price indexes can directly be computed.

Even for this simple case there are problems involved. For example, it is not immediately clear how changes in quality can be handled. In a few cases (tons of steel might be an example) this is not a critical issue since the product is quite homogenous. However in most other cases, such as the

number of computers produced, the quality of a particular unit might change over time or across companies (as in different brands).

Another problem that may complicate the measurement of output is the existence of inventories. Data are generally reported in terms of sales, whereas actual production is the relevant output for the measurement of productivity. Inventories constitute the difference between these two figures. For the measurement of output, therefore, sales data should ideally be adjusted by net inventory change. In other words, the correct output series to use is obtained from adding sales to inventory change.

For a firm that produces multiple outputs, there are further difficulties: how to add together goods that are measured in different units is a standard index-number problem? It is not an easy problem to deal with. While determining the total value of production is relatively straightforward, dividing this value into its aggregate quantity and price components is not. This aggregation issues will be dealt with in greater detail below.

Measurement of Labor

Labor input is relatively easy to measure compared to other inputs, since labor statistics are generally presented in terms of wage bill paid and the number of workers or person-hours. By dividing the wage bill by the number of workers or person-hours, we obtain an estimate of the average wage rate.

The number of person-hours is generally a better measure of true labor input than number of workers, since the latter does not reflect changes in the hours worked per worker.

Measurement of Capital

The most problematic input to measure is capital. First, the categories are often not clearly defined. Although buildings and structures, machinery and equipment, etc are often accounted for, other categories that are potentially important are ignored. One such example is research and development, which might be considered a long-term investment, and therefore a component of the capital stock. The main difficulty of measuring capital, however, is how to deal with an input that provides a stream of services over time, and is often not considered as part of the explicit costs of the firm.

A relevant measure of the available capital stock is computed as what is left of the capital investment in past time periods for the firm. This is generally written for each capital asset x_k as

$$X_{k,t} = \sum_{\tau=0}^{T} X_{k,t,t-\tau} = \sum_{\tau=0}^{T} S_{k,t,\tau} Z_{k,t-\tau}$$

23)

where T is the life of the durable good, $X_{k,t,t-\tau}$ is the stock of x_k in time period t still remaining from investment in period $t-\tau$, $S_{k,t,\tau}$ is defined as the

physical survival rate for age τ investment in time period t for asset k, and $Z_{k,t-\tau}$ is gross investment in asset k at time $t-\tau$. This summation must be done for each asset individually, and then the assets must be aggregated based on their user costs, as will be discussed below.

Determining the level of $x_{k,t}$ for each asset therefore requires finding a benchmark level of the stock in period 0, deflating the value of investment by relevant deflators (to convert to constant dollars) and cumulating the investment from that point on based on some assumption about survival rates.

Finding a benchmark is sometimes difficult, often requiring some judgment together with past data and numbers from other studies. As for the deflators to be used in the second step, they may be obtained from the output price series for the supplying industries, such as office equipment. The most difficult is step three, which requires us to characterize $S_{k,t,\tau}$, the physical survival rate. There are a number of possible assumptions for this: (a) one-hoss shay (the machine runs at full tilt until it dies), (b) constant exponential decay (i.e., the decay per time period is a constant percentage, say $\delta\%$, which implies that $S_t = (1-\delta)^t$), (c) straight line or linear depreciation (e.g., 5% of the initial capital stock in its time period), (d) decelerated depreciation (any method where the age-price profile declines slower than concave). The

most common method is a form of exponential decay called the perpetual inventory method, based on geometric deterioration. This assumption implies that capital services never actually reach zero so every unit of investment is perpetually a part of the stock of capital. The perpetual inventory method essentially requires that

$$K_t = (1 - \delta_t)K_{t-1} + I_{t-1}$$

24)

Where, K_t is the capital stock at the beginning of time t and I_{t-1} is the investment in period $t - 1$. Often a constant exponential rate is assumed for δ_t, which makes it fall under the category of constant exponential decay.

Next a price for the capital good needs to be obtained. Since the underlying theory specifies the service flow from capital as the relevant input to measure, it is necessary to construct corresponding data series measuring the service flow price. This concept leads to notion of the user cost of capital, which not only includes the investment price, but also adjusts it by the interest rate, the depreciation rates, and government taxes and incentives.

Mathematically this is represented by the following equation:

$$c_t = TX_t[r_t J_{t-1} + \delta J_t - \Delta J_t] + b_t$$

(25)

where b_t represents the effective property tax rate, J_t is the asset price at time t, $\Delta J_t = J_t - J_{t-1}$ denotes the capital gains, r_t is the rate of interest, δ is the depreciation rate, and TX_t is the effective rate of taxation on capital income given by

$$TX_t = (1 - T_t\Theta_t - \kappa_t)/(1 - T_t) \quad (26)$$

where T_t is the effective corporate income tax rate, Θ_t is the present value of depreciation deductions for tax purposes on a dollar's investment over the lifetime of the good, and κ_t is the effective rate of the investment tax credit.

4.2.3 Econometric Issues

Many different function forms have been used for the econometric estimation of productivity growth. The choice among different functional forms is generally based on the type of analysis to be carried out. Some functions simplify computation of elasticity formulas and specification of constraints such as constant returns to scale, some facilitate consideration of dynamic interactions, some allow curvature conditions to be directly imposed, and some enhance the ability to identify the difference between short-run and long-run behavior. Most modern studies of production technology, however, do rely on some type of flexible functional form, which

allows generality in terms of interactions among arguments of the function, such as substitution among inputs.

One example of a flexible functional form which has been used extensively for the analysis of production is the translog function. The translog production function, assuming instantaneous adjustment of all inputs is of the form:

$$\ln Y_t = \alpha_0 + \alpha_K \ln K_t + \alpha_L \ln L_t + \alpha_t t + 0.5\, B_{KK} (\ln K_t)^2 + B_{KL} (\ln K_t)(\ln L_t) + B_{Kt} (\ln K_t).t + 0.5 B_{LL} (\ln L_t)^2 + B_{Lt}(\ln L_t).t + 0.5 B_{tt}\, t^2$$

27)

Where the assumption of constant returns to scale implies that

$$\alpha_K + \alpha_L = 1, \quad B_{KK} + B_{KL} = B_{LL} + B_{KL} = B_{Kt} + B_{Lt} = 0$$

(28)

It is clear from observation that the translog function is a generalization of the Cobb-Douglas functional form. The Cobb-Douglas form is restrictive in terms of the implicit substitution assumptions: elasticity of substitution between all inputs is one and shares of the inputs are constant. Extending the Cobb-Douglas to the translog function enables these constraints to be relaxed because cross-effects between inputs are recognized and therefore more complex substitution patterns can then be captured.

With the increasing recognition that productivity growth is the key to sustained economic expansion, measuring productivity is becoming important to economists and policy makers alike. The accurate measurement of productivity growth plays an important role in providing the information economists need to put forth better policy recommendations and for policy makers to make right decisions. In this article we have considered some of the ways to capture this elusive concept of productivity. Although much further research remains to be done in this area, it is hoped that this article will prove helpful by clarifying some of the concepts on productivity and by documenting some of the measurement methods employed by economists.

Let us now have some light upon productivity and profitability, as both these factors are very much important in the growth of any industry in a country.

4.2.4 Productivity and Profitability:

According to the book named ***"Value Added Productivity Measurement and its Practical Applications – with linkage between productivity and profitability"*** by Masayoshi Shimizu, Kiyoshi Wainai and Elena Avedillo-Cruz in association with ***Japan Productivity Center for Socio Economic Development***, when measuring productivity, the first step is to measure the output in different dimensions as follows:

1. *Production Quantity*: Expressing output in terms of physical volume is the most appropriate measure for productivity analysis.

   This is simple, however, only if physical output is homogenous. Otherwise, a weighting system must be adopted for aggregating different types of output.

2. *Production Value*: In dealing with heterogeneous output, expressing them in monetary value terms may be more convenient. The sales value of units of finished product completed during the period.

   Profit and Loss statements are computed by the following formula of production value:

   Production Value = Net sales + Change in Inventory of Finished Products and Work-in-Process

3. *Value Addition*: Output is expressed in monetary figures is Value Added. Value Added is defined as the "wealth" created by the products and/or services generated by an organization.

   The equation of Value Added is as follows:

   Value Added = Net Sales – Value of Purchases from Outside + Change in inventory

The next step is to measure input regarding resources- tangibles or intangibles necessary to produce goods or services. The input measurement is thus classified as input of labor, capital, and intermediate input.

Considering labor, there are three ways of measuring it, namely:

1. Number of Employees
2. Personnel Expenses
3. Total Man-hours Worked

Among the three, *Number of Employees* is the easiest to obtain and is expressed in terms of physical volume. The second easiest is *Personnel Expenses;* because it can be derived from profit and loss statements by summing up all the expense items pertaining to those employees receive (salaries and wages, bonuses, allowances, per diems, etc.)

Total Man-hours Worked refers to the total number of hours worked by the total labor force. It excludes hours paid but not worked such as holidays, sick and vacation leaves and other paid leaves. Thus, it is considered a more accurate measure and is expressed in physical volume terms. However, not many companies keep record of this.

Capital input may be measured in physical volume terms (i.e. machine hours for specific types of machinery and equipment) or monetary value terms (i.e. fixed assets, machinery and equipment, total assets).

4.3 Labor Productivity:

Labor Productivity (I) = Value Added/ Number of Employees

Labor Productivity (II) = Value Added/ Personnel Cost

Labor Productivity (III) = Value Added/ No. of Employees (On Average)

= (Amount Sold/ No. of Employees) X (Value Added/ Amount Sold)

4.4 Significance of Formula:

The number of employees in the denominator of labor productivity (I) formula includes executives (directors and auditors), and refers to the total number of employees including part-time and regular employees.

Labor Productivity (II) refers to distribution of value added to the number of employees of the contribution of each worker in generating value added for the company.

Labor Productivity (III) refers to productivity per amount of personnel expense, and represents wage value added productivity performance at the firm level. In the formulae, labor productivity is assumed to remain constant on a long-term basis.

Labor Productivity (III) refers to the amount sold per person as an indicator of the gross production per person because the amount of production is hard to capture from the profit and loss statement in effect.

4.5 Bangladesh Scenario:

During the last few years, labor productivity in the Bangladeshi RMG factories has improved. But it is yet to go a long way to catch up with the labor productivity of Mexico, Hong Kong, Taiwan, Malaysia. (Hafiz G. A. Siddiqi). Therefore, it needs to improve labor productivity to remain competitive.

However in Bangladesh, very little value addition is done in RMG sector. For that reason, National Productivity Organization (NPO) of Bangladesh under Ministry of Industry has changed the value addition concept and formula. They have value addition and have put some different parameters.

Thus the formula looks like:

(i) $labor\ productivity = \frac{units\ produced\ /\ day}{number\ of\ employees}$

(ii) $labor\ productivity = \frac{dollar\ sales\ /\ day}{number\ of\ employees}$

It can also be measured by each line in terms of units produced or in term of dollar sales. This line productivity is used where team (line) based approach is used and appraised.

In this study, the number i) of the labor productivity formula

$$labor\ productivity = \frac{units\ produced\ /\ day}{number\ of\ employees}$$

has been used to calculate the RMG workers' productivity.

Dollar sales figures are not available at enterprise level as these units do not publish their accounting reports. Where such figures might be available there is a strong tendency to underreport sales figures to minimize income tax payments.

Hence use of the labor productivity measure of (*i*) is justified for this study.

Summary of Chapter Four

Many theoretical approaches are there to calculate productivity. One generalized approach is the simple method of measuring by comparing the ratio of Output to Input. Productivity means doing things right at the least possible cost in the least possible time with the highest possible quality. So, assuming it true, the simple calculation of using the formula *Productivity = Output/Input* can be used if possible.

Another approach to measure productivity is the measurement of productivity using *"Total Factor Productivity"* approach.

However, in Total Factor Productivity (TFP) approach, it is very difficult to determine and to get the all particulars of the each of the factors relating to measuring the productivity of the RMG workers of Bangladesh. However, one study by the World Bank identified through regression analysis evidence of higher productivity in FDI firms in EPZs and also in knitwear industries.

It is often required, but not very easy to obtain to determine the Capital and Other Inputs, which may include: labor, energy, non-energy intermediate

materials, and sometimes purchased services. Thus, it is not a very effective approach to measure the productivity of the workers.

Another problem lies in the measurement of productivity with profitability. There are several approaches to this method of calculation such as:

Production Value = Net sales + Change in Inventory of Finished Products and Work-in-Process

But this approach is only effective in dealing with heterogeneous output, expressing them in terms of monetary value may be more convenient. The sales value of units of finished products completed during the period.

