

## Influence of Supply Chain Integration on Operational Performance in the Ghana Cocoa Industry

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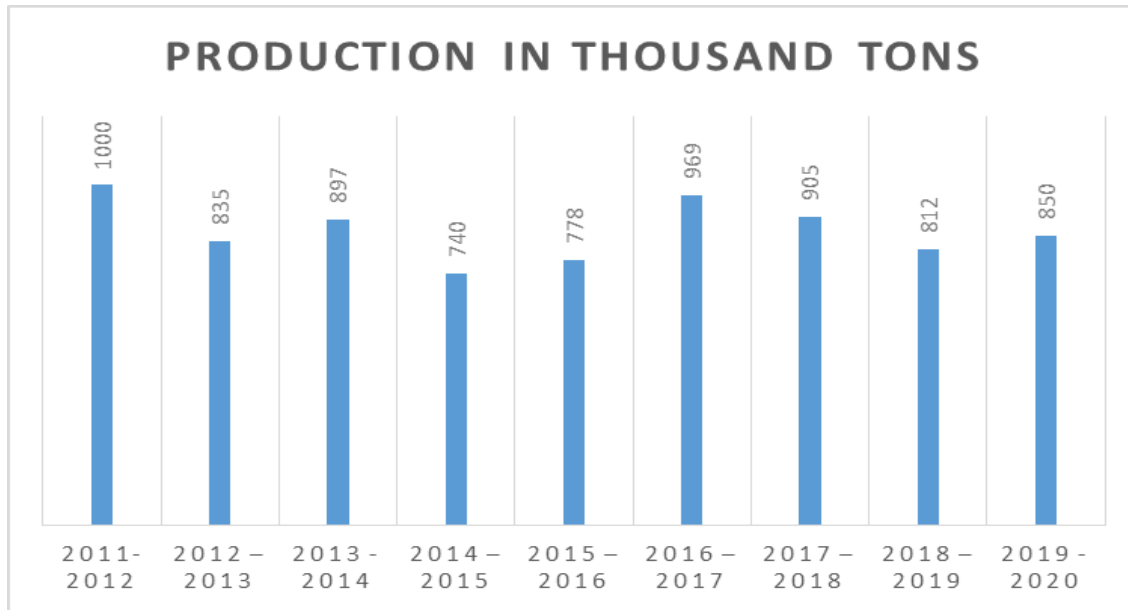
### Abstract

*Purpose: In today's business environment companies improve operational performance through effective and efficient coordination of supply chain integration both internal and external. The purpose of this paper is to understand how supply chain integration translates into operational performance and whether collaborative risk management play moderating role in supply chain integration and operational performance relationship in the Ghana cocoa industry. Design/methodology/approach: This paper is designed to employ a model that incorporates supply chain integration, collaborative risk management and operational performance. It is underpinned by relational view theory and the proposed model is to establish the direct and indirect effects of supply chain integration (internal, supplier and customer) on operational performance in the cocoa supply chain in Ghana. The framework also identifies collaborative risk management which will subsequently strengthen the relationship to enhance operational performance in the cocoa sector. Originality/value: The study effectively used relational view theory to develop a comprehensive model involving supply chain integration and operational performance. Even though previous studies identify similar work on supply chain integration in other sectors, however, none of such studies have been reported in the cocoa industry especially in Ghana. Again, the proposed theoretical model is a potential blueprint for successful implementation of supply chain management. It also serves as a guide to establish a set of key drivers for enhancing operational performance in the cocoa industry*

**Keywords:** Supply Chain Integration, collaborative risk management and operational performance.

### 1.0 Introduction

One of the major producers of cocoa as cash crop in the agricultural sector is Ghana. It is the main stay of the country's economy accounting for 20% of the global production and 30% of the total export earnings (Bangmarigu and Qineti, 2018; Monastyrnaya et al. 2016). In 2016, cocoa sector alone contributes about 14.5% of the country gross domestic product (GDP) (Verité, 2018, Ghana Statistical Service, 2017). Due to expansion of the sector over the years, more than 25-30% of the population in the country depends on it for their livelihood and sustainability (Verité, 2018). The cultivation of cocoa was introduced into the country by a native called Tetteh Quarshie, who brought the beans from Fernando Po in Equatorial Guinea and now production is done in commercial quantities. Despite the contribution of cocoa in Ghana's economy, the role of supply chain integration and its implementation in the industry is underestimated and therefore more concerns have been raised. This has resulted in fluctuations and production decline over the years since 2011/2012 crop season that recorded 1 million tons (Asante-Poku and Angelucci, 2013). The decline has affected the operational performance of the various companies in the industry. Table 1.1 below shows cocoa production decline in Ghana from 2011/2012 to 2019/2020 crop seasons.

