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Assessing the Effect of Logistics Challenges on Operational Performance: The case of Soufflet Malt Ethiopia S.C.

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DECLARATION

I, Eyoel Getachew the undersigned, declare that this document entitled: "Assessing the Effect of Logistics Challenges on Operational Performance the case of Soufflet Malt Ethiopia S.C." is my own thesis work. I have done the document independently with the guidance of my respected advisor. Furthermore, it had not been used for completion or award of any program, diploma/degree, in AAU or any academic institution, and finally, I acknowledge all materials used for this thesis document.

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CERTIFICATION

This is to certify that the above statement made by the MA candidate under my advisee is correct to the best of my knowledge as an advisor. Hence, I attest that the student can submit the research thesis to the department for further evaluation by examiner/s.

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APPROVAL-SHEET

This is to certify that the research entitled "*Assessing the Effect of Logistics Challenges on Operational Performance the case of Soufflet Malt Ethiopia S.C.*" by Eyoel Getachew has been submitted for examination. After careful review and assessment, the research document has been approved and signed by the examining committee.

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ABSTRACT

The purpose of this study was to examine the impact of transportation and logistics problems on the operational performance of Soufflet Malt Ethiopia S.C supply chain. Proper management of transportation and logistics is a crucial aspect of a supply chain operation, especially in the manufacturing industry.

This study identified seven critical challenges including Logistics Infrastructure and Facilities, Planning & Scheduling Maturity, Cost Inflation, information flow and technology integration, regulatory and policy issues, warehousing efficiency and supply chain visibility. This research used a quantitative approach, by using structured questionnaires with a five-point Likert scale to people inside and outside the company.

Data analysis included frequency, mean, standard deviation, Pearson's correlation coefficient and multiple linear regression to determine the relationship of these challenges to operational performance. I distributed 148 questionnaires and 112 or 75.5% were completed and returned. The seven combined challenges explained 86.8% (R2 = 0.868) of the variation in operational performance.

Important predictors of performance were logistics infrastructure and facilities, cost inflation, regulatory and policy issues, information flow and technology integration and supply chain visibility. Logistics Infrastructure and Facilities have had the greatest impact, with problems such as poor road conditions, limited transport options and few alternative routes. Next in importance were logistics costs, mainly because of high fuel prices and inefficient operations. Infrastructure efficiency and Planning & Scheduling Maturity had a positive but not significant impact on performance. The study concludes that for better operational performance, Soufflet Malt Ethiopia S.C. invest in transportation and warehouse infrastructure, strengthen digital logistics systems like ERP and SAP, improve supply chain visibility through real time information sharing, enhance planning and scheduling practices, and collaborate with policymakers to reduce regulatory bottlenecks. These measures can improve operational efficiency, reduce logistics costs, and strengthen overall supply chain performance. This study contributes to the body of knowledge on supply chain management in Ethiopia and recommends other studies such as comparing different sectors and long-term studies.

Keywords: Logistics Infrastructure and Facilities, Cost Inflation, information flow and Integration, Policy Challenges, Supply Chain visibility, Operational Performance.

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List of Abbreviations

ANOVA	Analysis of Variance
GDP	Gross Domestic Product
OP	Operational Performance
IFTI	Information Flow and Technology Integration
IT	Information Technology
ICT	Information Communication Technology
RP	Regulatory and Policy
SD	Standard Deviations
TLC	Transportation and Logistics Challenges
VIF	Variance inflation Factor

CHAPTER ONE

1. INTRODUCTION

1.1. Background of Study

Evidently, the manufacturing sector of Ethiopia is showing positive signs of changing and slowly evolving towards modernization. Among sectors demonstrating growth, the malt supply chain is crucial to supplying malt to domestic and foreign breweries. Soufflet Malt Ethiopia S.C. is one of the major companies in this sector; it purchases barley from nearby farmers and turns it into malt. To ensure the balance of supply and demand, reduce extra or unnecessary costs, and meet the expected quality, must be transported and logistically handled well.

As one might expect, like every developing country around the world issues related with logistics and transportation greatly affect the Ethiopian malt supply chain, which has an impact on the system's overall dependability and efficiency. These difficulties include underdeveloped roads and infrastructure, delays in delivery, high transportation costs, and inventory control problems. To optimize the malt supply chain, this study will examine the unique difficulties that Soufflet Malt Ethiopia S.C. faces and offer suggestions for how to resolve them.

To make sure that supply chains are smooth and efficient, effective transportation, infrastructure and coordination are very essential, however challenges hold on in Ethiopia due to infrastructural and administrative imperatives. Soufflet Malt Ethiopia SC, a key player in malt generation, faces many obstacles that negatively affect its operational proficiency and advertise reach. This think about examines these challenges, pointing to propose noteworthy arrangements to reinforce the malt supply chain

1.2. Statement of the Problem

The country’s malt industry has great potential to increase the country’s agrarian economy and fulfill the developing nations and worldwide request for malted grain. In any case, the supply chain for malt production—particularly for industry pioneers like Soufflet Malt Ethiopia SC—faces a critical transportation and coordination challenges that ultimately, weaken productivity, cost-effectiveness, and item quality.

Soufflet Malt Ethiopia SC, a major producer supplying both local breweries and export markets, operates in a context where critical infrastructure gaps, bureaucratic inefficiencies, and fragmented coordination among stakeholders create systemic bottlenecks. Roads with a very low riding quality in barley-growing regions delay the timely delivery of raw materials to processing plants, while limited cold storage and warehousing facilities expose perishable goods to spoilage and quality degradation. In addition, the country's underdeveloped rail network and too much dependency on road transport increase fuel costs and delivery unpredictability. Regulatory hurdles, such as redundant customs checks and inconsistent enforcement of trade policies, further prolonging lead times and increasing operational expenses.

The above-mentioned challenges not only make it difficult for Souffle to strive but also impact on the entire supply chain, affecting farmers, transporters, and customers. Some studies look at logistics problems in Ethiopia's farming sector, but there is not enough information on how these issues specifically affect malt production.

Malt is an important and time-sensitive product that needs careful planning and coordination. Failing to give this issue due attention, will eventually hold back Ethiopia's ability to make the most of its farming strengths. This will hinder economic growth and business opportunities for companies like Soufflet Malt Ethiopia SC. This study aims to articulate and point out the problems in transportation and logistics. It will also try to offer useful suggestions and recommendations to make the malt supply chain stronger and more sustainable.

1.3. Objective of the Study

1.3.1. General objective of the study

The main objective of this study is to assess the effect of logistic challenge on operational performance in Soufflet Malt Ethiopia S.C.

1.3.2. Specific Objectives

To achieve the general objective, the specific objectives of this research proposal are:

1. To assess the level of operational performance of Soufflet Malt Ethiopia SC.
2. To assess the key logistics challenges within the Ethiopian malt industry, focusing on Soufflet Malt Ethiopia SC.

3. To analyze the impact of logistics challenges on operational performance of Soufflet Malt Ethiopia S.C.

1.4. Significance of the study

The final conclusions and suggestions of this research contribute a lot to both academic and practical purposes. For academics, it provides a significant input to the existing body of knowledge by providing a focused analysis of transportation and logistics challenges and its effect on operational performance. Moreover, the conclusion and recommendation of the study will give insight to future researchers to explore and investigate more in the area. For practitioners, the findings of this study will help the Ethiopian Malt industries identify areas for improvement and enhance their logistics supply chain.

1.5. Scope of the study

This study will mainly try to identify the effects transportation and logistics challenges on the operational performance of Ethiopian malt logistics supply chain, focusing on Soufflet Malt Ethiopia SC. To achieve this aim, the scope of the study focuses on the Transportation and logistics challenges relating to Logistics Infrastructure and Facilities, Planning & Scheduling Maturity, Cost Inflation, Information flow and technology integration, Warehousing efficiency, and supply chain visibility issues.

Geographically, the study was based on Addis Ababa, Soufflet Malt employee and governmental stakeholders. However, prior assumption is taken that a considerable number of employees and stakeholders who are responsible for logistic operations and management are available. Questioners, that are believed to be pertinent to the study and research questions, were distributed to the target populations.

1.6. Limitations of the Study

It is true that every study has its own limitations. This study was limited to investigating the major transportation and logistics challenges and their effects on operational performance. Potential limitations include limited access to certain company data and challenges in reaching all relevant stakeholders due to geographical constraints. The study was confined to Soufflet Malt Ethiopia SC, which may not fully represent the broader Ethiopian malt supply chain

1.7. Definition of Key Terms

Logistics Infrastructure and Facilities Challenges: These refer to obstacles stemming from inadequate, underdeveloped, or poorly maintained roads, railways, ports, and other transport facilities that hinder the efficient movement of goods and services across the supply chain (Rodrigue, 2020).

Cost Inflation: Logistics Costs: This refers to costs starting from planning how to conduct the business up to executing and managing the storage of products, services, and relevant information. It covers expenses related to transportation, warehousing, inventory control, and administrative operations. (Christopher, 2016).

Technology Integration Challenges: refers to some of the challenges that these organizations are facing when implementing and integrating new digital tools, systems, or platforms into their current supply chain and logistics operations. It can be expressed in terms of system compatibility, employee training, data integrity, and cybersecurity concerns. (Gunasekaran et al., 2017).

Regulatory and Policy Challenges: refers to some of the challenges faced due to local or international laws imposed by local, national, or international regulations, standards, and policies that negatively affect transportation, customs, trade, and environmental compliance can result in significant delays, higher costs, or operational restrictions (Martens et al., 2012).

Supply Chain Visibility Challenges: refers to challenges encountered due to lack of on time and accurate information regarding the location, movement, and condition of goods within the supply chain can limit effective decision-making and responsiveness (Caridi et al., 2010).

Warehousing Efficiency: It gives an indication and measures the degree of effectiveness a warehouse manages the storage, retrieval, and dispatch of goods with minimal waste, time, and cost. High degree of efficiency contributes to better inventory control and faster order fulfillment (Frazelle, 2002).

Operational Performance: The ability of a firm to effectively and efficiently use its resources to deliver products or services that meet quality, cost, speed, and flexibility goals. Key indicators include productivity, delivery reliability, lead time, and customer satisfaction (Neely et al., 2005).

1.8. Organization of the Study

The research has five chapters. The first chapter includes the background of the study, statement of the problem, research questions, objective of the study, significance of the study, scope of the study, limitations of the study and operational definitions. The second chapter (Literature Review) includes the discussion of concepts, theoretical reviews, empirical reviews related to the area of study, and conceptual framework. The third chapter describes the research design, participants of the study, the data source, data collection and analysis techniques and procedures. The fourth chapter deals with data analysis, interpretation and discussion of the findings accordingly. Finally, in the last chapter, conclusion, recommendations, and future research directions were included.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

This chapter presents a comprehensive review of theoretical perspectives on transportation and logistics challenges and their relationship with operational performance. It also includes an empirical review of related studies, the conceptual framework, and the hypotheses underpinning the study.

2.1. Theoretical Review

2.1.1. Supply Chain and Logistics Management

SCM involves the coordination of various critical business processes starting from end users of the product to original suppliers of raw material, delivering products, services, and information that adds value for customers and other stakeholders, as noted by Tracey et al. (2005: 179). Effective SCM necessitates the integration of all relevant components into a cohesive set of business processes within and among organizations. This co-ordination includes the different organizational elements responsible for various activities, along with the external suppliers and customers involved in planning and execution. SCM, as a management philosophy, adopts a systems approach to view the supply chain as a unified entity, suggesting that the concept of partnership encompasses all stages that contribute, directly or indirectly, to fulfilling customer requests. This means the supply chain includes not only manufacturers and suppliers but also transporters, warehouses, retailers, and the customers (Chopra and Meindl, 2001).

Furthermore, a supply chain is an interconnection of several tasks that manage the procurement of materials value addition and transforming materials according to the market demand, and the distribution of these products to customers (Ganeshan and Harrison, 1995). The degree of soundness of the supply chain can be assessed through satisfaction of the customer and the associated cost (Estampea et al., 2013). The Satisfaction of customer reflects the service level standards expected from a company, which is closely tied to the overall effectiveness of its supply chain (Chan, 2003). However, evaluating supply chain performance is complex due to the collaboration and interaction among multiple stakeholders aimed at achieving specific strategic objectives. (Estampea, et al., 2013).

