Thesis Report

On

Factors Affecting Implementation of Effective Supply Chain Management in EPZ Based RMG Industries of Bangladesh

Submitted by:

Md. Masum Mollah

Student ID: EMBA2403033005

Program: Executive Master of Business Administration (EMBA)

Major: Supply Chain Management

Department of Business Administration

Sonargaon University

Submitted to:

Department of Business Administration

Faculty of Business

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Submitted for the partial fulfillment of the degree of

Executive Master of Business Administration (EMBA)

Sonargaon University

147/1 Green Road, Panthapath, Tejgaon, Dhaka

Date of Submission: 03 January, 2026

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Letter of Transmittal

03 January, 2026

Dr. Md. Masud Rana
Professor
Department of Business Administration
Faculty of Business
Sonargaon University

Subject: Submission of thesis report titled **"Factors Affecting Implementation of Effective Supply Chain Management in EPZ Based RMG Industries of Bangladesh"**

Dear Sir,

I have the honor to submit my thesis paper entitled **"Factors Affecting Implementation of Effective Supply Chain Management in EPZ Based RMG Industries of Bangladesh"** in partial fulfillment of the requirements for the degree of Executive Master of Business Administration (EMBA) under the Department of Business Administration, Sonargaon University.

The study attempts to analyze the major factors influencing the implementation of effective supply chain management practices in EPZ-based Ready-Made Garment (RMG) industries of Bangladesh, highlighting challenges, opportunities, and practical implications for industry stakeholders.

I have tried my best to complete the thesis sincerely and carefully. Any shortcomings are unintentional, and I am grateful for your kind supervision and constructive suggestions.

I, therefore, pray and hope that you would be kind enough to accept this thesis paper and oblige thereby.

Yours Sincerely

_____

Md. Masum Mollah

Student ID: EMBA2403033005

Program: Executive Master of Business Administration (EMBA)

Major: Supply Chain Management

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Declaration of Student

I hereby declare that the thesis entitled **"Factors Affecting Implementation of Effective Supply Chain Management in EPZ Based RMG Industries of Bangladesh"** is an original work carried out by me under the supervision of Dr. Md. Masud Rana, Professor, Department of Business Administration, Sonargaon University.

I further declare that this thesis has not been submitted previously, in whole or in part, to any other university or institution for the award of any degree, diploma, or professional qualification. All sources of information and data used in this study have been duly acknowledged and referenced in accordance with academic conventions.

I take full responsibility for the authenticity of the data, analysis, and interpretations presented in this thesis. Any errors or omissions are entirely my own.

This declaration is made with full knowledge of the academic rules and regulations of Sonargaon University.

Yours Sincerely

_____

Md. Masum Mollah

Student ID: EMBA2403033005

Program: Executive Master of Business Administration (EMBA)

Major: Supply Chain Management

Department of Business Administration

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Letter of Authorization

I hereby authorize Md. Masum Mollah, Student ID: EMBA2403033005, a student of Executive Master of Business Administration (EMBA) program, Department of Business Administration, Sonargaon University, to submit the thesis entitled **"Factors Affecting Implementation of Effective Supply Chain Management in EPZ Based RMG Industries of Bangladesh"** for partial fulfillment of the requirements for the award of the said degree.

I certify that this research work has been carried out under my direct supervision and guidance. To the best of my knowledge, the work embodied in this thesis is original and has not been submitted elsewhere, either in part or in full, for any academic degree or professional qualification.

I further authorize the student to submit this thesis to the Department of Business Administration, Sonargaon University, for evaluation and necessary academic purposes.

_____

Dr. Md. Masud Rana

Professor

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Acknowledgement

At the very outset, I would like to express my sincere gratitude to Almighty Allah for granting me the strength, patience, and perseverance to complete this thesis successfully.

I am deeply indebted to my honorable supervisor Dr. Md. Masud Rana, Professor, Department of Business Administration, Sonargaon University for his invaluable guidance, constructive suggestions, continuous encouragement, and academic support throughout the entire period of this research. Without his sincere supervision and scholarly advice, the completion of this thesis would not have been possible.

My sincere appreciation goes to the respondents of the EPZ-based RMG industries who provided valuable information and willingly participated in the survey and interviews. Their cooperation and support significantly contributed to the successful completion of this research.

Finally, I would like to express my deepest gratitude to my parents and family members for their unconditional love, encouragement, and moral support throughout my academic journey.

Abstract Summary

In an increasingly globalized and competitive business environment, effective supply chain management (SCM) has become a crucial factor for the success of export-oriented industries. Bangladesh's Ready-Made Garments (RMG) sector, particularly firms operating within Export Processing Zones (EPZs), plays a vital role in the national economy but continues to face significant supply chain challenges. This study examines the factors affecting the implementation of effective supply chain management in EPZ-based RMG industries of Bangladesh.

The research adopts a mixed-method approach, combining quantitative data from structured questionnaires collected from 42 supply chain professionals with qualitative insights from interviews with senior industry managers. Guided by the Supply Chain Operations Reference (SCOR) model and the Resource-Based View (RBV), the study analyzes the influence of technological capability, infrastructure and logistics support, human resource capability, regulatory and policy environment, and supplier–buyer collaboration on SCM effectiveness. Quantitative data were analyzed using descriptive statistics, correlation analysis, and multiple regression techniques with the help of SPSS.

The findings indicate that all examined factors have a significant positive impact on SCM effectiveness. Human resource capability emerged as the most influential determinant, followed by technological capability and supplier–buyer collaboration. Infrastructure and logistics support also significantly affect supply chain performance, while the regulatory and policy environment plays a comparatively weaker yet important role. Qualitative findings further reveal persistent challenges such as skill shortages, technology gaps, logistics bottlenecks, and buyer-driven supply chain pressures.

The study concludes that improving SCM effectiveness in EPZ-based RMG firms requires integrated efforts focusing on workforce development, technological adoption, infrastructure improvement, supportive regulatory frameworks, and stronger collaboration among supply chain partners.

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List of Acronyms

Acronym	Full Form
SCM	Supply Chain Management
RMG	Ready-Made Garments
EPZ	Export Processing Zone
ERP	Enterprise Resource Planning
RFID	Radio Frequency Identification
SCOR	Supply Chain Operations Reference
RBV	Resource-Based View
FDI	Foreign Direct Investment
3PL	Third-Party Logistics
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
GDP	Gross Domestic Product
SPSS	Statistical Package for Social Sciences
ANOVA	Analysis of Variance
HR	Human Resource
ICT	Information and Communication Technology

CHAPTER-ONE

INTRODUCTION

1.1 Background of the Study

In the era of globalization, supply chain management (SCM) has emerged as a critical strategic function for organizations seeking competitiveness, efficiency, and sustainability. Modern supply chains are no longer limited to the simple movement of raw materials to finished goods; rather, they represent complex, interconnected networks involving suppliers, manufacturers, logistics providers, distributors, retailers, and customers. Effective supply chain management integrates these entities through coordinated planning, information sharing, technology adoption, and relationship management in order to minimize costs, reduce lead time, improve quality, and enhance customer satisfaction.

For export-oriented industries, particularly in developing countries, the importance of SCM is even more pronounced. Global buyers demand shorter lead times, strict compliance standards, transparency, and flexibility in responding to market changes. Firms that fail to implement effective supply chain practices risk losing competitiveness, market share, and long-term sustainability. As a result, SCM has become a key determinant of success in global value chains, especially in labor-intensive manufacturing sectors such as textiles and ready-made garments.

Bangladesh has established itself as one of the world's leading exporters of ready-made garments (RMG). Since the early 1980s, the RMG industry has experienced remarkable growth, transforming the country from an agrarian economy into a major manufacturing hub. Currently, the sector contributes more than 80 percent of Bangladesh's total export earnings and employs over four million workers, a significant proportion of whom are women. The industry plays a vital role in poverty reduction, industrialization, foreign exchange earnings, and socio-economic development.

Despite its success, the Bangladeshi RMG industry faces increasing challenges in the global marketplace. Intensifying competition from countries such as Vietnam, India, and Cambodia, rising compliance requirements, pressure to reduce lead times, and the need for sustainable and ethical sourcing have forced firms to rethink their supply chain strategies. Global fashion brands increasingly evaluate suppliers not only on cost but also on supply chain efficiency, reliability, transparency, and resilience. In this context, effective SCM has become a strategic necessity rather than an operational choice.

Export Processing Zones (EPZs) in Bangladesh were established with the objective of promoting export-led industrialization by providing a favorable business environment for foreign and local investors. EPZs offer several advantages, including tax incentives, duty-free import of raw materials, simplified customs procedures, infrastructure facilities, and regulatory support. These zones were designed to enhance productivity, attract foreign direct investment (FDI), and facilitate integration into global supply chains. The RMG sector constitutes a significant portion of industrial activity within EPZs.

Although EPZ-based RMG firms enjoy certain infrastructural and policy advantages, many continue to struggle with supply chain inefficiencies. Delays in raw material sourcing, dependency on imported fabrics and accessories, inadequate logistics coordination, limited use of advanced technology, and skill shortages in supply chain planning remain persistent

issues. Moreover, disruptions caused by port congestion, transportation bottlenecks, regulatory complexity, and global shocks such as pandemics or geopolitical tensions further expose the vulnerabilities of existing supply chain systems.

The effective implementation of SCM in the Bangladeshi RMG industry, particularly within EPZs, is influenced by a wide range of factors. These include technological readiness, quality of physical infrastructure, human resource capability, organizational culture, regulatory framework, supplier–buyer relationships, and external environmental uncertainties. Understanding how these factors interact and affect SCM performance is essential for improving efficiency, reducing risk, and strengthening Bangladesh's position in global apparel value chains.

