

**ADDIS ABABA UNIVERSITY**

**SCHOOL OF COMMERCE**



**EXAMINING THE EFFECT OF SUPPLY CHAIN RISKS ON PERFORMANCE  
OF AWASH WINERY SHARE COMPANY**

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**ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE**

**Examining the Effect of Supply Chain Risks on Performance**

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## **Declaration**

I, the under signed, declare that this thesis entitled “ Examining the Effect of Supply Chain Risks on Performance of Awash Winery Share Company” is my original work and has not been presented for a degree in any other university. All the references are duly acknowledged.

Declared by:

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Signature and Date

## **Confirmation**

This to certify that Wondafrash Gemedra has carried out his thesis work on the topic entitled “Examining the Effect of Supply Chain Risk on Performance of Awash Winery Share Company”. Accordingly, I here assure that his work is appropriate and standard enough to be submitted for the award of Master of Arts in Logistics and Supply Chain Management.

Advisor

Mengistu Bogale (PhD)

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Signature and Date

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## **List of Acronyms**

SCM-Supply Chain Management

PMS-performance Management System

TPM-Total Productive Measurement

RM-Risk Management

MTO-Make to Order

MTF-Make to Forecast

SCRM-Supply Chain Risk management

SCI-Supply Chain Integration

## Abstract

*Supply Chain Risk management is a vital approach to enhance the various aspects of operational performance of the firm. The main target of the study was to examine the effects of Supply Chain risks on performance of Awash Winery Share Company. The process of examination has many touch points with multiple functions within the company and these functions need to be examined in order to provide better performance to the company and service to the customer as well. Quantitative methods of research were used and data were collected to the study using questionnaire. The collected data were analyzed using both descriptive statistics (mean and standard deviation) and inferential statistics (correlation and linear regression). From the result of the analysis it is concluded that operational risks (supply risks, process risk & demand risks) have strong effect on operational performance of the company. Therefore, in order to achieve advancement in market share and profitability in the long run through enhancing operational performance, it is better for the company to give due emphasis to the constructs of supply risks, process risks and demand risks and the measure of operational performance.*

**Keyword:** Supply risk, process risk, demand risk and operational performance.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background of the Study

A supply chain is a network of entities such as manufactures, suppliers and distributors working together to transform goods from raw materials to final product while moving them to the end customer. Effective supply chain management is a critical component of a firm's ability to fill consumer demand, regardless of the industry. Supply chain performance may be decreased by disruptive events occurring in the supply chain system. Supply chain disruptions are "Unplanned events that may occur in the supply chain which might affect the normal or expected flow of materials and components" (Svensson, 2000). Any risk for the information, material and product flows from original supplier to the delivery of the final product to the end user. In simple terms, supply chain risks refer to the possibility and effect of a mismatch between supply and demand. (Juttner, 2003) defines SCRM as the management of risks for the supply chain "through a coordinated approach" a amongst supply chain members.

Today's Supply Chain Management came in to view as a new philosophy when compared with the traditional way of handling supply chains, it was distinguished by a strategic alignment on the way of collaborative achievement to align different supply chain firms in to an interconnected whole (Mentzer, 2001).

One of the most meaningful changes in the paradigm of modern business management is that individual businesses no more compete as merely autonomous entities but preferably competing as supply chains. When we are looking supply chain management in this emerging competitive environment, the ultimate success of the business will believe in management's ability to unify the company's intricate network of business relationships (Hassan Zadeh, 2010). Successful supply chain management (SCM) has become a potential constructive way of securing competitive advantage and enhancing organizational performance since the competition is no more between organizations, but among supply chains (Niknia, 2007).

Higher customer anticipation and environment excitability increased the globalization, on the other hand (Christopher and peck, 2004; Norrman and Jansson, 2004), due to this and other reasons supply chains are more undoubtedly exposed to risks, supply chain risk management (SCRM) has emerged as a significant area of the study since the current research area, the study of SCRM to that extent has not been sufficient to meet those challenges related with increasing supply chain risks (Khan and Burnes,

2007; Thun and Honeing, 2011). New extant studies have strongly concentrated on supply side risk as other side risks may be manageable once we have controlled supply side risk (Tang and Nurmaya Musa, 2011) however, the supply chain ripple effect makes it crucial to manage supply chain risks in collaboration with other supply chain collaborator (Noorman and Jonsson, 2004).

Its capability is not only threatened by risks from the supply side but also from internal production and the customer side as well as their interrelations no matter what kind of risk management technique or procedure is taken, supply chain risks might be understood and managed as a whole for an end to end supply chain (Rao and Goldsby, 2009). From the perspective of supply chain, supply chain collaboration is an important area to reduce supply chain risks since then this approach has not been investigated exhaustively (Cheng, 2011).

Awash Winery Share Company was founded in 1943 in Addis Ababa Ethiopia, Awassh wine is Ethiopian most loved brands, they produces wine in Awash, Gouder, Kemila, Axumite and Gebeta. Awash Winery Share Company has two plants in Addis Ababa, located at Mekanisa and Lideta. Mekanisa was the first wine making company that was opened in Ethiopia.

In September, 2013, 8 Miles LLP, a private equity fund chaired by Sir Bob Geldof and Mulugeta Tesfakiros, an Ethiopian entrepreneur, became the owner of the company. Since then, significant investments have been made to upgrade facilities and further improve quality. Their mission is to create, promote and sustain a service oriented and daring leadership culture by having a competent, happy and satisfied workforce, and also their vision is to drive the Ethiopian wine market growth through excellence and innovation.

## **1.2 Statement of the Problem**

A supply chain includes the functional activities and processes associated with the flows of products, services, information and capital from their origin to the end customers of an organization Butilica, (2011). The supply chain management (SCM) refers to the planning and management of all activities related to procurement, production, distribution and coordination among supply chain members, according to the Supply Chain Management Professionals Council. The SCM has undergone transformations related to the activities, processes and actors involved over time. Kumar and Nambirrajan (2013) shows that the focus gradually shifted from organizational integration to the integration of supply chain activities and enterprises.

There are problems in the whole supply chain which critically influences operational performance of an organization such as supply risk, process risk and demand risk. Globally the operational problems of wholesale business expressed through; lack of guidelines for creating alliances with supply chain partners; failure to develop measures for monitoring alliances; instability to broaden on the supply chain vision beyond procurement of product distribution to encompass large business processes; inability to integrate the company's internal procedures; lack of trust inside and outside a company, organizational resistance to the concept; lack of integrated information systems and electronic commerce linking firms (Fernie and Sparts, 2014).

Accordingly, the researcher was interested to conduct assessment and analysis on the effect of supply chain risk on the operational performance, Awash Winery Share Company. Therefore, since the effort is to examine the effects and relationship between SCRM practices and performance for empirical confirmation of their effect on the company, hence this paper aimed to contribute to the debate by testing the effect of supply chain risks on performance in the case company.

### **1.3 Research Question**

In order to address these research gaps. This study examined empirically the following research question:

1.3.1 How does supply risk affect the operational performance of the organization?

1.3.2 How does process risk affect the operational performance of the organization?

1.3.2 How does demand risk affect the operational performance of the organization?

### **1.4 Research Objectives-**

General objective

To develop supply chain risk management practices theoretically and empirically; and to identify the effects of supply chain risks on operational performance with special attention on the case company.

Specific objectives

The specific objectives of this study:

1.4.1 To investigate the impact of supply risk on operational performance

1.4.2 To examine the influence of process risk on operational performance

1.4.3 To verify the impact of demand risk on operational performance.

### **1.5 Significance of the Study**

This research will be important for efficient execution of supply chain management to those companies who produce core competencies in order for them to be competitive with in the market. The research will also generate knowledge to the companies about how supply chain risks affect operational performance; it also indicated that the strength and weakness parts of the organization. To scholars, the study is expected to add to the already existing body of knowledge on the margining field of supply chain risk management and supply chain risk disruption reduction. Essentially, this study will act a reference material as well as pointer to the future research direction.

In addition, the study will be important as a reference to researchers similar to this topic, and it will also give additional insight to collaboration system in the supply chain process. The study will also help students and other scholar's to gain knowledge in terms of information that will be attained during this study. The study will be an enhancement to the academic body of knowledge for researchers, while to other scholars; it will be a source of reference material on the subject and useful for further study.

### **1.6 Scope of the Study**

Supply chain risk management will be a broad area of the study if we are looking from managerial point of conception, so it will be difficult and unmanageable to conduct with respect to time, finance, quality. Therefore the scope of this research was deal with supply chain risk management practices and operational performance of Awash winery Share Company. The scope of this study was also deal with the risks towards the supplier, process and demand side as well.

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

This research didn't cover the full area of the case company. The sample didn't in corporate all the supply chain participants and was collected within the company. Besides the study assessed the effects of supply chain risk strategy practices from the stand point of the focal company; it involved supply chain operational risk (supply risk, process risk and demand risk) reactions towards the company. The research was limited on Awash Winery Share Company offices Addis Ababa area this is due to time and

resource limitation. Therefore it did not represent all constructs that have been explained in supply chain risk management.