However, to overcome these problems of measuring productivity of the RMG workers, the National Productivity Organization (NPO) of Bangladesh under Ministry of Industry has changed the value addition concept and formula. They have put some different parameters to value addition. Thus the formula:

$$\textit{(i) labor productivity} = \frac{\textit{units produced / day}}{\textit{number of employees}}$$

$$\textit{(ii) labor productivity} = \frac{\textit{dollar sales / day}}{\textit{number of employees}}$$

However, as the value of Taka against the US Dollar fluctuates so often, and also the total information from the different RMG factories is often not being communicated for various reasons, the first approach in measuring the labor productivity of the RMG workers in Bangladesh has been used in this thesis work.

The approach of measuring the labor productivity calls for going into the real experiment and results. The next chapter (chapter 5) deals with the findings and analysis in detail.

Chapter 5

PRODUCTIVITY VARIABLES: FINDINGS AND ANALYSIS

THIS CHAPTER INCLUDES

Chapter Five

Productivity Variables: Findings and Analysis

The study is aimed to find out the relationship between the productivity variables and its significance in enhancing the productivity of the RMG factory workers in Bangladesh.

The selection process of the productivity variables:

It was gathered from Professor Durga Das Bhattacharjee, Professor of Management, Faculty of Business Studies, University of Dhaka, that there are more than three hundred variables related with the labor productivity either directly or indirectly. The first step in this research was to identify the major factors affecting productivity. From the primary survey of around six hundred RMG workers, thirty-two initial variables had been selected.

The initial thirty two variables are :

1. *Length of service*
2. *Length of service in company*
3. *Length of service in current position*
4. *Wage Satisfaction*

5. *Timely Payment Satisfaction*
6. *Working Hour Satisfaction*
7. *Machine condition satisfaction*
8. *Overtime Satisfaction*
9. *Working Space*
10. *Break Facility*
11. *Machine Layout*
12. *Inventory Control*
13. *Product Design*
14. *Performance Appraisal*
15. *Recruitment Policy*
16. *Training & Development*
17. *Cleanliness*
18. *Restroom facility*
19. *Temperature Control*
20. *Lighting Facility*
21. *Recreation Facility*
22. *Leave facility*
23. *Medical benefit (at the premise)*
24. *Medical benefit (off the premise)*
25. *Safety measures*
26. *Ethical practice – dismissal*

27. *Ethical practice – penalty*

28. *Ethical practice - Supervisors behavior*

29. *Team & Colleague*

30. *Top Management*

31. *Free lunch, free snacks, free daycare service*

32. *Monthly meeting*

The relationship between productivity and the above mentioned factors has been established in previous research work done by members from organizations such as the Centre for Policy Dialogue (CPD), Bangladesh Garment Manufacturers and Exporters Association (BGMEA), different RMG experts, consultants and students from the Institute of Business Administration (IBA), University of Dhaka.

Textual papers completed in 2005 on *Factors of Productivity* by Manas Paul, Hasan Mazhar and Muntasir Hossain and on *Labor productivity Analysis* by Faisal Chowdhury, Shaikh Shahab Ahmed, Nasriful Alam and Sayeed Salam have contributed greatly in determining the factors which affect productivity. Moreover, improving worker's productivity in the Ready-Made Garments Sector of Bangladesh by A.M.M Khairul Bassar, Syed Masud Hasan, Kanchan Kumar Das, Bangladesh Society for TQM, has identified some internal environment factors such as lighting facility, temperature, performance appraisal as responsible for poor human performance in the RMG sector.

In addition, BGMEA article on *Productivity* cites 'number of machine breakdown' and 'number of days of sick leave' as factors that adversely affect productivity. That is why variables like 'Leave facility', 'Machine condition satisfaction' were taken into consideration. *Foreign Ownership and firm productivity in Bangladesh Garment Sector*, research done by Hiau Looi Kee in May, 2005 in association with World Bank, shows that FDI firms are on average 20% more productive than domestic firms. The working condition in FDI firms are much better than their local counterparts. So, in this thesis the working conditions of various firms and its impact on labor productivity has been meticulously observed.

Since the research has been taken to help improve the productivity of the ready-made garment factory workers of Bangladesh, the productivity dimensions that are relevant in case of the Bangladeshi workers have been taken into account. With the help of statistical analysis 19 key variables have been selected. For the selection of those main variables, thirty nine factories were visited. (Source: Attended in Appendix G)

Workers, owners and management of those factories had been interviewed. Numerous focused group discussions were held where various combinations of the participants were ensured to observe different outcomes. All relevant data of the survey were then analyzed with statistical tools. On numerous

occasions another fifty garments factories had been randomly visited for further interviews. Also Seminars and symposiums organized by CPD and other organizations have been attended for this study. After selecting these 19 variables, opinions gathered from numerous experts is considered for the final justification.

The data input:

The average score of each of the feedback of every questions received from each factory visited was given as an input in SPSS software. For example, for one particular question, 20 factory workers have been asked from the factory "A". The average ratings of the twenty feedbacks were given as an input in case of the particular question in case of factory "B". Similar steps have been taken in case of other questions. The average points of each of the questions have been given in the SPSS input separately in case of each of the factories visited during the surveys. The scale used in case of each of the feedback was five points Likert Scale. *Appendix B* will help understanding the structure of the questionnaire used in the survey.

5.1 Insight into the Productivity variables:

The productivity variables are those factors which play a significant role in increasing or decreasing the performance/productivity of the laborers working in the Ready-made Garments factories.

The variables of the productivity of the RMG workers have been chosen in light of the recommendations that the foreign buyers and agencies have been suggesting. However, the variables chosen in the study are more from the workers who are associated with the export-oriented Ready-made Garments units in Bangladesh.

The workers in the Bangladeshi RMG units are the ones who get the first hand experience of the total ready-made garments factory environment encompassing the management, human resources, and training and development facilities. It is only very much logical and hence imperative to take their own perspective of the variables that are of significance for increasing their productivity. But at the same time, as mentioned earlier, this study includes many issues, which do have significant influence on the productivity of the workers of the RMG units in Bangladesh. As a result, this study is pioneer in this field that scrutinizes to determine the major influencing productivity variables, which are responsible for increasing the productivity of the Bangladeshi Ready-made Garment laborers.

This study is a pioneering one also because it first determines the productivity variables which are responsible for the increased productivity of the Bangladeshi RMG workers. It then chooses scientifically (through hypotheses testing) the major determinants of the variables among the total chosen ones.

Then the degree of the influence is determined through regression analysis in order to find out the major influencing variables. These variables can be taken care of in order to increase the workers' productivity.

5.1.1 Quantifying the Qualitative data:

The data obtained by interviewing the workers with structured questionnaire, are of qualitative ones. But, since the workers were asked to rank the feedback in terms of assigning some numbers (5 point Likert Scale), thus the data became quantified and hence those data were made logical and comparable while comparing with quantitative data on "Productivity".

To testify to the validity of the methodology adopted in this thesis, reference may be made to the study titled "Critical Success Factors for the Poultry Entrepreneurs in Bangladesh" by Prof. Nazrul Islam, Professor of Business Administration, University of Khulna, and others who had also recoursed to the similar methodology. In their study, both primary and secondary sources were used for collecting data. Entrepreneurs selected on a judgmental basis from all firms were interviewed with a structured questionnaire. Additional variables were identified from the literature for the success of the entrepreneurs that were used in the questionnaire. The respondents were asked to give their judgment against each of the variables (in a statement

form) in a 5 point Likert scale (1 indicating strongly disagree and 5 indicating strongly agree). Secondary data were collected from the available research studies. Factor analysis has been conducted for reducing the large number of variables into explanatory factors. Using Varimox method (Orthogonal rotation), principal component analysis technique was used in factor analysis using the SPSS (Statistical Package for the Social Sciences).

Fifteen factors were identified as crucial for success in poultry business. These factors explained more than 80% of the variability of data. The results show that the entrepreneurial success of poultry business highly depends on sociopolitical orientation of the entrepreneurs. Achievement motivation, efficiency, commitment towards work, dynamism and self-confidence are also found to be crucial for success in poultry farm operation. The other factors include profit seeking, flexibility, instant decision making capability, cooperation from the stakeholders, independence, knowledge of technology, continuous adjustment with environment, learning by experience, and enjoying work.

Thus, in this study, the comparisons were made between "Productivity" of workers with the different variables in "Paired Comparison" which was used in the "Hypotheses testing".

5.2 The Productivity variables:

The study has categorized five main types, which are mainly responsible for having significant influence over the productivity of the RMG workers of Bangladesh.

The five main categories of the productivity variables are:

- *Direct Influence*
- *Semi-Direct Influence*
- *HR Issues*
- *Working Condition*
- *Ethical Practices*

5.2.1 Explaining the variables:

The exact information that was gathered about the variables for the study are explained as follows.

- **Direct Influence:**
  - **Wage**: Remuneration received for the monthly work
  - **Payment of Wage On Time**: Monthly payment on the prescheduled time

- **Recruitment Policy**: The workers are employed through the "word of mouth" of the existing employees and by the advertisement posted at factory gate
- **Training & Development Facility**: Training provided in the initial stage to accommodate the worker with the machine and some special trainings are arranged on basis of necessity
- **Leave Facilities**: The numbers of days employees enjoy leave from the workplace including weekly and festival holidays
- **Medical Benefits (At the Premise)**: The facilities for the basic treatments with trained people within the factory
- **Medical Benefits (Off the Premise)**: In case of emergency and accidents the factory provides off the premise medical facilities.

➢ **Working Condition:**

- **Working Space**: The cubicle space including height, width, and length required by the laws
- **Cleanliness**: Proper cleanliness in the production floor
- **Restroom Facility & Condition**: Ample washing & resting facilities
- **Lighting Facility**: Properly lighted for smooth good working condition

- **Recreation Facility (Music)**: Centrally controlled music facility available for the entertainment of the workers
- **Break Facilities**: Work break for 15 minutes in the afternoon and during overtime period another break is given with snacks
- **Temperature Control**: Maintaining a soothing atmosphere through a stable temperate flow
- **Safety Measures**: Minimizing accidents and work hazards to maintain safety level as per the provision of law for the workers.

➢ **Ethical Practices**

- **Penalty:** Financial punishment for absenteeism, late coming etc
- **Dismissal:** Firing of an employee in any terms
- **Supervisor's Behavior:** The way immediate supervisor behaves with the workers

These were the factors that came out from the in-depth interviews which were later discussed with the workers and were asked about their satisfaction level on each factor along with reasons. Also they were asked to rank ten important factors that they think would affect their productivity.

5.3 Assumptions:

5.3.1 The Workers:

The socio-economic background of the workers who are engaged and employed in the Ready-made Garments industry of Bangladesh is more or less very much homogenous.

The majority of the workers come from rural areas. They often come to Dhaka in search of a job for a better living. Economically they belong to the poorest strata of the society. In the city, they reside in congested slums, often sharing a single room with many others like themselves, who also gathered in the city for a better living. Thus, the social-economic backgrounds of these workers are very much alike.

Therefore, it is only logical to assume safely that worker of one garment factory with the given environment and facilities would perform equally in other garments. Also, the turnover rate of the workers in the Ready-made Garment industry is relatively high. It is often found that the workers if made redundant by one garment factory management, easily gets another job in some other garments. This is because first of all it is relatively very easy to train these workers. Secondly, Bangladesh does mainly, CMT (cutting, making and trimming) jobs and not jobs of higher value addition for the international RMG markets.

5.3.2 The Opinions:

Since the workers were chosen randomly and responded very promptly, the visits to the factories were made only at a days notice, the opinions of the workers can be considered valid.

5.4 The Study:

The variables that had been chosen are the prominent dimensions of productivity of the laborers of the RMG sector of Bangladesh.

5.4.1 The Sample Size:

The sample size is the feedback of six hundred RMG workers of thirty-nine export-oriented RMG units in Dhaka city and Chittagong city of Bangladesh. As the background of the workers is very similar, the six hundred workers are likely to give opinions that can fall under normal distribution.

5.4.2 The experiment instrument:

These dimensions of the productivity were taken into account for the formulation of the instrument of experiment, i.e., *"The Questionnaire"*.

5.4.3 The experiment and the scale used:

From the questionnaire, the feedbacks obtained from the workers in terms of ticking the scores on the five points Likert scales, the variables have been used as input for factor analysis and Regression analysis.

As the sample size which was used (39 Export oriented RMG factories) is adequate to represents the typical picture of hundred percent export-oriented RMG factories in Bangladesh. This study will definitely be helpful in determining the true picture of the RMG factories of Bangladesh engaged in export.

