Assessing the Challenges and Implementation of Supply Chain Integration in the Cocoa Industry: a factor of Cocoa Farmers in Ashanti Region of Ghana

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Abstract

The problem of partial supply chain integration is going on within the cocoa industry in Ghana. The study sort to examine the major challenges within the industry, which inhibits effective implementation and use of supply chain integration; the relative importance index run on the mean factors indicated that, all the factors of internal, customer and supplier integrations were important for all the groups. The study further revealed that the best way of implementing supply chain integration is to start from functional integration through internal to external integrations. Implementing complete integration both upstream, operations, and downstream is better. Some of the major challenges were poor technological innovations, lack of information sharing and poor integrated database. Finally, the Cocoa industry should adopt pragmatic approach to implement all the three aspects of integration and follow the right way of implementing them to reduce the challenges of integration.

Key words: Supply chain integration, Challenges, implementation, Cocoa Industry, Farmers, Ghana

1. Introduction

Supply-chain integration has become a prominent issue during the last decade. In recent years, there has been a great deal of empirical evidence to show that successful supply-chain integration can improve a firm's performance and competitive advantage (Fabbe-Costes and Jahre, 2008; van der Vaart and van Donk, 2008; Singh and Power, 2009; Ou et al. 2010; Wiengarten et al. 2010). Supply chain management (SCM) seeks to enhance competitive performance by closely integrating the internal cross-functions within a company and effectively linking them with the external operations of suppliers, customers, and other channel members to be successful (Monzcka and Morgan, 1997; Ellram and Cooper, 1993; Lambert, et al. 1998; Kim, 2006; Tan, Kannan, & Hadfield, 1998). This means that a firm that is pursuing SCM practices needs to pay attention to supply chain integration (SCI) and its implementation (Narasimhan, 1997; Lambert, et al. 2001, 1998, Hussein & Nassar, 2010).

Cocoa has been the backbone of Ghana's economy for more than six decades, and provides about one-third of all export revenues; accounting for between 25-30 percent of total export earnings and contributes about 10% to GDP (Tutu, 2009**;** Ghana Cocoa Board, 2010).

Despite the contribution of cocoa to Ghana's economy, it seems the pivotal role of supply chain integration and its implementation in the industry is underestimated. This has resulted in decline and fluctuations in production of cocoa beans. The fluctuations experienced in production are because of several factors prominent among them includes poor supply chain Integration, inappropriate mode of transport along the cocoa supply chain, bad road networks that prevent smooth transportation of cocoa beans.

Again, poor technological innovations, Poor information flow along the cocoa supply chain has reduced efficiency and effectiveness within the industry. It is in the light of these problems and its concomitant effects that informed the researchers to embark on this study to look into how challenges of supply chain integration could be overcome to improve cocoa production in Ghana. The study employed the following objectives: one, to examine the scope of integration within the farmers supply chain in Ghana's cocoa industry; two, to evaluate the process of implementing SCI mix and finally, to assess the major supply chain integration challenges within the cocoa industry in Ghana. The study was also guided by the following research questions: What is the scope of integration within the farmers supply chain in Ghana's cocoa industry? What are the processes of implementing SCI mix within the farmers supply chain? and what are the major supply chain integration challenges within the cocoa industry in Ghana? It is hoped that this would help the cocoa industry to overcome the challenges of supply chain integration, gain competitive advantage to make informed decisions for their businesses to do well to improve Ghana's economy. Finally, the study will contribute to existing knowledge on SCI and serve as a springboard for further studies.

2. Literature Review

2.1 Supply Chain Management (SCM)

The paradigm of "supply chain management (SCM)" has gone through huge developments globally. SCM seeks to enhance competitive performance by closely integrating the internal cross-functions within a company and effectively linking them with the external operations of suppliers, customers, and other channel members to be successful (Otchere, Annan & Anin, 2013; Monzcka and Morgan, 1997; Ellram and Cooper, 1993; Lambert, James and Elram, 1998; Kim, 2006; Tan, Kannan, and Hadfield, 1998). The objective of supply chain management is to maximize the overall value generated rather than profit generation (Otchere et al, 2013). Although the importance of supply chain relations is widely acknowledged, seamless coordination is rarely achieved in practice coupled with several challenges (Hussain and Nassar, 2010; Otchere et al, 2013).