## **1.8 Organization of the Study**

This research is organized into five chapters:

Chapter one includes background of the study, statement of the problem, basic research questions, objectives of the study, significance of the study, scope of the study, limitation of the study and definition of terms. Chapters two described review of related literature. This part dealt with theoretical and empirical evidences relevant to the proposed study in details. Chapter three is research methodology of the study this chapter described the type and designs of the proposed study the subjects/participants of the study, the sources of data, the data collection tools, the procedure of data collection and the methodology of data analysis will be described. Chapter four shall describe results and discussion of the study and it also interpreted or discussed the findings. This chapter utilized extensive use of literature review, and tries to address the statement of problem indicated in the first chapter. Chapter five is the final chapter of the research it comprises; summary of findings, conclusions, recommendations and limitation or suggestions for future study.

## CHAPTER TWO: LITERATURE REVIEW

### 2.1. Theoretical Review

This section's main objectives are to conceptualize the effect of supply chain risks on Awash Winery Share Company's performance through literature reviews, articles and various search engines. Kombo and Tromp (2006) defines a theoretical framework as a collection of theories-based interrelated ideas.

#### 2.1.1. Risk and Uncertainty

Uncertainty can be stated as the lack of succeeding continuous results. When considering the duration of uncertainty the effect of supply chain may be classified in to short term uncertainty and long term uncertainty discussed by (Vaagen , H., 2013). Short term uncertainty indicates the demand variation in those activities interrupted due to the need of equipment maintenance (adjustment), speed up orders or day to day processing verities. On the other hand long term uncertainty includes demand variation on a particular time period so the flexibility of demand on a particular time period will be associated with raw material/finished product unit, price changes and production rate variations occurring for longer period time. So the idea of risk is repeatedly stayed for condition where the negative results, their amount and their chances are well known.

The most use of the term "risk" is basically based on the variance-based view (Miller, 1992). Within the classic decision theory, the typical feature of risk is "The difference with in the allocation of achievable results, their probabilities and their subjective values" March and Shapira (1987). A unique bad performance will result from big variations and the degree of risk increase accordingly. An essential character of risk is an anticipated value understood by the concept of variance based theory (Yattes and Stones, 1992; Shapira 1995) ; it is the deviation from the anticipated value in this sense , risk is basically failure to achieve the anticipated target (Ellis, 2010).

Evolving both elements in to the concept of supply chain risk we define supply chain risk as" the potential variation from the anticipated value of a certain supply chain performance measure (Based on Wagner and Bond, 2008; Kumar; 2010).

#### 2.1.2. Classification of Supply Chain Risks

There are two types of supply chain risks in general, these are disruption risk and operational risk (Kleindorfer and Saad, 2005Tang 2006; Knemeyer 2009, Wakolbinger and Cruz. 2011). According to (Bhattachary, 2010; Lockamiy and Mecormack,2010) operational risk is concerning on the cooperation

between supply and demand this type of risk comes about from insufficient or failed process, people and systems. We can state quality or delivery problems as an example of operational risk. According to a global study by Accenture in 2006, managers report that the great noticeable and difficult risks to their supply chains are still those controllable risks which are linked with the performances of their supply chain partners (Byrne, 2007). Hence, this study centers on operational risk in supply chain contexts.

#### ***2.1.2.1 Disruption Risk***

Disruptions are uncontrollable occasions that have low tendency to happen but capable to cause extreme harms (Chapra and Sodhi, 2004). The source of disruption includes fire accidents, earthquake, block outs, theft and damage surges, and labor disputes (Chopra and Sodhi, 2004; kn Emeryer, 2009). When supply chains look disruptions, the normal development of materials and products will be disturbed influencing each part of the supply chain consequently (Hendricks and Singhal, 2003; kleindorfer and Saad, 2005). The result from supply chain disruption includes delays, reduced customers satisfaction, increased stock and financial related loss (Riddalls, 2002; stauffer, 2003). Besides, Hendricks and Singhal (2008) highlights that disruptions within the supply chain could be a reason to lose firms reputation and reveals the company to huge operational and financial related risks (Stautfer, 2003; Gumbel, 2006; Martha and subbakrishha, 2002). Hence the need to consider external factors that cause supply chain disruptions is verifiable for firms in order to succeed with in the competitive market (Hensiz and Zelner, 2003). Disruption risk is less controllable where as operational risk moderately more controllable (Byrne, 2007).

#### ***2.1.2.2. Operational Risk***

Initially variation in supply chain are raised from three sides: upstream from supplier performance, downstream from customers demand and inside from the production processes of the focal firm discussed by (Davis, 1993; Germain, 2008). Accordingly the three types of supply chain operational risk can be named as supply risk, demand risk and process risk. Subsequently the efficiency of any process falls with increase in the inconstancy related with the flow is that variability related with quality, quantity or timing (Schmenner, 2004). In light of this theory, variance based supply chain risk (supply risk, demand risk or process risk ) will weaken supply chain performance.

## **Supply risk**

Supply risk is the existing deviations within the inbound supply in terms of time, quality and quantity which will result in uncompleted orders (Kumar 2010). (Zsidisein and Ellram, 2003) states production capacity limitations, need of quality control, congestion within the productions and machine breakdown are the numerous factors that can affect supplier performance. All those can hinder supply in terms of supply lead time, quantity and quality.

However, the costs incurred by many suppliers allow companies to rely on one (Single Sourcing) or two (Double Sourcing) suppliers that only increase the supply risk (Tang & Tomlin), 2008).

Supply-related risks can also increase in the foreign market due to the globalization of the supply chain, which makes the supply chain more complex by allowing more members and reducing the response to changes that favor disruption of supply and create uncertainty (Halik, 2005; wagner and bode, 2006).

## **Demand risk**

Demand risk is the result of risks due to unanticipated character of consumer demand with in the markets (Tang and Temlin, 2008). Companies promotion their market plays a vital role to decrease the variation that comes from the consumers (the choice makers coordinate, 2011). Establishing production in a new place for a company may be one of the competitive advantages to minimize the demand risk in the supply chain (Liu and Nagurney, 2011). According to the financial analyst's report (2009), 500 worldwide executives listed the risk of demand as a top risk factor that needs to be taken in to account when relocating.

When we are dealing demand risks; firms will run loss in two ways, one if their demand estimate is higher than the actual customer demand in this case the firm will come across with over stocked products, and the other is if their demand estimate is lower than the actual customer demand in this case it is against cost to the firm in terms of lost sales. Thus demand management procedure is an appropriate tool for firms in order to handle the risk associated with demand. This tool may clarify the major source of demand risk as demand instability (Tang and Tamlin, 2008).

Demand is always questionable (Black Hurst and Wu, 2009). In a competitive business manufacturing, firms are always affected by unanticipated characteristics of demand (Cf. Wilding, 1998). If there is uncertainty, there will be an inherent risk that influences the decisions of companies. Van Der Vorst and

Beulens (2002) clarify the uncertainty with questions such as what the current consumer demand will be? Is the supplier supplying the goods? Is the supplier supplying the specified quality? Decisions made by these vulnerabilities affect the performance of companies. “The more uncertainty is associated with a process, the more waste is in the process. Companies consider the presence of uncertainty in demand and create strategies to reduce waste and make better decisions to improve their performance (Mason-Johnes and Towill, 1998).

### **Process risk**

According to (Kumar; 2010) process risk is the existing deviations from the required quality and quantity at the required time frame in the manufacturing firms. All manufacturing firms are not absolutely perfect, variation exists everywhere at any time (Melnik; 1992). Accordingly (Hopp and Spearman; 2000) has summarized two basic types of variability in a manufacturing system. The first one is process variability basically caused by different default such as machine down time, setups or operator unavailability. The other type of variability is resulted by the mechanism the activity is discharged to the system and the mechanism of the activities between situations or the layout of the manufacturing firm which we call it flow variability. These factors can lead to inconsistency in output time and product quality, which makes the production process performance unstable and poses a risk to the process.

The productivity and effectiveness of a production system in a firm is mainly corrupted by inconsistent output time, output rate and the quality of the product. Any activity or scrap which is out of specification will decrease highly the profitability of the firms as it needs extra resources (Hopp and Spearman, 2000). Most of the time for their deliverables this will heighten dissatisfaction, and at last harms the efficiency of the whole supply chain. In short , the process risk undermines the producer’s ability to meet customer orders efficiently and ultimately damage the supply chain performance.

#### **2.1.3. Supply Chain Performance Measurement Criteria**

A well-designed performance measurement system (PMS) should help chain managers to know and improve supply chain operations performance (Chan, Chan and Qi; 2006). PMS examines the existing supply chain literature and reveals a set of criteria or standards that serve as rules in the design of PMS. Limiting this to PMS for Takle and Gabrielsen supply chains (2006) suggests a set of criteria and standards for measuring supply chain performance systems. The list below can be seen in Takle and Gabrielsen (2006) as criteria and standards.

**Holistic approach:-** according to (Chan and Qi, 2003) organization should stretched the performance measuring tool more distant from their boundary within the supply chain. Accordingly their performance must be evaluated to a greater degree of the organization in order to determine the supply chain channel along the global optimization more confident.

**Process based:-** the successful management of the supply chain requires a change from managing individual functions to coordinating activities in key supply chain business processes (Lambert and Cooper, 2000). The measurement of supply chains should reflect this change and focus on supply chains instead of functions.