The ranking reflects the most significant to relatively less significant productivity dimensions that can be emphasized and prioritized in order to enhance the productivity of the RMG workers of Bangladesh.

5.4.4 The Scope and the Limitations:

The scope of the study is within the hundred percent export-oriented Ready-made Garments factories located in Dhaka and Chittagong, owned and run by Bangladeshi management. The study is valid for the RMG units of the least developed countries like Nepal, Maldives, Bhutan, Sri Lanka who share common features of the hundred percent export-oriented RMG units of Bangladesh, owned and operated by the local owners.

5.5 The Findings and Analysis of the study:

5.5.1 Sample Descriptive Statistics

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Labor Productivity	39	8.92	.64	9.56	4.2794	2.34528	5.500
Length of service	39	7.10	2.50	9.60	4.7789	1.74838	3.057
Length of service in company	39	5.23	1.00	6.23	3.0562	1.30679	1.708
Length of service in current position	39	4.85	.50	5.35	2.2594	1.33267	1.776
Wage Satisfaction	39	3.20	1.40	4.60	3.6779	.94949	.902
Timely Payment Satisfaction	39	3.75	1.25	5.00	3.7600	1.13017	1.277
Working Hour Satisfaction	39	3.35	1.45	4.80	3.6668	.91401	.835
Machine condition satisfaction	39	3.45	1.55	5.00	3.8685	.97328	.947
Overtime Satisfaction	39	3.45	1.55	5.00	3.7591	.85944	.739
Working Space	39	3.45	1.55	5.00	3.9156	1.01120	1.023
Break Facility	39	3.25	1.75	5.00	3.7118	.88591	.785
Machine Layout	39	3.20	1.80	5.00	3.8847	.95589	.914
Inventory Control	39	2.85	2.15	5.00	3.8756	.89135	.794
Product Design	39	3.00	2.00	5.00	3.7840	.87278	.762
Performance Appraisal	39	3.50	1.50	5.00	3.5999	1.02432	1.049
Recruitment Policy	39	2.45	2.55	5.00	3.7694	.70065	.491
Training & Development	39	3.25	1.75	5.00	3.3460	.89988	.810

Cleanliness	39	2.15	2.85	5.00	4.3108	.60704	.368
Restroom facility	39	2.45	2.55	5.00	3.6551	.83970	.705
Temperature control	39	3.10	1.90	5.00	3.6286	.84518	.714
Lighting facility	39	3.35	1.65	5.00	3.8369	1.14610	1.314
Recreation facility	39	3.50	1.33	4.83	3.2337	.89773	.806
Leave facility	39	3.70	1.30	5.00	3.5385	1.01459	1.029
Medical benefit (at the premise)	39	2.70	2.30	5.00	3.6282	.95365	.909
Medical benefit (off the premise)	39	3.00	2.00	5.00	3.3815	.84742	.718
Safety measures	39	2.95	2.05	5.00	4.0110	.91998	.846
Ethical practice - dismissal	39	2.35	2.65	5.00	3.6712	.69925	.489
Ethical practice - penalty	39	2.75	2.25	5.00	3.6202	.92634	.858
Ethical practice - Supervisors behavior	39	3.50	1.50	5.00	3.7721	.97803	.957
Team & Colleague	39	3.45	1.55	5.00	3.6168	.85571	.732
Top Management	39	2.15	2.45	4.60	3.5919	.62900	.396
Free lunch, free snacks, free daycare service	39	4.10	1.30	5.40	3.9474	.96297	.927
Monthly meeting	39	3.31	1.40	4.71	3.6392	.71625	.513

5.5.2 Measurement of Reliability

Reliability estimates are required when variables developed from summated scales are used as predictor components in objective models. The internal

consistency reliability of survey instruments is a measure of reliability of different survey items intended to measure the same characteristic. Cronbach's alpha is a numerical coefficient of internal consistency reliability. Computation of alpha is based on the reliability of a test relative to other tests with same number of items, and measuring the same construct of interest (*Hatcher, 1994*). According to Nunnaly J (1978), a proposed psychometric instrument should only be used if an α value of 0.70 or higher is obtained on a substantial sample.

Reliability Coefficients

No. of Cases = *39.0*

No. of Items = *29*

Alpha = *0.9776*

The value of α = 0.98, which is substantially higher than the prescribed acceptance value of 0.7. Hence, it can be concluded emphatically that the variables considered have reliably measured the construct of labor productivity.

5.5.3 Modes of Analysis

Since the proposed model necessitates the use of Multi-variate mode of analysis, commensurate analytical tools were utilized. The primary mode of analysis entailed of Factor Analysis (Principle Factor Analysis). This mode of

analysis is used to uncover the latent structure (dimensions) of the set of variables. Our main objective is to reduce the large number of variables to a smaller number of factors for modeling purposes because the large number of variables precludes modeling all the measures individually. During the conductance of the factor analysis, both exploratory factor analysis and Confirmatory factor analysis would be utilized. Exploratory factor analysis would be used to uncover the underlying structure of the relatively large set of variables. Our à priori assumption is that any indicator may be associated with any factor and factor loadings would be used to intuit the factor structure of the data. Confirmatory factor analysis would be utilized to determine if the number of factors and the loadings of measured (indicator) variables on them conform to what is expected based on pre-established theory. Our à priori assumption is that each factor (the number and labels of which has been specified beforehand) is associated with a specified subset of indicator variables. As the extraction method, Principal Component Analysis would be undertaken. Consequently, Varimax rotation which is an orthogonal rotation of the factor axes to maximize the variance of the squared loadings of a factor (column) on all the variables (rows) in a factor matrix will be undertaken. A Varimax solution yields results which make it as easy as possible to identify each variable with a single factor.

Furthermore, a Multiple Regression Analysis would be conducted on the factor component to ascertain the factor that explains the variance of labor productivity to the greatest extent. The findings from the regression analysis would primarily allow us to predict the labor productivity of factories in the RMG Industry through gathering data on the relevant variables. Furthermore, we would be able to identify a set of variables that play a pivotal role in determining labor productivity.

In the end, a correlation analysis would be undertaken to explore the relationship between the personal characteristics of the labor force and their level of satisfaction with various variables.

5.6 Findings of the Research

This section discusses the outcomes that have resulted from the various modes of analysis that were discussed previously.

5.6.1 Findings from Factor Analysis

Total Variance Explained by Factors

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	21.096	65.926	65.926
2	2.751	8.598	74.524
3	1.853	5.790	80.314
4	1.183	3.698	84.011
5	1.065	3.328	87.340

Extraction Method: Principal Component Analysis.

The analysis concludes that there are five (5) latent dimensions that could be considered as underlying factors that encompasses the 32 variables that were initially considered. The factors in combination explain approximately 87.3% of the variance in the data, which indicates that the predictive validity of the model is considerably high. The most important factor among these five is the first component, which in isolation accounts for 65.93 % of the variance in the data. The other components appear to be of lesser consequence as they account for a relatively lesser magnitude of variance in the data. The factors signify two aspects. Firstly, each factor measures some part of a common aspect. Secondly, each factor also captures a unique aspect that is not addressed by any other factor. In the following sections, each of the components would be explored in detail.

Factor 1:

The first factor is considered as the most important component as it explains 65.93 % variance in the data and has an Eigen value of 21.1. The factor includes of 20 variables that are listed below:

No.	Variable	Communalities (Extraction)	Factor Loading
1	Wage Satisfaction	0.832	0.79
2	Timely Payment Satisfaction	0.935	0.78
3	Working Hour Satisfaction	0.888	0.71
4	Machine condition satisfaction	0.889	0.65
5	Overtime Satisfaction	0.882	0.78
6	Working Space	0.945	0.80
7	Break Facility	0.818	0.60
8	Machine Layout	0.900	0.75
9	Inventory Control	0.896	0.70
10	Product Design	0.814	0.71
11	Performance Appraisal	0.945	0.78
12	Recruitment Policy	0.873	0.43
13	Cleanliness	0.861	0.75
14	Temperature control	0.829	0.73
15	Lighting facility	0.875	0.67
16	Recreation facility	0.787	0.71
17	Safety measures	0.764	0.69
18	Ethical practice – Supervisors behavior	0.861	0.79
19	Team & Colleague	0.872	0.84
20	Top Management	0.882	0.75

The high value of factor loadings for nearly all the variables (>0.70) indicates that there is a substantial relationship between the factor and the variables that constitutes the factors. Hence, it can be successfully concluded that these variables belong to this factor. Furthermore, the high values for communalities (>0.80) indicates that substantial relationship exists between each of the variables and the rest of the variables jointly. It indicates that each of these variables belong to the same underlying construct.

Factor 2:

The second factor explains 8.60 % variance in the data and has an Eigen value of 2.75. The factor includes of 6 variables which are listed below:

No.	Variable	Communalities (Extraction)	Factor Loading
1	Restroom facility	0.88	0.62
2	Leave facility	0.88	0.64
3	Medical benefit (at the premise)	0.96	0.72
4	Medical benefit (off the premise)	0.87	0.83
5	Ethical practice - dismissal	0.88	0.65
6	Ethical practice - penalty	0.92	0.78

The high value of factor loadings for nearly all the variables (>0.60) indicates that there is a substantial relationship between the factor and the variables that constitutes the factors. Hence, it can be successfully concluded that these variables belong to this factor. Furthermore, the high values for communalities (>0.80) indicates that substantial relationship exists between

each of the variables and the rest of the variables jointly. It indicates that each of these variables belong to the same underlying construct.

Factor 3:

The third factor explains 5.80 % variance in the data and has an eigenvalue of 1.85. The factor includes of three variables, which are listed below:

No.	Variable	Communailities (Extraction)	Factor Loading
1	Length of service	0.90	0.91
2	Length of service in company	0.92	0.84
3	Length of service in current position	0.91	0.70

The high value of factor loadings for nearly all the variables (>=0.70) indicates that there is a substantial relationship between the factor and the variables that constitutes the factors. Hence, it can be successfully concluded that these variables belong to this factor. Furthermore, the high values for communalities (>=0.90) indicates that substantial relationship exists between each of the variables and the rest of the variables jointly. It indicates that each of these variables belong to the same underlying construct.

Factor 4:

The fourth factor explains 3.70 % variance in the data and has an eigenvalue of 1.18. The factor includes of two variables that are listed below:

No.	Variable	Communalities (Extraction)	Factor Loading
1	Recruitment Policy	0.87	0.71
2	Training & Development	0.91	0.86

The high value of factor loadings for nearly all the variables (>0.70) indicates that there is a substantial relationship between the factor and the variables that constitutes the factors. Hence, it can be successfully concluded that these variables belong to this factor. Furthermore, the high values for communalities (>=0.90) indicates that substantial relationship exists between each of the variables and the rest of the variables jointly. It indicates that each of these variables belong to the same underlying construct.

Factor 5:

The fifth factor explains 3.33 % variance in the data and has an even value of 1.07. The factor includes of 2 variables, which are listed below:

No.	Variable	Communalities (Extraction)	Factor Loading
1	Free lunch, free snacks, free daycare service	0.83	0.69
2	Monthly meeting	0.72	0.82

The high value of factor loadings for nearly all the variables (>0.70) indicates that there is a substantial relationship between the factor and the variables that constitutes the factors. Hence, it can be successfully concluded that these variables belong to this factor.

Furthermore, the high values for communalities (>=0.69) indicates that substantial relationship exists between each of the variables and the rest of the variables jointly. It indicates that each of these variables belong to the same underlying construct.

5.6.2 Findings from Regression Analysis

Subsequent to the factor analysis on the dataset, a multiple regression analysis was undertaken to identify the nature of the relationship of the variables with labor productivity (positive or negative) and to ascertain the strength of the relationship of the variables with labor productivity (magnitude). The results of the regression analysis are provided below:

Factor 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.874	.764	.528	1.61072

The R Square value of 0.764 means approximately 77 percent of the variation in labor productivity is explained by the variables considered. Since R^2 at most can be 1, we can say that the regression line fits the data extremely well i.e. the actual data points are very tightly clustered around the estimated regression line. The difference between R Square (0.764) and Adjusted R Square (0.528) indicates that a misspecification error might have taken place. This might have resulted from the failure to include other variables that affect labor productivity. However, since the magnitude of the difference is small (0.2) it is improbable for any misspecification error to have occurred.

Factor 2

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	159.718	19	8.406	3.240	.007
	Residual	49.294	19	2.594		
	Total	209.012	38			

It is also observed from the p-value of the F-statistic, that the regression is significant at $\alpha = 0.05$ (5 percent) level of significance. Hence, we can conclude that there exists a significant linear relationship between the variables considered and labor productivity. Therefore, it can be concluded that the predictive capability of this model is considerable i.e. with given data on the variables considered; this regression equation can be effectively used to predict labor productivity.