Companies sometimes share their supply chain information for their own good. One advantage that could be gained by sharing this information is reducing the lack of demand visibility as it moves from downstream end customer to upstream partners in the chain. It has also enabled them to work closely with customers and suppliers. It has also great advantages for improving information and product flows, and reduce surprises from demand fluctuations, enhance internal process integration, and work with suppliers to restructure the supply chain. (Krajewski and colleagues, 2010)

Factors that could affect supply chain performance include sourcing strategy, distribution strategy, and inventory management strategy, as well as collaboration with partners and information technology.

According to Jonsson, the crucial factors for the company's supply chain performance are strategic sourcing and the development of supplier relationships. (2008. How one chooses its sourcing strategies and collaboration energies will have a great effect on the efficiency and competitiveness of the company's supply chain. Both the supplier and the customers have equal impact in terms of company's performance and competitiveness.

According to Lo et al. (2007), a focus on the customer, ongoing improvement, and complete supplier engagement can enhance supply chain performance. Supply Chain Management is a vital strategic element for boosting an organization's effectiveness and efficiency (Gunasegaram et al., 2001). Businesses can achieve their goals by delivering superior service to their customers compared to their competitors (Neely et al., 1995). Effectiveness is measured by how well customer needs are fulfilled, while efficiency assesses the economical use of the firm's resources in achieving a certain level of customer satisfaction. For companies aiming to secure a competitive edge, enhancing supply chain performance is essential (Cai et al., 2009).

Supply chain performance measurement refers to the process of evaluating the efficiency and effectiveness of supply chain processes both upstream and downstream. This involves using specific metrics known as performance measures to gauge these aspects. A major challenge lies in identifying the key performance indicators for value-added supply chain activities, as well as the elements that will impact the core business processes that create value for customers (Gunasekaran & Kobu, 2007). Numerous companies are striving to

leverage benefits such as reduced lead times, production adaptability, quicker product development, and mutually beneficial strategies. (Gopal & Thakkar, 2012).

Planning and designing of a measurement for the supply chain performance system could be found difficult, and companies may face the following issues (Gopal & Thakkar, 2012): deviation from major strategy, giving too much focus on cost related issues may result in oversight for non-financial indicators, a lack of fair and equal approach, not giving due attention for customers demand and competitors potential, and a lack of a clear distinction between metrics at the strategic, tactical, and operational levels. According to studies, supply chain performance systems are not coordinated with the organization's strategy,

The results suggest that strategies aimed at reducing global supply chain costs have a considerable and beneficial effect on a company's cost and supply chain management. Additionally, there is a strong positive correlation between the five elements of the supply chain cost reduction strategy (SCCR) and supply chain performance, with the SCCR strategy having a moderate influence on supply chain performance (SCP). Moreover, supply chain performance affects overall organizational performance (Hiwot Getachew, 2022).

Logistics infrastructure includes roads, railways, airports, and seaports, as well as ICT and energy production (Srivastava, 2006). The development of roads in the country is advancing due to highway and road sector development initiatives. Presently, the road system can be categorized into three hierarchical classifications: Federal, Regional, and Rural roads, alongside urban and rural pathways. The Federal and Regional road network spans approximately 46,812 kilometers, with 6,938 kilometers being asphalt or concrete surfaced, as shown in Table 2 (Afro Consult & Trading PLC, 2010). This corresponds to a road network density of 0.57 km per 1,000 people or 41.4 km per square kilometer. By contrast, the average road density across Africa is 2.6 km per 1,000 individuals and 58 km per 1,000 square kilometers (Asnake, 2006). The main road network extends from Addis Ababa to regional cities with limited interconnectedness, making some nearby locations hundreds of kilometers apart by road due to the necessity of detouring through Addis Ababa. This situation drives up the costs of transporting agricultural goods from surplus-producing to deficit areas (Wubshet, 2011).

The federal road network effectively connects all regional capitals, major cities, ports, and key international entry points. However, only around 30% of rural regions have access to all-weather roads, and many of these roadways are in poor condition (Asnake, 2006). Figure 3 illustrates Ethiopia's road network.

Due to various factors particularly for Ethiopia and many of developing nations, Air transport is very preferable mode of transport in terms of efficiency, safety and specific supply factors. The air transport in Ethiopia is now entertained by the mainly three entities: (a) the Civil Aviation Authority (CAA), (b) the Airports Administration Enterprises (AAE) and (c) the Ethiopian Airlines (ET). The Ethiopian airports are of three levels: four international airports, fourteen other concrete or asphalt domestic airports and over thirty other grass or gravel surfaced feeder airports many of which are being upgraded.

The Ethiopian Airlines, some twelve other foreign airlines and six small domestic private airlines provide air freight services. The Airlines provides freight transport services to seventeen major local destinations and nine international destinations. It has six cargo airplanes and the recent (2009).

2.1.2. Transportation Challenges in Developing Countries

The results suggest that strategies aimed at reducing global supply chain costs have a considerable and beneficial effect on a company's cost and supply chain management. Additionally, there is a strong positive correlation between the five elements of the supply chain cost reduction strategy (SCCR) and supply chain performance, with the SCCR strategy having a moderate influence on supply chain performance (SCP). Moreover, supply chain performance affects overall organizational performance (Hiwot Getachew, 2022).

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Transportation difficulties in developing countries are distinct from those in developed nations due to various factors such as infrastructure deficiencies, economic limitations, population increase, and patterns of urbanization. According to Ermanno Nesci, a Senior Pavement and Materials Engineer, these countries experience significant transport challenges. They are facing various kinds of problems regarding transportation issues, lack of transport vehicles and scarcity. While developed countries generally possess strong infrastructure and established regulatory frameworks, Unfortunately, developing nations often lack the financial resources, technical expertise, and effective governance needed to address these issues. For example, while advanced nations focus on improving their previously established transport systems, developing countries are still striving to build basic, reliable, and accessible transport infrastructure crucial for their economic growth, as mentioned by transportation and infrastructure expert Matthieu Desiderio.

Ethiopia, with its population of 110 million, exemplifies the struggle of having one of the least developed transport and logistics sectors globally, ranked 126 out of 160 by the World Bank's 2016 Logistics Performance Index (LPI). The sector in Ethiopia confronts numerous challenges, such as historically limited participation from the private sector, both foreign and local, and a lack of coordination between governmental entities, particularly between

the Ministry of Revenue and the Ethiopian Shipping and Logistics Services Enterprise (ESLSE).

The government currently holds a dominant position in the sector, with only a few private companies involved in freight forwarding and logistics. The sector suffers from poor integration between government bodies and between these entities and the private sector, leading to notable inefficiencies. For example, it takes 40 days to clear imported goods from Ethiopian seaports, while middle-income countries typically achieve this in about 3 days. Additionally, Ethiopia's logistics costs relative to GDP are at 26%, significantly higher than the 10-15% range seen in middle-income countries, indicating that there is much progress to be made.

This inefficiency also hampers the competitiveness of other important sectors, including exports. For instance, transporting a 20-foot container of garments from Ethiopia to Germany is 247% more expensive than shipping the same container from Vietnam, and 72% more costly than from Bangladesh. Comparatively, Ethiopia lags behind its landlocked neighbors, Uganda and Rwanda. In 2016, Ethiopia's Logistics Performance Index (LPI) was 2.38, ranking it 126th out of 160 countries, while Uganda and Rwanda scored higher, with LPI scores of 2.58 and 2.97, ranking them 58th and 62nd, respectively.

2.1.3. The Ethiopian Context and Case Studies of Malt Supply Chains in Developing Countries

As noted by Bedada et al (2014), Current and future increment in terms of numbers and expansion of brewery factories currently indicates the demand for malt barley products in the future. Research on barley) improvement has produced substantial number of technologies, information, and knowledge, and producing. Additional input is also being made in order to better technologies and enhance products for the farmers. This collective effort show the opportunities for barley production improvement in the future.

Even Watabaji, et al, 2016 tried to explain the interconnection and dependency between value chain integration dimensions and value chain performance along the malt barley value chain in Ethiopia. This comparison were based on survey data sets obtained from 320 farmers and one hundred traders and qualitative interview responses captured from sixty-two key informants selected from among members of the chain. The structural equation modelling (SEM) technique tries to figure out and quantify the influence of value chain

integration on performance. The outcome of this analysis clearly indicates that there is a direct and positive relationship between coordination of activities and performance, and between joint decision-making and performance at farmers-cooperatives interface; and between commitment towards long-term relationships and performance at farmers- traders interface. It also has a significant contribution in identifying value chain integration and performance and their interdependence within malt barley value chain. The major conclusions of the analysis make crucial indications for agribusiness value chains in the developing countries. (Watabaji, et al, 2016)

According to the research made by Addisu Bezabih, titled Malt barley commercialization through contract farming scheme: A potential solution based on previous experiences and prospects, contract farming trends proves to be the best option for smallholder commercialization. Obviously, commercialization such as market orientation, participation in both inputs and outputs, expansion of cultivation areas, and adoption of technologies (varieties, fertilizer, etc.,) are observed along malt barley contract farming scheme.

Evidently, the malt demand increased by 83% after the privatization of beer companies and work potential increment. As result, malt barley contract farming scheme introduced by Heineken/chord to ensure local sourcing of malt barley by integrating large number of farmers into the value chain. The malt barley contract farming scheme observed as driver of smallholder commercialization highlight of firm farmer integration and agricultural transformation in the country. This is since contract farming is an emerging institutional innovation in Ethiopia linking farmers to reliable market, open access to inputs, technology and advisory services that lead to improved productivity, production, and income. Specifically, malt barley contract farming scheme is an innovative platform harboring public private partnership, the malting industry managed to secure 55% of the requirement from local sources. Contracted farmers take a 10% higher price for malt barley than non-contracted food barley producer counterparts due to high yielding varieties productivity advantage from same parcel of land, similarly, malt factories are integrated and benefiting from processing local raw material (Addisu Bezabih, 2018).

Studies on recent progress of malt barley contract farming scheme in Ethiopia report the following finding. The findings include thousands of farmers contracted to Heineken, Diego and Dashen breweries and Asela and Dashen malt factories; farmers positively responding to malt barley market signals, farmers are motivated to profit maximization, areas under

malt barley cultivation growing, considerable areas are specializing in malt production using emerging comparative advantages. These phenomena occurring in the malt barley value chain leads to make certain important conclusions in terms of the smallholders‟ market orientation, participation both in input and output markets and growing income imply that malt barley is commercialized to considerable level. However, there are still some challenges in the organization and operation of the contract farming schemes; along fulfilling malt barley requirement from local sources. Astonishingly, the impact of farm-farmer business integration reported to be very high for farmers while the impact on the firm is high but at high costs. That benefit imbalance was reported from the firm side that local malt barley production cost is higher than importing costs. Sustaining the success of malt barley firm-farmer business scheme, depends on strengthening performances of the interfaces of the intermediaries such as primary cooperatives, unions, microfinance institutions, research institutes, agricultural offices, donors, and facilitator projects operating between farmers and the firm. It was observed that primary cooperative, unions, etc., perform at different capacity, some at remarkable level while others fail to perform desired role accordingly (Addisu Bezabih, (2018).

Within most of the produce is contributed through traders (51.78%) followed by primary cooperatives (36.24%) and farmer traders (11.98%). Primary cooperative channel about 78.4% of what they have collected to unions, 11.5% to breweries, and the rest9.7% to AMF. Similarly, the major proportion of malt barley from unions is channeled to Breweries (78%) and the rest 22% to AMF. Farmer traders that have a capacity for producing on own farms at a considerable volume and who can buy from fellow farmers channel to breweries as per their contract arrangement with respective breweries i.e., to Heineken, which has a contact arrangement with select farmers and traders. AMF often buys from traders, who are engaged in malt barley trade. (Dawit Alemu, et al, 2015)

As per the reports of World Bank Report, 2013, [24] the World Bank Logistics Performance Index (LPI) provides a comprehensive measure of the state of trade logistics in a country facilitates comparisons with other countries. Ethiopia ranks at the lower end of the surveyed countries (141 out of 155 countries in 2012). Ethiopia is considered “logistics unfriendly.” The difference from individual countries in East Asia such as China, Korea, and Vietnam, as well as the grouping of East Asia and Pacific, is even starker.