2.2 Supply Chain Integration (SCI)

Supply chain integration is defined as "the extent to which all activities within an organization, and the activities of its suppliers, customers, and other supply chain members, are integrated together" (Narasimhan, et al.1998). SCM has three independent variables in its original scale they are: internal, suppliers and customer integrations. Some also considers integration in two levels: internal integration and external integration (Tutuncu and Kucukusta, 2008). Finally, Stevens (1989) classifies supply chain integration into three levels, from functional integration to internal integration and to external integration. However, this study focuses only on internal and external integration, because functional integration is a pre-requisite for all firms to implement and achieve Internal Integration (Otchere et al, 2013). The dominant belief is that supply chain integration (SCI) is a useful approach to improve various measures of firm performance (Fabbe-Costes and Jahre, 2008; Van der Vaart and Van Donk, 2008; Singh and Power, 2009; Ou et al. 2010; Wiengarten et al. 2010; Otchere et al. 2013). The basis of integration can therefore be characterised by cooperation, collaboration, information sharing, trust, partnerships, shared technology, and a fundamental shift away from managing individual functional processes, to managing integrated chains of processes (Vickery, Jayaram, Droge and Calantome, 2003; Kahn 1998; Pagell, 2004).

2.3 Internal Integration

Internal integration involves cross functional teams that may bring together a carefully selected array of specialists who share information and make product, process, and manufacturing decisions, jointly and simultaneously (Koufteros, Vonderembse & Jayaram, 2005; Otchere et al. 2013).

Internal integration is defined as a process of inter-functional interaction, collaboration, coordination, communication and cooperation that bring functional areas together into a cohesive organization (Kahn, 1998; Flynn et al, 2010; Zhao et al, 2011; Stock, Greis & Kasarda, 1998; Verona, 1999).

Furthermore, Supply chain partners who exchange information regularly are able to work as a single entity, and can understand the needs of the end customer better and hence can respond to market change quicker (Stein and Sweat, 1998). A prerequisite for successful SCM is internal integration (Lambert, Cooper & Pagh, 1998). Also, companies with a low internal integration strategy will achieve low level of external integration and companies implementing the full internal integration strategy will have the highest levels of external integration (Stevens, 1989; Gimenez and Ventura, 2005; Otchere et al, 2013). Generally, it is believed that firms achieve a relatively high degree of internal integration before they attempt to develop a higher degree of external integration (Gimenez and Ventura, 2005; Otchere et al. 2013). Internal integration can be accomplished through automation and standardization of each internal logistics function, the introduction of new technology, and continuous performance control under formalized and centralized organizational structure (Bowersox, 1989).

2.4 External Integration

As the competitive environment is becoming increasingly challenging, firms are undertaking efforts to compete along multiple fronts. However, many firms find it difficult to compete in the market by relying on their internal resources and competencies alone. They have turned to collaborate with their customers and suppliers to obtain information and complementary resources, which they can deploy to build competitive advantage. External supply chain integration reveals two major areas of emphasis. They are: Customer integration (CI) and Supply integration (SI). Supplier integration also called "backward" integration (Frohlich and Westbrook, 2001) refers to the process of interaction and collaboration between an organization and its suppliers to ensure an effective flow of supplies (Zhao et al, 2011). Customer integration, also called "forward" integration (Frohlich & Westbrook, 2001) refers to the process of interaction and collaboration between an organization and its' customers to ensure an effective flow of products and/or services to customers (Zhao et al. 2002). Customer integration involves sharing demand information, help the manufacturer to understanding better the customer needs and to forecast better customer demand, as well as collaborative involvement of customers with respect to product design, provision of better quality products at lower cost and more flexibility in responding to customer demand (Flynn et al. 2010).