**Aligned with strategy:-** the performance measurement system must pass along with the overall technique of the supply chain. For example if the overall supply chain objective is short delivery time, logistic methodologies that emphasize low cost can be in conflict (Coyle, 2003, Keebler et al. 1999).

**A dynamic system:-** a key model for the performance measurement system is the need for a dynamic system (Foldan and Broune 2005). The supply chain could be a dynamic system that progress over time, and the performance measurement system must be able to change over time to consolidate the changes in the supply chain and remain relevant in a sustainable way (Kennerly and Neely, 2003).

**Balanced approach:-** the reason for this is to distribute performance measurement on a set of parameters that the majority of the business / supply chain performance measurement systems should adjust financial and non-financial measures (Gunasekaran, 2004, Chan and Qi 2003, Lambert and Pohlen, 2001). Financial measures are critical for strategic decisions and external reporting, in which manufacturing and distribution operations are managed daily as non-financial measures (Gunasekaran et al., 2001).

**A managerial tool:-** it is assumed that the performance measurement system is an administrative tool and that the system must be able to organize the development from “measurement” to “management” (Basu, 2001). The performance measuring system should therefore be straightforward to understand and provide timely and accurate information.

**Cover strategic, tactical and operational level: -** the system of performance measurement should survey and provide important information at the appropriate management level. Strategic level measurements have an impact on management decisions at the top level; strategic level addresses

resource allocation and operational level measurement and evaluates the results of low-level management decisions (Gunasekaran, 2004).

**Provide a forward looking (Leading) perspective:** - the system of performance measurement should capture trends instead of snapshot of the business (Busi, 2005).

**Tool for improvement:-** the system of performance measurement should focus on advancement. Modern strategies and ideas, such as TPM (Total Productive Measurement) and TPS, emphasize persistent changes that are expected to increase performance over time (Coyle et al; Kennerly and Neely, 2003, Basu, 2001).

**Provide drill-down functionality:-** the system of performance measurement should enable managers to identify specific areas for improvement (Lapide, 2000).

**Handling conflicting objective:-** the performance measurement system should evaluate the various tradeoffs within the supply chain and view the results in order to avoid sub optimization (Lambert and Pohlen 2001).

**Simple:-** the performance measurement system should be easy to understand at all organizational levels and should include a limited number of important measures (33-37) (Busi, 2005, lapide, 2000, Neely, 1997).

**Comparability:** the system of performance measurement should enable the supply chain to benchmark its performance against a set of standards (Gunasekaran, 2004; Cayle, 2003).

**Relevant metrics:-** the performance measurement system should only use relevant measurements that make it possible to make appropriate decisions (Coule, 2003).

#### **2.1.4. Supply Chain Risk Management**

According to (Nieger, 2008) the degree of complexity of the process in a firm determines the degree of the vulnerability of a supply chain. Firms now understood and focused on their core competence in order to reduce the complexity and vulnerability of a supply chain by outsourcing on those activities which are not core for them. At present, the best managers in 1000 companies worldwide regard supply chain disruptions and their related operational and financial risks as their main concern (Craighead, 2007). Disaster response cannot be compared with the risk management in the supply chain. At present, the best

managers in 1000 companies worldwide regard supply chain disruptions and their related operational and financial risks as their main concern (Craighead, 2007). Disaster response cannot be compared with the risk management in the supply chain. SCRM is still more or less a new research area and subject-related studies are rare (Ojala and Hallikas, 2006; Juyyner, 2005). In addition, it should be noted that risks can not be completely eliminated from supply chains, but strategies can be developed to deal with these risks if the dynamics between risk factors in a supply chain are understood (Faisal et al; 2006).

It is important for supply chain supervisors to recognize that they are changing the risk profile for that organization and for others in the network to minimize known risks (Peck, 2005). In this way, the risk mitigation in the supply chain needs to be extended from the company's own sites to suppliers. There is a need to work together to identify risks, evaluate, manage and plan business progress, as well as to formally evaluate how suppliers deal with these issues and to place criteria in contracts (Normann and Jansson, 2004). Risk management capabilities, the fullness of risk signal, the development of risk management plan and the improvement of the visibility of end-to-end information are fundamental requirements for the success of supply chain management (Giuniero and Percy, 2000; Christopher and Lee, 2004). While returning to single procurement decisions and changing approaches to inventory management will probably help to maintain continuity during future crises, experts have clearly illustrated and logistics managers have openly allowed companies to considerably improve their disaster management planning for risk management in supply chains (Sound and Moberg, 2003).

### **2.1.5. Supply Chain Risk Management Process**

According to Jorian (2001) the success of organizations based upon the risk management operations and an appropriate understanding of the impact of the company on different types of risk. Lam (2001) further argues that management reduces gaining volatility, maximizes value for shareholders and improves the work and financial security within the firm. It can therefore be seen that organizations are valuable in establishing risk management practices that mitigate the various risks faced by the organization. The formal risk management practices specifically involve the following steps:

#### **2.1.5.1. Risk Identification**

Simmons (2000) appreciate that the definition of the business objectives may be a very important initial step towards mitigation risk since in an organization doesn't know where to go it is difficult to identify what risks may likely to happen. Actually, an unclear business goal could be a strategic risk and should be helped at this stage. By examining the strategy and plans, interviews and management session on

targets and objectives. For clarity, the business objectives are analyzed. Further as noted by Kersnar (2009) the risk identification process should try to identify as much as possible to expel ambiguity, conflict disagreements and other unclearness as possible.

It has been found that line supervisors and risk specialists use past experience, analysis and process analysis as tools to identify risk facing the organization. However, sophisticated tools to identify available risks, such as scenario analysis and strengths, weaknesses and threats (SWOT) analysis, are not often used in companies where the risk is identified.

Based on the target areas, each reporting division, or entity should provide feedback about the risks of failing to achieve the targets. The target and risks will be linked to performance measures at the stage of the design of the area report (Simmons, 2000).

#### ***2.1.5.2. Risk Analysis and Treatment of Risks***

After an organization has distinguished its problems, the next step within the risk management practice is for the organization, to analyze organization risk vulnerability. According to Lam (2003), in order to come out with effective analysis for the strategic risks; this step includes mainly a conceptualizing session and will involve the institutional qualities shortcomings, opportunities and threats. In an effort to assess the impact of the strategic risks for an organization, an effort will be made to assess the impact of the risks on resource values and financial performance analysis of the potential benefits of different risk mitigation efforts and the need for risk transfer and financing arrangements (Berinato, 2006).

Both risks and characteristics should be identified from the widest possible range problems, including at least strategy, operations, culture, and systems competence and branding. Although unattainable, the problems should be exhausted. In addition to effectively managing the various exposures an organization may face, an organization should set up corporate accounting systems to distinguish and measure the associated exposures and internal control processes used to verify whether exposures are kept within limits and whether the system remains in line (Shimell, 2002).

According to Deloach (2002), the next step is to establish risk procedure for both the company and for the business unit. This process is carried out before mitigating risks arising from internal controls or other risk mitigation strategies, such as insurance, risk prevention or risk mitigation. What inspections would be required if they were not in place.

Based on the risk management, the RM performance group can work with each reporting department level to link the organization strategy to the objectives and residual risks of this area in order to develop performance measures to be developed for the risk division. This will allow the organization to monitor progress towards the success of the company's objectives and to high light areas where improvements or problems need to be tackled.

#### ***2.1.5.3. Risk Evaluation and Control***

Gupta (2009) notes that the formal strategy similar the risk management process by including a vital control element where by corporate management is assumed to monitor performance results against intended objective to ensure that corporate activities remain on track and correspond to the set course is that some diversion from the beaten track also hold the key for producing innovation ideas and adaptive responses to changing surrounding conditions. While evaluating and controlling the distinguished risks in supply chain the result should match with the tolerance of the organization objectives to attain (Shimell, 2002).

Corporate decision on the tolerability of these exposures in view of the prevailing organizational responses should be assessed and agreed by the strategy group and ways of overcoming the same risks should be developed. While performing projects it is necessary to balance the planning in versatile arrangements in order to evaluate the associated risks in project management. Once the exposures to risks are distinguished, the vulnerability of their exposure to the various risks can be analyzed so that the possible financial impacts can be determined (Berinato, 2006).

At this stage the implementation group must review company methodology with each business unit in order to determine how the results of the unit lead to the achievement of the company objectives. Performance measures should be improved on the basis of the strategy in order to compare actual results with the strategies. Since performance measurements influence behavior, they should be understood effectively by all employees, achievable, limited in number and lead to the right behavior.

Having a risk management plan and implementing isn't satisfactory for ensuring that the plan is followed or that the company is controlling its risks. A feedback loop to ensure that the report are returned to the RM division, management at the top level and the board is essential for organizational and strategic achievement.

The risk management department should normally investigate internal and external incidents that could lead to the modification of the overall strategic plan. Each unit should evaluate how these changes would affect its objectives and risks.