**Table 1.1: Cocoa production decline in Ghana from 2011/2012 to 2019/2020 Crop Seasons (in 1000 tons).**

**Source: Ghana Statistical Service, 2019**

Other factors affecting production decline include transportation challenges along the cocoa supply chain, poor road networks that prevent smooth transportation of cocoa beans as well as information flow challenges along the cocoa supply chain has reduced efficiency and effectiveness within the cocoa industry.

Key players in the Ghana cocoa supply chain perform various roles and functions for sustainable growth and development. Among these include farmers who are responsible for growing and harvesting of cocoa beans, Licensed buying companies (LBCs) responsible for the purchase of domestic and transportation of bagged cocoa beans for shipment, the Ghana cocoa board (COCOBOD), a government institution that controls and supervises the production and marketing of cocoa beans with the support of its five subsidiaries companies and the processing and waste companies, whose function is to process inferior and waste cocoa beans for secondary products (Ahoa et al., 2020)

Supply chain integration analysis in the cocoa industry in recent times is receiving growing attention from academicians and practitioners all over the world (Tseng and Liao, 2015; Yuen and Thai, 2016). A number of studies have identified that supply chain integration has been widely adopted in other sectors to improve operational performance, but little is known in the cocoa industries especially Ghana cocoa supply chain. It is one of the key ingredients of supply chain management (Duong and Pache, 2017). It is the ability of organizations to collaborate and coordinate with supply chain partners to achieve efficiency and effectiveness. It is the degree by which organizations coordinate with their supply chain partners to achieve operational excellence (Malekiand Cruz-Machado, 2013).

Competition has now shifted from organisations to industry level and any disruption in the supply chain does not affect only organizations but industry as well. The complex nature of the environment in which companies and organisation operates have negative impact in their businesses. This causes disruptions to affects their operations and therefore the implementation of collaborative risk management in supply chain integration and operational performance relationship could minimise the identifications of these disruptions in their operations. Collaborative risk management therefore refers to any incident that causes disruptions in the flow of goods and services across the entire supply chain (Kovacs and Falagara, 2021). It is beneficial for organisations to reduces the causes of supply chain disruptions and lowering operational losses through the implementation of collaborative risk management to curb the situation (Ahmed et al., 2020). While Sutduean et al. (2019) confirmed moderating effects of marketing communications in the relationship between supply chain integration and supply chain performance, Arora et al. (2020) also confirmed moderating role of supply base size in strategic sustainable purchasing and environmental collaboration relationship thereby resulting in improvement on organisational sustainable performance. Caniato and Grobler (2015) identify negative moderating effects of product complexity in new product development and supply chain integration relationship. Rahim et al. (2019) empirically identify positive moderating effects of product complexity in the relationship between operational risk management and customer complaints.

However, it can be deduced from previous research that supply chain integration is potential to be considered as a predictor for operational performance as well as the moderating role of collaborative risk management which will strengthen the relationship in the cocoa industry in Ghana. Meanwhile, a theoretical perspective is important to establish the relationship between the variables under study. Therefore, to examine the relationship between supply chain integration and operational performance in Ghana cocoa sector, the researcher will adopt relational view theory to explain the relationship.