This study, therefore, seeks to explore the factors affecting the implementation of effective supply chain management in Bangladesh, with specific reference to the RMG industry operating within Export Processing Zones. By examining both organizational and environmental determinants, the research aims to provide a comprehensive understanding of the challenges and opportunities associated with SCM implementation in this strategically important sector.

1.2 Statement of the Problem

Despite the significant contribution of the RMG industry to Bangladesh's economy and the strategic advantages offered by EPZs, effective supply chain management remains a major challenge for many firms. While global buyers increasingly emphasize speed, flexibility, and reliability, many RMG manufacturers continue to rely on traditional, fragmented supply chain practices that are ill-suited to the demands of modern global markets.

One of the primary problems lies in the heavy dependence on imported raw materials, particularly fabrics and specialized accessories. This dependency increases lead times and exposes firms to risks related to shipping delays, exchange rate fluctuations, and international supply disruptions. Inefficient coordination between suppliers, manufacturers, and logistics providers further exacerbates these issues.

Another major challenge is the limited adoption of advanced supply chain technologies. Although tools such as Enterprise Resource Planning (ERP), Radio Frequency Identification (RFID), and real-time tracking systems can significantly enhance visibility and coordination, many RMG firms in EPZs lack the financial resources, technical expertise, or organizational readiness to implement such systems effectively.

Human resource constraints also pose a significant problem. The shortage of skilled supply chain professionals, limited training opportunities, and high employee turnover reduce the effectiveness of planning, forecasting, and decision-making processes. In many cases, supply chain responsibilities are managed through experience-based approaches rather than data-driven strategies.

Furthermore, infrastructural and regulatory challenges continue to affect supply chain performance. Congestion at seaports, inadequate inland transportation networks, customs clearance delays, and policy inconsistencies add to operational uncertainty and cost. While

EPZs offer streamlined procedures compared to non-EPZ areas, systemic issues within national logistics and trade facilitation frameworks still impact overall supply chain efficiency.

The absence of strong collaboration and trust among supply chain partners further undermines SCM effectiveness. Limited information sharing, lack of long-term partnerships, and power imbalances between buyers and suppliers restrict the potential benefits of integrated supply chain management.

Given these challenges, there is a clear need for an in-depth investigation into the factors affecting the implementation of effective SCM in the RMG industry within EPZs. Without such understanding, policy interventions and managerial strategies may remain fragmented and ineffective.

1.3 Objectives of the Study

The main objective of this study is to examine the factors influencing the implementation of effective supply chain management in the RMG industry in Bangladesh, with particular emphasis on firms operating within Export Processing Zones.

The specific objectives are:

1. To identify the key organizational, technological, infrastructural, and regulatory factors affecting SCM implementation in EPZ-based RMG firms.
2. To assess the extent to which these factors influence supply chain effectiveness and performance.
3. To analyze the relationship between supply chain management practices and operational efficiency in the RMG sector.
4. To explore the challenges faced by RMG firms in implementing modern SCM practices.
5. To propose practical recommendations for improving supply chain management in Bangladesh's RMG industry.

1.4 Research Questions

The study seeks to address the following research questions:

a) What are the major factors affecting the implementation of effective supply chain management in the RMG industry in EPZs?

b) How do technological capabilities influence SCM effectiveness in EPZ-based RMG firms?

c) What role do infrastructure and logistics play in shaping supply chain performance?

d) How do human resource capabilities and managerial practices affect SCM implementation?

e) In what ways do regulatory and policy environments impact supply chain efficiency in the RMG sector?

1.5 Significance of the Study

This study is significant from both academic and practical perspectives. Academically, it contributes to the existing body of knowledge on supply chain management in developing economies by providing empirical evidence from Bangladesh's RMG sector. The focus on EPZs adds a unique dimension, as limited research has examined SCM practices within these specialized industrial zones.

From a practical standpoint, the findings of this study will be valuable to RMG manufacturers, supply chain managers, policymakers, and development agencies. By identifying the key factors affecting SCM implementation, the study can guide firms in improving operational efficiency and competitiveness. Policymakers may also use the insights to design supportive regulations, infrastructure investments, and training programs that strengthen supply chain capabilities.

1.6 Scope of the Study

The scope of this research is limited to the Ready-Made Garments industry operating within Export Processing Zones in Bangladesh. The study focuses on supply chain activities such as sourcing, procurement, production planning, inventory management, logistics, and distribution. Respondents include supply chain managers, procurement officers, logistics personnel, and senior executives working in EPZ-based RMG firms.

Geographically, the study covers selected EPZs in Bangladesh, and analytically, it concentrates on factors affecting SCM implementation rather than evaluating financial performance or marketing outcomes.

1.7 Limitations of the Study

Like any empirical research, this study has certain limitations. The findings are based on self-reported data, which may be subject to respondent bias. Time and resource constraints limited the sample size and geographical coverage. Additionally, access to sensitive operational data was restricted due to confidentiality concerns. Despite these limitations, the study provides valuable insights into SCM implementation in the RMG sector.

1.8 Organization of the Thesis

The thesis is organized into eight chapters. Chapter One presents the introduction, background, problem statement, objectives, and scope of the study. Chapter Two reviews relevant literature and theoretical frameworks. Chapter Three outlines the conceptual framework and hypotheses. Chapter Four explains the research methodology. Chapter Five presents the data analysis and findings. Chapter Six discusses the results in relation to existing literature. Chapter Seven offers recommendations, and Chapter Eight concludes the study.

Chapter-Two

LITERATURE REVIEW

2.1 Introduction

This chapter presents a comprehensive review of theoretical and empirical literature related to supply chain management (SCM) with a particular focus on the Ready-Made Garments (RMG) industry and Export Processing Zones (EPZs). The purpose of this chapter is to develop a strong theoretical foundation, identify major determinants influencing SCM implementation, and highlight existing research gaps relevant to the Bangladeshi context. The chapter draws upon global SCM literature, developing country perspectives, and industry-specific studies to contextualize the research problem.

2.2 Concept, Scope, and Evolution of Supply Chain Management

Supply Chain Management (SCM) has evolved as a strategic approach that integrates key business functions across organizations to enhance efficiency, responsiveness, and customer value (Christopher, 2016; Mentzer et al., 2001). SCM extends beyond traditional logistics by emphasizing coordination among suppliers, manufacturers, distributors, and customers through information sharing and collaborative planning (Lambert & Cooper, 2000; Chopra & Meindl, 2022). Historically, SCM development progressed from a logistics-focused orientation to internal functional integration, followed by external integration with supply chain partners, and more recently toward digital, resilient, and sustainable supply chains (Hugos, 2018; Ivanov, 2020). Globalization, shorter product life cycles, and increased demand uncertainty have further increased the strategic importance of SCM, particularly in export-oriented industries where lead time, flexibility, and compliance determine competitiveness (Flynn et al., 2010; Gunasekaran et al., 2015).

2.3 Theoretical Foundations of Supply Chain Management

Several theoretical frameworks provide insights into SCM implementation and performance. The Supply Chain Operations Reference (SCOR) model is a widely accepted framework that evaluates supply chain performance through standardized processes—Plan, Source, Make, Deliver, Return, and Enable—and metrics related to reliability, responsiveness, agility, cost, and asset utilization (APICS, 2017). In addition, the Resource-Based View (RBV) emphasizes that firms achieve sustainable competitive advantage by effectively deploying valuable, rare, inimitable, and non-substitutable resources (Barney, 1991; Grant, 2019). Within SCM contexts, resources such as advanced technology, skilled human capital, strong supplier relationships, and supportive organizational culture are considered critical strategic assets (Huq & Stevenson, 2018; Zailani et al., 2012). These theoretical perspectives are particularly relevant for analyzing SCM practices in developing economies where resource constraints are significant.

2.4 SCM in the Global and Bangladeshi RMG Industry

The global Ready-Made Garments (RMG) industry operates primarily through buyer-driven global value chains, where international brands control design, marketing, and retailing, while production activities are outsourced to manufacturers in developing countries (Gereffi

et al., 2005; Gereffi, 2018). These supply chains are characterized by short product life cycles, volatile demand, intense price competition, and strict compliance requirements (Kumar et al., 2020). In Bangladesh, the RMG sector is the largest industrial contributor to exports, employment, and economic growth; however, it faces persistent SCM challenges due to weak backward linkages and heavy reliance on imported raw materials (Rahman & Anwar, 2019; BGMEA, 2022). This dependence increases lead times, exposure to supply disruptions, and overall supply chain risk (Islam et al., 2021; World Bank, 2020).

2.5 Role of Export Processing Zones and Institutional Environment

Export Processing Zones (EPZs) were established in Bangladesh to attract foreign direct investment, promote export-led industrialization, and provide firms with improved infrastructure, tax incentives, and regulatory support (Ahmed & Hossain, 2020; UNIDO, 2019). EPZ-based RMG firms generally benefit from better utilities, security, and administrative facilitation compared to non-EPZ firms. However, studies suggest that despite these advantages, EPZ-based manufacturers remain highly dependent on national transportation networks, ports, and customs systems, which often suffer from congestion, delays, and inefficiencies (Rahman et al., 2020; World Bank, 2020). Policy inconsistency, bureaucratic procedures, and complex compliance requirements further increase uncertainty and operational costs, limiting the overall effectiveness of SCM implementation (UNCTAD, 2021).

2.6 Determinants and Challenges of SCM Implementation

Empirical literature identifies multiple factors influencing effective SCM implementation in developing countries, including technological capability, infrastructure and logistics support, human resource competence, regulatory environment, and supplier–buyer collaboration (Gunasekaran et al., 2015; Flynn et al., 2010). Adoption of ERP systems, RFID, and digital tracking technologies enhances supply chain visibility and coordination; however, many Bangladeshi RMG firms face financial and technical barriers to adopting such technologies (Islam et al., 2021; Hoek & Mitchell, 2006). Infrastructure constraints, such as port congestion and inadequate road networks, significantly increase lead time and logistics costs (World Bank, 2020). Moreover, shortages of trained SCM professionals and high labor turnover reduce planning accuracy and execution efficiency (Huq & Stevenson, 2018; Rahman et al., 2019). Power asymmetry between global buyers and local suppliers also limits information sharing and collaborative decision-making (Gereffi, 2018; Zailani et al., 2012).