### **2.1.6. Supply Chain Risk Mitigation Strategies**

There are risks in everywhere at every time; in order to mitigate risks properly risk management system plays an important role which risk can be addressed, and how to address them (Shi, 2004). Elkins; 2005 suggested 18 best practices to mitigate supply chain risks. But organizations should prioritize which best practice is applicable to achieve the risk management capabilities for them. Meanwhile organizations take in to consideration the activities with minimum level of investment and could create prompt benefits. There should be a strategy that identifies the short term activities that can be implemented with a minimum investment and build up a road map for the deployment of intelligent business frameworks and advanced supply chain systems for intensive project team resources. SAM system (Kleindorfer and Soad, 2005) illustrates three basic tasks have to be practices in order to mitigate supply chain risk management persistently and concurrently.

#### **2.1.6.1. Mitigation Strategies for Supply Risks**

##### **Sourcing strategy**

Companies must define a procurement strategy that is consistent with their internal approach and quality strategies in order to moderate risks and remain competitive on the market (Treleven and Schweikhart, 1998). Single and multiple sourcing strategies are the two types of sourcing strategies having their own advantages and disadvantages (Chopra and Sodh; 2011). In order to be safe from increased risks arising from single source dependence (Passage et al; 2011), multiple sourcing strategies are selected. In addition to multiple sourcing strategies, the risk associated with quality of supply was minimized (Costantino 2010; Trelven & Schweikhart, 1988). Furthermore, a single sourcing strategy is also helpful in reducing supply risks due to commitment and cost of supply (Deming, 1982; Robert, 1983; Treleven and Schweik Hart, 1988). Hahn, (1986) argues that a combination of single and multiple sourcing strategies could be the best strategy. This thesis is consistent with Hahn, (1986) that a mixed strategy of single sourcing and multiple sourcing is practical for companies to optimize benefits and reduce risks.

## **Dealing with certified suppliers**

A supplier who fulfills technical specification such as quality, cost and delivery shall be granted or certified by the name of the supplier (Cox and Blackstone, 1998). The certification process provides customers with the necessary information on the actual performance of the supplier where these customers can better know their suppliers (Zsidisin and Ellram, 2003).

Companies take part in supply risks with their suppliers through their procurement activities (Zsidisin; 2003). According to a Murph (1992) study, 50 percent of the cost failure to deliver the standard is due to problems with certified suppliers. Larson and Kulchitsky (1998) noted the importance of dealing with certified suppliers to obtain good quality products and a lower price for buyers in order to minimize the risks through their inbound supply. Carter and Narasimhan (2006) and Lockhart & Ettkin (1993) also imply that determining how well a supplier is capable of checking whether the supplier meets the criteria such as quality, cost and deliverability that are highly demanded by the buyers.

## **Flexible Supply Strategy**

Tang & Tomlin (2008) stresses the need to develop a flexible supply strategy to reduce supply related risk. Companies can mitigate supply risks, example through the development of a flexible supply strategy. It is clear that when a company builds multiple suppliers, orders are transferred to many suppliers whereby the risk of supply cost is reduced (Tang & Tomli; 2008). In addition companies can mitigate supply risks linked to commitment by designing a flexible supply strategy. Flexible supply contracts such as quantity flexible contracts on obligations to be fulfilled bind customer-supplier commitments to achieve a shared objective (Gottardi; 2010).

## **Inventory Management**

Inventory is sometimes used as a buffer to mitigate demand and supply related risks in the supply chain (Lee and Billington) 1993; Zsidisin & Ellram, 2003). The inventories can be placed in the supply chain at any point in order to achieve different goals. Zsidisin & Ellram (2003), for example, notes that inventories on the supplier side help to mitigate supply-related risks, while inventories on the manufacturer side can also be used to resolve demand uncertainties however the cost of holding inventories is associated to various issues, including capital tied up, obsolescence and a marked price down (Lee & Billington, 1993; Cachon, 2004). Companies must therefore determine the amount of

safety stock at any time in the store in order to reduce costs, improve efficiency and mitigate the risks associated with handling stocks (Newman, 1993; Willems & Graves, 1998).

#### ***2.1.6.2. Mitigation Strategies for Demand Risks***

The common approach used by companies to mitigate the risk of demand is flexible (Lee, 2004; Lui & Nagurney, 2011). Flexibility is a broad concept that includes product, process, manufacturing and market flexibility (Sethi & Sethi, 1990). Tang and Tomlin (2008) reveal two flexibility strategies (product flexibility and pricing flexibility) that can be used to mitigate demand risks. In addition to Zsidisin & Ellram (2003) it suggests the significance of inventories to reduce the risks associated with uncertainty in demand should be detected.

#### **Developing a Flexible Product**

Tang and Tomlin (2008) are supported, the risk of demand can be mitigated by developing a flexible product to allow product differentiation. Product flexibility is explained by the ability to easily add or replace components to make the product unique (Yi et al., 2011; Sethi and Sethi, 1990). By developing a flexible product, a product can be distinguished so that the effect of demand risks can be mitigated by delaying the point of product differentiation until the actual demand is known.

#### **Pricing Flexibility**

Flexibility pricing is another strategy that can be used to mitigate the risk of demand (Tang & Tomlin, 2008; Tang & Tomlin, 2009). By allowing a flexible market pricing, companies can initiate their customers' tastes. The implementation of a flexible pricing strategy by Gregson (2008) and Tang Tomlin (2008) affects customer demand. The illustration by Tang and Tomlin (2009) on the dell computer case also shows how Dell mitigates the risk of demand by implementing a flexible strategy. It is indicated that when certain components from Taiwan were disrupted due to an earth quake, the price of a certain product was reduced in order to shift the customers accordingly (Tang and Tomlin 2008). By having studied market behavior and customer needs, Dell was able to mitigate demand risks through a flexible price strategy.

#### **Inventory Management**

The increased product diversity and the short product life span contributed to increased demand risk (Blackhurst & Wu, 2009). When the actual demand in the market exceeds the expected; companies fail

to meet their customers' alarming needs. In such cases, inventories have a fundamental importance in mitigating market demand higher than forecast demand, inventories can be used to meet service standards and improve the service level of companies (Kopczak & Lee, 1993).

#### ***2.1.6.3. Mitigation Strategies for Process Risks***

Flexibility in manufacturing process is stated as “the ability to realign manufacturing resources to that different product of acceptable quality can be produced efficiently” (Sethi & Sethi, 1990). Flexibility is one way of mitigating process risks in line with the reduction of supply and demand risks (Tang & Tomlin, 2008; Sethi & Sethi, 1990). Flexibility in the context of a manufacturing process is explained as “being able to reconfigure manufacturing resources so as to produce efficiently different products of acceptable quality” (Sethi & Sethi, 1990). (Tang & Tomlin, 2008; Sethi & Sethi, 1990). Tang and Tomlin (2008). In alignment to mitigate supply and demand risks, flexibility is implied as one way to mitigate process risks (Tang & Tomlin, 2008; Sethi & Sethi, 1990). Tang and Tomlin (2008) suggest manufacturing flexibility as one strategy to reduce the effect of process risks which will be described below.

#### **Flexibility in manufacturing process**

Flexibility manufacturing process enhances efficiency and effectiveness of firms (Stalk & Hout, 1990; Tang & Tomlin, 2008). By flexible manufacturing process, firms will be enabled to produce multiple variant products where by meeting customer needs on time, with better quality and with the required capacity (Tang & Tomlin, 2008). By flexible manufacturing process, firms will be enabled to produce multiple variant products where by meeting customer needs on time, with better quality and with the required capacity (Tang & Tomlin, 2008). In addition, Stalk and Hout (1990) claims that market is more flexible and responsive. The adoption of a flexible production process thus reduces the process risks associated with capacity, quality and time (Tang & Tomlin, 2008).

According to Tang & Tomlin (2008), the interests of companies must be understood how much flexibility is needed to mitigate these risks and to keep the costs of the company as low as possible. Tang (2006) also mentioned that the majority of the possible benefits to mitigate the risks of the supply chain can be acquired if flexibility is maintained.

## 2.2. Empirical Review

Papadakis (2006) empirically investigates the vulnerability of supply chains by analyzing and comparing make-to-order (MTO) and make-to-forecast (MTF) models facing supply disruptions. The result of this study showed that features of the supply chain such as resilience on specific customers, the degree of single sourcing and global sourcing dependence are all relevant to a company's exposure.

Kern (2012) studied on SCRM and supply disruption, interesting on the process dimensions of upstream SCRM and shows that competent SCRM (including risk identification, evaluation and mitigation) brings to higher performance in companies. The outcome of this study indicates that the strategy of supply chain risk mitigation has a direct positive and significant impact on operational performance.

In a detailed empirical study, Hendricks and Singhal (2003) investigate that the disruptions of the supply chain can lead to a company's long-term negative financial performance, especially in terms of shareholder wealth and stock returns compared to industry benchmarks. From this study we can articulate disruption of supply chain affects the performance of the company for long period of time.

Wagner and Bode (2008) conducted a study on the relationship between supply chain risks and supply chain performance. The results they obtained significantly clarify the relationship between risks and organizational performance. In addition, supply side risks and demand side risks only negatively influence organizational performance, which they measure internal of order fill capacity, delivery dependability, customer's satisfaction and delivery speed. The result from this study indicated supply side risks and demand side risks negatively affects organizational performance.

Chen, J., Shoal, A.S. and Prajogo, D.I. (2013) also made a study on the relationship between supply chain operational risk and operational performance of firms, their study provides evidence that supply chain operational risk weakens supply chain performance. On the other hand, as shown in their study, there is a very strong relationship between supply risk and process risks.