2.5 Challenges and implementation process of Supply Chain Integration

Supply chain management (SCM) executives face unique challenges, with respect to integrating supply chain specific strategies with the overall corporate business strategy; hence seamless coordination is rarely achieved in practice (Hussain and Nassar, 2010; Otchere et al, 2013). Most SCI related problems emanate, either from uncertainties or an inability to co-ordinate several activities and partners. Simultaneously, customers have become more discerning and are demanding better quality products, higher levels of service and reduced prices, (Sweeney, 2011). Unfortunately, obtaining supply chain integration has been an elusive quest for many companies (Fawcett & Magnan, 2002). Studies have revealed that, unlike other endeavors that a firm undertakes, there is no blueprint for integration and aggregate measure of overall supply chain performance from which a firm could compare performance with other industry members. To complicate matters, there are various existing definitions for supply chain integration as well as lack of adequate resources (Pagell, 2004; (Simatupang & Sridharan, 2004a, b) cited in Soni and Kodali, 2010).

Also, Samuel et al. (2004) &Wong and Wong (2008) cited in Soni and Kodali (2010) indicated that although the supply chain operations reference (SCOR) model provides a common supply chain framework, standard terminology, common metrics associated benchmarks, and best practices, the approach seems rigid. After extensive review of different perspectives from previous publications on supply chain integration challenges, they tried to introduce a comprehensive source, which will contain all the challenges mentioned in the literature in one paper as follows: Transaction Costs, strategy and planning, customer order management, logistic management, manage operation and flexibility, setting up standards of trade, procurement management, enterprise integration, application integration, extranet adaption challenges, business process integration, culture and change, supplier competence requirements, globalization, data and information integration (Hussain and Nassar, 2010).

Many authors have therefore, proposed several drivers as benchmark for implementation process, measuring best practices and performance of SCI. Every implementation process and performance measure represents a broader field or area of measurement, such field or area of measurement is termed as significant category. The elements of the significant category are referred as "drivers" of supply chain performance (Soni and Kodali, 2010). Table 2.1 presents some implementation and performance drivers by some authors.

Table 2.1 Significant categories (drivers) of measuring SCI implementation and performance.

Name of authors	Significant categories (drivers)
Soni and Kodali (2010)	Facilities, transportation, information, inventory, sourcing, and pricing.
Wood (1997) Chase et al. (2006)	Cost, quality, delivery speed, delivery reliability, demand flexibility, new product flexibility
Tan, et al.1998)	Cost, quality, flexibility, and delivery
Sha & Chen (2008)	Cost, quality, delivery, flexibility, and Innovation
Kim (2006)	Technical initiative, structured initiative, logistics initiative, differentiation, financial performance, and customer satisfaction
Rosenzweig et al.(2003)	Cost, process flexibility, product quality, delivery,
Geanuracos, (1994)	Quality, market share, customer satisfaction, human resources, innovation, and learning
Gunasekaran et al. (2001)	Supplier, production, delivery, and customer Strategic, tactical, and operational
Closs and Mollenkopf (2004)	Customer service, cost management, quality, productivity, and asset management
Chopra and Meindl (2004)	Facilities, transportation, information, inventory, sourcing, and pricing
Beamon (1999)	Resource utilization, output, flexibility, planning, and product design.

Source: (Adopted and modified from, Wood, 1997; Chase et al, 2006 as in Soni & Kodaly, 2010; ***&*** *Hussain and Nassar, 2010*).

The implementation process should start from functional integration through internal integration to external integration (Supplier & Customer). Some authors argue that performance improvements are not assured with just one aspect of SC integration, they have proposed that implementing integration both upstream, operations, and downstream is better than concentrating the firm's efforts on integrating customers or suppliers (Frohlich and Westbrook, 2001; Otchere et al, 2013). Furthermore, it is confirmed that, the best integration strategy must involve "complete integration" (Frohlich and Westbrook, 2001; Kim, 2006; Kannan and Tan, 2010; Otchere et al, 2013).