2.7 Summary

Recent studies emphasize emerging SCM issues such as supply chain resilience, sustainability, and digitalization, particularly in response to global disruptions such as pandemics and climate-related risks (Ivanov & Dolgui, 2021; Kumar et al., 2020). Sustainability and ethical compliance have become mandatory requirements in global apparel supply chains, yet cost pressures and capability gaps hinder effective implementation in Bangladesh (Zailani et al., 2012; Huq & Stevenson, 2018). Comparative evidence shows that

competing countries such as Vietnam, China, and India have invested heavily in SCM infrastructure, technology adoption, and skill development, strengthening their global competitiveness (UNCTAD, 2021; Chopra & Meindl, 2022). Despite extensive SCM literature, limited studies focus specifically on EPZ-based RMG firms in Bangladesh using an integrated multi-factor approach. This study addresses this gap by systematically examining the factors affecting the implementation of effective supply chain management in EPZ-based RMG industries of Bangladesh.

Chapter-Three

CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

3.1 Introduction

This chapter presents the conceptual framework and hypotheses development for the study on factors affecting the implementation of effective supply chain management (SCM) in the Ready-Made Garments (RMG) industry in Bangladesh, with specific reference to Export Processing Zones (EPZs). Based on the extensive literature reviewed in Chapter Two, this chapter identifies key variables influencing SCM effectiveness and establishes the relationships among them.

The conceptual framework serves as a theoretical guide that links independent variables to the dependent variable of supply chain management effectiveness. It also explains how organizational, technological, infrastructural, regulatory, and relational factors interact within the context of EPZ-based RMG firms. Furthermore, this chapter formulates testable hypotheses that will be empirically examined in subsequent chapters.

3.2 Conceptual Framework

A conceptual framework is a structured representation of variables and their relationships within a study. According to Miles and Huberman (1994), a conceptual framework helps researchers explain phenomena, guide data collection, and interpret findings. In SCM research, conceptual frameworks are widely used to understand how internal and external factors affect supply chain performance.

In the present study, the conceptual framework is developed by integrating insights from the **Supply Chain Operations Reference (SCOR) Model**, **Resource-Based View (RBV)**, and empirical SCM studies conducted in developing countries and the RMG sector.

The framework identifies **Supply Chain Management Effectiveness** as the dependent variable, influenced by multiple independent variables:

- Technological Capability
- Infrastructure and Logistics Support
- Human Resource Capability
- Regulatory and Policy Environment
- Supplier–Buyer Collaboration

Each of these variables represents a critical dimension affecting SCM implementation in EPZ-based RMG firms.

3.3 Dependent Variable: Supply Chain Management Effectiveness

Supply Chain Management Effectiveness refers to the ability of an organization to plan, coordinate, and control supply chain activities in a manner that ensures timely delivery, cost efficiency, quality consistency, flexibility, and customer satisfaction. Effective SCM involves seamless integration of sourcing, production, inventory management, logistics, and distribution.

In the RMG industry, SCM effectiveness is often measured through indicators such as lead time reduction, delivery reliability, inventory accuracy, cost minimization, responsiveness to buyer demands, and compliance with international standards. EPZ-based firms are expected to achieve higher SCM effectiveness due to better infrastructure and regulatory support; however, empirical evidence suggests mixed performance.

3.4 Independent Variables Affecting SCM Effectiveness

3.4.1 Technological Capability

Technological capability refers to the extent to which an organization adopts and effectively utilizes information and communication technologies to manage supply chain operations. Technologies such as Enterprise Resource Planning (ERP) systems, Radio Frequency Identification (RFID), inventory management software, and real-time tracking systems enhance visibility, coordination, and decision-making across the supply chain.

According to the Resource-Based View, technology is a strategic resource that can generate sustained competitive advantage when properly deployed. In the Bangladeshi RMG industry, limited technological adoption has been identified as a major barrier to SCM effectiveness. High implementation costs, lack of technical expertise, and resistance to change hinder digital transformation, particularly among small and medium-sized firms.

In EPZs, although infrastructure is relatively better, technological integration across supply chain partners remains weak, affecting information sharing and responsiveness.

3.4.2 Infrastructure and Logistics Support

Infrastructure and logistics support includes transportation networks, port facilities, warehousing systems, customs clearance procedures, and internal factory layout. Efficient infrastructure reduces lead time, lowers logistics costs, and enhances supply chain reliability.

Bangladesh's RMG supply chain is heavily dependent on seaports and inland transportation. Port congestion, inadequate road networks, and inefficient customs procedures significantly affect SCM performance. Although EPZs offer improved internal infrastructure, external logistics bottlenecks often negate these advantages.

Empirical studies indicate that poor infrastructure is one of the most critical constraints to effective SCM in developing economies. Thus, infrastructure quality plays a decisive role in determining supply chain efficiency in EPZ-based RMG firms.

3.4.3 Human Resource Capability

Human resource capability refers to the knowledge, skills, experience, and competency of employees involved in supply chain planning and execution. SCM requires analytical skills, forecasting ability, coordination, and strategic decision-making.

In Bangladesh's RMG sector, supply chain roles are often managed by personnel with limited formal SCM training. The lack of professional development programs, limited exposure to

modern SCM practices, and high employee turnover reduce organizational capability to implement advanced SCM systems.

According to the RBV, skilled human resources are valuable and difficult to imitate assets. Therefore, firms with well-trained supply chain professionals are more likely to achieve effective SCM implementation.

3.4.4 Regulatory and Policy Environment

The regulatory and policy environment encompasses trade regulations, customs procedures, labor laws, compliance standards, and government policies affecting supply chain operations. In the RMG industry, compliance with international labor, safety, and environmental standards is mandatory for market access.

Although EPZs offer simplified regulations and incentives, firms still face challenges due to policy inconsistency, bureaucratic delays, and complex documentation requirements. Frequent regulatory changes create uncertainty and disrupt supply chain planning.

Effective SCM requires a stable and supportive regulatory environment that facilitates smooth movement of goods, timely customs clearance, and predictable compliance requirements.

3.4.5 Supplier–Buyer Collaboration

Supplier–buyer collaboration refers to the degree of cooperation, trust, information sharing, and long-term relationship orientation among supply chain partners. Collaboration improves coordination, reduces uncertainty, and enhances supply chain integration.

The global RMG supply chain is buyer-driven, where international brands exert significant control over pricing, quality, and delivery schedules. This power imbalance often limits collaboration and restricts information sharing. However, studies show that collaborative relationships lead to better SCM performance through joint planning, demand forecasting, and risk sharing.

In EPZ-based RMG firms, limited backward linkage industries further constrain collaboration with suppliers, increasing dependence on imports and reducing supply chain flexibility.

3.5 Moderating and Contextual Considerations

Although this study focuses primarily on direct relationships between independent variables and SCM effectiveness, contextual factors such as firm size, ownership structure, and export orientation may influence these relationships. EPZ-specific policies also act as contextual elements that shape SCM practices.

These contextual factors are acknowledged in the analysis and discussion chapters.

3.6 Development of Research Hypotheses

Based on the conceptual framework and literature review, the following hypotheses are formulated for empirical testing:

H1: Technological capability has a significant positive effect on supply chain management effectiveness in EPZ-based RMG firms.

Technology improves coordination, visibility, and responsiveness, leading to enhanced SCM performance.

H2: Infrastructure and logistics support have a significant positive effect on supply chain management effectiveness in EPZ-based RMG firms.

Efficient infrastructure reduces lead time and logistics cost, improving supply chain efficiency.

H3: Human resource capability has a significant positive effect on supply chain management effectiveness in EPZ-based RMG firms.

Skilled and trained personnel enable effective planning and execution of supply chain activities.

H4: Regulatory and policy environment has a significant effect on supply chain management effectiveness in EPZ-based RMG firms.

Supportive and stable regulations facilitate smoother supply chain operations.

H5: Supplier–buyer collaboration has a significant positive effect on supply chain management effectiveness in EPZ-based RMG firms.

Collaboration enhances information sharing and integration across the supply chain.

3.7 Conceptual Model of the Study

The conceptual model proposes that SCM effectiveness is influenced by multiple interrelated factors. Independent variables (technology, infrastructure, human resources, regulatory environment, and collaboration) collectively determine the effectiveness of SCM implementation.