Compared with supply risk which has no direct effect on supply chain performance, the findings show that demand risk has a direct negative effect on operational performance. This may suggest that firms find it more difficult to cope with demand variations than supply variations, which makes the negative effect from demand side more visible. There are two believable explanations here. First, operational performance is concerned with finished products, while supply risk is concerned with raw materials or components. The problem with supplied materials does not directly affect the end product since it can be

corrected with in the production system. Second, in confutation with the inventory issue, the direct effect of demand risk on performance could suggest that firms sense more reluctant to keep inventory of finished products to counter demand fluctuations compared to keeping stock of raw materials to coveter supply risk. Thus the relative effect gives new insights into how supply chain operational risk weakens supply chain performance.

Kihyun (2011) provided a theoretical framework for resilient supply chain framework and empirical validation of supply chain risk as well as processes used to mange supply chain risks effectively. The study clarified and defined what it means to develop and maintain supply chain resilience and the type of firm-level that characterize supply chain processed as move secure and resilient. The study examined the following factors; antecedents that lead a focal firm to adopt and implement resilient supply chain practices that in turn, allow supply chain processes to be more resilient; flexible resilient supply chain practices (Contingency planning, information sharing, collaboration, postponement, and security compliance) and redundant resilient supply chain practices (safety stock and slack capacity); and resilient supply chain capabilities that show readiness, response and recovery capability. The result of this study depicted that flexible strategies have a positive effect on operational performance.

Christopher and Lee (2004) suggested that one key element in any strategy designed to mitigate supply chain risk is improved “end-to-end” visibility. The study argued that supply chain “Confidence” will increase in proportionate the quality of supply chain information. To restore supply chain elements of supply chain confidence: visibility and control. Total end-to-end visibility will enable supply chains to be transparent, and the right information would be attainable to the right member of the supply chain at the right time. Enabling adequate control levers to be accessible to the partners will also allow prompt action to be taken when information discloses such needs. The result from this study indicates supply chain collaboration strategies have a direct positive and significant impact on operational performance of an organization.

### **2.3. Literature Gap**

From literature, it is evident that limited studies have been carried out in the area of supply chain risk management especially in alcohol industry in Ethiopia. Even the empirical studies in developed countries have tended to favor other business organizations (Waters, 2007). The concentration of this study has been on supply chain operational risks; and tried to give justifications for the below key dimensions:

- The effect of fleet management on the operational performance of supply chain.
- The effect of improper plant layout in production process meanwhile affects smooth flow of fleets and staffs.
- To what extent the customer has been committed to the products.
- To what extent the consistency of product supply align with customers demand.
- How well the firm has been organized to cross-functional unification and simplification of the production process.

## 2.4. Conceptual framework

Supply chain integration (SCI) helps firms to reconfigure their resources and capabilities internally and externally to consolidate their supply chain as a whole in an effort to improve long-term performance (Horvath, 2001)

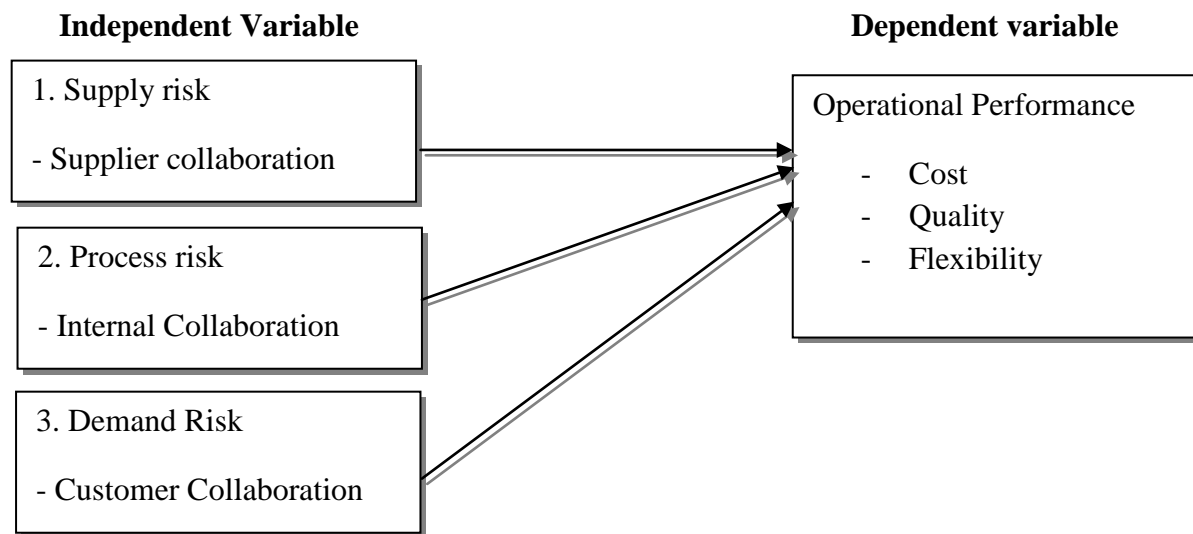


Figure 1 – conceptual model for supply chain integration (adopted from Hussien, 2014)

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1. Research Design**

According to (Burns & Grove 2001) increasing the opportunities of obtaining information that could be correlated with the real situation helps the researcher to plan and implement the study in a way that will help to obtain the intended results. The research conducted on the selected area of the firm in Addis Ababa Ethiopia. The data used in the study was quantitative which was collected from primary sources; the study used Cross-Sectional field survey method to assess the effect of supply chain risks on operational performance of an organization. In cross functional field survey, dependent and independent variables was measured at the same point by using questionnaire. The sample for this study was selected from the target population by using probability sampling technique.

The study adopted an explanatory survey design to investigate the effect of supply chain risk management practices in organizational performance. The research design is deem appropriate for this study since it enabled the study to describe the situation and its usefulness in identifying relationship between variables (Aldridge and Levine, 2001; Bourque and Fielder 1995; Sampling guide; Statistical Good Practice Guide; Fowler, 2001).

### **3.2. Research Approach**

The study adopted empirical investigation with explanatory research design since the major focus of the research is examining the effect of supply chain risks on operational performance of Awash Winery Share Company.

The research was carried out progressively undergoing a different set of activities. At first an initial plan was setting research objectives. Then after, a set of research questions was designed that was needed to be addressed in order to achieve the purpose of the research.

The research utilized an intensive amount of literatures to answer the research questions. The literatures were mainly focused on supply chain risk management while making literature review, different search engines such as Google scholar, science direct, journal storage Google books were used. After reviewing different literatures on supply chain risks a conceptual frame work has been developed to determine independent and dependent variables. Further literature review was then be used in the category of supply chain risks to go through mitigation strategy for supply risks, mitigation strategy for process risks

and mitigation strategy for demand risks. This was enabled to design the theoretical background of the research.

After the theoretical frame work this thesis valued the next step was design an interview questionnaire to collect primary data. The interview questionnaire was designed based on list of supply chain risks and the associated risk mitigation strategies extracted from different literatures. After the data was collected, the next step was analyzing the data to answer the research questions.

### **3.3. Sampling and Sampling Techniques**

Sample size was determined by Carvalho (1984) method, this method was preferred to determine a sample size by the researchers.

According to Hair, (2010), target population is said to be a specified group of people or object for which questions can be asked or observed made to develop required data structure and information. This implies that the target population of the study was depend on those respondents of the company who can easily understand the questionnaire from both the company and customers perspective, in order to get efficient and effective information.

The sampling techniques for this research were used probability sampling particularly stratified sampling technique; samples were collected from each department according to the proportion to the total population. And it was important to collect data from those who have knowledge and awareness about supply chain management practices in order for competitive advantage and operational performance of the company.

Table 3.1: Carvalho’s Sample Size Determination

Population Size	Small	Medium	Large
51-90	5	13	20
91-150	8	20	32
151-280	13	32	50
281-500	20	50	80
501-1,200	32	80	125
1,201-3,200	50	125	200
3,201-10,000	80	200	315
10,001-35,000	125	315	500
35,001-150,000	200	500	800

Source: Carvalho (1984)

Table 3.2 Sample size determination of the study

Strata(Department)	Total population of each stratum	Target population of each stratum	Sample size of each stratum
Commercial	52	35	7
Production and technical	325	230	46
Procurement and logistics	110	80	16
Finance and administration	150	105	21
<b>Total</b>	<b>637</b>	<b>450</b>	<b>90</b>

### 3.4. Data Type and Source

The required data for the study was collected using both primary and secondary data collection methods.

Primary data:-was collected from the selected sample of respondents. According to Biggan (2008) primary data is the information that the researcher finds out by him/her self reporting a specific topic. It implies that the information resulting from it is more consistent with the research questions and objectives.

Secondary data:-the source of secondary data for this research was annual report and journals as stepping board for the research.

### **3.5. Data Gathering Technique and Instruments**

By using survey questionnaire, the researcher distributed the questionnaire to all the selected sample respondents. As a measuring tool the researcher utilized quantitative methodology for the purpose of this study. In order to assess the research question quantifiable the researcher used the Likert-type scale method using a range of responses: - strongly Disagree, Disagree, Neutral, Agree and Strongly Agree with a numeric value of 1-5 respectively.