In the 2012/13 World Economic Forum (WEF) World Competitiveness Report, Ethiopia's infrastructure development is ranked 119 out of 144, far behind Vietnam and China (95 and 48, respectively), but better than Tanzania and Uganda (132 and 133, respectively). (World Bank Report, 2013)

Old fashion systems that are Paper-based systems are very common type of data storage in most supply chains. They have been preferred by most emerging economies in the past, due to the low associated cost (Setboonsarng et al., 2009). However, electronic record-keeping has become common practice in the digital era. In this type of system, data can be stored in centralized or decentralized systems.

Supply chain is all about meeting the demands of the end user in terms of goods and services that involves information, physical goods and monetary flaws whose objective is to satisfy end consumer requisites with goods and services from diverse, connected suppliers (Ayers (2001). In its definition it focuses on the three main following items: Goods/Service, information, and Money.

Supply chain connects different types of stakeholders like suppliers of raw materials, companies that add value to the raw materials and others that stores the finished products in their warehoused, distributor's that transport products to retailers and retailers that deliver products to the end consumer (Christopher,1998). This approach mainly focuses on stakeholders of supply and material and service movement.

Finally, Dr. Dawei LU (2011) explains Supply chain as companies that are very much interdependent and enhance inputs from their source of origin to the end products or services that are demanded by the designated end customers.

In a simpler term, Supply Chain Management can be expressed as a connection of facilities that collects raw materials, adds value and change them into intermediate goods and final products and then eventually delivers the end products to the end user customers through a predefined distribution system. It spans procurement, manufacturing, and distribution. The main target of supply chain management is to "maximize performance of the network by increasing maximum value to the raw product for the least possible cost." It strives to enhance productivity by cooperating agents within the firm and deliver a better product which is a win for all parties involved. (Rajendra Kumar Shukla et al., 2011)

Mainly, in Supply chain management, It's a mechanism which systematically integrate and coordinate information, raw materials and monitory flaws throughout the supply chain so that the product is delivered and distributed to the target customer and in the right quantity. At least three or more organizations or individuals take part in the upstream and downstream flow of information, cash, products, and services (Mentzer, 2001). Supply Chain Management is a set of approaches that efficiently integrate and coordinate the materials, information and financial flows across the supply chain so that merchandise is supplied, produced and distributed in the right quantities, to the right locations, and at the right time, in the most cost-efficient way, while satisfying customer requirements (Hugo, et.al, 2011). Supply Chain Management is management of material, money, men, and information within and across the supply chain to maximize customer satisfaction and to get an edge over competitors.

2.1.4. Operational Performance

The company's wellness, in terms of profitability and cash flow, affects how competitive and stable it is, whether it's making products or providing services. According to Neely and others. Operational performance measures the company's efficiency in using its resources to create goods or services. It measures things like quality, cost, delivery time, and adaptability.

Logistics costs are also an important factor. According to Christopher (2016), the overall performance of the companies is highly dependent on the company's ability to keep their shipping costs low while still providing good service usually perform better overall. High logistics costs are often a result of broken processes and not enough money spent on supply chain technology.

Implementing modern technology together is also important. Gunasekaran and others. In 2017, it was highlighted that using technologies like ERP, IoT, and AI helps with making better decisions, tracking things in real time, and working together. These improvements lead to better performance. However, people's inability to change and high costs can make it hard to efficient implementation.

A closer look at the supply chain greatly affects how well the operations run. Caridi and others. In 2010, it was found that having clearer visibility helps with better predictions, faster reactions to problems, and better teamwork throughout the supply process. Finally,

rules and regulations laid by authorities can help or hurt performance. As Martens and others say in 2012, highly strict or unclear rules can slow down processes, especially when moving goods between countries. In a nutshell, how well a business operates depends on many linked things, such as its facilities, technology, cost control, and following rules. To better the performance, you need an effective and wholesome plan for managing the supply chain...

2.2. Empirical Review

Logistics Infrastructure and Facilities Challenges: The research by Rodrigue and others, in 2017, stated that poor transport networks limit logistics activities and make supply chains less dependable. In the same way, Abate (2018) discovered that the quality of roads affects how quickly deliveries are made and how well operations run in Ethiopia. Fenta and Fekadu (2022) found that having little transport options makes it more expensive and takes longer for businesses in Ethiopia to get supplies.

Cost Inflation Challenges: The research by Guner and Acarturk (2020) showed that high-Cost Inflations make operations less efficient and decrease competitiveness. The World Bank (2023) reports show that high fuel prices and poor transportation systems are common problems in African supply chains, including in Ethiopia.

Regulatory and Policy Challenges: Geda and Teshome (2019) stated that repeatedly changing rules and very weak and partial law enforcement slow down the movement of goods in Ethiopia. Hofman and Ojah (2020) discovered that too many rules and corruption seriously hurt logistics performance in African countries.

Information Flow and Technology Integration: The study by Lu and Liu (2019) inferred that the decision making and overall logistic operation can be enhanced by the usage of combined information and communication technology (ICT). Mekonnen and Hailu (2021) stated miscommunication and delays in the works of Ethiopian logistic companies are the result of lack of usage of Information technology (IT) well. On the other hand, Zhang and others. In 2020, a study showed that there was no tangible link between using IT and how well some low-tech factories performed. This suggests that the results might depend on the specific situation.

Supply Chain Visibility Challenges: The research by Christopher and Peck (2004) said that being able to see what is happening is very important for strong and flexible supply chains. In the same way, the study by Ali and Awan (2020) showed that better visibility makes it easier to respond and reduces uncertainty in operations.

Warehousing Efficiency and Logistics Planning/Scheduling Issues: The report by Naslund and Williamson (2010) showed that in some industries, improving warehouses only leads to small benefits if there are still problems in other parts of the logistics process.

Furthermore, studies like those by Mentzer *et al.* (2001) and the World Economic Forum (2022) showed that operational performance is most impacted by systemic logistics inefficiencies – especially in developing countries – where infrastructure, cost, and governance issues prevail.

2.3. Conceptual Framework of the Study

Based on the above theoretical and empirical literature reviews, the researcher formulated the study hypotheses as follows. **Figure 1** below shows the conceptual framework and identifies the independent variables of Transportation and Logistics Challenges (namely: Logistics Infrastructure and Facilities, Planning & Scheduling Maturity Cost Inflation, Information flow and integration, regulatory and policy, Warehousing efficiency, and Supply chain visibility challenges) with the dependent variable being Operational Performance.

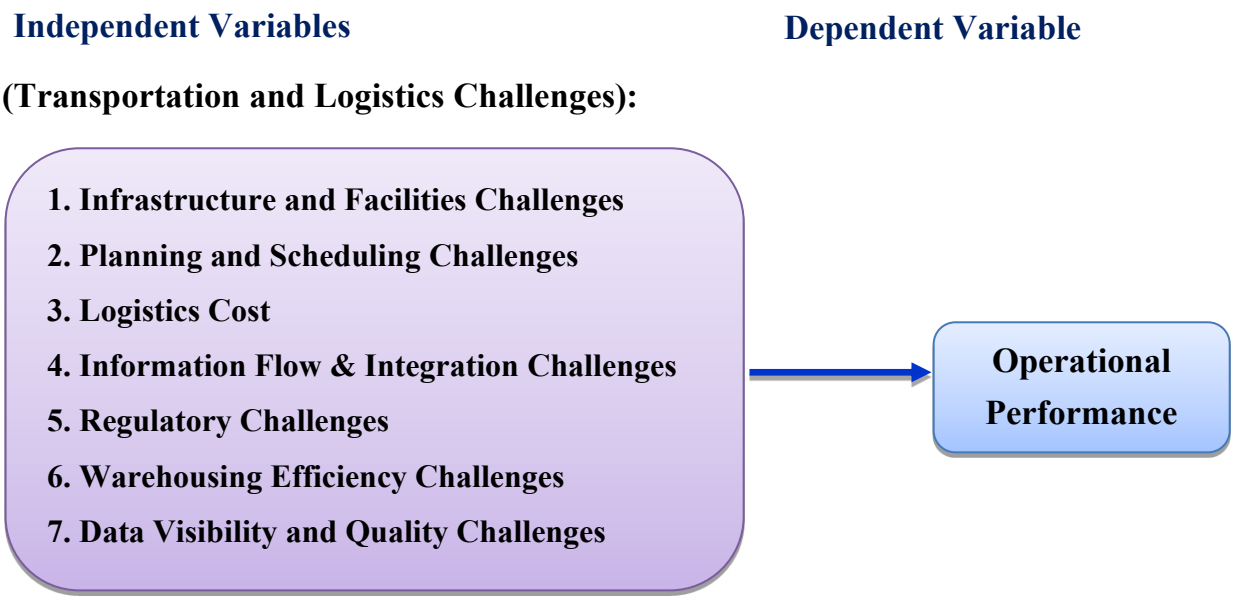


Figure 2.1: Conceptual Framework

Source: *Compiled from the above theoretical and empirical reviews (2026).*

2.4. Hypotheses of the Study

Based on the preceding conceptual framework and research questions, the study formulates the following hypotheses and proposes Multiple Linear Regression model to determine the relationship between Transportation and Logistics Challenges and Operational Performance.

H1: Logistics infrastructure and facilities challenge significantly affect the operational performance of Soufflet Malt Ethiopia S.C.

H2:Planning & Scheduling Maturity level of Soufflet Malt Ethiopia S.C. affects its operational performance.

H3: Costs Inflation affects significantly the operational performance of Soufflet Malt Ethiopia S.C.

H4: Information flow and integration challenges significantly affect operational performance Soufflet Malt Ethiopia S.C.

H5: Regulatory factors have significantly affected the operational performance of Soufflet Malt Ethiopia S.C.

H7: visibility and quality significantly affected the operational performance of Soufflet Malt Ethiopia S.C.

CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

3.1. Description of the Study Area/ Soufflet Malt Ethiopia SC

Soufflet Malt Ethiopia SC is a company engaged in the production of malt from barley for use in brewery industries in Ethiopia. The company operates as part of Soufflet Group, an international company involved in agricultural and food-processing activities across different countries.

The company has a significant contribution to the Ethiopian brewing industry through the supply of locally produced malt. In addition to supporting industrial production, the

company works closely with local farmers by creating market opportunities for barley production through contract farming arrangements.

The manufacturing process carried out by the company involves several stages, including barley collection, cleaning, steeping, germination, kilning, storage, and distribution of the final malt product to brewery companies.

The researcher selected this company as the study area because it has well-established departments such as finance, supply chain, and production management

As one of the recognized malt suppliers in Ethiopia, the company maintains working relationships with farmers, suppliers, transport service providers, employees, and brewery companies. These interactions make the organization suitable for conducting research related to procurement management, logistics activities, operational efficiency, and organizational performance.

3.2. Research Approach

Saunders et al. (2010) asserted that the choice of research approach is important when deciding the research design. It enables us to make more learnt decisions about research design, which is more than just the methods by which data are collected and procedural steps by which they are analyzed. The quantitative research approach was used for this study. The researcher used quantitative methods to examine the level of operational performance, the major transportation and logistics challenges, and their effects on operational performance. Creswell (2014) indicated that quantitative approach is the one in which the investigator primarily used postpositive claims for developing knowledge that is the cause-and-effect association between known factors/variables and collect data using the predetermined instruments that yield statistical data.

3.3. Research Design

The research design of this study was descriptive and explanatory types, and it was done by applying quantitative research approach. The rationality for the choice of descriptive survey method is the fact that descriptive survey studies are used to describe and interpret trends of events as they exist at present. The quantitative approach involves descriptive statistics such as means, standard deviations, correlations, and regressions model. In addition, this study used explanatory research design to analyses cause effect relation between dependent and

independent variables. It attempts to connect transportation and logistics challenges with operational performance. Creswell (2014) asserted that explanatory research is useful for identifying the type of association, explaining complex relationships of multiple factors that explain an outcome, and predicting an outcome from one or more predictors.