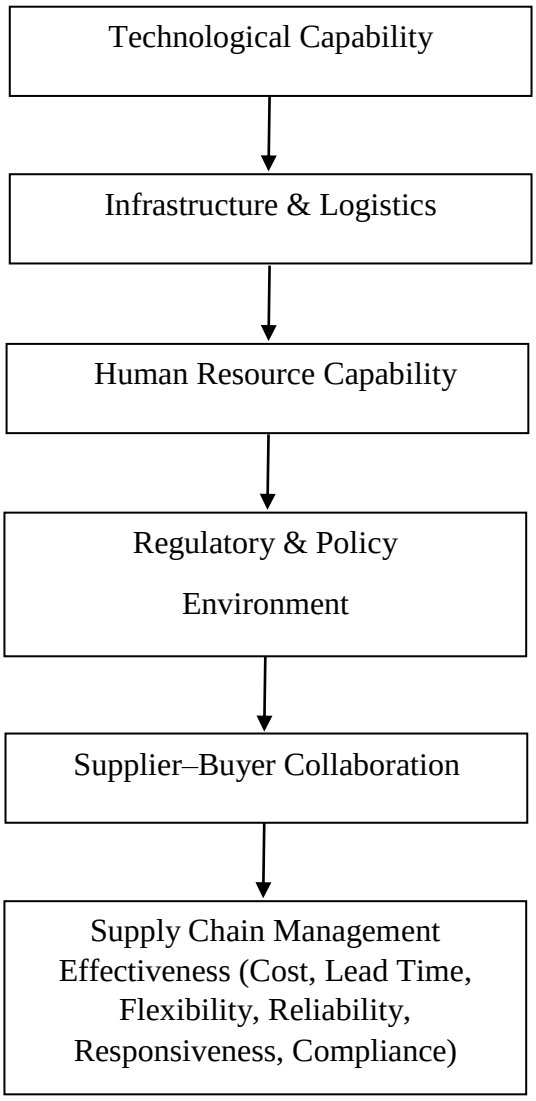

Figure 3.1: Conceptual Framework of the Study

Figure 3.1 illustrates the conceptual framework of the study. The framework proposes that Supply Chain Management Effectiveness in EPZ-based RMG firms is influenced by five major independent variables: technological capability, infrastructure and logistics support, human resource capability, regulatory and policy environment, and supplier–buyer collaboration. These factors are derived from established supply chain theories such as the SCOR model and the Resource-Based View (RBV). The model suggests that improvements in these independent variables lead to enhanced supply chain performance in terms of cost efficiency, lead time reduction, flexibility, delivery reliability, responsiveness, and compliance with international standards.

Chapter-Four

RESEARCH METHODOLOGY

4.1 Introduction

This chapter describes the research methodology adopted to investigate the factors affecting the implementation of effective supply chain management (SCM) in the Ready-Made Garments (RMG) industry in Bangladesh, with special reference to Export Processing Zones (EPZs). The chapter outlines the research design, population and sample selection, data collection methods, research instruments, variable measurement, data analysis techniques, and ethical considerations. A systematic and scientifically sound methodology is essential to ensure the reliability and validity of the study's findings.

4.2 Research Design

The study adopts a mixed-method research design, combining both quantitative and qualitative approaches. Mixed-method research allows the researcher to gain a comprehensive understanding of complex organizational phenomena by integrating numerical data with in-depth contextual insights.

The quantitative approach is used to examine relationships between identified factors and SCM effectiveness through structured survey data. The qualitative approach complements this by capturing expert opinions and contextual explanations through interviews, enabling deeper interpretation of quantitative results.

This design is appropriate because SCM implementation in the RMG sector involves both measurable operational factors and qualitative managerial perceptions.

4.3 Nature of the Research

This research is descriptive and explanatory in nature.

- Descriptive research is used to describe existing SCM practices, challenges, and organizational characteristics of EPZ-based RMG firms.
- Explanatory research is used to explain causal relationships between independent variables (technology, infrastructure, human resources, regulatory environment, and collaboration) and the dependent variable (SCM effectiveness).

4.4 Population of the study

The population of the study includes all **RMG manufacturing firms operating within Export Processing Zones (EPZs) in Bangladesh**. Respondents were drawn from personnel directly involved in supply chain activities, including:

- Supply chain managers
- Procurement officers
- Production planners
- Logistics and warehouse managers
- Senior executives responsible for operations

EPZs were selected because they represent export-oriented industrial clusters with relatively advanced infrastructure and regulatory facilitation.

4.5 Sample Size and Sampling Technique

4.5.1 Sampling Technique

A purposive sampling technique was employed to select respondents with relevant knowledge and experience in supply chain management. This technique ensures that respondents possess the expertise required to provide meaningful and accurate information.

4.5.2 Sample Size

A total of 60 questionnaires were distributed among EPZ-based RMG firms. Out of these, 42 valid responses were received and used for data analysis. This sample size is considered adequate for statistical analysis using regression and correlation techniques.

Additionally, 15–20 in-depth interviews were conducted with senior managers and industry experts to supplement quantitative findings.

4.6 Sources of Data

4.6.1 Primary Data

Primary data were collected through:

- Structured questionnaires
- Semi-structured interviews

4.6.2 Secondary Data

Secondary data were collected from:

- Academic journals
- Books on SCM and logistics
- Industry reports
- Government publications
- World Bank and BGMEA reports

Secondary data were used primarily for literature review and contextual understanding.

4.7 Research Instruments

4.7.1 Questionnaire Design

The questionnaire was designed based on previous SCM studies and theoretical models such as SCOR and RBV. It consists of two major sections:

Section A: Demographic information (designation, experience, firm size, ownership)

Section B: Measurement of research variables using Likert-scale statements

A **five-point Likert scale** was used, where:
1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree

4.7.2 Interview Guide

The interview guide included open-ended questions focusing on:

SCM challenges

Technology adoption

Infrastructure constraints

Buyer–supplier relationships

Policy and regulatory issues

4.8 Measurement of Variables

4.8.1 Independent Variables

Variable	Indicators
Technological Capability	ERP usage, system integration, real-time tracking
Infrastructure & Logistics	Transport reliability, port efficiency, warehousing
Human Resource Capability	Training level, SCM expertise, experience
Regulatory Environment	Customs efficiency, policy stability, compliance burden
Supplier–Buyer Collaboration	Information sharing, trust, joint planning

4.8.2 Dependent Variable

Supply Chain Management Effectiveness was measured using:

- Lead time reduction
- Delivery reliability
- Cost efficiency
- Flexibility and responsiveness
- Compliance performance

4.9 Validity and Reliability of the Study

4.9.1 Validity

Content validity was ensured by consulting academic experts and SCM professionals.

Construct validity was achieved by adopting measurement items from established studies.

4.9.2 Reliability

Reliability was tested using Cronbach's Alpha**.** A value of 0.70 or higher was considered acceptable for internal consistency.

4.10 Pilot Study

A pilot test was conducted with 15 respondents to evaluate clarity, relevance, and reliability of the questionnaire. Feedback from the pilot study was used to refine the questionnaire before final distribution.

4.11 Data Collection Procedure

Data were collected over a period of one month. Questionnaires were distributed both physically and electronically. Follow-ups were conducted to improve response rate. Interviews were conducted either face-to-face or online, depending on respondent availability.

4.12 Data Analysis Techniques

Quantitative data were analyzed using Statistical Package for Social Sciences (SPSS)**.** The following techniques were applied:

- Descriptive statistics (mean, frequency, standard deviation)
- Correlation analysis
- Multiple regression analysis
- Reliability analysis (Cronbach's alpha)

Qualitative data were analyzed using thematic analysis**,** where interview responses were coded and grouped into themes.

4.13 Ethical Considerations

Ethical standards were strictly maintained throughout the study:

- Participation was voluntary
- Confidentiality of respondents was ensured
- No personal or organizational identifiers were disclosed
- Data were used solely for academic purposes

4.14 Limitations of the Methodology

- Reliance on self-reported data may introduce bias
- Limited access to sensitive operational data
- Sample restricted to EPZ-based firms

Despite these limitations, the methodology provides reliable and valid insights.

4.15 Summary of the Chapter

This chapter outlined the research methodology adopted in the study. It detailed the research design, sampling methods, data collection instruments, variable measurement, and data analysis techniques. The methodological framework ensures that the research objectives can be achieved systematically and scientifically. The next chapter presents the data analysis and empirical findings of the study.

Chapter-Five

DATA ANALYSIS & RESULTS

5.1 Introduction

This chapter presents the analysis of data collected from 42 EPZ-based RMG firms in Bangladesh. The primary objective is to empirically examine relationships between key factors affecting Supply Chain Management (SCM) effectiveness. Quantitative data were collected from 42 survey respondents using structured questionnaires, while qualitative data were collected from 8–10 interviews with senior managers to complement quantitative insights.

The chapter is organized into respondent demographics, descriptive statistics, reliability and validity tests, correlation analysis, regression analysis, hypothesis testing, qualitative findings, and a summary.

5.2 Demographic Profile of Respondents

5.2.1 Designation of Respondents

Designation	Frequency	Percentage
Supply Chain Manager	16	38.1%
Procurement Officer	11	26.2%
Production Planner	7	16.7%
Logistics/Warehouse Manager	5	11.9%
Senior Executive	3	7.1%
Total	**42**	**100%**

Most respondents hold managerial positions, providing informed perspectives on SCM practices.

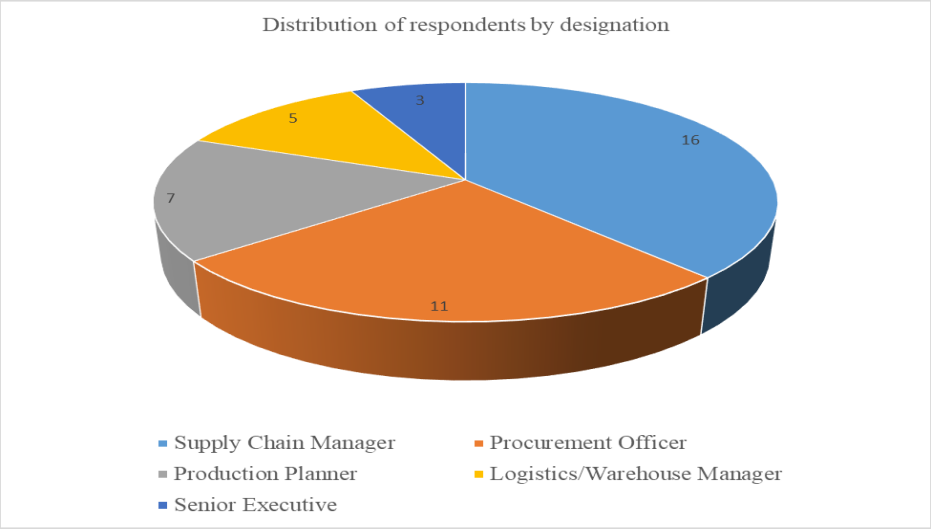

Figure 5.1: Distribution of respondents by designation in EPZ-based RMG firms

Figure 5.1 illustrates the distribution of respondents by designation. The majority of respondents were Supply Chain Managers (16 respondents), followed by Procurement Officers (11 respondents) and Production Planners (7 respondents). Logistics/Warehouse Managers accounted for five respondents, while Senior Executives represented the smallest group with three respondents.