### **3.6. Data Analysis**

As this study is quantitative in nature, inferential statistical technique was employed to analyze the information and the data was analyzed using SPSS. The statistical tools were associated with the objectives of the research. Informational statistics particularly the parson's correlation was used to show the effect and the strength/ degree as well as the way of associations between variables. In addition regression analysis was used to show the effect of independent on dependent variables.

### **3.7. Reliability and Validity Test**

#### **Reliability**

Golofshani (2003) defines reliability as the level to which results of a study are consistent over time and there is a fact based image of the total population under study. According to Toke, (2012), the purpose of reliability analysis is to find the extent to which a measurement procedure yields the same result if the process is repeated over and over again under the same conditions. The most common technique used in the literature to assess the Scale's reliability and stability is use of Chronbach Alpha statistics. Chronbach Alpha should be over 0.7 to bring out a reliable scale and any scale with Chronbach Alpha less than this standard should be removed Sekaran (2005).

To insure the measurement and assessment of the real situation in the company the researcher made all necessary efforts on the questionnaires structurally as well as content wise.

Table 3.2 Reliability of constructs

<b>Variables</b>	<b>Reliability</b>
<b>Operational risks</b>	
Supply risk	.768
Process risk	.867
Demand Risk	.776
<b>Operational Performance</b>	
Cost	.700
Quality	.702
Flexibility	.707

### **Validity**

According to Mugenda and Mugenda (1999), Validity of research tool has three components: the first is construct validity which deals with the consistency of the questions with the responses intended by the researcher. This validity assured by structuring the questionnaire according the specific objectives. The second form of validity is content validity, i.e. the ability of an instrument to gather the data needed for the analytical techniques will be proposed (Peil, 1996). This was confident using close ended questions to avoid irrelevant answers. To insure internal validity of the questionnaire the researcher gave the draft questionnaire to the supervisors for review and recommendations which was make part of the final questionnaire. Construct validity was assured by rearranging the questions according to the observation of the respondents in order to keep the flow of questions.

### **3.8. Ethical Consideration**

A formal letter was written from Addis Ababa University School of Commerce, Department of Logistics and Supply Chain Management to the case company. The data collection was started only after getting acceptance from the case company as mentioned above. In addition to this, name of the respondents (selected for the sample) was not included to keep confidentiality.

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND DISCUSSION

#### 4.1. Introduction

As discussed in previous chapter this study attempted to examine the effect of supply chain risks on the performance of Awash Winery Share Company, the findings of the study presented and discussed in this chapter. The questionnaire were developed in five Likert scales ranging from five to one; where 5 represents strongly Agree, 4 Agree, 3 Neutral, 2 Disagree and 1 Strongly Disagree. In order to assess the relationship between supply chain risks and operational performance, correlation and regression analysis were conducted for scale typed questionnaire. A total of 90 questionnaires were distributed to employs and 84 of the questionnaire were obtained valid and used for analysis. The collected data were presented and analyzed using SPSS (Version 20) statistical software.

The study used correlation analysis, specifically Pearson Correlation to measure the degree of association between different variables under consideration. Regression analysis was also used to test the effect of independent variable on dependent variable.

#### 4.2 Response Rate

A total of 90 questionnaires were distributed to employees and 84(93%) questionnaires were obtained. The remaining 6(7%) were not collected due to unwillingness to provide information and some respondents were in absence of leave. Based on these, the response rate is 93%.

Table 4.1: Response Rate

Name of plant	No. of questionnaires distributed	No. of questionnaires collected	No. of questionnaires uncollected
Lideta Plant	55	51	4
Mekanisa Plant	35	33	2
Total	90	84	6

### 4.3 Respondent Profile

Table 4.2: Gender

<b>Gender</b>				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid F	27	32.1	32.1	32.1
M	57	67.9	67.9	100.0
Total	84	100.0	100.0	

Source: (SPSS Output, 2019)

From the above table 4.2 respondent profile data characteristics is gender. The gender distribution of respondents of Awash Winery Share Company covers 67.9% male while 32.1% of the respondents cover female. This shows the gender distribution of sample is dominated by male.

Table 4.3: Educational Qualification

<b>Educational Qualification</b>				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Grade 10 and Below	23	27.4	27.4	27.4
Diploma	24	28.6	28.6	56.0
BSc/BA	27	32.1	32.1	88.1
MSc	10	11.9	11.9	100.0
Total	84	100.0	100.0	

Source: (SPSS Output, 2019)

Table 4.3 shows respondents were also asked their educational qualification. 11.9% of the respondents were at the level of second degree, 32.1% of the respondents were at the level of second degree, 28.6% were diploma and the remaining 27.4% of the respondents were below grade 10. This shows the sample comprises the whole representative of employee.

Table 4.4: Department

<b>Department in charge</b>				
	Frequency	Percent	Valid Percent	Cumulative Percent
Commercial or Marketing Department	6	7.1	7.1	7.1
Finance and Administration Department	21	25.0	25.0	32.1
Valid Procurement and Logistic Department	15	17.9	17.9	50.0
Production and Technical Department	42	50.0	50.0	100.0
Total	84	100.0	100.0	

Source: (SPSS Output, 2019)

The above table 4.4 was working department of respondents (Commercial, Finance and Administration, Procurement and Logistics and Production and Technical), regarding to this 7.1% were commercial while 25% were finance and administration, 17.9% were procurement and logistics and 50% were from production and technical. This implies that all respondents are directly or indirectly involved in the operation of supply chain performance of the firm therefore their information can be considered as reliable and relevant for the study.

Table 4.5: Years Stayed at the Organization

<b>Years Stayed at the Organization</b>				
	Frequency	Percent	Valid Percent	Cumulative Percent
1-3 Years	4	4.8	4.8	4.8
4-6 Years	6	7.1	7.1	11.9
Valid 7-9 Years	22	26.2	26.2	38.1
Over 10 Years	52	61.9	61.9	100.0
Total	84	100.0	100.0	

Source: (SPSS Output, 2019)

The last item on table 4.5 was work experience of the respondent in the company, in this regard 4.8% of them have 1-3 years experience while 7.1% of them have 4-6 years experience again 26.2% of the respondent have 7-9 years experience and the remaining 61.9% of them have over 10 years experience. Most of the respondents of the company have over 10 years experience at this firm, this implies that the information was collected from those respondents who have experienced longer years in the company.

#### 4.4 Response on Supply Chain Risks and Operational Performance.

##### 4.4.1 Constructs of Supply Risks.

Table 4.6 Mean and Standard Deviation of Supply risks.

<b>Descriptive Statistics</b>			
	N	Mean	Std. Deviation
Your company products meet quality specification requirements on consistent basis	84	3.71	.939
Your company meet the required delivery lead time on a consistent basis	84	3.54	.828
Your company meet the required volume on a consistent basis	84	3.42	.698
Your company deliver orders as promised	84	3.89	.761
Your company supply products at minimum lot size for retailers	84	3.50	.685
The costs for your deliverable product reasonable and deserves the end customers	84	3.82	.794
Your company follow up scheme on your distributors on their performance to retailers as per the agreement made on	84	3.56	.869
Your company implement computerized system to major distributors	84	3.56	.869
Your company have a strategy to supply products at lower price cost for big sale volume	84	3.39	.792
How well your company utilize the fleets without outsourcing	84	3.54	.828
Valid N (list wise)	84		

Source: (SPSS Output, 2019)

The research questionnaire designed using 5 point likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 5-

Strongly Agree, 3-Neutral, 2-Disagree and 1-Strongly Disagree. Based on the response of the respondents. Mean computed on the above table 4.6 mean (M) score of 0-1.50 means that the respondents strongly disagree, between 1.5 to 2.50 means they disagree 2.50 to 3.50 means the respondents were neutral, 3.50 to 4.50 means they agree and a mean above 4.50 means the respondents strongly agreed. Based on the findings on Table 4.6, majority of the construct of supply risks scores greater than 3.50, when we seen the respondents from the perspective of descriptive statistics it indicated that the respondents agreed to the fact that supply risks are in their respective firms, which imply the effect of supply risk influence operational performance of an organization.

Table 4.7 Reliability Analysis of Supply Risks

**Reliability Statistics**

Cronbach's Alpha	N of Items
.768	10

Source: (SPSS Output, 2019)

#### 4.4.2 Constructs of Process Risks

Table 4.8 Mean and Standard Deviation of Process risks.