## **2.0 Literature Review**

### **2.1 Relational View Theory (RVT)**

The relationship between supply chain integration and operational performance is explained by relational view theory (RVT) developed by Dyer and Singh, (1998) which provides theoretical foundations for understanding why firms create and develop relationships and networks. The relational view is an inter-firm theory, which argues that firms can achieve supernormal benefits through the adoption of appropriate strategies (Dyer and Singh, 1998). The perspective of the theory argues that firms create value in alliances when they identify partners with complementary resources, build good relationships by sharing knowledge and make investments that are tailored to their partners (Dyer et al., 2018). The study expects that when companies in the cocoa industry deploy and integrate their supply chain and resources effectively by reducing risk factors involved in their operations through investment in inter-firm relational capabilities, inter-firm knowledge sharing and operating an effective governance structure within the supply chain networks, it is more likely to identify an improvement in operational performance. This relationship is however expected to be mitigated by the moderating effect of collaborative risk management to be implemented by organizations in the cocoa sector.

### **2.2 Operational Performance**

Operational performance alluded by Flynn et al. (2010), as the approach by which an organization can add value to a product to meet customer needs, rapidly launch new products onto the market, respond to variations in demand and supply, improve delivery time, reduce lead time to improve the entire services rendered to the ultimate consumer. Perols et al. (2013) also identifies operational performance as how well a firm accomplishes its financial and market-oriented goals. Camara et al. (2016) found that technological advancement facilitates supply chain process integration, which subsequently produce satisfactory operational performance. The measurement of operational performance identifies the expectations of customers of a firm within the supply chain in achieving satisfaction and providing value to customers. It is important for firms in the supply chain to measure its operational performance to identify its positive or negative direction of its operation. There has been a lot of debate on the measurement of operational performance. From Dawal et al. (2015) measured operational performance using quality, delivery and flexibility. Also, Vikas et al. (2017) used production flexibility, inventory turns, order fulfillment rates and total logistics costs as dimensions to measure operational performance. In line with this study, operational performance was measured through delivery time, flexibility and product quality. From Tortorella et al. (2019), stressed the visibility of operational performance to that of financial performance due to the fact that the former is kept in the confines of senior level managers. This makes operational performance easy to identify for data collection survey.

### **2.3 Supply Chain Integration**

Supply Chain Integration typically defined as the extent by which organizations are strategically interconnected with its supply chain partners in collectively managing processes (Schoenherr & Swink, 2012; Flynn et al., 2010). It is the process of matching internal and external supply chain flows through cooperation, collaboration and coordination, in order to add value to the final consumer (Arantes et al., 2018). Supply chain integration analysis in the cocoa industry has become a trending topic for a number of researchers in the developing countries (Syakibe et al. 2017; Kumar et al. 2018; Annan et al. 2016; Tsehaye, 2018; Anang, 2015). Previous studies have reported that supply chain integration have been widely studied and adopted in other industries to improve operational performance and to gain corporate competitive advantage. However, there has not been any empirical evidence to apply these findings in the cocoa industry supply chain. Supply Chain Integration is regarded as a powerful weapon an organization can use to gain competitive advantage thereby increasing operational performance (Kinya, 2016). It is a concept of flow of goods, services and information that have significant effect on operational performance (Kim et al. 2020). Scholars have affirmed positive relationship between supply chain integration and operational performance. Tsegaye (2018), confirmed a positive significant relationship between supply chain integration and operational performance in the Brewery industry in Ethiopia. Flynn et al. (2010), revealed inconsistent relationship between supply chain integration and operational performance.

In the same vein, Shou et al. (2018) confirmed inconclusive relationship between supply chain integration and operational performance in the manufacturing sector. Makmur, (2017), stated that the most important ingredients for implementing supply chain integration in the cocoa sector is by sharing information through cocoa farmers, cocoa traders and input suppliers. Three elements of supply chain integration include internal, supplier and customer integration which have not been extensively dealt with in the previous research.

Internal integration is the coordination of internal activities to achieve optimization in organization. According to Otchere et al., (2013), internal integration is the foundation for supply chain management. Companies with low internal integration strategy will yields low level of external integration and vice versa. Through automation and standardization, internal integration can be accomplished through internal logistics function and the introduction of new technology. Managers must be able to achieve internal integration by understanding business goals and requirements of external operators in the organization (Turkulainen et al., 2017).

The interorganizational links associated with suppliers and customers in the supply chain identify external integration (Gianni et al., 2017). After integrating the internal affairs of the organization, it must follow the integration of the design of external actors in the supply chain to ensure efficient usage of resources and the effective creation of customer value. Integration activities with suppliers involves operations with buyers and suppliers. Supplier Integration enables partners to match their business approaches and capabilities, so as to meet the demand and supply. Supplier Integration can be described as the creation of long-term business relationships, involving the introduction of communication interfaces, the simplification of order processes, the standardization of operations and the streamlining of joint work (Arantes et al., 2018).