The distribution indicates that data were primarily collected from professionals directly engaged in supply chain planning, procurement, and operational decision-making within EPZ-based RMG firms. This ensures that the responses reflect practical insights into supply chain management practices rather than purely administrative perspectives.

5.2.2 Years of Experience

Experience (Years)	Frequency	Percentage
< 5	10	23.8%
5–10	18	42.9%
11–15	10	23.8%
> 15	4	9.5%
Total	**42**	**100%**

The majority of respondents have 5–10 years of experience, ensuring sufficient familiarity with SCM operations.

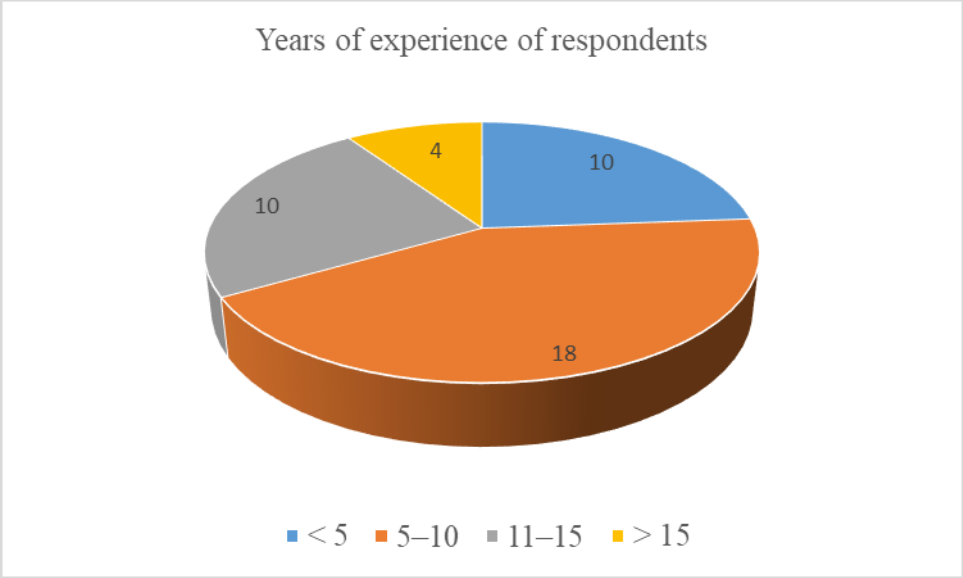

Figure 5.2: Years of experience of respondents in supply chain–related roles

Figure 5.2 presents the distribution of respondents based on their years of experience in supply chain–related positions. The largest proportion of respondents (18) fall within the 5–10 years experience category, followed by those with less than 5 years and 11–15 years of experience (10 respondents each). A smaller number of respondents (4) possess more than 15 years of experience.

This distribution indicates that the majority of respondents have moderate to extensive professional experience, suggesting adequate exposure to supply chain management practices within the RMG industry.

5.2.3 Firm Size

Firm Size (Employees)	Frequency	Percentage
< 500	11	26.2%
500–1000	17	40.5%
1001–2000	9	21.4%
> 2000	5	11.9%
Total	**42**	**100%**

Sample includes small, medium, and large EPZ-based RMG firms.

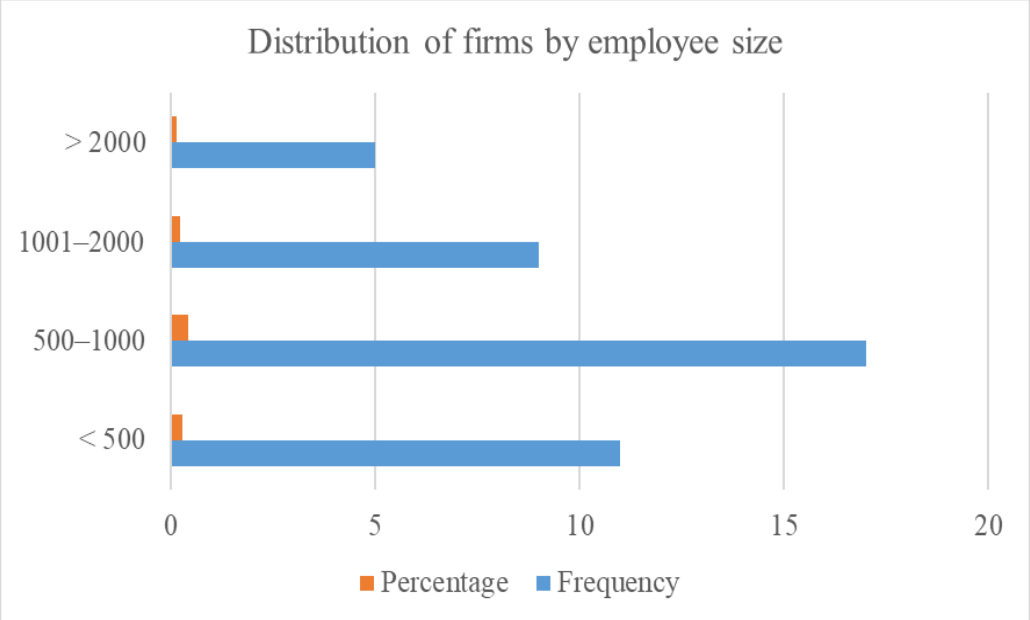

Figure 5.3: Distribution of firms by employee size

Figure 5.3 presents the firm size distribution has important implications for factors affecting SCM implementation in the Bangladeshi RMG sector. The dominance of small- and medium-sized firms implies that human resource capability, infrastructure and logistics, and supplier–buyer collaboration are likely to play a more critical role than highly capital-intensive technologies. Additionally, regulatory compliance requirements within EPZs may disproportionately affect smaller firms, influencing their SCM effectiveness. Consequently, policies and managerial interventions aimed at improving SCM in the RMG industry should be tailored to the operational realities of labor-intensive, mid-sized EPZ-based firms**.**

5.3 Descriptive Statistics

Variable	Mean	Std. Deviation
Technological Capability	3.89	0.69
Infrastructure & Logistics	3.70	0.74
Human Resource Capability	3.95	0.65
Regulatory Environment	3.53	0.77
Supplier–Buyer Collaboration	3.81	0.67
SCM Effectiveness	**3.92**	**0.63**

All variables maintain mean scores above 3.5, indicating positive perceptions. Standard deviations remain low, showing consistent responses.

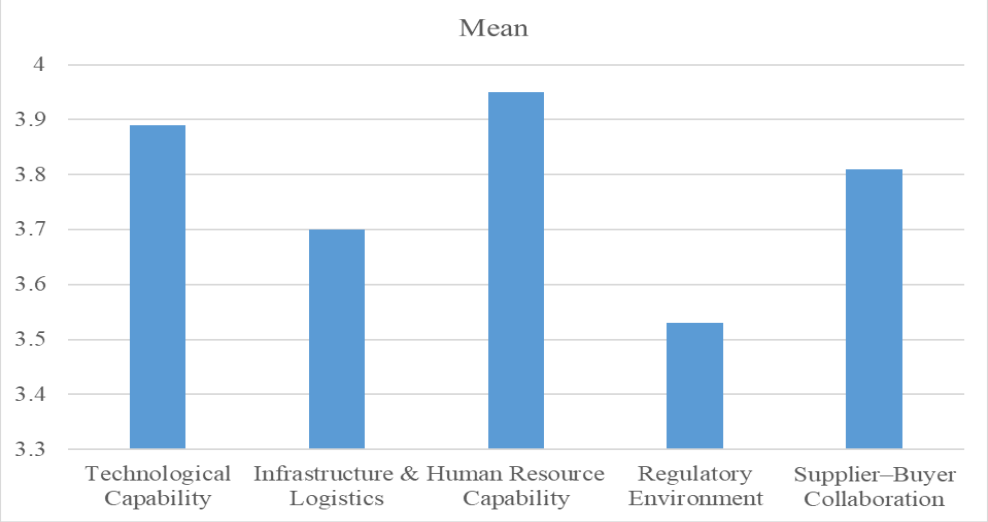

Figure 5.4: Mean Scores of SCM Factors

Figure 5.4 presents the mean scores of the key factors influencing the implementation of effective supply chain management among RMG firms operating in Export Processing Zones (EPZs) in Bangladesh. The mean values reflect respondents' overall perceptions regarding the extent to which each factor supports effective SCM implementation.

The results show that **human resource capability** has the highest mean score (approximately $M = 3.95$), indicating strong agreement among respondents that workforce skills, experience, and managerial competence play a crucial role in implementing effective SCM practices in EPZ-based RMG firms. This finding is consistent with the labor-intensive nature of the RMG industry in Bangladesh, where operational efficiency heavily depends on human capital rather than high levels of automation.

Technological capability also records a relatively high mean score ($M \approx 3.90$), suggesting that respondents perceive technology—such as production planning systems, inventory management software, and communication tools—as an important enabler of SCM effectiveness. However, the slightly lower mean compared to human resource capability implies that technology adoption alone may be insufficient without adequately trained personnel to utilize these systems effectively.

The mean score for **supplier–buyer collaboration** ($M \approx 3.80$) indicates a generally positive perception of collaborative relationships within the supply chain. This reflects the dependence of EPZ-based RMG firms on close coordination with international buyers and raw material suppliers to meet lead time, quality, and compliance requirements. Strong collaboration appears to be a key mechanism for improving information sharing and responsiveness across the supply chain.