3.4. Population and Sampling Design

This research study was carried out at Soufflet Malt Ethiopia S.C. According to the data from the management of the company, a total of 112 employees currently working at Soufflet Malt Ethiopia SC. In addition, there is external population including 12 aggregators (also called brokers),5managers, 16 coordinators, and 91 drivers, which are directly involved in the transportation and logistics supply chain of the company. Accordingly, the sum of these sub-population, that is 236, is the target population of this study.

3.5. Sampling Design

3.5.1. Sampling Techniques

As described by (Turner and Houle, 2019), the two main types of the sampling technique are: probability-sampling and the non-probability sampling. Probability sampling types, including simple random, cluster, stratified-random, and multistage samplings, need every element of the population to have a known (and non-zero) chance of being selected.

In this study, random sampling was used to select the sample respondents as it is an effective approach and ensures that the study identifies the right population. Studies revealed that to achieve equal representation for each of the determined members in the population, random sampling technique/method is applied and effective in conducting research (Creswell, 2014; Shrout and Rodgers, 2018).

3.5.2. Sample Size

The sample size for this study was determined using the formula recommended by Yamane (1967),which is applied for population with known numbers, as follows.

$n = \frac{N}{1+N(e^2)}$ where,n- sample size, N- total population, and e^2- probability of error.

Thus, with N = 236, e = 5% (at 95 % confidence level), the sample size is calculated as:

$$n = \frac{236}{1+236(0.05)^2} = 148.$$

Hence, the total sample size of this study was148, which was distributed to each sub-population category using proportionate allocation method as presented in the table below.

Table 3-1. Sample size of the study and proportionate allocation

Population Category	Population (Pi)	Sample Size = (Pi/N) *n	Sample Size Percentage (%)
Employees of Soufflet Malt Ethiopia SC	112	70	47.5
Aggregators (Brokers)	12	8	5.1
Managers	5	3	2.1
Coordinators	16	10	6.8
Drivers	91	57	38.6
Total (N)	**236**	**148**	**100.0**

Source: *Survey by the researcher (2026)*

3.6. Data Type and Sources

Both primary and secondary sources of data were employed in the study to get valuable information regarding the transportation and logistics challenges and their effects operational performance. Primary data were collected from the sample respondents through the structured close ended questionnaire and open-ended interview questions. The questionnaire was developed in five-point Likert scales ranging from one to five; where 1 represents Strongly Disagree and 5 Strongly Agree. Moreover, different secondary information sources were gathered from literature, websites, and the company's financial and other reports.

3.7. Data Collection Methods

To collect primary data, structured close ended questionnaire was used and distributed to the sample respondents. The questionnaire was commented on by the research advisor and professionals to refine the questions. After that, the researcher distributed the questionnaire to the sample respondents. The distribution, continuous follow up and the collection of questionnaires were done by the researcher and facilitator.

3.8. Data Analysis Methods

The study was carried out using quantitative analyses. The data collected were first sorted and then coded with the aid of the Statistical Package for Social Sciences (SPSS) program. The quantitative data were analyzed using both descriptive statistics and inferential statistics analyses to summarize and relate study variables.

Descriptive statistics were used to compute frequency, percentage, mean, and standard deviation. As a part of inferential analysis, the study used the Pearson Correlation and Multiple Linear Regression analyses to identify the association/relationship between the independent variables (transportation and logistics challenges) and dependent variable, that is, operational performance.

3.9. Data Validity and Reliability

3.9.1. Data Validity

According to Creswell (2014) validity is one of the strengths of research and determining whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of an account. In this study, opinions from the research advisor and experts were used to ensure the content validity, whether the items measure the area of interest or the concept it intends to measure.

3.9.2. Reliability

According to Mohamed (2013), one of the main requirements of any research process is the reliability of data and findings. Any questionnaire should be reliable and valid to use the right results for further actions. Reliability is the consistency of your measurement. It is the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. For this study, Cronbach's alpha coefficient was calculated, which is the most frequently used index of reliability. It represents number between 0 and 1. According to Zikmund *et al.* (2010) scales with coefficient alpha less than 0.6 are considered as poor reliability, between 0.6 and 0.7 indicates fair reliability, between 0.7 and 0.8 indicates acceptable reliability and higher are considered good.

Accordingly, the result of reliability test in this study (Table 3.2) revealed that coefficient alpha values for almost all independent variables and dependent variables are greater than 0.74. Moreover, the overall coefficient alpha of the study was found to be 0.954, indicating

good internal consistency and is, thus, indication of acceptability of the scale for further analysis.

Table 3-2. Results of reliability statistics

Variable	Cronbach's Alpha	N of Items
Operational Performance	.754	5
Logistics Infrastructure and Facilities	.840	5
Planning and Scheduling Maturity	.835	5
Cost Inflation	.751	5
Information Flow& Integration	.825	5
Regulatory Factors	.742	5
Visibility and Quality Challenge	.869	5

Source: Survey findings (2026)

3.10. Model Specification and Study Variables

For this study, the researcher develops a model using Multiple Linear Regression to determine the effect of the transportation and logistics challenges on operational performance at Soufflet Malt Ethiopia SC. Accordingly, to analyze the data and test the study hypotheses, the following equation was used.

$$Y = \alpha_0 + \alpha_1 * X_1 + \alpha_2 * X_2 + \alpha_3 * X_3 + \alpha_4 * X_4 + \alpha_5 * X_5 + \alpha_6 * X_6 + e$$

were

Y= Operational performance

α_0 = *Constant*

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5,$ = Coefficients

X_1 = *Infrastructure*

X_2 = *Planning & Scheduling Maturity*

X_3 = *Cost Inflation*

X_4 = *Information flow & integration*

X_5 = *Regulatory Factors*

X_6 = *Organizational visibility*

e = Sampling error

3.11. Ethical Issues

The participation of respondents wasstrictly voluntary basis. Participants were fully informed as to the purpose of the study and consent verbally. Measures are taken to ensure the respect, dignity and freedom of each individual participating in the study. In addition, participants were notified that the information they provided would be kept confidential and not be disclosed to anyone else. The findings of the research are presented without any deviation from the outcome of the research. In addition, the researcher gives full acknowledgement to all the reference materials used in the study.

CHAPTER

4. RESULT AND DISCUSSIONS

In this chapter, the data obtained from the participants are analyzed, presented, interpreted and discussed accordingly. The chapter starts by providing demographic and personal information of study participants. The descriptive and inferential statistics on the main items of the study are presented thereafter.

4.1. Response Rate and Study Participants

Out of the 148 distributed questionnaires, 112 (75.5 %) were filled and returned, and hence used for the analysis of the study as this response rate is enough to confidently run the analysis.

Among the total 112 participants, 51.8% were employees of the study company, 33.9 % were drivers, and the remaining 7.1 %, 4.5 %, and 2.7 % were coordinators, aggregators (also called brokers), and Managers, respectively, with response rate of 82.3 %, 66.4 %, 79.5 %, 66.3 % and 95.4 % respectively. Table 4.1 shows the response rate and frequency distribution of the study participants by category.

Table 4-1. Frequency distribution and response rate of study participants

Respondents Category	Sample Size		Returned		Response Rate (%)
	N	%	N	%	
Employees of the Company	70	47.5	58	51.8	82.3
Aggregators (Brokers)	8	5.1	5	4.5	66.3
Managers	3	2.1	3	2.7	95.4
Coordinators	10	6.8	8	7.1	79.5
Drivers	57	38.6	38	33.9	66.4
Total	**148**	**100.0**	**112**	**100.0**	**75.5**

Source: Survey findings (2026)

4.2. Demographic Information of Respondents

Prior to the analysis of the data of main variables of the study, some background information such as considering demographic data of the participants is useful to make the analysis more

meaningful for the readers. In this part, the purpose of the demographic analysis is to describe the characteristics of the sample respondents such as their numbers by employment status or category, proportion of males and females in the sample, age group category, highest educational level they achieve, experience in logistics service delivery, and others.

As indicated in the table below, the gender proportion of male respondents is 78.6 % while the female respondents were 21.4 %. Even though the ratio of the respondents was showing some variation, comparable respondents from both categories of gender participated in this current survey study. This enables the researcher to see that there is no bias in the survey instrumentsin relation to the gender of the study participants.Regarding age of the participants, majority of the respondents,67.0%, were aged between 26 and 35 years, followed by 23.2% aged above35 yearsand 9.8 % participants aged between 18 and25 years. It shows that 90.2 % of surveyparticipants were aged above 25 years.

As can be seen from the table below, the highest educational level the participants achieved shows that 47.3 % were first-degree holders, 24.1 % were TVET or Diploma holders, 20.5% were second degree holdersand above, and the remaining 8.1 % participants were at high-schooland below level. The result shows that majority, 103 (92%), of study participants were TVET/Diploma holders and above. This is an indication that majority respondents were at adequate educational level to understand and give appropriate responses to the request.

Another demographic characteristic of the study participants istheir experience in transportation and logistics operations or service delivery. The participants'experience in transportation and logistics operations or service deliveryshows39.3 % had between 11 and 15 years of experience,32.1% had over 15 years, andthe remaining 21.4 % and 7.1% participants had between 6 and 10 years and less than 5 years of experience, respectively.In general, the respondents profile indicates that the study participants had the knowledge to understand the transportation and logistics challenges and their effects on operational performance of the company and were good enough to respond to the study questionnaire.

Table 4-2. Demographic characteristics of study participants

Variable	Alternative	Frequency	Percent
Gender	Male	88	78.6

	Female	24	21.4
	Total	112	100.0
Age group (years)	18 – 25	11	9.8
	26 – 35	75	67.0
	Above 35	26	23.2
	Total	**112**	**100.0**
The highest education level achieved:	High-school and below	9	8.1
	TVET or Diploma	27	24.1
	First Degree	53	47.3
	Second Degree and above	23	20.5
	Total	**1129**	**100.0**
Participants category:	Company Employees	58	51.8
	Aggregators	5	4.5
	Managers	3	2.7
	Coordinators	8	7.1
	Drivers	38	33.9
	Total	**112**	**100.0**
Experience in transportation and logistics operations or service delivery:	Less than 5 years	8	7.1
	6 – 10 years	24	21.4
	11 – 15 years	44	39.3
	Above 15 years	36	32.1
	Total	**112**	**100.0**

Source: Survey result (2026)

4.3. DescriptiveAnalysis of Operational Performance of Soufflet Malt Ethiopia S.C.

This section presents and interprets the descriptive statistics on operational performance in the organization case based on the data collected from the selected respondents.

As described in the Methodology Chapterthe participants of this study were requested to rate the operational performance of the company using the five-point Likert-scale ranging from 1 (strongly disagreed) to 5 (strongly agreed) on the specific items of the operational performance measurement Scale.

According to Marczyk, *et al*. (2005), the statistical approach to determine equivalence between groups (or categories) is to use analyses of means and standard deviations for the variables of interest for each category (group) in the study. The meaning indicates to what extent the sample group of the study averagely agrees or disagrees (does not agree) with the given statement. Accordingly, in this study, the higher the mean value indicates the more the participants agree with the statement and the lower the mean value the more the participants disagree with the statement. On the other hand, standard deviation shows the variability of an observed response from a single sample.

A calculated mean value represented based on rule of thumb pertaining to the intervals for breaking the range in measuring variables captured with five-point scales (that ranges from strongly-disagree to strongly-agree) is 0.8, which is actually found by dividing the difference between the maximum and minimum values to the maximum value (Kidane, 2012), that is, 0.8= (5-1)/5. Hence, the calculated mean values that range from 1.00 to 1.80 imply 'strong-disagreement' to the statement, from 1.81 to 2.60 implies 'disagreement', whereas the remaining ranges:from 2.61 to 3.40, 3.41 to 4.20, and 4.21 to 5.00 representparticipants' perceptions of 'neutrality', agreement' and 'strong-agreement', respectively. Accordingly, the participants' perception of transportation and logistics challenges, and operational performance level are analyzed and interpreted, descriptively, using the mean and standard-deviation statistical values as follows.

a) Descriptive statistics for operational performance:

Table 4.3 below displays responses related to the operational performance of the company. The overall mean value is 4.16 with a standard deviation of 0.403, indicating a moderate agreement among respondents with relatively low variability.This suggests that respondents agree that the company performs relatively well operationally.