Coefficients

Model		Unstandardized Coefficients		t	Sig.	Correlations		
		B	Std. Error			Zero-order	Partial	Part
1	(Constant)	-5.721	3.485	-1.642	.117			
	Wage Satisfaction	2.645	.743	3.558	.002	.122	.632	.396
	Timely Payment Satisfaction	-2.215	1.150	-1.926	.069	-.156	-.404	-.215
	Working Hour Satisfaction	-1.295	1.908	-.679	.506	-.074	-.154	-.076
	Machine condition satisfaction	-.371	1.620	-.229	.821	-.036	-.053	-.026
	Overtime Satisfaction	-3.889	1.511	-2.575	.019	-.130	-.509	-.287
	Working Space	.712	1.587	.448	.659	-.074	.102	.050
	Break Facility	.663	1.183	.561	.581	-.056	.128	.063
	Machine Layout	-.252	1.028	-.245	.809	-.006	-.056	-.027
	Inv. Control	1.825	1.278	1.428	.169	.017	.311	.159
	Product Design	-.957	1.013	-.945	.357	-.037	-.212	-.105
	Performance Appraisal	2.119	1.520	1.394	.179	-.009	.305	.155
	Cleanliness	3.663	1.520	2.409	.026	.089	.484	.268
	Temperature control	-1.198	.753	-1.592	.128	.054	-.343	-.177
	Lighting facility	-.699	1.175	-.595	.559	-.154	-.135	-.066
	Recreation facility	-.336	.585	-.575	.572	.019	-.131	-.064
	Safety measures	-.330	.827	-.399	.695	-.119	-.091	-.044
	Ethical practice - Supervisors behavior	-1.134	1.498	-.757	.458	-.018	-.171	-.084
	Team & Colleague	.828	1.072	.772	.449	.031	.174	.086
	Top Management	2.504	1.779	1.407	.176	.170	.307	.157

As the regression results show, there is a positive association between Wage Satisfaction, Working Space, Break Facility, Inventory Control, Performance Appraisal, Cleanliness, Team & Colleague and labor productivity. Among these variables, there exists significant relationship between Wage Satisfaction & Cleanliness. In relation to other variables, the magnitudes of the slope coefficients of these variables also indicate that they are substantial determinants of labor productivity.

Furthermore, the partial correlation coefficients of Wage Satisfaction & Cleanliness, 0.632 & 0.434 respectively, indicates that with a higher level of satisfaction with Wage Satisfaction & Cleanliness among the workers, labor productivity will increase.

Factor 3

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	46.465	3	15.488	3.335	.030
	Residual	162.547	35	4.644		
	Total	209.012	38			

It has been observed from the p-value of the F - statistic, that the regression is significant at $\alpha = 0.1$ level of significance. Hence, we can conclude that there exists a significant linear relationship between the variables considered and labor productivity.

Coefficients (a)

Model		Un standardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	**3.828**	1.073		3.567	**.001**			
	Length of service	**-.741**	.330	-.552	**-2.244**	**.031**	-.067	-.355	**-.334**
	Length of service in company	**2.186**	.718	1.218	3.045	**.004**	.168	.458	.454
	Length of service in current position	**-1.191**	.610	-.677	**-1.951**	**.059**	.028	-.313	**-.291**

As the regression results show, there is a significant positive association between length of service in company and labor productivity. However, there is a significant negative association between length of service, length of service in current position and labor productivity. Among these variables, there exists significant relationship between Wage Satisfaction & Cleanliness. In relation to other variables, the magnitudes of the slope coefficients of these variables also indicate that they are substantial determinants of labor productivity.

Furthermore, the partial correlation coefficients of length of service in company, 0.458, indicate that with a higher level of service in the current company, labor productivity will increase.

The regression analysis of the other components has not been provided as no significant linear relationship was found between the independent variables and labor productivity.

5.6.3 Findings from Correlation Analysis

Another mode of analysis was conducted on the data, independent of the two previous forms of analysis. A correlation matrix was developed to ascertain the strength of the relationship between the personal characteristics of the workers and their level of satisfaction with the various dimensions.

Correlation Matrix

		Length of service	Length of service in company	Length of service in current position
Length of service	Pearson Correlation	1	.796(**)	.715(**)
	Sig. (2-tailed)	.	.000	.000
Length of service in company	Pearson Correlation	.796(**)	1	.903(**)
	Sig. (2-tailed)	.000	.	.000
Length of service in current position	Pearson Correlation	.715(**)	.903(**)	1
	Sig. (2-tailed)	.000	.000	.
Wage Satisfaction	Pearson Correlation	.244	.423(**)	.529(**)
	Sig. (2-tailed)	.134	.007	.001
Timely Payment Satisfaction	Pearson Correlation	.365(*)	.460(**)	.662(**)
	Sig. (2-tailed)	.022	.003	.000
Working Hour Satisfaction	Pearson Correlation	.370(*)	.540(**)	.673(**)
	Sig. (2-tailed)	.021	.000	.000
Machine condition	Pearson Correlation	.487(**)	.677(**)	.752(**)

satisfaction				
	Sig. (2-tailed)	.002	.000	.000
Overtime Satisfaction	Pearson Correlation	.421(**)	.574(**)	.675(**)
	Sig. (2-tailed)	.008	.000	.000
Working Space	Pearson Correlation	.257	.482(**)	.624(**)
	Sig. (2-tailed)	.115	.002	.000
Break Facility	Pearson Correlation	.539(**)	.693(**)	.770(**)
	Sig. (2-tailed)	.000	.000	.000
Machine Layout	Pearson Correlation	.406(*)	.618(**)	.730(**)
	Sig. (2-tailed)	.010	.000	.000
inv. Control	Pearson Correlation	.478(**)	.687(**)	.781(**)
	Sig. (2-tailed)	.002	.000	.000
Product Design	Pearson Correlation	.352(*)	.547(**)	.701(**)
	Sig. (2-tailed)	.028	.000	.000
Performance Appraisal	Pearson Correlation	.428(**)	.617(**)	.740(**)
	Sig. (2-tailed)	.007	.000	.000
Recruitment Policy	Pearson Correlation	.200	.516(**)	.644(**)
	Sig. (2-tailed)	.222	.001	.000
Training & Development	Pearson Correlation	.107	.541(**)	.634(**)
	Sig. (2-tailed)	.515	.000	.000
Cleanliness	Pearson Correlation	.410(**)	.607(**)	.696(**)
	Sig. (2-tailed)	.010	.000	.000
Restroom facilty	Pearson Correlation	.506(**)	.597(**)	.768(**)
	Sig. (2-tailed)	.001	.000	.000
Temperature control	Pearson Correlation	.534(**)	.621(**)	.705(**)
	Sig. (2-tailed)	.000	.000	.000
Lighting facilty	Pearson Correlation	.432(**)	.603(**)	.711(**)
	Sig. (2-tailed)	.006	.000	.000
Recreation facility	Pearson Correlation	.039	.255	.318(*)
	Sig. (2-tailed)	.813	.117	.049
Leave facilty	Pearson Correlation	.502(**)	.600(**)	.778(**)
	Sig. (2-tailed)	.001	.000	.000
Medical benefit (at the premise)	Pearson Correlation	.493(**)	.575(**)	.766(**)
	Sig. (2-tailed)	.001	.000	.000
Medical benefit (off	Pearson Correlation	.289	.427(**)	.607(**)

the premise)				
	Sig. (2-tailed)	.074	.007	.000
Safety measures	Pearson Correlation	.360(*)	.498(**)	.655(**)
	Sig. (2-tailed)	.024	.001	.000
Ethical practice - dismissal	Pearson Correlation	.369(*)	.568(**)	.718(**)
	Sig. (2-tailed)	.021	.000	.000
Ethical practice – penalty	Pearson Correlation	.448(**)	.470(**)	.660(**)
	Sig. (2-tailed)	.004	.003	.000
Ethical practice - Supervisors behavior	Pearson Correlation	.356(*)	.497(**)	.681(**)
	Sig. (2-tailed)	.026	.001	.000
Team & Collegue	Pearson Correlation	.155	.347(*)	.509(**)
	Sig. (2-tailed)	.345	.030	.001
Top Management	Pearson Correlation	.286	.458(**)	.610(**)
	Sig. (2-tailed)	.078	.003	.000
Free lunch, free snacks, free daycare service	Pearson Correlation	.170	.143	.129
	Sig. (2-tailed)	.302	.385	.435
Monthly meeting	Pearson Correlation	-.177	-.221	-.255
	Sig. (2-tailed)	.282	.176	.118

*** Correlation is significant at the 0.01 level (2-tailed).*
** Correlation is significant at the 0.05 level (2-tailed).*

There exists a significant positive relationship between length of service in the industry, length of service in current company and length of service in current position, with correlation coefficients of 0.796 & 0.715 respectively.

Furthermore, there exists a significant positive relationship between length of service in the company, length of service in industry and length of service in current position, with correlation coefficients of 0.796 & 0.903 respectively.

Finally, there exists a significant positive relationship between length of service in current position, length of service in industry and length of service in current company, with correlation coefficients of 0.715 & 0.903 respectively.

The high degree of association between length of service in the company and length of service in the current position indicates that there exists least amount of job rotation or alternation. Hence, the jobs are specialized in nature and opportunities for occupational flexibility are limited. This apparent lack of maneuverability can act as a potential de-motivating factor.

The high degree of association between length of service in the company and length of service in the industry indicates that there is little movement of workers within the industry. This might be an indicator of high occupational immobility, which might have emanated from high geographical immobility.

5.7 Predictive and Discriminant Validity

Multicollinearity in logistic regression models is a result of strong correlations between independent variables. The existence of multicollinearity inflates the variances of the parameter estimates. That may result, particularly for small and moderate sample sizes, in lack of statistical significance of individual independent variables while the overall model may be strongly significant. Multicollinearity may also result in wrong signs and magnitudes of regression coefficient estimates, and consequently in incorrect conclusions about relationships between independent and dependent variables.

The Variance Inflation Factor (VIF) is 1/Tolerance, it is always >= 1 and it is the number of times the variance of the corresponding parameter estimate is increased due to multicollinearity as compared to as it would be if there were no multicollinearity. There is no formal cutoff value to use with VIF for determining presence of multicollinearity. Values of VIF exceeding 10 are often regarded as indicating multicollinearity, but in weaker models, which are often the case in logistic regression; values above 2.5 may be a cause for concern.

In our dataset, a relatively high degree of multicollinearity was observed initially, with a high proportion of the variables displaying VIF values of above 10. Subsequent to the conductance of the factor analysis, the multicollinearity was substantially reduced; although the intentionality of principal component analysis to accomplish diminution in independent variable multicollinearity was non-existent. The effect was purely a derivative.

It should be noted, that multicollinearity not only can inflate or deflate the regression coefficients, but also may even change their signs. Hence, the Discriminant ability of our regression models – the capacity of the model to identify the effect of the individual independent variables on labor productivity, both their magnitude and nature of association- is limited. However, this does not pose any peril to the validity of the conclusions of this research. To reiterate the objectives, this research attempted to identify a set of variables that play a pivotal role in determining labor productivity. The regression models were developed only to evaluate the ability of the individual factors in explaining the variance in labor productivity. The high value of R^2 for Factor 1 indicates that the model has satisfactorily explained the variance. Since, we are not discriminating between the independent variables within the factors in respect to their magnitude and nature, this particular problem of multicollinearity is not applicable to the matter. In

addition, the F-statistic has validated the overall significance of the regression model, allowing us to conclude that the cumulative effect of the independent variables on labor productivity is highly significant.

Furthermore, it has been suggested that when the purpose of the regression analysis is prediction or forecasting, multicollinearity is not a serious problem because the higher the R^2, the better the prediction. Hence, the predictive ability of our regression models is highly valid.

Summary of Chapter Five

The study is focused to find out the relationship between the productivity variables and its significance in enhancing the productivity of the RMG factory workers of Bangladesh. How the initial set of thirty-two variables that can influence total productivity is shown in this chapter. Numerous factories were visited. Rigorous interviews have been taken to find out the impact of these variables on labor productivity. Applying various statistical tools the relationship of the individual variable and labor productivity was checked scrupulously. Nineteen main variables have been identified through the analysis, which plays a pivotal role in the determination of labor productivity. After the identification of the major influencing variables of labor productivity, it is necessary to draw conclusions of the entire research. In the next chapter conclusion is drawn and some recommendations have been made.