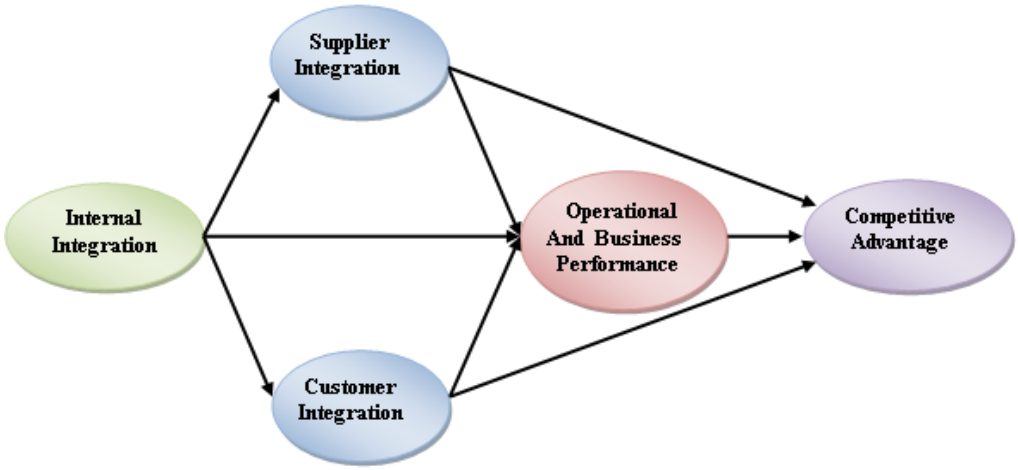
2.6 Performance and Competitive Advantage

A number of researchers have also found that higher levels of integration generally lead to better performance (Gimenez and Ventura, 2005; Stock et al. 1998). Some researchers have use all three integration variables in assessing the effect of supply chain integration on performance and found that, SCI directly relates to performance and that internal and external integration influence each other along with performance. However, internal integration's impact on performance depends on the functional areas that are being integrated and the level of external integration (Gimenez and Ventura, 2005; Stank et al. 2001; Zhao et al. 2011; Flynn et al. 2010; Rosenzweig, Roth, and Dean, 2003). In line with other papers from 2000 onwards discussing SCI and performance Stock et al. (2000); Frohlich and Westbrook, (2001) found that the levels of integration correlate and influence each other positively. Furthermore, it is difficult to come to a conclusion that integration clearly affects performance, since most of the studies in this field are discernable enough that integration and performance have been defined and measured variously and mostly limited way (Fabbe-Costes and Jahre, 2007). Firms have realised that enhanced competitiveness requires that companies ceaselessly integrate within a network of organizations.

It is the extent to which organisations integrate with their supply chain "partners" that determines their competitiveness (Christopher, 2011). Other theories that provide competitive advantages are: Competitive Forces Analysis (CFA), Resource-based view (RBV), and The value chain (Otchere et al. 2013).