<b>Descriptive Statistics</b>			
	N	Mean	Std. Deviation
Your company face disruption due to equipment failure (equipment age and down time)	84	3.57	.882
Your company face disruption due to procurement failure	84	3.44	.700
Your company always deliver the required products as scheduled	84	3.42	.698
The production process have the capacity to fulfill customer orders	84	3.89	.761
The process has very low variance in product quality	84	3.50	.685
The process has very low variance in daily production out put	84	3.82	.794
The process has very low variance in production lead time	84	3.56	.869
Your company has flexible strategy process to mitigate risks	84	3.56	.869
Your company production machinery layout is properly set for smooth production flow	84	3.39	.792
Your company utilize planned maintenance manual for equipments and machinery	84	3.89	.761
Your company utilize planned maintenance manual for the fleets	84	3.50	.685
Your company compound is properly set for smooth flow of fleets and workers	84	3.82	.794
Valid N (list wise)	84		

Source: (SPSS Output, 2019)

The research questionnaire designed using 5 point likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 5-Strongly Agree, 3-Neutral, 2-Disagree and 1-Strongly Disagree. Based on the response of the respondents. Mean computed on the above table 4.8 mean (M) score of 0-1.50 means that the respondents strongly disagree, between 1.5 to 2.50 means they disagree 2.50 to 3.50 means the respondents were neutral, 3.50 to 4.50 means they agree and a mean above 4.50 means the respondents strongly agreed. Based on the findings on Table 4.8, majority of the construct of process risks scores greater than 3.50, when we seen the respondents from the perspective of descriptive statistics it indicated that the respondents agreed to the fact that demand risks are in their respective firms, which imply the effect of demand risk influence operational performance of an organization.

Table 4.9 Reliability Analysis of Process Risks

Reliability Statistics	
Cronbach's Alpha	N of Items
.867	12

Source: (SPSS Output, 2019)

#### 4.4.3 Constructs of Demand Risks.

Table 4.10 Mean and Standard Deviation of Demand risks.

Descriptive Statistics			
	N	Mean	Std. Deviation
Your customers place orders consistent with their forecast demand volume	84	3.57	.882
Your customers commit to their demand forecast	84	3.44	.700
Your customers provide your reliable forecast on their demand	84	3.65	.963
Your customers actual demands are consistent with your forecast	84	3.52	.702
Your customers place orders consistent with your nominated product specifications	84	3.87	.773
Your customer orders consistent with your nominated lead time	84	3.87	.773
Your customer feeling on the cost of your products	84	3.50	.829
Your customer feeling on the variety or flexibility of your products	84	3.49	.611
Your customer feeling for the product coverage in alignment of their needs	84	3.65	.963
Valid N (list wise)	84		

Source: (SPSS Output, 2019)

The research questionnaire designed using 5 point likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 5-Strongly Agree, 3-Neutral, 2-Disagree and 1-Strongly Disagree. Based on the response of the respondents. mean computed on the above table 4.10 mean (M) score of 0-1.50 means that the respondents strongly disagree, between 1.5 to 2.50 means they disagree 2.50 to 3.50 means the respondents were neutral, 3.50 to 4.50 means they agree and a mean above 4.50 means the respondents

strongly agreed. Based on the findings on Table 4.10, majority of the construct of process risks scores greater than 3.50, when we seen the respondents from the perspective of descriptive statistics it indicated that the respondents agreed to the fact that supply risks are in their respective firms, which imply the effect of demand risk influence operational performance of an organization.

Table 4.11 Reliability Analysis of Demand Risks

**Reliability Statistics**

Cronbach's Alpha	N of Items
.776	9

Source: (SPSS Output, 2019)

**4.4.4 Constructs of Operational Performance.**

Table 4.12 Mean and Standard Deviation of Operational Performance.

**Descriptive Statistics**

	N	Mean	Std. Deviation
Flexibility	84	3.0387	.53562
Quality	84	3.2530	.45999
Cost	84	3.2440	.51334
Valid N (list wise)	84		

Source: (SPSS Output, 2019)

The research questionnaire designed using 5 point likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 5-Strongly Agree, 3-Neutral, 2-Disagree and 1-Strongly Disagree. Based on the response of the respondents. mean computed on the above table 4.12 mean (M) score of 0-1.50 means that the respondents strongly disagree, between 1.5 to 2.50 means they disagree 2.50 to 3.50 means the respondents were neutral, 3.50 to 4.50 means they agree and a mean above 4.50 means the respondents strongly agreed. Based on the findings on Table 4.12, Majority of the Construct of operational performance scores an average of 3.00; this implies that the operational performance is neutral therefore it needs improvement.

Table 4.13 Reliability Analysis of Operational Performance

Reliability Statistics	
Cronbach's Alpha	N of Items
.794	3

Source: (SPSS Output, 2019)

## 4.5. Inferential Statistics for Supply Chain Risks and Operational Performance

### 4.5.1 Multi Collinearity Test

Table 4.15 Multi Collinearity test of independent variable

Coefficients <sup>a</sup>		
Model	Collinearity Statistics	
	Tolerance	VIF
1 Supply Risk	.241	4.143
Process Risk	.200	5.010
Demand Risk	.469	2.130

a. Dependent Variable: Operational performance

Source: (SPSS Output, 2019)

The result in table 4.15 show that there is multi-collinearity between independent variables has no series problem since the value of tolerance for all independent variable is greater than 0.1 and all VIF is less than 10 ( $VIF < 10$ ) (Pallant 2005). From the above the table we can conclude that there is no collinearity with in the data of the study.

### 4.5.2. Correlation Analysis

Correlations are the measure of the linear relationship between two variables. A correlation coefficient has a value ranging from -1 to 1. Values that are closer to the absolute value of 1 indicate that there is a strong relationship between the variables being correlated where as values closer to 0 indicates that there is little or no linear relationship. As described by Andy (2006), the correlation is a commonly used measure of the size of an effect: Value of  $\pm 0.1$  represent a small effect,  $\pm 0.3$  is a medium effect and  $\pm 0.5$  is a large effect.

Hence, in this study Bivariate Pearson Coefficient(r) was used to examine the relationship between the four supply chain dimensions by using a two-tailed test of statistical significance at the level of 95% significance,  $p < 0.05$ ).

Interpretation of correlation coefficient (r) size is as follows:

If the correlation coefficient falls between 0.10 to 0.20, it is slight correlation or small; if it is between 0.20 to 0.40 is low correlation or weak relationship, if it lies between 0.40 to 0.70 moderate; if it falls among 0.70 to 0.90 high correlation or substantial and if it is with 0.90 to 1.00 it is very high correlation or very strong correlation or very strong correlation between variables (B.Burns & Burns, 2008).

Table 4.14 Correlation of independent variables with dependent variable

		<b>Correlations</b>			
		Operational performance	Supply Risk	Process Risk	Demand Risk
Operational performance	Pearson Correlation	1	.		
	Sig. (2-tailed)				
	N	84			
Supply Risk	Pearson Correlation	.424**	1		
	Sig. (2-tailed)	.000			
	N	84	84		
Process Risk	Pearson Correlation	.584**	.870**	1	
	Sig. (2-tailed)	.000	.000		
	N	84	84	84	
Demand Risk	Pearson Correlation	.607**	.656**	.727**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	84	84	84	84

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

Source: (SPSS Output, 2019)

Table 4.14 shows the correlation coefficient of the three factors measuring the effect of supply chain risk where all are positively correlated with operational performance of the company within the range of .424 up to .607 ( $r = .424$  to  $r = .607$ ). All are significant at both  $p < 0.05$  and  $p < 0.01$  level.

When we further look at into each factor with their coefficient which indicates the three independent variables: Supply risk ( $r = .424$ ), process risk ( $r = .584$ ) and demand risk ( $r = .607$ ). All are important

determinants of supply chain risks and significant to show the effect of supply chain risks on operational performance.

Regarding the relationship between independent variables, the above correlation table 4.14 depicts that majority of the independent variables are correlated at  $p < 0.01$  and  $p < 0.05$  level of significance.

Supply risk has a positive relationship with process risk and it is statistically significant with a confidence level of 95 percent. This is displayed in the table as ( $r = .870$ ,  $p < 0.05$ ) which actually means there is a true or significant correlation between the two variables. Demand risk shows the second positive and strong association with process risk with the result of ( $r = .727$ ,  $p < 0.01$ ). This result implied the two variables are strongly related with a confidence of 99%. The third positively and strongly correlated dimensions are demand risk and supply risk with the value of ( $r = 0.656$ ,  $p < 0.01$ ).

#### 4.5.3 Regression Analysis

Regression analysis is a way of predicting an outcome variable from one predictor variable (simple regression) or several predictor variables (multiple regressions) (Andy Field, 2009). The model of regression shows how much of the variance in the measure of supply chain risk is illustrated by the underlying dimensions of predictors of supply chain model. The regression was conducted between supply risks (independent variable) and operational performance (dependent variable). The second regression was made between process risks (independent variable) and operational performance (dependent variable). Finally, the third regression was made between demand risks (independent variable) and operational performance (dependent variable). The results of the regression analysis are presented as follows.

#### 4.5.4 Regression Analysis between Supply Chain Risks and Operational Performance

Table 4.16 Regression Model between Supply Chain risks and Operational Performance

<b>Model Summary</b>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.669 <sup>a</sup>	.448	.427	.32099

a. Predictors: (Constant), Demand Risk, Supply Risk, Process Risk  
Source: (SPSS Output, 2019)

As shown in the table 4.16, there is casual relationship between supply chain risks and operational performance. The adjusted R square is 0.427, which implies that supply chain risks can account for 42.7% of the variation in operational performance. Although there might be many factors that can explain the variable on operational performance, nearly 42.7% of it is explained by supply chain risks. This means that the remaining 57.3% of the variation in operational performance cannot be explained by those dimensions of supply chain risks.

The R square value of .448 (44.8%) implies relative contribution of supply chain risks in interpreting the operational performance of the company, the remaining 55.2% of the changes in the change can be attributed to other factors.