Chapter 6

CONCLUSION AND RECOMMENDATIONS

THIS CHAPTER INCLUDES

Chapter Six

Conclusion and Recommendation

The research has successfully identified a set of 19 variables from an initial set of 32 independent variables, which it believes plays a pivotal role in the determination of labor productivity. There appears to be little inter-relationship within the variables, the appearance of an apparent pervading principle that binds all the variables in a comprehensive whole is absent. However, this very phenomenon can also be regarded as the major potency of this research.

Although the chosen variables have diminutive inter-relationships, they are highly representative of the larger set of variables from which they were derived. Thus, this selected set of variables retains the ability to provide an all-embracing perspective on productivity i.e. they reflect on the different facets of labor productivity and simply do not provide a one-dimensional inspection of productivity.

The diversity and profusion of the selected set of variables, displayed by the low correlations between them, indicates that the variables themselves are individual concepts and are not simply the manifestations of an underlying

notion. The distinctiveness of each of the variables indicates that each of them are equally vital in establishing labor productivity and thus demand equal attention. This provides the management of the RMG manufacturers with the opportunity to select a subset from among the proffered variables that they themselves deem important under their context.

In conclusion, this research leaves the management of RMG manufacturers with a prescription. It provided them with a fixed set of factors against which they can compare the performance of their organizations and ascertain the aspects where they are deficient. This diagnosis and consequent treatment of problem areas would not only benefit them with direct monetary gains through higher labor productivity but also reward them with a highly motivated and satisfied labor force.

As the RMG industry is providing a basis for further industrialization in the economy of Bangladesh, it has become an imperative on the part of policy makers in the country and the international community to support the dynamic growth from all sides. For that purpose, improvement in labor productivity variables identified in this thesis should be accepted as instrumental directly and indirectly along with infrastructural improvement highlighted by many others including BGMEA, CPD and ILO. As a dominant

employment generating sector, RMG industry can contribute significantly to MDG by reducing the poverty level to half by the year 2015.

6.1 *Strength of the Study*

The study firstly helps to determine the more significant factors that play significant influencing power regarding the productivity enhancement of the ready-made garments factory workers. These variables have been much debated about for so long, but the more significant influencing productivity variables have not been found out as this in this study.

The second strength of the study is that, the variables that were found out were more of a blender of "Pure observation" and "The workers' experience". The reason why these variables have been chosen using these two approaches is that, no matter what it may appear on observation, it is the workers who are operating in a particular type of factory environment. So, for a proper, comprehensive study, and also to minimize the chances of choosing the inappropriate variables that may not have any significant impact on the RMG workers' productivity, both of the styles were used.

The third strength of the study is the finding out of the more significant productivity variables. This works very usefully in two ways. First, as the more influencing variables are found out, it becomes easy for the garment factory

management to concentrate on the productivity variables. This will, in effect, help the management in two ways. Firstly, they will be able to focus on the crucial factors of productivity and take the necessary steps to increase the workers' productivity. Secondly, this focused approach will help save the factory managers two of their most valuable resources: time and money. The management can now obtain a greater and effective leverage in enhancing the productivity of ready-made garments factory workers.

It will also be very much helpful to the foreign investors in knowing the more significant variables of the Bangladeshi RMG workers.

The fourth strength of the study is that, it has helped rank the productivity variables in order of significance. The ranking of the factors help the management determine the more significant areas to emphasize at a time. The approach then becomes "Rifle" (focused) approach rather than "Shot-gun approach" (diffused).

The development partners have been urging for incorporating certain required changes in the working environment and the management styles of the Bangladeshi RMG factories. These suggestions have been ignored by the local RMG factory owners. This is because the local RMG factory owners could not determine the more important factors to focus on. At the same time incorporating changes such as installing air cooler, providing free lunch on the job, or providing hygienic drinking water seemed too expensive to do at a

time. Now, that the factors have been determined and the significance has also been found out, the management will now try to incorporate the changes logically and systematically. This will not make the changes seem very radical and expensive. Thus, the significance of the suggestions of the development partners is determined as per Bangladeshi RMG workers of Bangladesh. Their suggestions have been well substantiated in this study.

Thus, this study is indeed a very significant one and will help enhance the productivity of the Bangladeshi RMG factory workers.

6.2 Limitations of the Study

The study entails the organizational behavior of the Bangladeshi ready-made garments factory workers and the investors. Thus, the countries with the socio-economic similarity as that of Bangladesh can mainly benefit from the study.

The size of the capital investment of the RMG factories would have been helpful if it could be determined from the survey. This would have given the idea of the prevailing working environment of any particular size (in term of capital investment) of export-oriented RMG factories and the possible areas of concern where they can focus. However, the RMG factory owners kept that

information deliberately undisclosed and the labeled the information as "classified".

As the background of the RMG workers of Bangladesh is unique especially, the inherent quality that they are born with regarding stitches, the factors these workers seem very important to them may not necessarily be the same for the RMG workers of other LDC who may have similar socio-economic background. Nevertheless, the study will definitely help the RMG factory owners of the LDCs to realize the significance of many factors that are very much important to consider in motivating the RMG factory workers to higher productivity.

6.3 Contribution of the study:

The study by nature is a pioneering one. This study reveals the productivity factors/variables, which if taken care of is likely to lead to increase the productivity of the RMG factory workers of Bangladesh.

The study also finds out the relationship between each factor with productivity of workers in paired comparison test. This helps to find out the nature of relationship of each of the productivity variables (whether strong or weak) and thus determine the significant productivity variables.

The productivity factors/variables are finally ranked in order of importance. Thus, in this study, it had been feasible to:

- Calculate the productivity of the RMG laborers and determine the more influencing variables
- Identify the critical variables of the labor productivity through (Hypotheses testing),
- Rank those variables according to their degree of bearing on the productivity of the RMG workers (by Regression analysis), and
- Compare the intra-factory labor productivities, the reasons for varying the productivity and finally
- Suggest ways to improve the laborers' productivity based on the findings of the research.

The study will contribute nationally in enhancing the productivity of the RMG workers. The factory owners as well as the government of Bangladesh can benefit themselves greatly from the study. The reason is that this study reveals the areas of concern, which must be taken care of both by the entrepreneurs and the government.

The future investors in RMG are also informed with substantiated facts about the strength of Bangladeshi RMG units. Thus, many potential investors are likely to come up for investing in Bangladesh for cheap and abundant labor supply from around the world.

The study can be simulated in any other countries with different relevant variables in order to help increase the productivity of the RMG factory workers. Thus, the study can be used as a reference model internationally too.

6.4 Agenda of future research

This study has revealed the important productivity variables chosen, both as observed and as the workers preferred and much purposeful research can be done in future.

The change of the preference can be observed if trend analysis is done by the future researchers.

The variables found out may have different significance that can be analyzed in future studies.

Since, the backward linkage industries and training institutes are lacking during these days, the presence of these two important factors can be considered in the study of the RMG workers' productivity in future.

This study can be further used in determining the major productivity variables in relation to the size of capital investment in future.

Each of the variables can be studied separately as a part of research studies by researchers working in other different research areas.

Team approach to management development tried in Sri Lanka may be applied by researchers in the future to improve firm level productivity.

Impact of IT on labor productivity can also be studied.

Corporatization and introduction of corporate culture may be studied and encouraged by policy makers.

Introduction and impact of workers security scheme and profit sharing may also be studied.

REFERENCE

REFERENCE

Articles:

Dr. Martelli Associates (1998). "Textile and Clothing Industry of Bangladesh in a changing World Economy". *IFC–WASHINGTON.* pp.16-35.

Krugman, Paul. 1994. "The Myth of Asia's Miracle," *Foreign Affairs*, 73: 62-78.

Raihan (1999). "The Textile and Clothing Industry of Bangladesh: In a Changing world economy". *Center for Policy Dialogue,* report no. 18, pp. 267- 275

Rao, Bhanoji and David Owyong. 1997. "Sources of Growth in the Singapore Economy: Some New Results," paper presented at the Taipei International Conference on Efficiency and Productivity Growth, Academia Sinica

Spinanger D. (2000). "The WTO, ATC and Textile and Clothing In a Global Perspective: What's in it for Bangladesh?" *Center for Policy Dialogue, paper: 8, pp. 3-10*

Spinanger D. and Wogart J.P. (2000). "Will the Emperor Wear Clothes from Bangladesh in 2005?" *Sustainable Trade in Textile and Clothing.* pp.31-37

Young, Alwyn. 1992. "A Tale of Two Cities," *NBER Macroeconomics Annual 1992*, Oliver J. Blanchard and Stanley Fischer, eds. Cambridge, MA: MIT Press, pp 13-54.

Nazrul Islam, Md. Mizanur Rahman and Muhammad Ziaulhaq Mamun. (2002). "Critical Success Factors for the Poultry Entrepreneurs in Bangadesh". *Journal of Business Administration. Vol-28, July and October, 2002.*

Books:

Center for Policy Dialogue(CPD) (2003). *Phasing out of the Apparel Quota.* 1st Edition. The University Press Limited, pp. 39-62

Heckscher, Eli and Bertil Ohlin (translated and edited by Harry Flam and M. June Flanders). 1991. *Heckscher-Ohlin trade theory.* Cambridge, Mass.: MIT Press

Helpman, Elhanan and Paul Krugman. 1985. *Market structure and foreign trade,* Cambridge, Massachusetts: MIT Press
Hollander S(1979)., *The Economics of David Ricardo* (Buffalo, NY: The University of Toronto Press

The Readymade Garments Industry of Bangladesh (2004), Hafiz G.A. Siddiqi.

Islam S.(2001). *The Textile and Clothing Industry of Bangladesh in a Changing World Economy.* 1st Edition. The University Press Limited, pp. 70 – 81

Ricardo D(1817)., *The Principles of Political Economy and Taxation* (Homewood, IL: Richard Irwin)

Reports:

IFC (1999)
Bangladesh Bureau of Statistics, 1997, Statistical Yearbook of Bangladesh, (Dhaka, Government of Bangladesh).

Government of People's Republic of Bangladesh, Ministry of Finance, 2005, Bangladesh Economic Review 2005(Dhaka).

Centre for policy Dialogue, 2001, Policy Brief on Industry and Trade.

The Fifth Five Year Plan 1997-2002, Planning Commission, Ministry of Planning, Government of Bangladesh

Websites:

http://www.independent.org/pdf/working_papers/53_sweatshop.pdf

http://yaleglobal.yale.edu/about/pdfs/decoding_cancun.pdf

http://nobelprize.org/economics/educational/trade/ohlin.html

http://courses.ag.uidaho.edu/aers/agecon524/NewTradeTheory.pdf

http://en.wikipedia.org/wiki/Heckscher-Ohlin_model

http://cepa.newschool.edu/het/profiles/ricardo.htm

http://www.apo-tokyo.org/productivity/016_prod.pdf

http://www.banglapedia.org/

http://www.bangladesh.net/article_bangladesh/investment_and_industry/investment_and_industry_main.htm

www.britannica.com/eb/article-33440

www.cpd-bangladesh.org

Appendix A

Notes on Factor Analysis

1. Factor analysis is used to uncover the latent structure (dimensions) of a set of variables. It reduces attribute space from a larger number of variables to a smaller number of factors and as such is a "non-dependent" procedure.

2. Rotation serves to make the output more understandable and is usually necessary to facilitate the interpretation of factors. The sum of eigenvalues is not affected by rotation, but rotation will alter the eigenvalues (and percent of variance explained) of particular factors and will change the factor loadings.

3. Varimax rotation is an orthogonal rotation of the factor axes to maximize the variance of the squared loadings of a factor (column) on all the variables (rows) in a factor matrix, which has the effect of differentiating the original variables by extracted factor. Each factor will tend to have either large or small loadings of any particular

variable. A Varimax solution yields results, which make it as easy as possible to identify each variable with a single factor.

4. Communality is the squared multiple correlation for the variable using the factors as predictors. The communality measures the percent of variance in a given variable explained by all the factors jointly and may be interpreted as the reliability of the indicator.

5. The eigenvalue for a given factor measures the variance in all the variables, which is accounted for by that factor. The ratio of eigenvalues is the ratio of explanatory importance of the factors with respect to the variables. If a factor has a low eigenvalue, then it is contributing little to the explanation of variances in the variables and may be ignored as redundant with more important factors.

6. The factor loadings, also called component loadings in PCA, are the correlation coefficients between the variables (rows) and factors (columns). Analogous to Pearson's r, the squared factor loading is the percent of variance in that variable explained by the factor. To get the percent of variance in all the variables accounted for by each factor,

add the sum of the squared factor loadings for that factor (column) and divide by the number of variables.