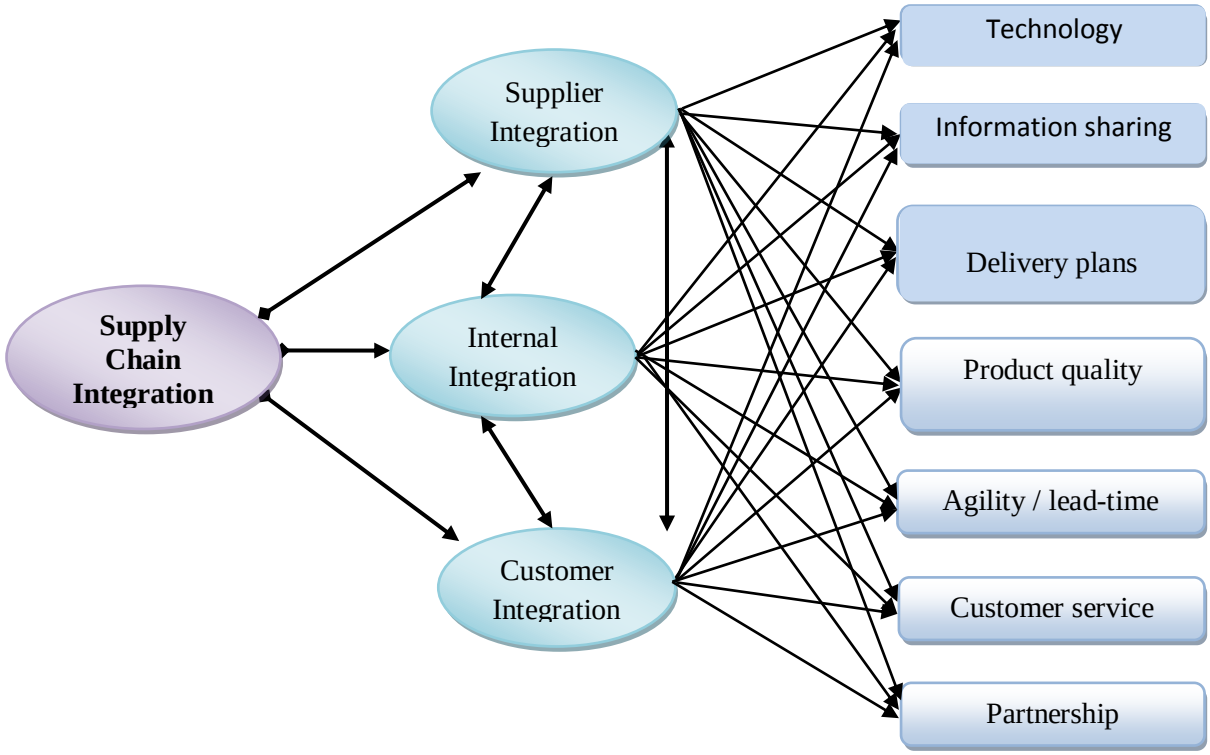
2.7 Conceptual framework

Figure 2.1 process of integration



Source: (Otchere et al. 2013; Adopted with modification from Koufteros *et al*, 2005).

Figure 2.2 Significant drivers for measuring & implementing SCI.



Source: (researchers construct, adopted & modified from Lee, et al. 2007 and table 2.1, 2012)

Figures 2.1 and 2.2 explain the conceptual framework and theory of the study: Figure 2.1 explains that internal integration leads to external integration and both lead to improved performance and competitive advantage. Figure 2.2 on the other hand explains the implementation process adopted for this research.

Also, Supply chain integration is moderated through supplier, internal and customer integration; and each of the integration factors is linked to all the drivers. For example, information sharing lowers costs from 12-23 percent and significantly impact on supply chain performance when sharing retailers' demand data (Lee et al. 2000; Zhao et al. 2002).

3. Methodology

The study adopted an adductive (inductive and deductive) approach, although the focus leaned more towards deductive given the literature background to the study. Interview administered questionnaire and self-administered questionnaire were used to collect quantitative data from the farmers. The questionnaire had a very simple structure to enable the researchers cover all research questions. The target population for this research consists of cocoa farmers in Ashanti region. In order to increase precision and to minimize sampling bias, five districts out of the twenty-seven districts in the Ashanti Region were randomly selected they are: Atwima Mponua, Atwima Nwabiagya (Nkawie), New Edubiase, Offinso and Ahafo Ano South districts. It was not possible to survey the entire population within the selected areas however; efforts were made to ensure that the sample size had equal representation to address the research questions. Two hundred thirty (230) farmers from Ashanti region out of about 8,000,000 cocoa farmers in Ghana were selected. The study also ensured that the selected farmers have had a fair exposure in the industry and a performance trend that provided in-depth information for analytical purposes.