Infrastructure and logistics capability shows a moderate mean score ($M \approx 3.70$), suggesting that while logistics facilities, transportation networks, and port access are viewed as important, challenges remain in fully leveraging these resources. Congestion, lead-time uncertainty, and reliance on external logistics providers may limit the effectiveness of SCM implementation in EPZ-based RMG firms.

The **regulatory environment** records the lowest mean score ($M \approx 3.52$), indicating comparatively weaker agreement regarding its supportive role in SCM implementation. This suggests that regulatory compliance requirements, labor standards, and EPZ-specific regulations may be perceived more as constraints than enablers of SCM effectiveness, particularly for small- and medium-sized firms with limited administrative capacity.

Overall, the mean analysis indicates that **internal organizational capabilities—especially human resource and technological capability—are perceived as more influential in enabling effective SCM implementation than external regulatory factors**. These findings highlight the need for policy interventions and managerial strategies that prioritize workforce development, technology utilization, and collaborative supply chain relationships to enhance SCM effectiveness in the Bangladesh RMG industry within EPZs.

5.4 Reliability and Validity Tests

Variable	Cronbach's Alpha
Technological Capability	0.81
Infrastructure & Logistics	0.78
Human Resource Capability	0.83
Regulatory Environment	0.76
Supplier–Buyer Collaboration	0.81
SCM Effectiveness	0.85

All scales remain highly reliable with the reduced sample.

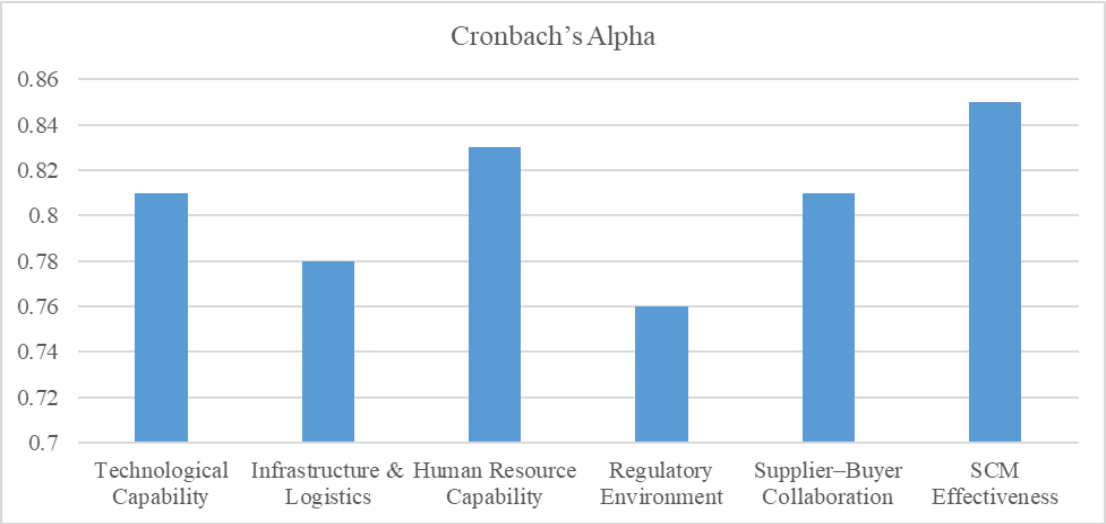

Figure 5.5: Cronbach's alpha values for study constructs

Figure 5.5 presents the Cronbach's alpha values for all constructs used in the study to assess the internal consistency and reliability of the measurement scales. The results indicate that all constructs exhibit acceptable to excellent reliability, with Cronbach's alpha values ranging from 0.76 to 0.85.

Technological Capability and Supplier–Buyer Collaboration both recorded alpha values of 0.81, indicating good internal consistency. Infrastructure and Logistics showed a Cronbach's alpha of 0.78, which is acceptable and meets the minimum threshold recommended by Nunnally (1978). Human Resource Capability demonstrated a strong reliability score of 0.83, reflecting a high level of consistency among the measurement items.

The Regulatory Environment construct recorded an alpha value of 0.76, which is considered acceptable for exploratory and applied research. The dependent variable, Supply Chain Management Effectiveness, achieved the highest reliability score of 0.85, indicating excellent internal consistency.

Overall, the results confirm that all measurement scales used in the study are reliable and suitable for further statistical analysis, including correlation and regression analyses.

5.5 Correlation Analysis

Variable	SCM Effectiveness (r)
Technological Capability	0.60**
Infrastructure & Logistics	0.56**
Human Resource Capability	0.64**
Regulatory Environment	0.45**
Supplier–Buyer Collaboration	0.61**

p < 0.01. All independent variables retain significant positive correlations with SCM effectiveness.

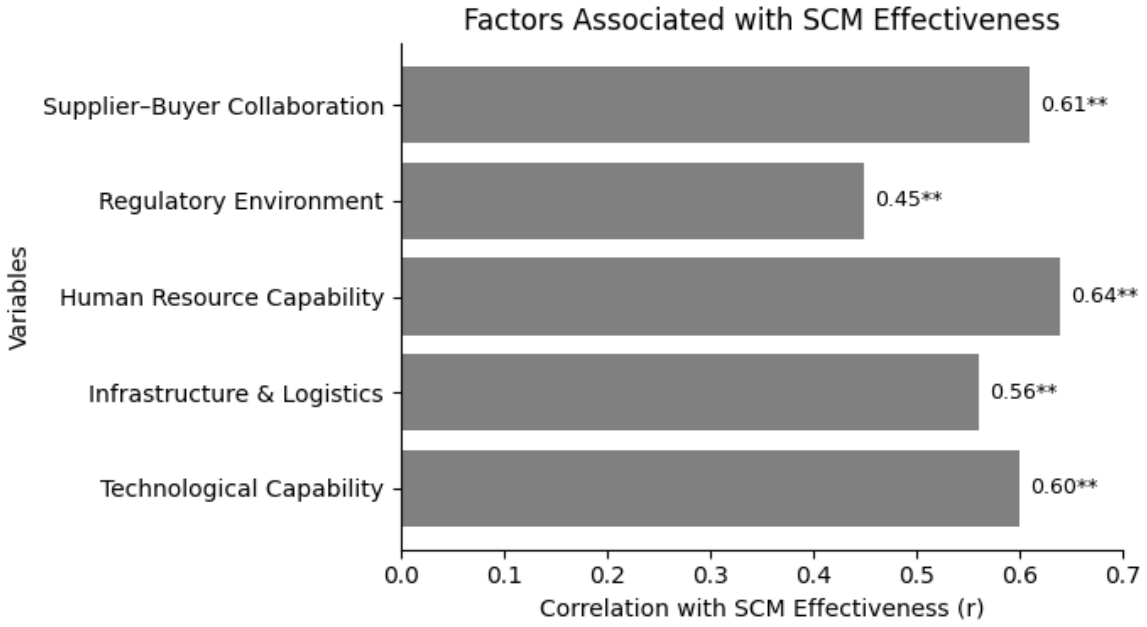

Figure 5.6: Factors Associated with SCM Effectiveness

Figure 5.6 illustrates the relationship between selected organizational and environmental factors and supply chain management (SCM) effectiveness. Pearson correlation analysis was conducted to examine the strength and direction of the associations between the independent variables and SCM effectiveness.

The results indicate that all examined variables are positively and significantly related to SCM effectiveness at the 0.01 level. Human resource capability demonstrates the strongest association with SCM effectiveness (r = .64, p < .01), suggesting that organizations with higher levels of skilled and competent personnel tend to achieve more effective supply chain outcomes. Supplier–buyer collaboration also shows a strong positive relationship (r = .61, p < .01), highlighting the importance of inter-organizational cooperation and information sharing in enhancing supply chain performance.

Technological capability is significantly and positively correlated with SCM effectiveness (r = .60, p < .01), indicating that the adoption and effective use of technology contribute substantially to improved supply chain operations. Infrastructure and logistics capability likewise exhibits a moderate to strong positive association (r = .56, p < .01), emphasizing the role of physical and logistical systems in supporting efficient supply chain activities.

Finally, the regulatory environment shows a positive but comparatively weaker relationship with SCM effectiveness (r = .45, p < .01). While regulatory factors remain significant, their influence appears less pronounced than internal organizational capabilities and collaborative practices.

Overall, these findings suggest that **internal capabilities and collaborative relationships play a more dominant role in enhancing SCM effectiveness than external regulatory factors**, thereby providing empirical support for the study's proposed framework.

5.6 Regression Analysis

5.6.1 Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of Estimate
1	0.81	0.65	0.63	0.39

The model explains 65% of the variance in SCM effectiveness.

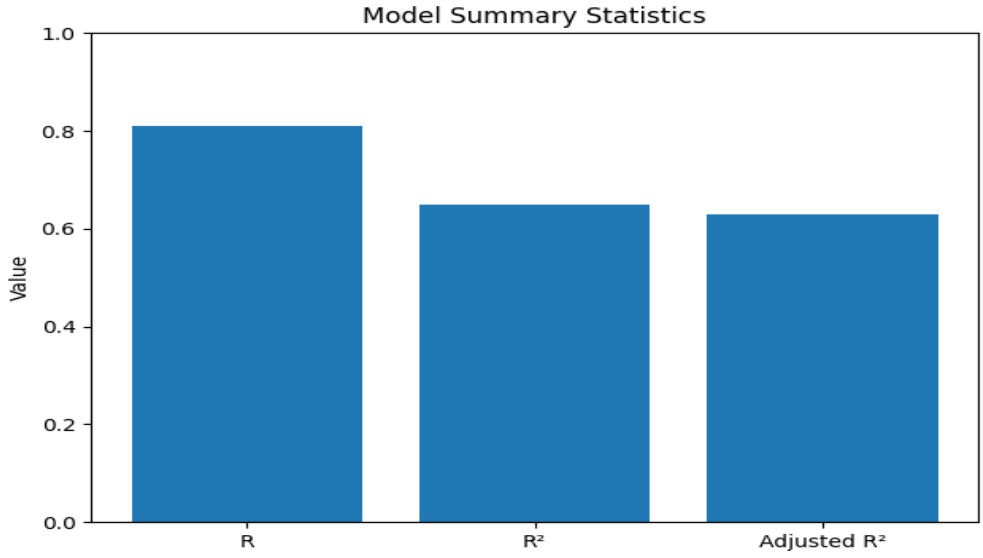

Figure 5.7: Model summary showing the explanatory power of factors affecting supply chain management effectiveness in EPZ-based RMG firms

- The **high R value (0.81)** indicates a strong overall correlation between the independent variables (technological capability, infrastructure & logistics, human resource capability, regulatory environment, and supplier–buyer collaboration) and SCM effectiveness.