Customers Integration identifies mutual coordination and interaction between a given company and its customers, to ensure the effective flow of products and services to customers. Customer's integration involves sharing of customer's demand information, aiding producers to understand customer's demand in a better manner and expecting customer's demand as well as collaborating and cooperating with customers to design, to reach products with better quality, lower costs and greater flexibility in response to customer's demand. Customer integration is directly related to operational performance (Otchere et al., 2013). The idea of internal and external integration in supply chain adds additional burden to stakeholders within companies and organizations (Flynn et al. 2016). This calls for effective and efficient coordination of these activities to improve operational performance.

#### **2.4 Supply Chain Integration and Operational Performance.**

There are growing concerns from scholars about the relationship between supply chain integration and operational performance. The integration of technology, people, business and processes is crucial for company survival to gain competitive edge and this is not only important in the current digital age but also within the organization across extended enterprises especially the cocoa sector (Awad and Nassar, 2010). Supply chain integration is an important concept in developing supply chain functions to enhance operational as well as business performance (Yu et al. 2019; Prajogo et al, 2018). A positive relation exists between supply chain integration and operational performance relationships (Tsegaye, 2018; Kinya, 2016; Pati et al., 2016; Errassafi et al. 2019). Yuen & Thai, (2017) indicates a positive relationship between supply chain integration and firm performance. Atasevena and Nairb (2017), also concluded a positive significant relationship between supply chain integration and firms' operational performance using a meta-analytical methodology. It was also confirmed that supplier integration enhances product quality, while customer integration identifies positive effects on market success. In a similar vein, Ralston et al. (2014) affirmed a positive relationship between supply chain integration and firm performance. Dametew et al. (2016) also concluded significant positive effect between supply chain integration and firm performance relationship in the manufacturing industry. From Othman et al. (2016) observed a positive significant correlation between supply chain integration, just-in-time purchasing and manufacturing on logistics performance of suppliers in the automotive industry in Malaysia. To maximize firm performance, organizations must establish closer relationships with supply chain partners to achieve such results (Yuen and Thai, 2016). From Kim and Cai (2016) argued that current trends in supply chain management extends business uncertainties such as collaborative risk management that arises from their operations. Supply chain managers must have the requisite knowledge and capabilities as well as the resources to make quick and effective decisions to circumvent these uncertainties. They must establish practical supply chain strategies to quickly react to changes in the market and to improve operational as well as business performance. Thus, managers must consider collaborative risk management as a contingency factor to resolve uncertainties in their operations. While a number of researchers supports the view that supply chain integration enhances operational performance (Sundram et al. 2016; Flynn et al. 2010; Pati et al., 2016), others identify inconclusive and mixed results (Koufteros et al. 2010; Swink et al. 2007). For example, Chang et al. (2016) also identifies inconsistent relationship between supply chain integration and firm financial performance. They concluded that the three dimensions of supply chain integration (internal, supplier and customer) enhances firm performance.

However, the existing literature on supply chain management has far neglected collaborative risk management as moderating variable on the relationship between supply chain integration and operational performance, especially in the cocoa sector due to the mixed findings obtained from the recent studies. Even though most previous researches address the relationship between supply chain integration and business performance but little attention is conducted on the relationship between the three dimensions of supply chain integration (internal, supplier and customer) and operational performance, especially in the cocoa industry. The key question is whether the implementation of supply chain integration can make a significant impact on operational performance in the cocoa sector? The influence of supply chain integration on operational performance in the cocoa sector is deficient in the developing country like Ghana. This conceptual paper intends to fill this gap on the significant value of supply chain integration and its results on operational performance in the cocoa sector.