Among the five items of operational performance, logistics operations align well with production requirements scored the highest (Mean = 4.30, SD = 0.583), suggesting effective coordination between production and logistics. It followed by the company can quickly respond to logistics disruptions followed closely (Mean = 4.26, SD = 0.515), indicating adaptability and resilience in operations, and the company consistently meets delivery timelines also performed well (Mean = 4.23, SD = 0.520). This shows that the respondents agreed to these three statements.

On the other hand, the respondents agreed on the remaining two statements such as cost efficiency is achieved in logistics operations received a solid mean (Mean = 4.13, SD = 0.528), and the lowest rated statement, customer satisfaction due to reliable delivery (Mean = 3.89, SD = 0.676), highlights an area for potential improvement and suggests that there is room to enhance the customer experience at Soufflet Malt Ethiopia SC.

Table 4-3. Descriptive statistics for operational performance.

Statement (N = 112)	Mean	SD
The company consistently meets delivery timelines.	4.23	.520
Logistics operations align well with production requirements.	4.30	.583
Customer satisfaction is high due to reliable delivery.	3.89	.676
Cost efficiency is achieved in logistics operations.	4.13	.528
The company can quickly respond to logistics disruptions.	4.26	.515
Overall Average	**4.16**	**.403**

Source: Survey result (2026)

4.4. Descriptive Analysis of Logistics Challenges of Soufflet Malt Ethiopia S.C.

As described in the preceding sections of the thesis, logistics challenges are conceptualized using challenges related to 1) Logistics Infrastructure & Facilities; 2) Planning and Scheduling Maturity; 3) Cost Inflation; 4) Information Flow & Integration; 5) Regulatory factors; and 6) Data Visibility and Quality. In line with these dimensions, the data collected from the Study Organization are presented descriptively as follows.

b) Descriptive statistics for logistics infrastructure and warehouse facilities challenge

Logistics infrastructure and facility capacity play an important role in maintaining supply chain efficiency and smooth operational performance. To assess the major infrastructure-related challenges facing Soufflet Malt Ethiopia SC, this section analyzes descriptive statistics related to transportation and warehousing activities. Table 4.4 summarizes the responses collected from participants across ten variables associated with logistics infrastructure and facility constraints.

The overall result presented in Table 4.4 shows a composite mean score of 4.11 with a standard deviation of 0.492. This suggests that most respondents agreed that the company

is experiencing significant logistics infrastructure and facility challenges, and the low standard deviation indicates consistency in their responses.

Regarding transportation infrastructure (Sub-Mean = 4.10, SD = 0.491), respondents identified several issues affecting the smooth movement of goods and materials. Poor road conditions delaying product delivery received the highest mean score (Mean = 4.33, SD = 0.591), indicating that it is the most serious transportation challenge. Inadequate transport facilities (Mean = 4.25, SD = 0.637) and the lack of alternative distribution routes (Mean = 4.21, SD = 0.560) were also identified as major problems. In addition, respondents agreed that traffic congestion (Mean = 3.90, SD = 0.657) and poor connectivity with suppliers and customers (Mean = 3.82, SD = 0.687) negatively affect delivery reliability and logistics operations.

The findings relating to warehousing efficiency (Sub-Mean = 4.13, SD = 0.493) also indicate the presence of considerable operational challenges. Insufficient storage capacity to meet operational demand was rated as the most significant warehouse-related issue (Mean = 4.35, SD = 0.581). Inventory mismanagement causing delays in order fulfillment (Mean = 4.29, SD = 0.580) was another major concern raised by respondents. Furthermore, poor warehouse layout affecting productivity (Mean = 4.11, SD = 0.676), lack of proper monitoring systems (Mean = 4.02, SD = 0.723), and inefficient loading and unloading activities (Mean = 3.88, SD = 0.712) were identified as additional operational problems.

Overall, the findings indicate that both transportation and warehousing challenges are negatively affecting the operational performance of Soufflet Malt Ethiopia SC. External factors such as poor road infrastructure and limited transport facilities disrupt the movement of goods, while internal warehouse limitations contribute to operational delays and inefficiencies within the supply chain. Table4-4. Descriptive statistics for Logistics Infrastructure and Facilities challenges.

Statement (N = 112)	Mean	SD
Poor road conditions delay product delivery.	4.33	.591
Inadequate transport facilities hinder logistics operations.	4.25	.637
Traffic congestion impacts delivery timelines.	3.90	.657
Lack of alternative routes increases vulnerability to disruptions.	4.21	.560
Poor connectivity to suppliers/customers affects delivery reliability.	3.82	.687
Transportation Sub-Average	**4.10**	**.491**

Storage capacity is insufficient to meet demand.	4.35	0.581
Inventory mismanagement leads to delays in order fulfillment.	4.29	0.580
Poor warehouse layout affects productivity.	4.11	0.676
Warehouse operations lack proper monitoring systems.	4.02	0.723
Loading and unloading processes are inefficient.	3.88	0.712
Warehousing Sub-Average	*4.13*	*0.493*
Composite Average	**4.11**	**0.492**

Source: Survey result (2026)

c) Descriptive statistics for Planning & Scheduling Maturity.

Table4.5 below focuses on planning and scheduling issues. The overall mean of Planning & Scheduling Maturity was 4.04 with a standard deviation of 0.485. As can be seen from the results, the participants strongly agreed only to one item of Planning & Scheduling Maturity variable, that is, the most significant challenge was delays due to poor planning of transportation routes (Mean = 4.23, SD = 0.684).

Other notable concerns include frequent scheduling conflicts in delivery (Mean = 4.08, SD = 0.712), order fulfillment hindered by poor logistics coordination (Mean = 4.07, SD = 0.625), and inventory misalignmentwith logistics planning (Mean = 4.04, SD = 0.728).On the other hand, the lowest rated issue wasthe item about reactive rather than proactive planning (Mean = 3.77, SD = 0.671), indicating that a shift is needed toward more strategic planning practices.In general, planning weaknesses are moderate but impactful.Top-ranked: Delays due to poor route planning are the top-ranked item, and the relatively lower meansfor reactive planning suggests companies are aware but struggling to shift to proactive approaches.

Table 4-5. Descriptive statistics for Planning & Scheduling Maturity.

Statement (N =112)	Mean	SD

Delays occur due to poor planning of transportation routes.	4.23	.684
The company faces frequent scheduling conflicts in delivery.	4.08	.712
Inventory levels are not aligned with logistics planning.	4.04	.728
Order fulfillment is hindered due to poor logistics coordination.	4.07	.625
Reactive rather than proactive logistics planning is a challenge.	3.77	.671
Overall Average	**4.04**	**.485**

Source: Survey result (2026)

d) Descriptive statistics for logistics cost inflationary challenges

Table 4.6 presents data on logistics cost-related issues. The overall meaning ofthe five logistics cost-related items is 4.10 with a standard deviation of 0.448, indicating agreed responses with low variability among the responses. Among the five items considered, inefficient logistics operations increasing cost per unit (Mean = 4.25, SD = 0.528) and high fuel costs (Mean = 4.24, SD = 0.647) were the most pressing concerns as the study participants strongly agreed to both cost-related challenges.

Logistics costs as a significant portion of operational budget (Mean = 4.08, SD = 0.617) and warehousing and/or transportation costs hindering profitability (Mean = 4.06, SD = 0.701) were also key issues. The result also showed that frequent budget overruns (Mean = 3.85, SD = 0.687) was scored the lowest, yet still notable cost-related challenge in the Ethiopian Malt supply chain with a focus on Soufflet Malt Ethiopia SC.Hence, cost-related challenges are pressing, especially with rising fuel prices and inefficient operations, indicating a need for better cost control and optimization in the logistics operations of Soufflet Malt Ethiopia SC.

Table 4-6. Descriptive statistics for Cost Inflation.

Statement (N = 112)	Mean	SD
High fuel costs impact overall transportation expenses.	4.24	.647
Logistics costs constitute a significant part of operational budget.	4.08	.617
Inefficient logistics operations lead to increased cost per unit.	4.25	.528
The company frequently exceeds its logistics cost estimates.	3.85	.687

Transportation and warehousing costs hinder profitability.	4.06	.701
Overall Average	**4.10**	**.448**

Source: Survey findings (2026)

e) Descriptive statistics for information flow and integration challenges

Table 4.7 reflects information flow and technology integration challenges. The results revealed that communication and technology issues remain significant in logistics operations.The overall mean of information and technology related challenges was 4.11, with a standard deviation of 0.485, showing agreed responses with low variability among the responses. Among the five items, the highest concern was outdated logistics systems (Mean = 4.32, SD = 0.573) – indicating a need for technology upgrades, followed by poor IT integration (Mean = 4.26, SD = 0.549) as the participants showed strong agreement to both statements.

On the other hand, the participants agreed on the remaining three items such as difficulty in tracking travel due to inadequate digital tools (Mean = 4.19, SD = 0.651), lack of real-time information affects decision-making (Mean =3.90, SD = 0.684), and information delays cause disruption in logistics processes (Mean = 3.89, SD = 0.689).

In general, the results confirm that outdated logistics systems and poor IT integration were considered as the top-ranked challenges, which suggest technological limitations impede responsiveness, and implies that a need for investment in modern logistics and data platforms.

Table 4-7. Descriptive statistics for information flow and integration challenges.

Statement (N = 112)	Mean	SD
Lack of real-time information affects decision-making.	3.90	.684
Information delays cause disruption in logistics processes.	3.89	.689
Logistics platforms and technology systems are outdated (or insufficient).	4.32	.573
Poor data sharing and integration of IT systems between stakeholders/departments is a challenge.	4.26	.549

Difficulty in tracking travel due to inadequate digital tools.	4.19	.651
Overall Average	**4.11**	**.485**

Source: Survey findings (2026)

f) Descriptive statistics for regulatory challenges

Table 4.8 shows that regulatory issues also significantly affect logistics operations in the study area.The overall mean of regulatory and policy related challenges was 4.03, with a standard deviation of 0.514, showing agreed responses with relatively low variability among the responses.Among the five items of regulatory and policy challenges, custom procedures and policy inconsistency scored the highest (Mean =4.25, SD = 0.637),which increased logistics cost and lead times, and followed by regulatory inspections and bureaucracy (Mean =4.17, SD = 0.535)that delay transportation activities.

Similarly, the participants agreed to the remaining three items including trade restrictions and lack of streamlined processes affect smooth logistics operations (Mean = 4.13, SD = 0.729), government regulations slow down customs and logistics processes (Mean = 3.85, SD= 0.687), and licensing and compliance requirements cause delivery delays (Mean = 3.75, SD = 0.704).

In general, custom procedures, policy inconsistency, and regulatory inspections and bureaucracy are the major challenges that increase logistics cost and delay transportation activities. These indicate systemic inefficiencies that are harder for the industry to control, calling for broader policy reforms.

Table 4-8. Descriptive statistics for regulatory and policy challenges.

Statement (N = 112)	Mean	SD
Government regulations slow down customs and logistics processes.	3.85	.687
Complex custom procedures and inconsistent policies increase logistics cost and lead times.	4.25	.637
Licensing and compliance requirements cause delivery delays.	3.75	.704
Trade restrictions and lack of streamlined processes affect smooth logistics operations.	4.13	.729

Regulatory inspections and bureaucracy delay transportation activities.	4.17	.535
Overall Average	**4.03**	**.514**

Source: Survey findings (2026)

g) Descriptive statistics for supply chain data visibility and quality challenges

The results from Table 4.10 show that the overall mean of the supply chain visibility related issues was 4.20, with a standard deviation of 0.492, indicating relatively strong agreed responses with low variability among the responses. The resultconfirmed that lack of transparency in supplier operations (Mean = 4.31, SD = 0.554) and poor communication with partners (Mean = 4.30, SD = 0.583) are the top-ranked issues and underline the existence of communication gapsin the company.These findings indicate that improved visibility and coordination could have the most immediate impact on performance.

On the other hand, the participants agreed to the remaining items such as lack of centralized tracking systems leads to inventory errors (Mean = 4.28, SD = 0.618), inability to track travel in real time affects performance (Mean = 4.11, SD = 0.649), and inaccurate or unavailablestatus of data on supply chain (Mean = 3.98, SD = 0.629).