7. Multicollinearity in logistic regression models is a result of strong correlations between independent variables. The existence of multicollinearity inflates the variances of the parameter estimates. That may result, particularly for small and moderate sample sizes, in lack of statistical significance of individual independent variables while the overall model may be strongly significant. Multicollinearity may also result in wrong signs and magnitudes of regression coefficient estimates, and consequently in incorrect conclusions about relationships between independent and dependent variables.

Appendix B

	Visa Performance of Quota Year-2003										Quota Distributed in 2004			
	IMPORT			LOCAL								Free Quota		EPB List
	DHK	CTG	Total Import 2003	DHK	CTG	Total Local 2003	Special Shift	TOTAL Performance	% of Prorata	Total Distributed	Surrender Given 2004	IMP	LOC	Total Distributed Quota in 2004
237	119,601	62,655	182,256	43,664	-	43,664		225,920	1.65	372,768	89,529	36,817		499,114
331	-	-	-	-	-	-		-	0	-	-		-	-
334	183,605	99,760	283,365	6	-	6		283,371	1.12	317,376	6,729	11,232	8,986	344,323
335	357,760	39,498	397,258	-	-	-		397,258	1.3	516,435	22,038	20,164	-	558,637
336/636	412,570	148,832	561,402	-	-	-		561,402	1.34	752,279	123,204	35,858	-	911,341
338/339	1,310,175	911,553	2,221,728	259,402	30,933	290,335		2,512,063	1.09	2,738,149	85,955	104,308	83,446	3,011,858
340/640	3,667,780	1,073,839	4,741,619	468,638	20,761	489,399		5,231,018	1.1	5,754,120	276,393	236,123	188,898	6,455,534
341	2,217,684	892,379	3,110,063	4,838	-	4,838		3,114,901	1.24	3,862,477	414,310	195,086	156,069	4,627,942
342/642	530,808	234,614	765,422	-	-	-		765,422	1.11	849,618	9,381	33,352	-	892,351
347/348	2,027,704	941,835	2,969,539	266,775	50,480	317,255		3,286,794	1.25	4,108,493	60,492	174,635	139,708	4,483,328
351/651	826,546	256,224	1,082,770	104,346	46,814	151,160		1,233,930	1.07	1,320,305	9,207	53,736	42,988	1,426,236
352/652	6,582,759	8,922,512	15,505,271	602,988	468,949	1,071,937		16,577,208	1.17	19,395,333	382,753	802,621	642,096	21,222,803
363	12,916,328	28,149,624	41,065,952	6,428,632	1,419,110	7,847,742		48,913,694	0.99	48,424,557	575,093	2,004,182	1,603,346	52,607,178
369S	1,204,937	1,289,189	2,494,126	408,198	193,591	601,789		3,095,915	1.05	3,250,711	15,388	134,417	107,535	3,508,051
634	539,136	315,088	854,224		-	-		854,224	1.12	956,731	35,430	39,259	-	1,031,420
635	239,812	351,663	591,475	4,089	2,966	7,055		598,530	1.04	622,471	6,897	25,459	20,367	675,194
638/639	1,107,879	1,402,704	2,510,583	16,158	1,386	17,544		2,528,127	1.15	2,907,346	53,284	132,545	106,036	3,199,211
641	718,448	53,483	771,931	597	-	597		772,528	1.55	1,197,418	6,479	81,815	-	1,285,712
645/646	216,115	357,955	574,070	10,056	-	10,056		584,126	1.27	741,840	24,266	30,993	24,794	821,893
647/648	1,144,410	1,609,194	2,753,604	9,231	20,951	30,182		2,783,786	1.0925	3,041,286	17,075	110,716	88,573	3,257,650
VISA DATA SOURCE: EPB														
CHARGED DATA SOURCE: USTR WEB SITE														

APPENDIX C

Questionnaire:

Survey Questionnaire for Workers

1. Length of service in this sector:
2. Length of service in this company:
3. Length of service in this position:
4. Promotion sequence, if any:

5. Satisfaction level with wage:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

6. Satisfaction level with on time payment of wage:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

7. Satisfaction level with working hours:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

8. Satisfaction level with machine condition:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

9. Satisfaction level with overtime payment:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

10. Satisfaction level with working space:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

11. Satisfaction level with break facilities:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

12. Satisfaction level with machine layout:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

13. Satisfaction level with inventory control:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

14. Satisfaction level with product design:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

15. Satisfaction level with performance appraisal:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

16. Satisfaction level with recruitment policy:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

17. Satisfaction level with training & development facility:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

18. Satisfaction level with cleanliness:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

19. Satisfaction level with restroom facility & condition:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

20. Satisfaction level with temperature control:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

21. Satisfaction level with lighting facility:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

22. Satisfaction level with recreation facility (music or any):

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

23. Satisfaction level with leave facilities:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

24. Satisfaction level with medical benefits (at the premise):

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

25. Satisfaction level with medical benefits (off the premise):

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

26. Satisfaction level with safety measures:

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

27. Satisfaction level with ethical practices like

Dismissal

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

Penalty

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

Supervisor's behavior

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

28. Satisfaction level with team / colleagues

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

29. Satisfaction level with top-management interactions

1 (very bad) 2 3 (moderate) 4 5 (very good)
Reasons:

30. Significance of "Free-Lunch"/ "Free-Snacks"/ "Free-Day-care services"

1 (very low) 2 3 (moderate) 4 5 (very HIGH)
Reasons:

31. Significance of Monthly Meetings(where the top management listens to the complaints of the workers)

1 (does not matter)2 3 (would be good if it happened) 4 5 (It is very much Important and is much needed)
Reasons:

32. What according to you influences your productivity? Rank ten most important ones according to you.

- Wage
- Payment Of Wage On Time
- Working Hours
- Overtime Payment
- Working Space
- Break Facilities
- Machine Condition
- Machine Layout
- Inventory Control
- Performance Appraisal
- Recruitment Policy
- Training & Development Facility
- Cleanliness
- Restroom Facility & Condition
- Sanitary Facility & Condition
- Lighting Facility
- Recreation Facility (Music)
- Leave Facilities
- Medical Benefits (At The Premise)
- Medical Benefits (Off The Premise)
- Safety Measures
- Ethical Practices
- Others _____

33. What can be done to increase your productivity?

THANK YOU VERY MUCH

Open Ended Questionnaire for
In-depth Interview with Management Expert

1. Please comment on your factory's following points:
    - Wage
    - Payment Of Wage On Time
    - Working Hours
    - Overtime Payment
    - Working Space
    - Break Facilities
    - Machine Condition
    - Machine Layout
    - Inventory Control
    - Performance Appraisal
    - Recruitment Policy
    - Training & Development Facility
    - Cleanliness
    - Restroom Facility & Condition
    - Sanitary Facility & Condition
    - Lighting Facility
    - Recreation Facility (Music)
    - Leave Facilities
    - Medical Benefits (At The Premise)
    - Medical Benefits (Off The Premise)
    - Safety Measures
    - Ethical Practices

2. What according to you influences the labor productivity of your factory. Identify ten most important ones that you think are important at your factory (from the above list or others)?

3. What are the reasons of your comment?

4. Why do you think the differences exist?

5. What is your future plan for improvement?

6. Any recommendations:

THANK YOU VERY MUCH

APPENDIX D

Company Visited For the Productivity Analysis

SPSS data of direct Influencing Variables vs. Labor Productivity

	Name of the Company	No. of Workers	Labor Productivity	Wage Satisfaction	Timely Payment Satisfaction	Working Hour Satisfaction	Overtime Satisfaction	Product Design
1	MBM Garments Ltd	2500	3.01	4.10	5.00	4.75	4.75	5.00
2	Eden Garments Ltd	1000	2.50	3.60	3.40	3.45	3.45	3.50
3	Triangle Garments Ltd	350	1.80	4.45	4.95	4.75	4.80	4.70
4	Shezad Ltd.(knit)	1200	.64	4.00	4.80	4.00	4.00	3.60
5	Coast to Coast(knit)	2000	1.03	4.20	4.60	4.80	4.60	4.20
6	Logos Apparel(knit)	4000	9.53	3.75	3.75	3.60	3.90	3.75
7	Commitment Apparels Ltd.	550	6.41	1.40	1.40	2.60	2.65	2.00
8	Masse Manufacturing Ltd.	600	6.47	2.05	1.25	1.45	1.55	2.15
9	Outright Fashion Ltd.(knit)	1700	2.49	1.80	2.05	1.80	2.65	3.00
10	Knittex Industries Ltd(knit)	1250	4.20	4.30	4.00	3.25	4.35	4.50
11	Delta Composite Garments(knit)	3500	5.20	4.50	3.80	3.56	4.00	4.00
12	Rainbow Apparels(KNIT)	7200	4.60	4.60	3.60	3.70	4.00	3.86
13	Design & Fashions Ltd(woven)	550	7.20	4.33	3.80	3.60	4.20	4.50
14	Standard Group(woven)	7300	9.56	4.50	3.80	4.00	3.50	4.20
15	SAS Fashion Wear Ltd(woven)	6000	7.57	4.45	4.00	4.00	3.60	4.00
16	Evince Ladies Wear L	1200	1.58	3.25	4.05	3.70	3.40	3.60
17	Palmal Garments	2400	3.75	3.92	4.00	3.33	3.17	3.33

18	Stylecraft Limited	1600	2.25	3.83	3.83	3.42	3.17	3.33
19	Youth Group	1069	3.20	4.18	4.82	4.72	4.90	4.63
20	Bellisima Ltd.	745	2.10	4.10	5.00	4.60	4.70	5.00
21	Speedwell Ltd.	400	1.30	4.25	5.00	4.42	4.92	4.92
22	Jupiter(Knit)	450	3.14	4.00	5.00	4.60	5.00	2.40
23	Wooltex(knit)	412	2.56	3.80	5.00	4.30	4.20	5.00
24	Jamuna(woven)	1149	7.37	3.80	5.00	4.30	4.20	5.00
25	Impress Garments	550	5.09	4.00	5.00	4.50	4.35	4.65
26	Impress Allied	320	4.69	4.00	4.90	4.65	4.20	4.65
27	Interfab BD Ltd	1000	8.40	4.20	4.10	4.65	4.25	4.40
28	Commitment Apparels Ltd.	550	2.15	1.40	1.40	2.60	2.65	2.00
29	Masse Manufacturing Ltd.	600	6.47	2.05	1.25	1.45	1.55	2.15
30	Outright Fashion Ltd.	1700	2.50	1.80	2.05	1.80	2.65	3.00
31	IRIS KNITWEAR LTD(knit)	1750	6.70	4.50	4.00	4.30	4.00	3.25
32	Nahiyan Fashion Ltd(knit)	2000	5.60	4.33	4.00	3.75	4.30	3.55
33	Aboni Knitwear Limited	2560	5.70	4.50	3.89	3.88	4.30	3.50
34	Interstoff Apparels Limited(knit)	700	2.74	2.00	2.50	3.00	2.50	3.50
35	Millennium Textiles (Southern) Limited(Knit)	2500	3.10	3.50	3.40	3.80	3.25	3.00
36	Interstoff Clothing Limited(knit)	3000	3.55	4.00	3.50	3.88	3.65	4.00
37	Anupam Sweaters(knit)	2500	3.50	3.80	3.60	3.55	3.80	4.00
38	Universe Knitting Garments Limited(KNIT)	2230	3.70	4.00	3.50	3.00	3.50	4.20
39	S.A. Rahman Sweaters(knit)	2400	3.55	4.20	3.65	3.50	4.00	3.56

N.T:

1 (very bad) 2 3 (moderate) 4 5 (very good)

SPSS data of Semi direct Influencing Variables vs. Labor Productivity

	Name of the Company	No. of Workers	Labor Productivity	Machine condition satisfaction	Machine Layout	Inventory Control
1	MBM Garments Ltd	2500	3.01	5.00	5.00	5.00
2	Eden Garments Ltd	1000	2.50	3.75	4.10	3.40
3	Triangle Garments Ltd	350	1.80	4.75	4.85	4.80
4	Shezad Ltd.(knit)	1200	.64	3.60	3.20	3.20
5	Coast to Coast(knit)	2000	1.03	4.40	4.80	3.80
6	Logos Apparel(knit)	4000	9.53	3.65	3.45	3.45
7	Commitment Apparels Ltd.(woven)	550	6.41	3.15	2.40	2.70
8	Masse Manufacturing Ltd.(woven)	600	6.47	1.55	1.80	2.15
9	Outright Fashion Ltd.(knit)	1700	2.49	1.70	2.35	2.40
10	Knittex Industries Ltd(knit)	1250	4.20	3.50	5.00	4.88
11	Delta Composite Garments(knit)	3500	5.20	4.20	4.80	4.50
12	Rainbow Apparels(KNIT)	7200	4.60	4.50	4.50	4.00
13	Design & Fashions Ltd(woven)	550	7.20	3.90	4.35	4.25
14	Standard Group(woven)	7300	9.56	4.30	4.60	4.00
15	SAS Fashion Wear Ltd(woven)	6000	7.57	4.25	4.25	4.60
16	Evince Ladies Wear Ltd	1200	1.58	3.35	3.45	3.30
17	Palmal Garments	2400	3.75	3.58	3.17	3.33
18	Stylecraft Limited	1600	2.25	3.58	3.33	3.42
19	Youth Group	1069	3.20	4.90	4.90	4.81
20	Bellisima Ltd.	745	2.10	5.00	4.80	5.00
21	Speedwell Ltd.	400	1.30	5.00	4.83	5.00