### 2.5 Moderating effects of Collaborative Risk management on supply chain integration and operational performance relationship

To predict the outcomes of future occurrences, probability plays a key role in decision-making process (Butler and Wildey, 2018). In this paper, the focus on uncertainty aroused from collaborative risk management (CRM) serving as a moderator of the supply chain integration and operational performance relationship. To investigate the effect of collaborative risk management on the strength of supply chain integration and operational performance relationship, Chaudhuri et al. (2018) identify moderation effects of supply chain risk management on the relationship between supply chain integration and manufacturing flexibility among manufacturing plants in Asia, and concluded that to increase flexibility performance, manufacturing firms must implement different mechanisms of supply chain risk management to prevent such occurrences. Additionally, Lu et al. (2017), identify strong moderation effects of market uncertainty in the supply chain integration and operational performance relationship in a study conducted in the automotive industry in China. Various benefits of collaborative risk management in organizations which includes reducing the causes of disruption as well as lowering the operational accidental losses and this may have a strong impact on operational and financial performance (Shou et al., 2018; Kauppi et al., 2016; Bode and Wagner, 2015). Chang et al. (2017) reported that time, relationship quality and national culture strengthened the association between supply chain integration and firm performance. In a similar development, Weingarten et al. (2016) stressed that supply chain integration can lead to improved business performance only when it is implemented to the latter. Despite the considerable number of researches which have examined the antecedents of collaborative risk management, its moderating effects on the relationship between supply chain integration and operational performance especially in the cocoa industry in Ghana is lacking in literature and this paper is necessary to fill this gap.

### 3.0 Discussion

Previous studies have identified clear evidence of the significance of supply chain integration and its positive relationship with operational performance of an organization. Even though useful, it provides less than comprehensive perspective of supply chain integration. The present study has developed a theoretical framework which reveals the moderating effects of collaborative risk management on the relationship between supply chain integration and operational performance. The study proclaimed that, in a different population setting such as cocoa industry in Ghana, supply chain integration still have a positive influence on operational performance but this can be achieved through the requirement of an intervening variable to amplify the desired impact. This study therefore calls for further investigations to address such impact in the cocoa industry. This study draws its conclusions from the previous studies and introduces collaborative risk management as a moderator to nullify inconsistencies in the relationships to correctly predict operational performance. The introduction of collaborative risk management as a moderating variable provides a useful guidance for researchers and practitioners in support of the decisions regarding supply chain integration. It will also serve as a roadmap for successful implementation of supply chain integration in the cocoa industry.

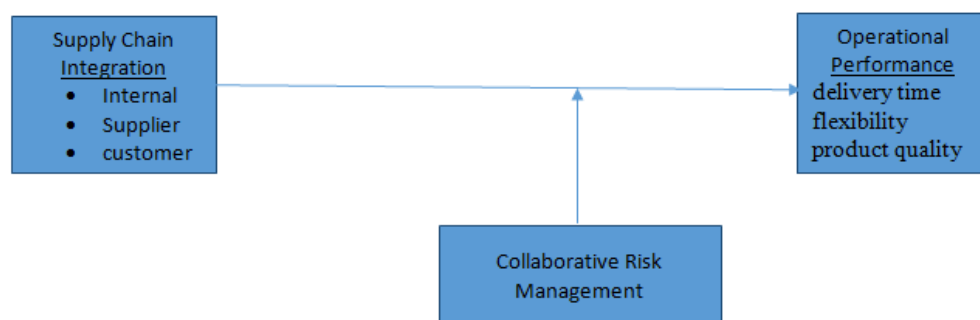


Fig 3.1: Conceptual framework

### 4.0 Conclusion

The objective of this study is to develop a unifying framework to discuss how collaborative risk management can strengthen the relationship between supply chain integration and operational performance in the cocoa sector in Ghana. Relational View Theory was adopted to provide a theoretical grounding for the conceptualized research model. Numerous studies have been conducted in the Ghana cocoa industry by many researchers and the focus of these studies ranges from the aspects of pest and disease control, cocoa certification, technical efficiency and sustainability but none of these studies has dealt with the influence of supply chain integration on operational performance in Ghana cocoa industry. The present research is, therefore, a novel to studying supply chain integration on operational performance in the cocoa industry of Ghana. Drawing from previous literature, the framework is to assist academicians and practitioners on effective implementation of supply chain integration to enhance operational performance, but this can be achieved when the relationship is being strengthened by collaborative risk management in the cocoa sector in Ghana. The study will also serve as a source of information for future studies.

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