Table 4.17 ANOVA Result between Supply Chain Risks and Operational Performance

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.690	3	2.230	21.643	.000 <sup>b</sup>
	Residual	8.243	80	.103		
	Total	14.933	83			

a. Dependent Variable: Operational performance

b. Predictors: (Constant), Demand Risk, Supply Risk, Process Risk

Source: (SPSS Output, 2019)

Table 4.17 shows the ANOVA results of multiple regression analysis. The significance value of 0.000 indicates that the regression relationship is significant in predicting the effects of the supply chain risks of the independent variables (supply risks, process risks and demanding risks) on operational performance of the company. The F-ratio in the ANOVA table tests whether the overall regression model is a good fit for the data. The F-value shows 21.643 which are greater than the F critical it shows the model is significant.

Table 4.18 Regression Coefficients between Supply Chain Risks and Operational Performance

Model		Coefficients <sup>a</sup>				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.232	.299		4.128	.000
	Supply Risk	-.357	.156	-.388	-2.293	.024
	Process Risk	.538	.159	.628	3.375	.001
	Demand Risk	.355	.106	.405	3.339	.001

a. Dependent Variable: Operational performance

Source: (SPSS Output, 2019)

On table 4.18 the standardize beta value shows the number of standard deviations that the outcome will change as result of one standard deviation change in predictor. The standard deviation units are directly comparable; therefore, they provide a better insight in to the importance of a predictor in the model. The large value beta coefficient in an independent variable has the more important determinant in predicting the dependent variable. The standardized beta value for process risk is .628. This implies that, this variable has relatively strong degree of importance for analyzing the effect of supply chain risk than others. Similarly the standardized beta value for demand risk is .405 next to process risk is great importance for analyzing the effect of supply chain risk.

R-square value indicates only the variance in the operational performance as it is explained by independent variables. When we look at the detail to what extent each independent variable influence the dependent variable. Supply risk and demand risk were found to be determinant of operational performance.

The coefficient table depicts that the significant regression coefficients, for both supply risk, process risk and demand risk are significant at  $p=0.05$ , this significance level tells us both variables uniquely contribute to the regression equation thereby making a significant contribution to the prediction.

## CHAPTER FIVE

### SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATION

#### 5.1. Summary of Major Findings

The researcher looked for the effect of supply chain operational risks on operational performance in case of Awash Winery Share Company. The study also illustrated the relationship that exists between the operational performance and supply chain operational risk dimensions with the intent of knowing the strength of the relationship of the dimensions in this particular case. In order to achieve these objectives, data were collected from the employees of the company and processed in quantitative approach and also used correlation and regression analysis.

The test result indicates that demand risk has positive and strong correlation ( $r=.607$ ) with operational performance at significance level less than (.000), process risks have also positive and strong correlation ( $r=.584$ ) with operational performance at significant level less than 0.000 and supply risks has significant positive correction ( $r=.424$ ) at a significant level .000.

#### 5.2. Conclusion

The research is based on supply on supply chain risks and operational performance of Awash Winery Share Company. The supply chain risks studied are encompassing supply risk, process risk and demand risk. The research result support that these three types of risks predicts the operational performance of an organization.

Supply risk and operational performance are positively and significantly related. The product quality specification requirements delivery lead time, consistency product volume, the cost of product reasonable and deserves the end customers; follow up of distributors on their performance, special term discount program to distributors and product improvement program for future business are critical issues which are not seen by the company.

Next to supply risk demand risk and operational performance are also positively and significantly related. Consistency of order placement with their forecast demand volume, reliability of customers actual demand with their forecast demand, consistency of customers orders with the company nominated lead time, customers feeling on the variety or flexibility of the product, customer feeling on the cost of

the product and products coverage in alignment of customers need are vital points ignored by the company.

The third dimension which is over sought in Awash Winery Share Company is process risk. In this category the items are:- disruption due to equipment failure, consultancy of production as scheduled, process variance in product quality, daily production output and production lead time; flexible strategy to mitigate risks, production machinery or equipment layout is properly set for smooth production flow, utilization of planned maintenance manuals for production machineries, equipment and for the fleets as well and also proper layout of the compound for smooth flow of fleets and workers are also critical issues seen in the pilot survey and needs an improvement.

### **5.3. Recommendation**

This study has several limitations which provide further research opportunities. Since this collected data only from Awash Winery Share Company, generalization of the findings to other industries will be very different. This research supports examining operational risk on the performance of the case company. Further research could take other perspectives of risk into account to enrich risk management strategies.

As the study clearly indicate the effect of supply chain risk on operational performance of the organizations, the firm should give due attention in properly implementing supply chain risk performance for efficient delivery service, effective production flow and better supply management.

In order to foster operational performance, it is also better for the organization to give due emphasis to supply chain performance measurement criteria.

From the analysis of the supply chain operational risks we can conclude that the three risk dimensions, gained good response from the respondents, but as can be seen from pilot survey the company plant layout is poor and the integration of the factory for product flow as well thus it needs the plant to do the layout properly.

The company should have to give a better emphasis on alignment among the stakeholders through better data integration and creating continuous contact among customers. Besides, the company should have to align itself with better supply chain risk management strategy which benefits the company and stakeholder through better integration.

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## APPENDIX I

### QUESTIONNAIRE

#### Dear Respondents;

My name is Wondafrash Gameda Conducting thesis entitled `` Examining the effect of supply chain risks on performance of Awash Winery share company’’ for the partial fulfillment of a Master of Arts Degree in Logistics and Supply chain Management. I would like to extend deep appreciation to your company and the staff the willingness in undertaking this valuable research. The study is purely for academic purpose and thus not affects you in any case and will not be used for any other purposes. Therefore i kindly request you to respond to each items of the question very carefully.

#### General instructions

- It is not necessary to write your name
- Try to address all the question given below
- Please tick  mark for your choice in the given box

#### Contact Address

If you have any query, please do not hesitate to contract me and I am available as per your convenience at (Mobile +215 9 11 34 86 30 or email: [wondafrashgameda12@gmail.com](mailto:wondafrashgameda12@gmail.com))

Thank you for scarifying your precious time in advance

#### Part I: Demographic information

1. Gender: Male  Female
2. Educational qualification:  
Grade 10 Complete  Grade 12 compete  Certificate   
College diploma  First degree  Second degree and above
3. Jobe title or proffession of in charge
4. Commercial  Production and Technical   
Procurement & Logistics  Finance & Adminstration

5. Years stayed at the organization

1-3 Years       4-6 Years       7-9 Years       Over 10 Years

**Part II. Question directly related to the study**

1. Below are some of the risks faced by various beverage industries in their supply chain. Please indicate the extent to which your company faces the named risks. The item scales are five point likert type scales with 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4= Agree and 5= Strongly Agree.

	<b>Supply Risk</b>	1	2	3	4	5
1	Your company products meet quality specification requirements on consistent basis					
2	Your company meet the required delivery lead time on a consistent basis					
3	Your company meet the required volume on a consistent basis					
4	Your company deliver orders as promised					
5	Your company supply products at minimum lot size for retailers					
6	The costs for your deliverable product reasonable and deserves the end customers					
7	Your company follow up scheme on your distributors on their performance to retailers as per the agreement made on					
8	Your company implement computerized system to major distributors					
9	Your company has a strategy to supply products at lower price cost for big sale volume					
10	How well your company utilize the fleets without outsourcing					

	<b>Process Risk</b>	1	2	3	4	5
1	Your company face disruption due to equipment failure (equipment age and down time)					
2	Your company face disruption due to procurement failure					
3	Your company always deliver the required products as scheduled					
4	The production process have the capacity to fulfill customer orders					
5	The process has very low variance in product quality					
6	The process has very low variance in daily production out put					
7	The process has very low variance in production lead time					
8	Your company has flexible strategy process to mitigate risks					
9	Your company production machinery layout is properly set for smooth production flow					
10	Your company utilize planned maintenance manual for equipments and machinery					
11	Your company utilize planned maintenance manual for the fleets					
12	Your company compound is properly set for smooth flow of fleets and workers					

	<b>Demand Risk</b>	1	2	3	4	5
1	Your customers place orders consistent with their forecast demand volume					
2	Your customers commit to their demand forecast					
3	Your customers provide your reliable forecast on their demand					
4	Your customers actual demands are consistent with your forecast					
5	Your customers place orders consistent with your nominated product specifications					
6	Your customer orders consistent with your nominated lead time					
7	Your customer feeling on the cost of your products					
8	Your customer feeling on the variety or flexibility of your products					

9	Your customer feeling for the product coverage in alignment of their needs					
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	<b>Operational performance</b>	1	2	3	4	5
1	Cost					
1.1	The price of product is reasonable					
1.2	The company inventory turnover is very good					
1.3	Operational cost is less compared with production cost					
1.4	The company resource utilization is very good					
2	Quality					
2.1	The company provides full delivery on requests and proposals					
2.2	Alignment of production process is high					
2.3	The company provides defect free products					
2.4	The company conducts survey to measure the level of customer satisfaction					
3	Flexibility					
3.1	The company produce multiple variant products					
3.2	The company deliver new product to market quickly					
3.3	The company have fast product development					
3.4	The company utilize outsourcing non-competence					