22	Jupiter(Knit)	450	3.14	5.00	5.00	4.60
23	Wooltex(knit)	412	2.56	5.00	4.20	5.00
24	Jamuna(woven)	1149	7.37	5.00	4.20	5.00
25	Impress Garments	550	5.09	4.85	5.00	4.70
26	Impress Allied	320	4.69	4.85	5.00	4.75
27	Interfab BD Ltd	1000	8.40	4.65	4.75	4.55
28	Commitment Apparels Ltd.	550	2.15	3.15	2.40	2.70
29	Masse Manufacturing Ltd.	600	6.47	1.55	1.80	2.15
30	Outright Fashion Ltd.	1700	2.50	1.70	2.35	2.40
31	IRIS KNITWEAR LTD(knit)	1750	6.70	3.55	3.75	3.33
32	Nahiyan Fashion Limited(knit)	2000	5.60	3.88	3.77	4.00
33	Aboni Knitwear Limited	2560	5.70	4.00	4.00	3.80
34	Interstoff Apparels Limited(knit)	700	2.74	3.50	3.00	2.70
35	Millennium Textiles (Southern) Limited(Knit)	2500	3.10	3.65	3.50	3.00
36	Interstoff Clothing Limited(knit)	3000	3.55	4.30	3.60	4.30
37	Anupam Sweaters(knit)	2500	3.50	3.50	3.55	4.30
38	Universe Knitting Garments Limited(KNIT)	2230	3.70	3.33	3.50	4.00
39	S.A. Rahman Sweaters(knit)	2400	3.55	3.80	4.20	3.88

N.T:

1 (very bad) 2 3 (moderate) 4 5 (very good)

SPSS data of HR related Variables vs. Labor Productivity

	Name of the Company	Labor Productivity	Performance Appraisal	Recruitment Policy	Training & Development	Leave facility	Medical benefit (at the premise)	Medical benefit (off the premise)
1	MBM Garments Ltd	3.01	4.40	5.00	5.00	4.95	5.00	5.00
2	Eden Garments Ltd	2.50	3.75	4.10	3.85	3.55	2.80	2.80
3	Triangle Garments Ltd	1.80	4.75	4.75	4.70	4.50	4.45	4.60
4	Shezad Ltd.(knit)	.64	3.60	3.60	2.20	3.60	3.00	2.20
5	Coast to Coast(knit)	1.03	4.20	4.40	1.80	4.40	4.80	4.40
6	Logos Apparel(knit)	9.53	3.30	3.25	2.75	1.30	3.65	2.15
7	Commitment Apparels Ltd.(woven)	6.41	1.85	3.55	2.60	2.35	2.45	3.05
8	Masse Manufacturing Ltd.(woven)	6.47	1.50	2.55	1.75	2.25	2.30	3.15
9	Outright Fashion Ltd.(knit)	2.49	1.95	2.70	2.30	2.55	3.10	3.85
10	Knittex Industries Ltd(knit)	4.20	3.85	3.50	4.00	3.50	3.00	2.80
11	Delta Composite Garments(knit)	5.20	3.80	4.00	4.25	3.33	3.00	2.60
12	Rainbow Apparels(KNIT)	4.60	3.70	3.80	4.00	3.65	3.70	2.90
13	Design & Fashions Ltd(woven)	7.20	4.00	3.20	3.90	3.60	3.50	3.00
14	Standard Group(woven)	9.56	4.30	3.50	3.00	3.45	3.20	3.00
15	SAS Fashion Wear Ltd(woven)	7.57	3.50	3.50	3.70	3.00	3.50	3.40
16	Evince Ladies Wear L	1.58	3.15	3.10	3.05	2.75	3.45	2.85
17	Palmal Garments	3.75	2.67	3.08	2.83	3.00	2.85	2.58
18	Stylecraft Limited	2.25	2.67	3.08	2.83	3.00	3.00	2.58
19	Youth Group	3.20	4.63	4.90	4.45	4.72	5.00	5.00
20	Bellisima Ltd.	2.10	4.90	4.30	3.40	5.00	5.00	3.90

21	Speedwell Ltd.	1.30	4.92	4.42	3.58	5.00	5.00	3.92
22	Jupiter(Knit)	3.14	4.40	3.00	2.20	4.60	5.00	4.20
23	Wooltex(knit)	2.56	5.00	4.20	3.50	5.00	5.00	3.80
24	Jamuna(woven)	7.37	5.00	4.20	3.50	5.00	5.00	3.80
25	Impress Garments	5.09	4.60	5.00	5.00	4.70	5.00	4.70
26	Impress Allied	4.69	4.60	5.00	5.00	4.75	5.00	4.65
27	Interfab BD Ltd	8.40	4.60	5.00	4.75	5.00	4.75	5.00
28	Commitment Apparels Ltd.	2.15	1.85	3.55	2.60	2.35	2.45	3.05
29	Masse Manufacturing Ltd.	6.47	1.50	2.55	1.75	2.25	2.30	3.15
30	Outright Fashion Ltd.	2.50	1.95	2.70	2.30	2.55	3.10	3.85
31	IRIS KNITWEAR LTD(knit)	6.70	3.75	3.80	3.50	3.55	3.75	3.55
32	Nahiyan Fashion Limited(knit)	5.60	4.00	3.80	3.60	4.00	3.00	3.25
33	Aboni Knitwear Limited	5.70	3.80	3.88	3.60	4.30	4.00	3.50
34	Interstoff Apparels Limited(knit)	2.74	2.75	4.00	3.50	2.55	2.50	2.00
35	Millennium Textiles (Southern) Limited(Knit)	3.10	2.88	4.00	3.00	2.65	3.00	2.65
36	Interstoff Clothing Limited(knit)	3.55	3.00	3.50	3.50	2.80	3.40	3.00
37	Anupam Sweaters(knit)	3.50	4.20	3.80	3.00	3.00	3.00	2.80
38	Universe Knitting Garments Limited(KNIT)	3.70	3.33	3.25	3.25	2.50	3.00	3.20
39	S.A. Rahman Sweaters(knit)	3.55	3.80	3.50	3.00	3.00	2.50	2.00

SPSS data of Working Condition Variables vs. Labor Productivity

	Name of the Company	Labor Productivit	Working Space	Cleanliness	Restroom facility	Lighting facility	Recreation facility	Break Facility	Temperature control	Safety measure
1	MBM Garments Ltd	3.01	4.95	5.00	5.00	5.00	3.65	5.00	3.85	5.00
2	Eden Garments Ltd	2.50	3.65	3.90	3.70	4.00	2.70	4.05	3.20	3.15
3	Triangle Garments Ltd	1.80	4.75	4.60	4.75	4.65	4.75	4.70	4.45	4.50
4	Shezad Ltd.(knit)	.64	4.60	4.00	3.00	3.80	3.00	3.40	3.20	3.40
5	Coast to Coast(knit)	1.03	5.00	4.80	4.40	4.80	4.60	4.00	4.60	5.00
6	Logos Apparel(knit)	9.53	3.70	4.80	3.70	1.65	4.45	4.15	3.70	2.95
7	Commitment Apparels Ltd.(woven)	6.41	1.85	3.70	2.70	1.70	2.30	3.40	2.30	2.05
8	Masse Manufacturing Ltd.(woven)	6.47	1.55	2.85	2.60	1.70	1.80	1.75	2.80	2.15
9	Outright Fashion Ltd.(knit)	2.49	2.15	3.60	2.55	1.80	3.45	2.35	2.55	4.25
10	Knittex Industries Ltd(knit)	4.20	3.88	4.50	3.20	4.50	4.02	3.50	4.00	4.00
11	Delta Composite Garments(knit)	5.20	4.33	4.65	3.60	4.60	4.00	3.60	4.30	4.30
12	Rainbow Apparels(KNIT)	4.60	4.30	4.33	3.20	4.75	3.85	4.00	4.00	4.40
13	Design & Fashions Ltd(woven)	7.20	4.10	4.60	3.00	4.00	3.40	3.50	3.85	4.20
14	Standard Group(woven)	9.56	4.25	4.75	2.75	4.35	3.15	3.40	4.30	4.35
15	SAS Fashion Wear Ltd(woven)	7.57	4.30	4.50	3.25	4.50	3.30	3.50	4.20	4.25
16	Evince Ladies Wear L	1.58	3.45	3.70	3.70	3.55	3.15	3.00	1.90	3.85
17	Palmal Garments	3.75	3.42	3.67	3.00	2.83	1.33	2.92	2.75	2.83
18	Stylecraft Limited	2.25	3.42	3.67	3.00	2.83	1.33	3.00	2.75	2.83
19	Youth Group	3.20	4.90	5.00	4.72	5.00	3.55	4.81	4.72	5.00
20	Bellisima Ltd.	2.10	4.70	4.90	5.00	5.00	2.30	4.90	4.90	5.00

21	Speedwell Ltd.	1.30	4.75	5.00	5.00	5.00	4.83	5.00	4.92	5.00
22	Jupiter(Knit)	3.14	5.00	5.00	5.00	5.00	2.40	5.00	4.60	5.00
23	Wooltex(knit)	2.56	4.20	5.00	5.00	5.00	4.20	5.00	5.00	5.00
24	Jamuna(woven)	7.37	4.20	5.00	5.00	5.00	4.20	5.00	5.00	5.00
25	Impress Garments	5.09	5.00	5.00	4.40	4.70	3.05	4.15	3.85	5.00
26	Impress Allied	4.69	5.00	5.00	4.55	4.65	3.05	4.20	3.85	5.00
27	Interfab BD Ltd	8.40	5.00	4.90	4.35	4.60	4.65	4.10	3.90	4.75
28	Commitment Apparels Ltd.	2.15	1.85	3.70	2.70	1.70	2.30	3.40	2.30	2.05
29	Masse Manufacturing Ltd.	6.47	1.55	2.85	2.60	1.70	1.80	1.75	2.80	2.15
30	Outright Fashion Ltd.	2.50	2.15	3.60	2.55	1.80	3.45	2.35	2.55	4.25
31	IRIS KNITWEAR LTD(knit)	6.70	4.55	4.00	3.50	3.50	3.40	4.35	3.00	4.67
32	Nahiyan Fashion Limited(knit)	5.60	4.26	4.30	3.33	3.88	2.65	3.78	2.75	4.00
33	Aboni Knitwear Limited	5.70	3.75	4.50	3.70	3.85	2.50	4.30	3.60	3.50
34	Interstoff Apparels Limited(knit)	2.74	4.00	3.65	2.75	4.50	3.75	2.50	2.55	4.00
35	Millennium Textiles (Southern) Limited(Knit)	3.10	4.00	4.50	3.00	3.85	3.00	3.00	3.88	3.50
36	Interstoff Clothing Limited(knit)	3.55	4.30	4.30	3.80	4.00	3.00	3.00	3.50	4.50
37	Anupam Sweaters(knit)	3.50	3.65	4.50	3.75	4.30	3.20	3.80	3.80	4.00
38	Universe Knitting Garments Limited(KNIT)	3.70	4.00	4.00	3.50	3.80	3.00	3.50	3.70	4.00
39	S.A. Rahman Sweaters(knit)	3.55	4.25	3.80	3.25	3.80	3.60	3.65	3.65	3.60