Table 3.1 Location and category of Respondents

Districts	Farmers
Atwima Mponua	46
Atwima Nwabiagya (Nkawie)	46
New Edubiase	46
Offinso	46
Ahafo Ano South	46
Total	**230**

Source (Author's construct, 2012)

Both open and closed ended types of questions were used. The open-ended questions solicited free responses from the respondents, and the closed-ended questions allowed respondents to choose one response out of several. The questionnaire consisted of both categorical and scale type question items. A five-point Likert-scale question items were used to gather the information on the perceptions of the respondents about supply chain integration, challenges of supply chain integration and competitive advantage. The questionnaire was pre-tested using a selected group of respondents from the target population. In all twenty-five (25) questionnaires were used for the pre-testing to ascertain the validity and reliability of the questions. The secondary data used for the study were sourced from the COCOBOD's web sites and diary. All data were coded and analysis were carried out using the Statistical Package for Social Sciences (SPSS) version 16.0 and Microsoft Excel 2007 Software to measure the means of all the factors of SCI and challenges, find the relative importance index (RII) of all the means, frequencies, and percentages. Notwithstanding, the challenges faced during the research, it did not in any way affected the reliability, validity, credibility, and accuracy of the result (Otchere et al. 2013).

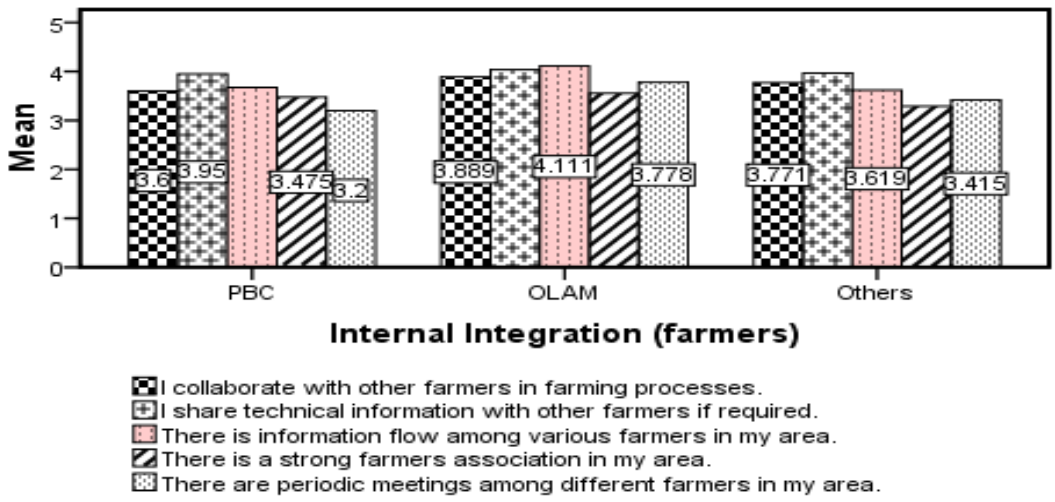
4. Result and Analysis

Out of the two hundred and thirty (230) questionnaires administered, 187 were returned representing 81.3% response rate.

4.1 Internal integration

Respondents were asked to rate the factors of internal integration within the cocoa farming industry that leads to improved performance and competitive advantage. The rating was a five point likert scale, ranging from 1 = 'Not Important at all' to 5 = 'Very Important'. Fig 4.1 indicates that, all the mean ratings fell between 'Neutral' and 'Important' threshold indicating that all the factors were important to them as far as internal integration is concern. Sharing technical information was rated highest for both farmers who answered for PBC (famers who sell their cocoa to PBC) = 3.95 (n=40) and all other LBCs (famers who sell their cocoa to other LBCs) = 3.97 (n=118). However, the highest mean factor for farmers who answered for Olam (famers who sell their cocoa to Olam) was information flow among various farmers in their area = 4.11 (n=27). The least mean factor for Olam and all others was strong farmer association =3.56 (n=27) and 3.29 (n=118) respectively and periodic meetings among different farmers = 3.20 (n=40) was the least for PBC. The relative importance index (RII) shows that Sharing technical information was ranked highest = 0.795 and periodic meetings among different farmers = 0.674 is the least ranked.