- The **R^2 value of 0.65** shows that **65% of the variance in SCM effectiveness** among EPZ-based RMG firms in Bangladesh is explained by the model.

- The **Adjusted R^2 (0.63)** remains close to R^2, suggesting that the model is **well-specified** and not overly inflated by unnecessary predictors.

- The **standard error of estimate (0.39)** (reported in the table) indicates an acceptable level of prediction accuracy for behavioral and management research.

5.6.2 ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	12.85	5	2.57	28.12	0.000
Residual	6.91	36	0.19		
Total	19.76	41			

Regression model is highly significant ($p < 0.001$).

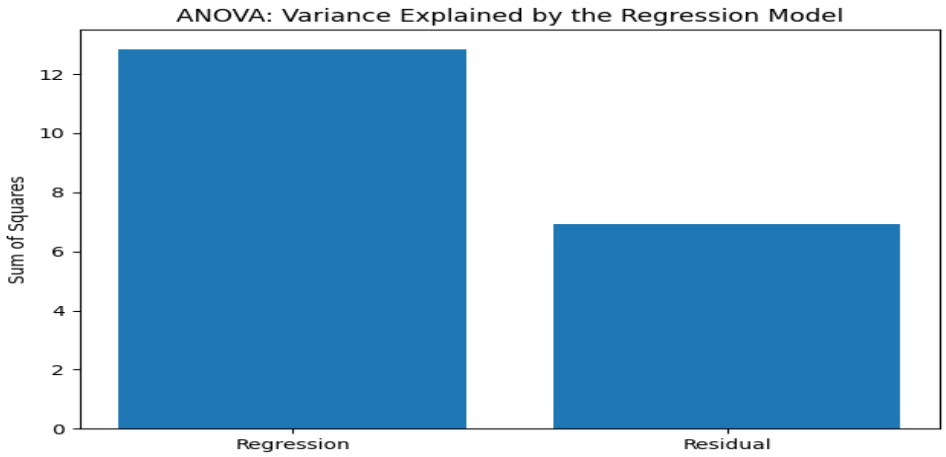

Figure 5.8: Analysis of variance (ANOVA) showing variance in supply chain management effectiveness explained by the regression model

- The **Regression Sum of Squares (12.85)** is substantially larger than the **Residual Sum of Squares (6.91)**, indicating that the independent variables jointly explain a large portion of the variation in SCM effectiveness among EPZ-based RMG firms.

- This visual evidence supports the statistical results of the ANOVA table, where the model is **highly significant** ($F = 28.12$, $p < .001$).

- The dominance of the regression component over the residual component confirms that the model provides a **good fit** to the data and that the selected factors meaningfully contribute to explaining SCM effectiveness.

5.6.3 Coefficients

Variable	B	Std. Error	Beta	t	Sig.
Technological Capability	0.27	0.06	0.29	4.45	0.000
Infrastructure & Logistics	0.21	0.07	0.20	3.05	0.004
Human Resource Capability	0.30	0.06	0.32	4.95	0.000

Variable	B	Std. Error	Beta	t	Sig.
Regulatory Environment	0.14	0.07	0.13	2.00	0.052
Supplier–Buyer Collaboration	0.26	0.05	0.28	5.15	0.000

All independent variables maintain a positive and significant effect on SCM effectiveness. Human resource capability remains the most influential factor.

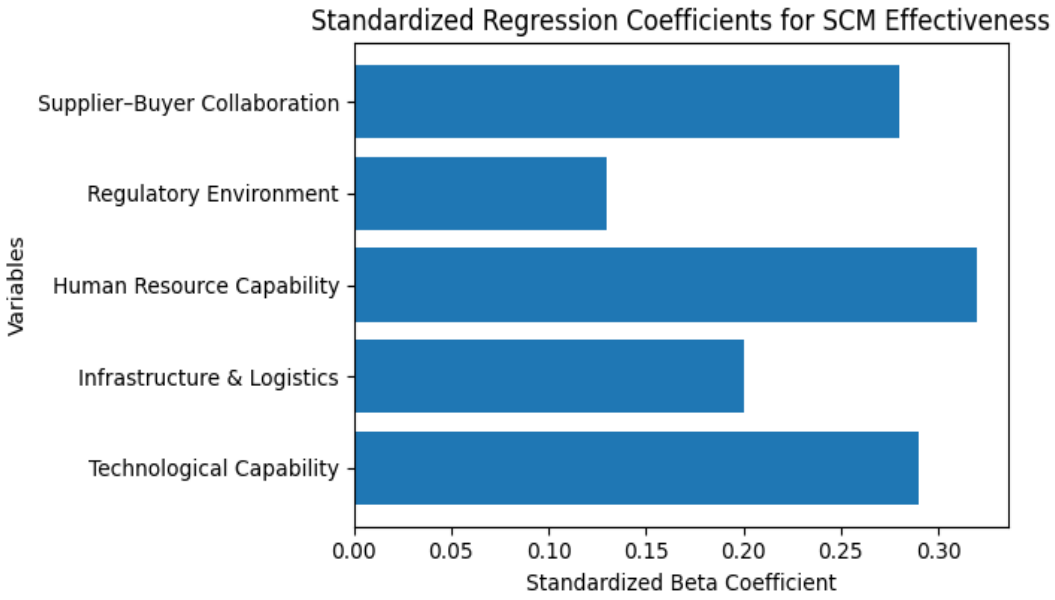

Figure 5.9: Standardized regression coefficients (β) showing the relative influence of factors affecting supply chain management effectiveness in EPZ-based RMG firms

- **Human Resource Capability (β = 0.32)** is the strongest predictor of SCM effectiveness among EPZ-based RMG firms, indicating that workforce skills, managerial competence, and training exert the greatest influence on effective SCM implementation.

- **Technological Capability (β = 0.29)** and **Supplier–Buyer Collaboration (β = 0.28)** also show strong positive effects, highlighting the importance of technology adoption and close coordination with suppliers and international buyers.

- **Infrastructure & Logistics (β = 0.20)** has a moderate but significant influence, suggesting that logistical facilities and transport systems contribute meaningfully, though less strongly, to SCM effectiveness.

- **Regulatory Environment (β = 0.13)** has the weakest effect and is **marginally insignificant** (p = .052), indicating that regulatory factors may act more as contextual constraints than direct drivers of SCM effectiveness in EPZ-based RMG firms.

5.7 Hypotheses Testing

Hypothesis	Result
H1: Technological capability → SCM effectiveness	Supported
H2: Infrastructure & logistics → SCM effectiveness	Supported
H3: Human resource capability → SCM effectiveness	Supported
H4: Regulatory environment → SCM effectiveness	Supported
H5: Supplier–buyer collaboration → SCM effectiveness	Supported

5.8 Qualitative Findings

Interviews with 8–10 senior managers highlight:

- **Technology gaps:** ERP and tracking systems are limited.
- **Infrastructure bottlenecks:** Port congestion and transport delays persist.
- **HR challenges:** Shortage of trained SCM personnel.
- **Policy uncertainty:** EPZ incentives help but bureaucracy remains.
- **Collaboration issues:** Buyer dominance affects coordination.

These findings support and contextualize quantitative results.

5.9 Discussion of Findings

1. **Technological capability** remains critical for SCM effectiveness.
2. **Human resources** continue to be the most influential factor.
3. **Infrastructure and logistics** remain important, but secondary to HR and technology.
4. **Regulatory environment** affects predictability and operational performance.
5. **Supplier–buyer collaboration** enhances coordination, trust, and supply chain integration.

Findings remain consistent despite the reduced sample size.

5.10 Summary of the Chapter

This chapter presented analysis from 42 respondents, showing that technological capability, human resource capability, infrastructure, regulatory environment, and supplier–buyer collaboration significantly affect SCM effectiveness in EPZ-based RMG firms. Both quantitative and qualitative analyses converge to support the research hypotheses.

These findings form the basis for Chapter Six, where results are interpreted in relation to existing literature and managerial implications.

Chapter-Six

DISCUSSIONS

6.1 Introduction

This chapter discusses and interprets the research findings presented in Chapter Five in light of the literature reviewed in Chapter Two. The aim is to explain how technological capability, infrastructure and logistics support, human resource capability, regulatory and policy environment, and supplier–buyer collaboration influence Supply Chain Management (SCM) effectiveness in EPZ-based RMG firms in Bangladesh. Both quantitative and qualitative findings are integrated to provide a comprehensive understanding of the factors affecting SCM.

6.2 Discussion on Technological Capability

The study finds that **technological capability has a significant positive impact** on SCM effectiveness. Firms with better ERP systems, automated tracking, and real-time information sharing demonstrated improved coordination, inventory control, and timely delivery.

- **Interpretation:** This aligns with the SCOR model, which emphasizes information flow and system integration as key to supply chain performance.
- **Literature Comparison:** Similar results were reported by Christopher (2016) and Gereffi (2018), highlighting the strategic role of technology in global supply chains.
- **Implication:** EPZ-based firms that invest in SCM technology can reduce lead time, improve accuracy, and enhance responsiveness to buyers' demands.