In general, the results revealed that the supply chain visibility is the most significant challenge area according to the average, highlighting its strong influence on operational performance at Soufflet Malt Ethiopia SC.

Table 4-9. Descriptive statistics for supply chain visibility challenges.

Statement (N = 112)	Mean	Std.
Inability to track travel in real time affects performance.	4.11	.649
Lack of transparency in supplier operations & shipments impacts efficiency.	4.31	.554
Poor communication with logistics partners hinders performance.	4.30	.583
Lack of centralized tracking systems leads to inventory errors.	4.28	.618
Data on supply chain status is often inaccurate or unavailable.	3.98	.629
Overall Average	**4.20**	**.492**

Source: Survey findings (2026)

In Summary, the results from descriptive statistics indicate that while operational performance is perceived as generally strong, it is vulnerable to multiple logistics and transportation challenges. The most impactful challenges: supply chain visibility, infrastructure issues, and cost pressures. Hence, improving real-time visibility, upgrading infrastructure and warehousing, and investing in modern technology can significantly enhance operational performance. In addition, regulatory reform and public investment in transport infrastructure could further mitigate delays.

4.5. The relationship between TLC and Operational Performance

Correlation is the measure of the relationship (linear) between two or more variables considered under the study. As described by Kothari (2004), a coefficient of correlation value (r) lies between ± 1. Positive values show positive relationship (association) between those variables, whereas negative values indicate negative relationship – as one value increases the other value decreases. A zero-coefficientvalue indicates that there is no association/relationship between those variables. The correlation coefficients values from .10 to .30 are considered 'weak correlation', values from 0.30 to 0.70 are considered 'moderate correlation', 0.70 to 0.90 are considered 'strong', and correlations of 0.90 to 1.00 are considered 'very strong' (Marczyk, *et al*., 2005).

In this study, Pearson's correlation coefficient, which is a measure of linear association, was used to identify the relationship between dependent-variable (Operational Performance) and independent-variables (Transportation and Logistics challenges). Accordingly, the results shown in the table below revealed that all theseven variables oftransportation and logistics challengesof this study are statically significant with operational performance, with the p-value of 0.000 at 0.01 significant levels.As can be seen from the relationship formed, strong and positive correlation was formed for operational performance with the five variables such as Logistics Infrastructure and Facilities, Logistics cost, Information flow and integration, Warehousing efficiency, and Supply chain visibility challenges, with coefficient values of 0.883, 0.847, 0.850, 0.842 and 0.748, respectively.On the other hand, moderate and positive correlation was formed with two variables such as Planning & Scheduling Maturity (0.686) and Regulatory and policy challenges (0.526).

Table 4-10. The correlations result between Operational performanceand Transportation and Logistics challenges.

N = 112		OP	TI	LP	LC	IF	RP	WE	SC
Operational Performance (OP)	Pearson Correlation	1	.883**	.686**	.847**	.850**	.526**	.842**	.748**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
Logistics Infrastructure and Facilities (TI)	Pearson Correlation		1	.642**	.834**	.874**	.383**	.876**	.772**
	Sig. (2-tailed)			.000	.000	.000	.000	.000	.000
Planning & Scheduling Maturity (LP)	Pearson Correlation			1	.715**	.676**	.366**	.634**	.649**
	Sig. (2-tailed)				.000	.000	.000	.000	.000
Cost Inflation (LC)	Pearson Correlation				1	.825**	.377**	.822**	.681**
	Sig. (2-tailed)					.000	.000	.000	.000
Information Flow & Integration (IF)	Pearson Correlation					1	.364**	.844**	.682**
	Sig. (2-tailed)						.000	.000	.000
Regulatory factors (RP)	Pearson Correlation						1	.412**	.315**
	Sig. (2-tailed)							.000	.001
Warehousing Efficiency (WE)	Pearson Correlation							1	.730**
	Sig. (2-tailed)								.000
Supply Chain Visibility (SC)	Pearson Correlation								1
	Sig. (2-tailed)								

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

Source: Survey findings (2026)

4.6. The Effect of Logistics Challenges on Operational Performance

Regression is a method used to predict the value of a dependent variable using one or more predicators (independent variables) (Albaum, 1997). Regression analysis is one of the widely used statistical tools applied for investigation of the relationships between study variables, usually, the investigator seeks to ascertain the casual effect of one variable upon another. The investigator also typically assesses the "*statistical significance*" of the estimated association, that is, the degree of confidence that the true relationship is close to the estimated relationship (Malhotra and Birks, 2007).

4.6.1. Assumptions for MultipleLinear Regression Analysis

Meeting the assumptions of linear regression analysis is essential to ensure the data accurately represent the study sample and produce reliable results (Hair *et al*., 1998). Accordingly, the following assumption tests were conducted for the current study.

a. Multicollinearity Analysis

Multicollinearity, which occurs when predicators(independent variables) are highly correlated, was assessed in this study. Dillon (1993) noted that excessive correlation among predicators (independent variables) leads to overlapping predictive power, potentially causing a paradox where the study model (such as linear regression) fits the data well, however, individual predictor variables lack statistical significance (Robert, 2006). The influence of multicollinearity is, hence, to minimize the predictive power of any predicator (independent) variable by the extent to which it is related with the remaining independent factors (Beyan, 2014).

To address this issue, Tolerance values and VIF (Variance Inflation Factor) values were calculated before performing regression analysis. The calculated Tolerance values for all the seven variables oftransportation and logistics challengesranged from 0.138 to 0.810, all exceeding the minimum acceptable threshold of 0.1. Similarly, all VIF values, which range from 1.235 to 7.238, were below the critical threshold of 10. These findings confirm that multicollinearity issues were not a significant concern in this study.

Table 4-11. Multicollinearity Test

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Logistics Infrastructure and Facilities	.138	7.238
	Planning & Scheduling Maturity	.412	2.426
	Cost Inflation	.218	4.579
	Information Flow & Integration	.185	5.402
	Regulatory factors	.810	1.235
	Warehousing Efficiency	.184	5.446

Supply Chain Visibility	.352	2.843

a. Dependent Variable: Operational Performance

Source: Survey findings (2026)

b. Independent Errors/Lack of Independence

Residual terms should be independent, meaning there should be no correlation between errors for different observations. This assumption was tested using the "Durbin-Watson" statistic, which determinesthe existing serial correlations between residuals. A Durbin-Watson value between 1.5 and 2.5 is considered acceptable for independent observations (David, 2012), while values below 1 or above 3 indicate potential concerns (Field, 2005). Accordingly, for this study, the result of "Durbin-Watson" test shows **2.084**, which is within the acceptable range of 1.5 to 2.5.

Table 4-12. Durban Watson test results

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.932[a]	.868	.859	.15108	2.084

a. Predictors: (Constant), Supply Chain Visibility, Regulatory factors, Planning & Scheduling Maturity, Information Flow & Integration, Cost Inflation, Warehousing Efficiency, Logistics Infrastructure and Facilities

b. Dependent Variable: Operational Performance

Source: Survey findings (2026)

4.6.2. Multiple Linear Regression Analysis

Linear regression estimates the coefficients of the linear equation, involving one or more independent variable (Field, 2005). In this study, the linear regression analysis was conducted to determine the explanatory power of the seven variables oftransportation and logistics challenges (Logistics Infrastructure and Facilities, Planning & Scheduling Maturity, Cost Inflation , Information Flow and Integration, Regulatory and Policy, Warehousing Efficiency, and Supply Chain Visibility) in predicting andto identify their relationship with the dependent variable, operational performance. The result also helps us

to determine and understand which variables of transportation and logistics challenges are more influencingoperational performancein the study area.

Accordingly, the result of the regression analysis of this study shows statistically significant relationship between the variables of transportation and logistics challenges and the operational performance. The R-Squared (coefficient of determination) indicates that the amount of variation in the operational performance (dependent variable) is explained by the transportation and logistics challenges (independent variables) in the linear regression model, withthe larger the R-Squared value indicating the more variability is explained by the model. Accordingly, the results revealed that the seven variables oftransportation and logistics challenges (Logistics Infrastructure and Facilities, Planning & Scheduling Maturity, Cost Inflation, Information Flow and Integration, Regulatory and Policy, Warehousing Efficiency, and Supply Chain Visibility) together accounted for 86.8 % (R^2 = 0.868) of the variance in operational performance (Table 4.14). Hence,86.8 % of the variation inoperational performance is explained by these seven transportation and logistics challengesconsidered in the current study.

Table 4-13. Model Summary of the multiple linier regression analysis.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.932[a]	.868	.859	.15108	.868	97.910	7	104	.000

a. Predictors: (Constant), Supply Chain Visibility, Regulatory factors, Planning & Scheduling Maturity, Information Flow & Integration, Cost Inflation, Warehousing Efficiency, Logistics Infrastructure and Facilities

b. Dependent Variable: Operational Performance

Source: Survey findings (2026)

Moreover, the significance of the overall model was confirmed using ANOVA analysis of variance. Thus, from the result in the **ANOVA** table below, with F-value of 97.91, the significant *p-value* is .000, which is below the alpha level, i.e. .05 (Table 4.15),

indicatingthat the sevenindependent variables taken together have statistically significant effect on and relationship with operational performance (dependentvariable).

Table 4-14. ANOVA result of the study.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.643	7	2.235	97.910	.000[a]
	Residual	2.374	104	.023		
	Total	18.017	111			

a. Predictors: (Constant), Supply Chain Visibility, Regulatory factors, Planning & Scheduling Maturity, Information Flow & Integration, Cost Inflation, Warehousing Efficiency, Logistics Infrastructure and Facilities

b. Dependent Variable: Operational Performance

Source: Survey findings (2026)

From the results of regression coefficients (Table 4.16), all the *Beta* Coefficient values between operational performance and the seven variables oftransportation and logistics challengesare positive, indicating the existence of direct relationship between operational performance and those variables. The standardized coefficients (*Beta-value)* for the five independent variables, i.e. Logistics Infrastructure and Facilities, Cost Inflation , regulatory and policy, information flow and technology integration, and supply chain visibility challenges are .315, .228, .188,.183, and .116, respectively, and their significance levels are .001, .003, .000, .029and .054, respectively, indicating that these five variables positively and significantly affect operational performance (the dependent variable) as their p-values are less than or equal .05 significance level. However, the remaining two independent variables, warehousing efficiency challenges (*Beta* = .116) and Planning & Scheduling Maturity (*Beta* = .023) are insignificant with operational performance as their p-values.577 and .674, respectively,are greater than .05 significant level.

In addition, from the coefficients of regression analysis, the independent variable with larger *B-coefficient* value has the higher contribution in influencing the dependent variable. Accordingly, the values of *B-coefficient* show that among the transportation and logistics challenges, the Logistics Infrastructure and Facilities challenges has the largest value (B =

.259), indicating that this variable has the highest contribution in influencing the operational performance, followed by Cost Inflation (B = .205), Information flow and technology integration (B = .152), Regulatory and policy challenges (B =.147), and Supply chain visibility challenges (B = .095), while Warehousing efficiency challenges (B = .038) and Planning & Scheduling Maturity (B = .019) haveinsignificant and the lowest contribution in influencing operational performance.

In other words, the results show that keeping other variables constant, a unit increase in Logistics Infrastructure and Facilitiesbrings a 0.259 unit increase in operational performancein the study area. Similarly, keeping other variables constant, a unit increase in Cost Inflation will lead to a 0.205 unit increase in operational performance, a unit increase in information flow and technology integration will lead to a 0.152 unit increase in operational performance,a unit increase in regulatory and policy will lead to a 0.147 unit increase in operational performance, and a unit increase in Supply chain visibility will lead to 0.095 unit increases in operational performance. On the other hand,keeping other variables constant, a unit increase in warehousing efficiency will lead to 0.038 unit increases and a unit increase in Planning & Scheduling Maturity will lead to 0.019 unit increases in operational performance,however, both variables are insignificant with operational performanceastheir p-values are above .05.

In general, from the coefficients of regression analysis, taking all the sevenindependent variables (transportation and logistics challenges) into account and keeping them constant at zero, the value of operational performance will be 0.407.