Fig 4.1 Means of Internal Integration (farmers)

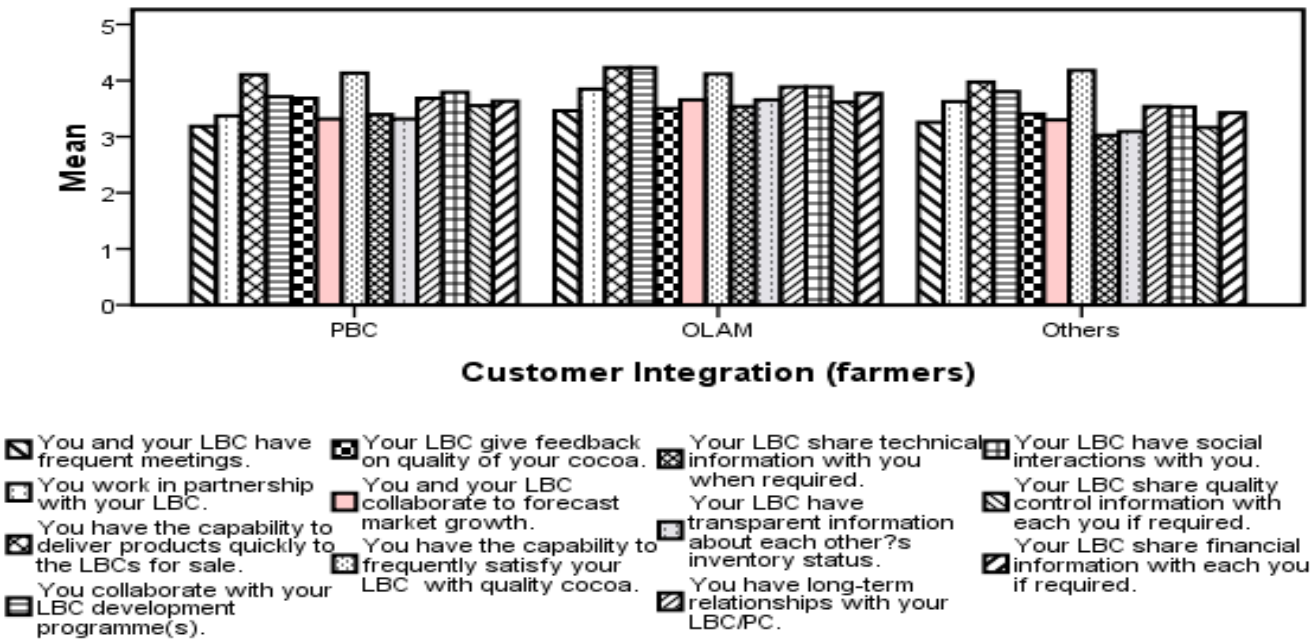


Source: (Author's own field survey, 2012)

Fig 4.2 Customer integration (CI) farmers

Farmers were asked to rate the factors of customer integration within the cocoa industry. The rating was a five point likert scale, ranging from 1 = 'Strongly Disagree' to 5 = 'Strongly Agree'. It is clear from Fig 4.2 that, the farmers ranked the entire factors above 'neutral' which means they are all important. In similar manner, Capability to frequently satisfy customers (LBCs) was still the highest factor for other LBCs (famers who sell their cocoa to other LBCs) and PBC (famers who sell their cocoa to PBC) = 4.18 (n=119), 4.15 (n=41), and third for Olam 4.11 (n=29) respectively. Furthermore, the relative importance index (RII) shows that, capability to frequently satisfy the LBCs with quality cocoa = 0.833 was ranked highest followed by the capability to deliver products quickly to the LBCs for sale =0.805, Sharing technical information = 0.639 was ranked the least.