SPSS data of Ethics related Variables vs. Labor Productivity

	Name of the Company	Labor Productivity	No. of Workers	Ethical practice - dismissal	Ethical practice - penalty	Ethical practice - Supervisors behavior
1	MBM Garments Ltd	3.01	2500	5.00	4.95	4.95
2	Eden Garments Ltd	2.50	1000	3.20	2.25	3.00
3	Triangle Garments Ltd	1.80	350	4.80	4.55	4.30
4	Shezad Ltd.(knit)	.64	1200	3.20	4.00	4.20
5	Coast to Coast(knit)	1.03	2000	4.10	4.80	4.20
6	Logos Apparel(knit)	9.53	4000	3.10	3.50	3.55
7	Commitment Apparels Ltd.(woven)	6.41	550	2.70	2.40	1.50
8	Masse Manufacturing Ltd.(woven)	6.47	600	2.65	2.85	2.55
9	Outright Fashion Ltd.(knit)	2.49	1700	3.30	3.05	3.10
10	Knittex Industries Ltd(knit)	4.20	1250	3.25	2.60	4.30
11	Delta Composite Garments(knit)	5.20	3500	3.60	3.00	4.50
12	Rainbow Apparels(KNIT)	4.60	7200	3.00	3.40	4.10
13	Design & Fashions Ltd(woven)	7.20	550	3.60	3.25	3.80
14	Standard Group(woven)	9.56	7300	4.00	3.50	3.75
15	SAS Fashion Wear Ltd(woven)	7.57	6000	3.50	3.25	3.45

16	Evince Ladies Wear L	1.58	1200	3.60	3.75	3.55
17	Palmal Garments	3.75	2400	3.08	3.42	2.58
18	Stylecraft Limited	2.25	1600	3.08	3.42	2.58
19	Youth Group	3.20	1069	5.00	4.81	4.55
20	Bellisima Ltd.	2.10	745	4.30	5.00	4.90
21	Speedwell Ltd.	1.30	400	4.42	4.92	5.00
22	Jupiter(Knit)	3.14	450	3.80	5.00	4.80
23	Wooltex(knit)	2.56	412	4.60	4.95	4.95
24	Jamuna(woven)	7.37	1149	4.60	4.95	4.95
25	Impress Garments	5.09	550	4.60	4.75	5.00
26	Impress Allied	4.69	320	4.65	4.70	5.00
27	Interfab BD Ltd	8.40	1000	4.35	4.85	4.70
28	Commitment Apparels Ltd.	2.15	550	2.70	2.40	1.50
29	Masse Manufacturing Ltd.	6.47	600	2.65	2.85	2.55
30	Outright Fashion Ltd.	2.50	1700	3.30	3.05	3.10
31	IRIS KNITWEAR LTD(knit)	6.70	1750	3.75	3.55	4.00
32	Nahiyan Fashion Limited(knit)	5.60	2000	4.50	3.80	3.75
33	Aboni Knitwear Limited	5.70	2560	3.50	3.60	4.25
34	Interstoff Apparels Limited(knit)	2.74	700	3.55	2.65	2.00
35	Millennium Textiles (Southern) Limited(Knit)	3.10	2500	3.00	2.50	2.85
36	Interstoff Clothing Limited(knit)	3.55	3000	3.65	2.85	3.50
37	Anupam Sweaters(knit)	3.50	2500	3.50	2.77	4.00
38	Universe Knitting Garments Limited(KNIT)	3.70	2230	3.00	2.50	3.80
39	S.A. Rahman Sweaters(knit)	3.55	2400	3.00	2.80	4.00

APPENDIX E

Other Factories surveyed for additional information

SLNo	Name of the Garments	Garments Profile
1.	Chaity Group Other Factories: Chaity Garments Ltd, Chaity Apparels Ltd, Chaity Embroidery Ltd., Chaity Classic Sportswear Mfg. Co. Ltd, Ashique Fashion Wears Ltd, Ashique Jeans Apparels Ltd, Nice Apparels Industry Ltd, The plasticman Ltd., Kit way pac (Pvt.) Ltd.	Managing Director: Abul Kalam Azad Office: Ashique Complex, 43, Chalabon, Azampur, Uttara. Phone: 880 -2-8923670 Fax No: 880 – 2 – 8913701 Email: info@chaity.com Established: 1991 No. of Employees: 3200 Products: Formal Trousers, Constructed Trousers, Casual Trousers, Jackets, Jeans, Suits, Shirts.
2.	AAA Fashions Ltd.	Managing Director: Anwar H. Khan Office: House – 074, Road – 7, Block – H, Banani, Dhaka. Factory: Khilkhet, Dhaka. Phone: 8953703, 8913610 Email: aaa@bangla.net Established: 1990 No. of Employees: 275 Product: Jacket, Pant, Jogging Shirts.
3.	SMH New Generations Apparels Ltd.	Managing Director: Syed Moazzem Hossain Office: TMC Building (7th Floor) 52, New Eskaton Road, Dhaka. Factory: 92, Kodda Bazar, Nowjur, Tangail Road, Gazipur.
4.	Newaz Garments	Chairman : ASM Quasem No. of Employee: 3500 Products: Shirt, T – Shirt. Established: 1983 Office: 42 – 1, Indira Road, Dhaka. Phone : 8110341, 8112704, 8116951, 8130336, 9115032 www.newage-group.com

5.	Tranquil	Location: Mili Shopping Centre, Ibrahimpur Established: 2005 No. of Employees: 220
6.	Bichitra Garments Ltd.	Location: Middle Badda Other Factories: Shapla Fashion, Ever Fashion Ltd. Established: 1995 No. of Employees: 800 Floor Space: 20000 square feet
7.	SQ Group	Location: Mowna Product: Knit Established: 1990 No. of Workers: 5000
8.	Standard group	Corporate Office: 53/1, New Elephant Road (3rd Floor), Dhanmondi, Dhaka. Phone: 9662007, 8627147 – 8, 8117716 Email: info@standard – group.com stg@bdcom.com Managing Director: Md. Mosharraf Hosssain Executive Director: M. Tofazzal Ali No. of Factories: 25 Established: 1984
9.	Shezad Ltd.	Owner: Shezad Parvez Managing Director: Mr. Mr. Jahed Azgar Chowdhury Space: 59400 sq. ft. Established: 1992 Product: Sweaters No. of Employees: 1200
10.	Sandyork Knitting Ltd.	Owner: Nazmul Hossain Established: 1994 Product: Cardigans No. of Employees: 475
11.	Allure Apparels Ltd.	Chairman : AKM Shahid Reza Factory Location : 37/38 Green Road, Dhanmandi, Dhaka Phone: 9663654
12.	Impress and Impress Allied Garments Ltd.	Location: Malibagh Proprietor: Reaz Ahmed Khan & Javed Ahmed Khan No. of Workers: 550 (Impress Garments) 320 (Impress Allied Garments)
13.	Interfab BD. Ltd.	Location: Gazipur Managing Director: Reaz Ahmed Khan No. of Workers: 1000

		Proprietor: Ahsan Kabir Khan
14.	Evince Ladies Wear Ltd.	Head Office: Evince Ltd. Plot – 33, Section – 7, Mirpur, Dhaka.
15.	Palmall Garments Ltd.	Type: Woven shirt factory Head office: 139, Motijheel C/A, Dhaka. Factory: Malibagh Chowdhurypara, Dhaka.
16.	Style Craft Ltd.	Type: Woven shirt factory Head office & Factory: 108, old Airport Road (2nd floor), Tejgaon, Dhaka.
17.	Youth Fashion Ltd. Youth Garments Ltd. Youth Spinning Mills Ltd.	Factory Location: Agargaon Managing Director: Mr. Rezakul Haider Established: 1983 No. of Workers: 1069
18.	Bellisima Ltd.	Factory Location: Elephant Road Established: 1994 No. of Workers: 740
19.	Speed Well Ltd.	Factory Location: Mirpur Managing Director: Feroz M Hasan Established: 1986
20.	Madonna Garments Ltd.	Factory Location: Mohakhali & Banani Managing Director: Ashraf H Majumder Established: 1990
21.	Global Buyers Ltd. Outright Fashions Ltd. Outwear Fashion Ltd. Outfit Fashion Ltd.	Factory Location: Banani Managing Director: Reazot Ali Established: 1998
22.	Masse Manufacturing Ltd.	Factory Location: Banani Managing Director: Tipu Sultan Established: 1988
23.	Millenium Textiles Ltd.	Factory Location: Ashulia Product Type: Knitted tops and bottoms.
24.	Intersoftf Apparels Ltd.	Factory Location: Kaliakoir, Shafipur Product Type: Knitted Tops and bottoms No. of Workers: 700
25.	Intersoff Clothing	Factory Location: Board Bazar, Gazipur Product Type: Knitted Tops and bottoms No. of Workers: 450
26.	Alif Group	Chairman: Md. Azizul Isalm Factory location: 21/22, Babar Road, Block–B, Mohammadpur, Dhaka.

		Phone: 9115124, 8115218, 9110065, 8118457
27.	IDS Group	ManagingDirector: Md. Edris Sarkar Factory location: 367/1, Shenpara, Mirpur Phone: 9006232, 8020125, 0189–211532
28.	Floret Fashion Wear	ManagingDirector: Abid Hossain Khan Factory: 315/B Tejgaon I/A, Dhaka. Phone: 8825099
29.	Coast to Coast Groups	Chairman : Md. Ashrafuzzaman No; of Employees: 2000 Daily production: 5000 pcs.
30.	Logos Apparels Ltd.	Chairman : Md. Altaf Sarkar No; of Employees: 4000 Yearly production: 90000 pcs.
31.	Knittex Industries Ltd.	Product Type: Knit No; of Employees: 877 Location: Baimile, Konabari, Gazipur
32.	Delta Composite Garments	Product Type: T-Shirts, Ladies Wear, Shirts, Men's undergarments and jackets.
33.	Rainbow Apparels	Product Type: T – shirts, Sportswear No. of Employees: 9000 Location: Panchabati, Naryanganj
34.	Kimia Garments ltd.	Location: 13, DIT Road, Khilgaon Chowdhurypara, Dhaka. Product Type: Ladies wear Production Details: 200 pcs per day General Manager: Abu Sufian Majumder
35.	Classic Apparels Ltd.	Location: 1, DIT Road, Chowdhurypara, Dhaka. Production details: 260 pcs per day. Product type: Ladies Wear CEO : Taufique Elahi

Appendix F

Interviews taken from RMG experts and professionals

1. Prof. Mostafizur Rahman
   Research Director (Acting Executive Director)
   Center for Policy Dialogues (CPD)
   Dhaka, Bangladesh

2. Mrs. Chrishani Pererra
   C.E.O.
   Gulshan USA Zippers Limited

3. Mr. Habibul Haque
   Sr. Deputy Secretary
   BGMEA

4. M.M. Masud
   Sr. Manager
   DADA (Savar) Limited

5. Md. Aminur Rahman
   Sr. manager (Admin)
   Youngone Hi tech Sports wear Inds. Ltd.

6. Mr. Anwar H Khan
   Managing Director
   AAA Fashions Ltd

7. Mr. Md. Abul Kalam Azad
   Chairman
   Chaity Group Limited

8. Syed Moazzem Hossain
   Managing Director
   SMH New Generations Apparels Ltd

9. Mr. Golam Faruq
   Managing Director
   SQ Group

10. Rana Riyadh
    Managing Director
    Bichitra Garments Limited

11. Mr. Mohammed Ali
Production manager
Bichitra Garments Limited

11. Mr. Parak Rama
Factory Manager
FS Sweaters of SQ Group

12. Mr. Tipu Sultan
C.E.O.
Masse Manufacturing Limited

13. Mr. Md. Tasikuzzaman
C.O.O
Madonna Group

14. Mr. Ashraf H Mazumder
Executive Director
Madonna Group

15. Mr. Reazot Ali
President
Global Buyers Limited

16. Mr. Zubair Alam
Director
Global Buyers Limited

17. Mr. Farzad Hossain
C.E.O
Sydney Garments Limited

18. Mr. Abu Suffian Mozumder
GM
Kimia Garments Ltd

19. Mr. Taufiq Elahi
C.E.O
Classic Apparels Limited

20. Mr. Sohel Rana
Production Manager
Kimia Garments Ltd.

20. Bellisima Ltd
21. Speedwell Ltd
22. Jupiter(Knit)
23. Wooltex(knit)
24. Jamuna(woven)
25. Impress Garments
26. Impress Allied
27. Interfab BD Ltd
28. Commitment Apparels Ltd (Unit-2, Woven)
29. Masse Manufacturing Ltd
30. Outright Fashion Ltd
31. IRIS KNITWEAR LTD(knit)
32. Nahiyan Fashion Ltd(knit)
33. Aboni Knitwear Limited
34. Interstoff Apparels Limited(knit)
35. Millennium Textiles (Southern)
36. Interstoff Clothing Limited(knit)
37. Anupam Sweaters(knit)
38. Universe Knitting Garments Limited(KNIT)
39. S.A. Rahman Sweaters (knit)

End.**