Table 4-15. Coefficients analysis of the regression model of the study.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.407	.155		2.623	.010
Logistics Infrastructure	.259	.079	.315	3.293	.001
Facilities Planning & Scheduling Maturity	.019	.046	.023	.422	.674
Logistics Cost Inflation	.205	.068	.228	2.993	.003

Information Flow & Integration	.152	.069	.183	2.212	.029
Regulatory factors	.147	.031	.188	4.754	.000
Warehousing Efficiency	.038	.068	.047	.560	.577
Supply Chain Visibility	.095	.049	.116	1.939	.055

a. Dependent Variable: Operational Performance

Source: Survey findings (2026)

From the values of coefficients in the above table for the constant and variables of transportation and logistics challenges, the regression equation is derived as:

$$\mathbf{Y = 0.407 + 0.259*X_1 + 0.019*X_2 + 0.205*X_3 + 0.152*X_4 + 0.147*X_5 + 0.038*X_6 + 0.095*X_7 + e}$$

where, Y= Operational performance, X_1 = Logistics Infrastructure and Facilities, X_2 = Planning & Scheduling Maturity, X_3 =Cost Inflation, X_4 = Information flow and technology integration, X_5 = Regulatory and policy, X_6 =Warehousing efficiency, and X_7 = Supply chain visibility challenges, and e = sampling error.

4.7. Hypotheses Testing

Hypothesis testing for this study is based on standardized coefficients *Beta* values and significance level (*P-values*) to determine whether the study hypotheses are accepted or not. Accordingly, the overall outcomes of the research hypotheses to determine the influence of transportation and logistics challenges on operational performanceare summarized as follows.

Table 4-16. Summary of the overall outcome of the study hypotheses.

Research Hypothesis	Findings	Results	Reason
H_1: Infrastructure challenges significantly affect the operational performance of Soufflet Malt Ethiopia S.C.	Positive and Significant	Supported	Beta= **.315** P=.001< .05
H_2: Planning & Scheduling Maturity level significantly affect the operational performance of Soufflet Malt Ethiopia S.C.	Positive but insignificant	Rejected	Beta= **.023** P=.674 >.05
H_3: Cost Inflation significantlyaffect the operational performance of Soufflet Malt Ethiopia S.C.	Positive and Significant	Supported	Beta= **.228** P=.003< .05

H_4: Information flow and integration challenges significantly affect the operational performance of Soufflet Malt Ethiopia S.C.	Positive and Significant	Supported	**Beta= .183** P=.029< .05
H_5: Regulatory Factors significantlyaffect the operational performance of Soufflet Malt Ethiopia S.C.	Positive and Significant	Supported	Beta= .188 P=.000 < .05
H_6: Poor supply chain visibility negatively affects operational performance.	Positive and significant	Supported	Beta= .116

Source: Survey findings (2026)

4.8. Discussions

The multiple linear regression analysis revealed that the seven variables of transportation and logistics challenges collectively explained 86.8% (R^2 = 0.868) of the variance in operational performance at the Soufflet Malt Ethiopia SC. Among these,five independent variables – Logistics Infrastructure and Facilities challenges, Cost Inflation challenges, regulatory and policy challenges, information flow and technology integrationissues, and supply chain visibility challenges – were statistically significant predictors, while warehousing efficiency and Planning & Scheduling Maturity challenges were not significant.

Logistics Infrastructure and Facilities Challenges:

Logistics Infrastructure and Facilities emerged as the most influential factor ($\beta = 0.315$, $p < 0.01$) of operational performance, suggesting that poor infrastructure significantly hampers operational performance. Participants emphasized issues such as poor road conditions, lack of alternative routes, and inadequate transport facilities. These findings align with those of Rodrigue *et al*. (2017), who emphasized that underdeveloped transport networks constrain logistics activities and reduce supply chain reliability. Similarly, Abate (2018) found that road infrastructure quality directly impacts delivery timelines and operational efficiency in Ethiopia. Additionally, Fanta and Fekadu (2022) confirmed that limited transport access leads to higher operational costs and delays in Ethiopian manufacturing supply chains.

Cost Inflation Challenges:

Logistics cost emerged as the second most significant predictor ($\beta = 0.288$, $p < 0.01$) of operational performance. Study participants pointed to high fuel prices and inefficient logistics operations as major contributors. This result is supported by Guner and Acarturk (2020), who found that excessive logistics costs lead to increased operational inefficiency and reduced competitiveness. Similarly, the World Bank (2023) logistics performance reports confirm that high fuel costs and inefficient transportation systems are common bottlenecks in African supply chains, including Ethiopia.

Regulatory Challenges:

Regulatory challenges were the third most influential predictor ($\beta = 0.188$, $p < 0.01$) of operation performance withparticipants highlighted burdensome customs procedures, inconsistent government policies, and bureaucratic delays as critical challenges. This result is consistent with the findings of Geda and Teshome (2019), who highlighted that policy unpredictability and poor regulatory enforcement delay goods movement in Ethiopia. Likewise, Hofman and Ojah (2020) found that excessive regulatory burden and corruption significantly reduce logistics performance across African countries.

Information Flow and Integration:

Information flow and integration ($\beta = 0.183$, $p < 0.05$) also significantly influenced operational performance. Respondents noted the use of outdated systems and poor integration with logistics partners. This result is supported with the work of Lu and Liu (2019), who emphasized that integrated information communication technology (ICT) systems enhance logistics responsiveness and decision-making. The result is also aligned with the findings of Mekonnen and Hailu (2021), who found that poor adoption of information technology (IT) in Ethiopian logistics firms leads to communication breakdowns and operational delays. In contrast, Zhang *et al*. (2020) found no significant relationship between IT integration and performance in certain low-tech manufacturing settings, indicating possible context-specific effects.

Supply Chain Visibility Challenges:

Though relatively less influential (β = 0.116, p = 0.054), supply chain visibility challenges remained a significant predictor of operational performance. Respondents stressed the lack of supplier transparency and poor communication with partners as the company's supply chain visibility related challenges. This is in line with the findings from Christopher and Peck (2004), who argue that visibility is key to resilient and agile supply chains. Similarly, the work of Ali and Awan (2020) found that enhanced visibility improves responsiveness and lowers uncertainty in operations.

Warehousing Efficiency and Logistics Planning/Scheduling Issues:

Warehousing efficiency challenges (β = 0.047, p > 0.05) and Planning & Scheduling Maturity related issues (β = 0.023, p > 0.05) did not significantly influence operational performance. This may reflect the Soufflet Malt Ethiopia SC's moderate investment in warehousing practices or the outsourcing of planning functions, thereby reducing their direct effect. Similar findings were reported by Naslund and Williamson (2010), who indicated that in certain industries, warehousing improvements yield marginal returns if other logistics bottlenecks persist.

Further support for these findings comes from global studies. For example, studies like those by Mentzer *et al.* (2001) and the World Economic Forum (2022) show that operational performance is most impacted by systemic logistics inefficiencies – especially in developing countries – where infrastructure, cost, and governance issues prevail.

CHAPTER

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary of major findings

In this study, Descriptive statistics, Pearson's Correlation analysis, and Multiple Linear Regression analysis were used to analyze the data. From the result of analysis and interpretation, the summary of the major findings of the study are presented as follows.

- The results from descriptive statistics indicate that while operational performance is perceived as generally strong, it is vulnerable to multiple logistics and transportation challenges. The results show the most impactful challenges include Supply chain visibility, infrastructure issues, and cost pressures. Hence, improving real-time visibility, upgrading infrastructure and warehousing, and investing in modern technology can significantly enhance operational performance. In addition, regulatory reform and public investment in transport infrastructure could further mitigate delays.

- The correlation coefficient analysis showed that the seven variables of transportation and logistics challenges – Logistics Infrastructure and Facilities, Planning & Scheduling Maturity, Cost Inflation , information flow and technology integration, regulatory and policy, warehousing efficiency, and supply chain visibility challenges – had positive, moderate to strong correlations,and hence, significant association with operational performance at the study area.

- The multiple linear regression analysis showed that the seven variables of transportation and logistics challenges collectively explained 86.8 % ($R^2 = 0.868$) of the variance in operational performance at the study area. Among these, five independent variables – Logistics Infrastructure and Facilities challenges ($\beta = 0.315$, $p < 0.01$), Cost Inflation challenges ($\beta = 0.288$, $p < 0.01$), regulatory and policy challenges ($\beta = 0.188$, $p < 0.01$), information flow and technology integration challenges ($\beta = 0.183$, $p < 0.05$), and supply chain visibility challenges ($\beta = 0.116$, $p = 0.054$) – were statistically significant predictors of operational performance. However, warehousing efficiency challenges ($\beta = 0.047$, $p > 0.05$) and Planning & Scheduling Maturity related issues ($\beta = 0.023$, $p > 0.05$) were found to have a positive but insignificant effect on operational performance in the study area.

- Logistics Infrastructure and Facilitieswere the strongest predictors of operational performance, indicating that Logistics Infrastructure and Facilitieschallenge highly affect the operational performance of the company. Specifically, study participants emphasized poor road conditions – underscoring the impact of inadequate infrastructure, inadequate transport facilities, and lack of alternative routes – highlight systemic weaknesses in the transport network.

- Logistics cost emerged as the second most influential predicator of operational performance at the study area, with participants highlighting inefficient logistics operations increasing cost per unit, and high fuel costs were the most pressing concerns in logistics operations of the company.

- Regulatory and policy challenges emerged as the third most influential factor of operational performance in the study area, with participants highlighting custom procedures and policy inconsistency (which increase logistics cost and lead time), and regulatory inspections and bureaucracy (that delay transportation activities) were the most pressing issues in logistics operations of the company.

- Information flow and technology integration challenges ranked as the fourth significant predictor of operational performance, with participants highlighting outdated logistics systems and poor information technology integration as the serious issues challenging logistics operation of the company.

- Supply chain visibility, though less influential than the other four factors, was still a significant predictor of operational performance. Participants highlight lack of transparency in supplier operations and poor communication with logistics partners are the top-ranked issues and underline the existence of communication gaps at the company.

- On the other hand, the results show that warehousing efficiency challenges and Planning & Scheduling Maturity related challenges were insignificant with operational performance at the study company.

5.2. Conclusion

This study investigated the effects of transportation and logistics challenges on the operational performance of the Soufflet Malt Ethiopia S.C. supply chain. It contributes to the growing body of knowledge on logistics supply chain management by highlighting how transportation and logistics challenges impact operational efficiency in the Ethiopian Malt industries context.

The regression results confirmed that Logistics Infrastructure and Facilities challenges, logistics costs challenges, regulatory and policy issues, information flow and technology integration challenges, and supply chain visibility challenges significantly affect operational performance, with Logistics Infrastructure and Facilities being the most dominant factor, followed by logistic cost. The findings highlight that inefficiencies in road conditions, high fuel and logistics costs, bureaucratic hurdles, outdated technologies, and poor visibility hinder the company's ability to operate optimally.

Conversely, warehousing efficiency challenges and logistics planning related issues had a positive but statistically insignificant impact on operational performance, suggesting these areas may not currently represent major bottlenecks, or their potential impact may be mitigated by other compensating factors within the company's transportation and logistics systems.

5.3. Recommendations

Based on the findingsand conclusions made above, the following recommendations are proposed for the Soufflet Malt Ethiopia S.C. and similar institutions.

1. **Invest in Logistics Infrastructure and Facilities Improvements:** The Soufflet Malt Ethiopia S.C. should collaborate with other malt companies, logistics service providers and policymakers to address infrastructure gaps, including lobbying for better roads and alternative transportation routes.

2. **Control and Optimize Logistics Costs:** The company and similar institutions should invest in effective route optimization tools, fuel-efficient transportation ways, and cost-effective third-party logistics services to manage and reduce high operational costs.

3. **Engage in Regulatory and Policy Dialogue:** Work with government agencies and industry associations to advocate streamlined customs procedures, reduced bureaucracy, and more predictable regulatory policies.

4. **Adopt Advanced IT Solutions:** Upgrade legacy systems and adopt integrated logistics platforms to improve information sharing, decision-making, and collaboration with logistics supply chain partners.

5. **Improve Supply Chain Visibility:** Establish real-time tracking systems and improve communication with suppliers and logistics partners to enhance transparency and responsiveness.