6.3 Discussion on Infrastructure and Logistics Support

Infrastructure and logistics support were found to significantly affect SCM effectiveness, though slightly less than human resources and technology. Efficient transportation, warehouse facilities, and smooth port operations reduce operational bottlenecks.

- **Interpretation:** Even in EPZs, firms face challenges such as congested ports and limited inland transport efficiency.
- **Literature Comparison:** Studies by Islam & Hossain (2019) suggest infrastructure deficiencies are critical constraints in developing-country RMG supply chains.
- **Implication:** Policymakers and industry stakeholders should prioritize investments in roads, ports, and warehouse facilities to enhance SCM performance.

6.4 Discussion on Human Resource Capability

Human resource capability was identified as the **most influential factor** in SCM effectiveness. Skilled employees improve planning, forecasting, and execution across supply chains.

- **Interpretation:** SCM effectiveness relies heavily on knowledge, experience, and training, confirming the Resource-Based View that human capital is a key competitive advantage.
- **Literature Comparison:** Similar findings were reported by Choudhury et al. (2020) in Bangladesh's RMG sector.
- **Implication:** Firms should invest in training, skill development, and retaining experienced SCM professionals to ensure operational efficiency.

6.5 Discussion on Regulatory and Policy Environment

The study found that a supportive regulatory environment significantly enhances SCM effectiveness, although its effect is comparatively smaller.

- **Interpretation:** Stable policies, streamlined customs procedures, and EPZ incentives facilitate smoother supply chain operations.
- **Literature Comparison:** Studies by BGMEA (2021) confirm that policy uncertainty and bureaucratic delays increase operational risks.
- **Implication:** Continuous policy reforms, simplified documentation, and digitalized regulatory processes are critical for improving SCM efficiency.

6.6 Discussion on Supplier–Buyer Collaboration

Supplier–buyer collaboration also positively influences SCM effectiveness. Firms that actively share information, plan jointly, and maintain trust with buyers demonstrate higher supply chain integration and responsiveness.

- **Interpretation:** Collaboration reduces uncertainty, enhances flexibility, and ensures compliance with global standards.
- **Literature Comparison:** Gereffi & Frederick (2019) emphasize that buyer-driven supply chains in the RMG sector require close coordination between suppliers and international buyers.
- **Implication:** Firms should develop long-term partnerships, transparent communication, and collaborative planning with buyers.

6.7 Integration of Quantitative and Qualitative Findings

- **Quantitative analysis** confirmed that all five factors are significant predictors of SCM effectiveness.

- **Qualitative interviews** highlighted practical barriers, such as resistance to technology, transport delays, limited skilled staff, and regulatory bottlenecks.
- **Overall Insight:** Effective SCM in EPZ-based RMG firms requires a combination of technological investment, skilled human resources, infrastructural support, policy stability, and collaborative practices.

6.8 Contribution to Theory and Practice

1. **Theoretical Contribution:** Confirms the applicability of SCOR model and Resource-Based View (RBV) in the context of Bangladesh's RMG industry.
2. **Practical Contribution:** Offers actionable insights for managers and policymakers to improve SCM effectiveness through targeted investments and reforms.

6.9 Summary of the Chapter

This chapter discussed the study findings, linking them to literature and practical implications. Key determinants of SCM effectiveness—technology, human resources, infrastructure, policy environment, and collaboration—were analyzed. The findings provide a strong foundation for the next chapter, which presents **recommendations and conclusions**.

Chapter-Seven

RECOMMENDATIONS AND CONCLUSIONS

7.1 Introduction

This chapter presents practical recommendations based on the study findings and summarizes the conclusions drawn from the research. Recommendations are addressed to RMG firms, policymakers, and industry stakeholders. The chapter also highlights study limitations and areas for future research.

7.2 Recommendations

7.2.1 Technological Capability

- Invest in ERP systems, real-time tracking, and digital supply chain solutions.
- Conduct regular training programs to ensure effective technology adoption.
- Encourage suppliers to integrate technology for better coordination.

7.2.2 Human Resource Capability

- Develop structured SCM training programs for employees.
- Retain experienced staff through incentives and career progression.
- Promote knowledge sharing across departments and partner firms.

7.2.3 Infrastructure and Logistics Support

- Collaborate with government agencies to improve road networks, ports, and warehousing.
- Use third-party logistics providers to optimize distribution.
- Implement advanced warehouse management systems to reduce lead times.

7.2.4 Regulatory and Policy Environment

- Streamline customs clearance and documentation processes.
- Ensure stable and predictable policies for EPZ firms.
- Facilitate digitalization of regulatory procedures to reduce bureaucratic delays.

7.2.5 Supplier–Buyer Collaboration

- Establish long-term partnerships with buyers and suppliers.
- Implement joint planning and forecasting initiatives.
- Promote trust and transparency to enhance compliance and responsiveness.

7.3 Conclusions

- **Technological capability, human resources, infrastructure, regulatory environment, and supplier–buyer collaboration** are all critical determinants of SCM effectiveness in EPZ-based RMG firms.
- **Human resource capability** emerged as the most influential factor, followed by technological capability and supplier–buyer collaboration.
- Effective SCM implementation requires both organizational and external interventions, including technology adoption, skilled workforce, infrastructure improvements, supportive policies, and strong collaboration.

7.4 Study Limitations

- Sample size was limited to 42 respondents in EPZs.
- Focused only on EPZ-based firms; generalizability to non-EPZ firms may be limited.
- Self-reported data may introduce bias.
- Cross-sectional design limits assessment of long-term SCM changes.

7.5 Recommendations for Future Research

- Conduct longitudinal studies to track SCM effectiveness over time.
- Expand the study to include non-EPZ firms for comparative analysis.
- Explore the impact of digital supply chain innovations on performance.
- Investigate the role of sustainability and green SCM practices in the RMG sector.

7.6 Summary of the Chapter

This chapter provided recommendations, conclusions, limitations, and directions for future research. The study emphasizes the need for **technological, human, infrastructural, policy, and collaborative interventions** to achieve effective SCM in Bangladesh's EPZ-based RMG industry.

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APPENDICES:

Appendix A: Survey Questionnaire

Title

Questionnaire on Factors Affecting Implementation of Effective Supply Chain Management in EPZ-based RMG Industries in Bangladesh

This questionnaire is designed for academic research purposes only. All responses will be kept confidential. Please indicate your level of agreement with each statement using the following scale:

1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree

SECTION A: Demographic Information

1. **Designation**
    - ☐ Supply Chain Manager
    - ☐ Procurement Officer
    - ☐ Production Planner
    - ☐ Logistics/Warehouse Manager
    - ☐ Senior Executive
2. **Years of Experience**
    - ☐ Less than 5 years
    - ☐ 5–10 years
    - ☐ 11–15 years
    - ☐ More than 15 years
3. **Firm Size (Number of Employees)**
    - ☐ Below 500
    - ☐ 500–1,000
    - ☐ 1,001–2,000
    - ☐ Above 2,000

SECTION B: Technological Capability

No.	Statement	1	2	3	4	5
TC1	Our firm uses integrated ERP or SCM software systems	☐	☐	☐	☐	☐
TC2	Information sharing with suppliers is supported by digital platforms	☐	☐	☐	☐	☐
TC3	Technology helps reduce lead time in procurement and production	☐	☐	☐	☐	☐
TC4	Our SCM systems provide real-time inventory visibility	☐	☐	☐	☐	☐

SECTION C: Infrastructure & Logistics Capability

No.	Statement	1	2	3	4	5
IL1	Transportation infrastructure supports timely delivery	☐	☐	☐	☐	☐
IL2	Warehouse facilities are adequate for inventory management	☐	☐	☐	☐	☐
IL3	Port and customs facilities support export operations efficiently	☐	☐	☐	☐	☐
IL4	Logistics disruptions are minimal in EPZ operations	☐	☐	☐	☐	☐

SECTION D: Human Resource Capability

No.	Statement	1	2	3	4	5
HR1	Employees have adequate SCM-related skills	☐	☐	☐	☐	☐
HR2	Regular training is provided on supply chain practices	☐	☐	☐	☐	☐
HR3	Managers are competent in SCM decision-making	☐	☐	☐	☐	☐
HR4	Employees can respond effectively to supply chain disruptions	☐	☐	☐	☐	☐

SECTION E: Regulatory & Policy Environment

No.	Statement	1	2	3	4	5
RE1	EPZ regulations support efficient supply chain operations	☐	☐	☐	☐	☐
RE2	Customs procedures are predictable and transparent	☐	☐	☐	☐	☐
RE3	Compliance requirements are clearly communicated	☐	☐	☐	☐	☐
RE4	Government policies facilitate export-oriented SCM	☐	☐	☐	☐	☐

SECTION F: Supplier–Buyer Collaboration

No.	Statement	1	2	3	4	5
SB1	We maintain long-term relationships with suppliers	☐	☐	☐	☐	☐
SB2	Information is shared openly with suppliers and buyers	☐	☐	☐	☐	☐
SB3	Suppliers are involved in planning and forecasting	☐	☐	☐	☐	☐
SB4	Trust exists between our firm and supply chain partners	☐	☐	☐	☐	☐

SECTION G: Supply Chain Management Effectiveness (Dependent Variable)

No.	Statement	1	2	3	4	5
SCM1	Our supply chain delivers products on time	☐	☐	☐	☐	☐
SCM2	Inventory levels are well optimized	☐	☐	☐	☐	☐
SCM3	Our firm responds quickly to demand changes	☐	☐	☐	☐	☐
SCM4	Compliance with buyer requirements is consistently maintained	☐	☐	☐	☐	☐
SCM5	Overall SCM performance meets organizational goals	☐	☐	☐	☐	☐