6. **Monitor and Enhance Planning and Warehousing:** Although not significant in this study, continuous improvement in warehousing practices, and Planning & Scheduling Maturity could still yield long-term operational benefits.

5.4. Future Research Directions

To deepen the understanding and address limitations of this study, future researchers are encouraged to explore the following areas.

1. **Industry Comparative Studies:** Future research should explore the logistics-performance link across different manufacturing sectors to identify industry-specific challenges and best practices.

2. **Longitudinal Analysis:** A longitudinal study could assess how logistics challenges evolve over time and how sustained interventions impact operational performance.

3. **Incorporating External Environmental Factors:** Future studies could include external variables like political instability, global market shocks, natural disasters, and others to better understand their impact on logistics operations.

4. **Qualitative Case Studies:** In-depth case studies of top-performing logistics operations within the country could provide practical insights for broader adoption.

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Appendix A



Addis Ababa University, School of Commerce,

Department Of

Logistics and Supply Chain Management, Graduate Program

Questionnaire for Respondents (English Version)

By: Eyoel G.

Dear respondents:

I am currently attending a Degree of Master of Art (MA) in Logistics and Supply Chain Management Program at Addis Ababa University (AAU). I am conducting a thesis on the title "***Assessing the Effect of Logistics Challenges on Operational Performance the case of Soufflet Malt Ethiopia S.C.***". This questionnaire is designed to collect data on Operational Performance level, Transportation and Logistics Challengesand their effects on operational performance of Soufflet Malt Ethiopia SC. I kindly ask you to give me a few minutes of your time to answer the questions. The success of the study will depend on the quality of responses you provide to the items in this questionnaire. So, I request you to answer all the questions as honestly as possible. Your answers will be handled strictly confidentially and will exclusively be used for the purpose of this research only.

Thank you for your cooperation and time!

PART I: Background Information

***Instruction*:** *(i)No need to write your name.*

(ii) Kindly respond by putting a tick (√) mark or by stating on the space provided.

1. **Gender:** Male () Female ()
2. **Age group (in years):** 18–24() 25–35() 36–45 () 46–50 () Above 50 ()

3. **Academic Qualification:** High School& below () Diploma () BA/BSc.() MA/MSc.() PhD () Other, Specify _____

4. **Respondent Category:** Employees of Soufflet Malt Ethiopia S.C. () Aggregators () Managers () Coordinators () Drivers ()

5. **Department:** _____

6. **Your position:** _____

7. **Years of experience in Logistics/Operations (years):**

Less than 5 () 6–10 ()11–15 () 16–20 () 21–25 () Above 25 ()

PART II: Statements on Transportation and Logistics Challenges and Operational Performance

Instruction:

(i) *Use key as: **1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree**. The higher the number means the more you agree and the lower the number means the more you disagree with the item/statement.*

(ii) *Please put a (√) mark with the option that reflects your level of agreement or disagreement with the given statement.*

Section A. Transportation and Logistics Challenges

No.	Variable/Statement	Alternatives				
		1	2	3	4	5
LIF	**Logistics Infrastructure and Facilities Challenges**					
1	Poor road conditions delay product delivery.					
2	Inadequate transport facilities hinder logistics operations.					
3	Traffic congestion impacts delivery timelines.					
4	Lack of alternative routes increases vulnerability to disruptions.					
5	Poor connectivity to suppliers/customers affects delivery reliability.					
PSM	**Planning and Scheduling Maturity**	**1**	**2**	**3**	**4**	**5**
1	Delays occur due to poor planning of transportation routes.					
2	The company faces frequent scheduling conflicts in delivery.					
3	Inventory levels are not aligned with logistics planning.					
4	Order fulfillment is hindered due to poor logistics coordination.					
5	Reactive rather than proactive logistics planning is a challenge.					
CI	**CostInflation**	**1**	**2**	**3**	**4**	**5**

1	High fuel costs impact overall transportation expenses.					
2	Logistics costs constitute a significant part of operational budget.					
3	Inefficient logistics operations lead to increased cost per unit.					
4	The company frequently exceeds its logistics cost estimates.					
5	Transportation and warehousing costs hinder profitability.					
IFI	**Information Flow and Integration**	**1**	**2**	**3**	**4**	**5**
1	Lack of real-time information affects decision-making.					
2	Information delays cause disruption in logistics processes.					
3	Logistics platforms and technology systems are outdated or insufficient.					
4	Poor data sharing and integration of IT systems betweenstakeholders/departments is a challenge.					
5	Difficulty in tracking travel due to inadequate digital tools.					
RF	**Regulatory Factors**	**1**	**2**	**3**	**4**	**5**
1	Government regulations slow down customs and logistics processes.					
2	Complex custom procedures & inconsistent policies increase logistics cost and lead times.					
3	Licensing and compliance requirementscause delivery delays.					
4	Trade restrictions and lack of streamlined processes affect smooth logistics operations.					
5	Regulatory inspections and bureaucracy delay transportation activities.					
SCV	**Data Visibility and Quality Challenges**	**1**	**2**	**3**	**4**	**5**
1	Inability to track travel in real time affects performance.					
2	Lack of transparency in supplier operations & shipments impacts efficiency.					
3	Poor communication with logistics partners hinders performance.					
4	Lack of centralized tracking systems leads to inventory errors.					
5	Data on supply chain status is often inaccurate or unavailable.					

Section B. Operational Performance

No.	Statement	Alternatives

		1	2	3	4	5
1	The company consistently meets delivery timelines.					
2	Logistics operations align well with production requirements.					
3	Customer satisfaction is high due to reliable delivery.					
4	Cost efficiency is achieved in logistics operations.					
5	The company can quickly respond to logistics disruptions.					

Finally, please share your comments and feedback regarding the following:

1. Challenges associated with the transportation and logistics management and practices at Soufflet Malt Ethiopia SC:

_____

_____

_____

_____

_____

2. Influences of those challenges on the operational performance of the company:

_____

_____

_____

_____

_____

3. Strategies for successful implementation of Transportation and Logistics Management:

_____

_____

_____

_____

_____

Thank you for taking the time to complete this questionnaire! Your input is greatly appreciated and highly valuable for this research.

Appendix B

Results of Multiple Linear Regression

Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	Supply Chain Visibility, Regulatory factors, Planning & Scheduling Maturity, Information Flow & Integration, Logistics Cost, Warehousing Efficiency, Logistics Infrastructure and Facilities[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Operational Performance

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.932[a]	.868	.859	.15108	.868	97.910	7	104	.000

a. Predictors: (Constant), Supply Chain Visibility, Regulatory factors, Planning & Scheduling Maturity, Information Flow & Integration, Cost Inflation, Warehousing Efficiency, Logistics Infrastructure and Facilities

b. Dependent Variable: Operational Performance

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.643	7	2.235	97.910	.000[a]
	Residual	2.374	104	.023		
	Total	18.017	111			

a. Predictors: (Constant), Supply Chain Visibility, Regulatory factors, Planning & Scheduling Maturity, Information Flow & Integration, Cost Inflation, Warehousing Efficiency, Logistics Infrastructure and Facilities

b. Dependent Variable: Operational Performance

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	.407	.155		2.623	.010		
Logistics Infrastructure and Facilities	.259	.079	.315	3.293	.001	.138	7.238
Planning & Scheduling Maturity	.019	.046	.023	.422	.674	.412	2.426
Cost Inflation	.205	.068	.228	2.993	.003	.218	4.579
Information Flow & Integration	.152	.069	.183	2.212	.029	.185	5.402
Regulatory factors	.147	.031	.188	4.754	.000	.810	1.235
Warehousing Efficiency	.038	.068	.047	.560	.577	.184	5.446
Supply Chain Visibility	.095	.049	.116	1.939	.055	.352	2.843

a. Dependent Variable: Operational Performance

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.407	.155		2.623	.010
	Logistics Infrastructure and Facilities	.259	.079	.315	3.293	.001
	Planning & Scheduling Maturity	.019	.046	.023	.422	.674
	Cost Inflation	.205	.068	.228	2.993	.003
	Information Flow & Integration	.152	.069	.183	2.212	.029
	Regulatory factors	.147	.031	.188	4.754	.000
	Warehousing Efficiency	.038	.068	.047	.560	.577
	Supply Chain Visibility	.095	.049	.116	1.939	.055

a. Dependent Variable: Operational Performance

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions							
				(Constant)	Logistics Infrastructure and Facilities	Planning & Scheduling Maturity	Cost Inflation	Information Flow & Integration	Regulatory factors	Warehousing Efficiency	Supply Chain Visibility
1	1	7.961	1.000	.00	.00	.00	.00	.00	.00	.00	.00
	2	.015	23.269	.08	.01	.00	.00	.01	.54	.01	.01
	3	.008	32.218	.62	.01	.04	.00	.01	.38	.02	.01
	4	.006	36.353	.21	.02	.69	.00	.01	.02	.02	.00
	5	.005	40.797	.03	.00	.03	.05	.06	.02	.00	.73
	6	.002	60.779	.01	.02	.03	.60	.48	.00	.06	.00
	7	.002	64.409	.03	.03	.11	.28	.07	.02	.86	.05
	8	.001	75.657	.02	.91	.10	.06	.37	.00	.03	.19

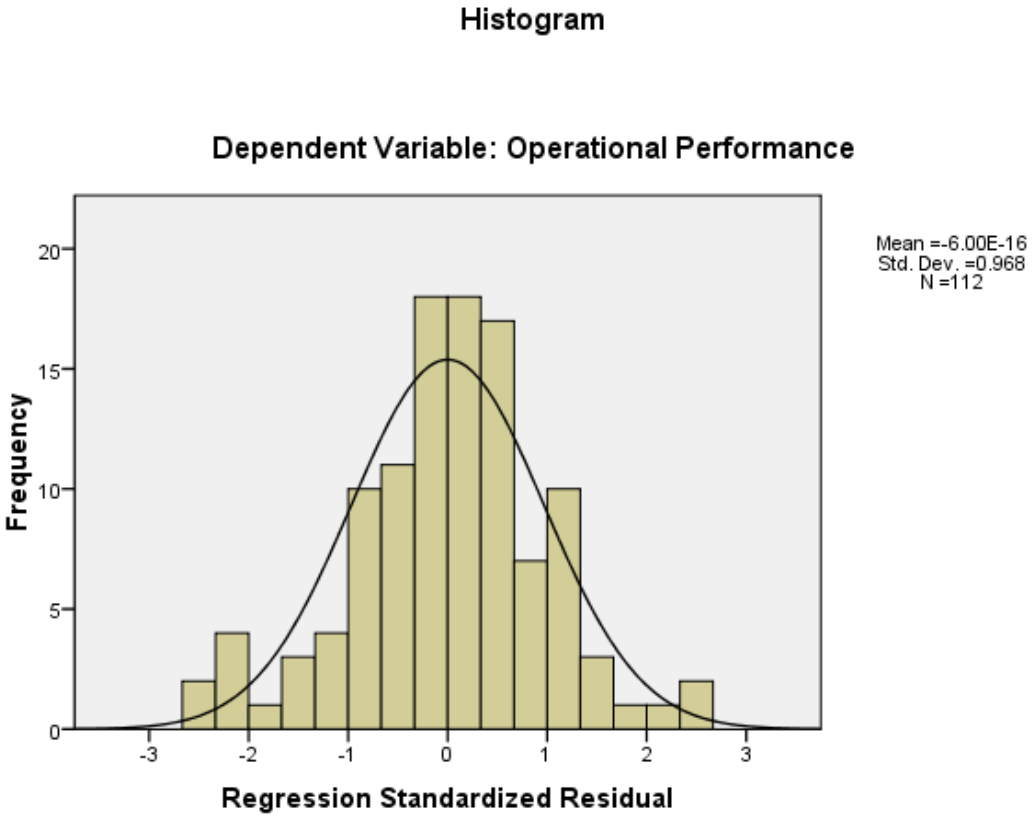
a. Dependent Variable: Operational Performance

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.2184	4.9879	4.1643	.37541	112
Residual	-.36855	.38534	.00000	.14624	112
Std. Predicted Value	-2.520	2.194	.000	1.000	112
Std. Residual	-2.439	2.551	.000	.968	112

a. Dependent Variable: Operational Performance

Charts



Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Operational Performance