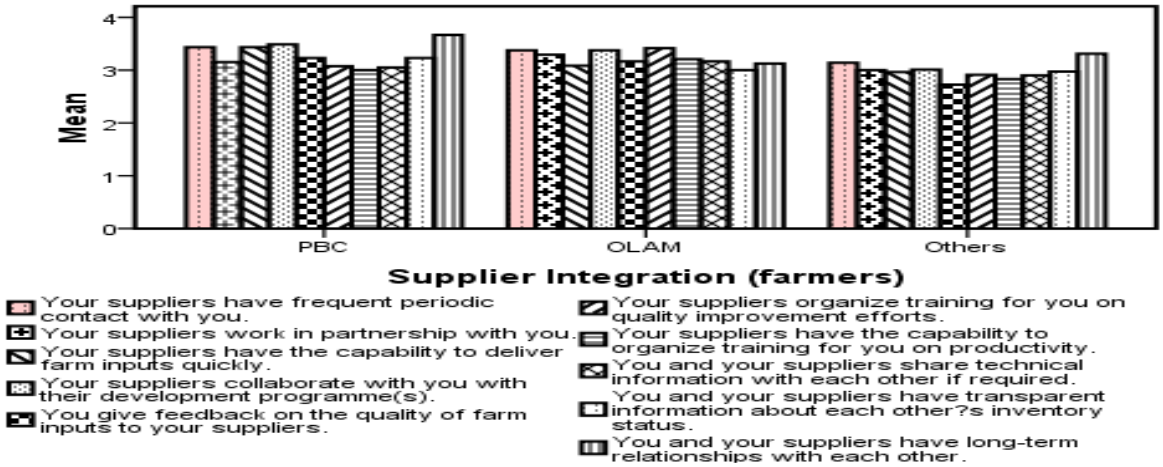
Fig 4.2 Means of Customer Integration (farmers)



Source: (Author's own field survey, 2012)

Once again, respondents were asked to rate the factors of supplier integration within their industry that leads to improved performance and competitive advantage. The rating was a five point likert scale, ranging from 1 = 'Strongly Disagree' to 5 = 'Strongly Agree'. Fig 4.3 Means of Supplier Integration (farmers), it is discerning enough from Fig 4.3 that almost all the factors were important. The highest rated factor was you and your suppliers (COCOBOB and others) having long-term relationships with each other = 3.65 (n=40) for PBC and 3.31(n=114) for others, while your suppliers organize training for you on quality improvement efforts =3.50 (n=26) for Olam. The relative importance index (RII) confirms that the highest ranked factor was 'you and your suppliers have long-term relationships with each other' = 0.672 followed by your suppliers have frequent periodic contact with you = 0.653 and the least ranked was you give feedback on the quality of farm inputs to your suppliers = 0.528.

Fig 4.3 Means of Supplier Integration (farmers)



Source: (Author's own field survey, 2012)

4.4 Challenges & Implementation

Looking at the means of all the factors and relative importance index of problems and challenges and all factors of SCI for PBC, Olam, COCOBOD and others, it was clear that the Ghanaian cocoa industry was saddled with most of the problems enumerated by Hussain and Nassar, (2010) and others stated in the literature. This included poor integrated database, lack of information sharing as a result of poor networking across the entire supply chain within the cocoa sector, low enterprise and application integration, extranet adaption challenges, Computer-based planning system, and collaboration. This situation has reduced the industries' competitiveness, capacity to generate employment, and enough revenue to make the cocoa industry vibrant. The concomitant effect is that Ghana is losing revenue for development Table 4.1 talks about some challenges the farmers faced.

Table 4.1 Challenges of supply chain integration

Item	Factors / Variables	PBC		Olam		Others		RII	R
		No	Mean	No	Mean	No	Mean		
G1	It is easy to source funds for your farming activities.	41	3.29	27	2.96	118	2.83	0.590	**1**
G2	Provision of fertilizer to the farmers comes at the right time.	41	3.00	27	2.59	118	2.51	0.526	**3**
G3	It is easy and inexpensive to get other farm inputs at the right time.	40	2.92	27	2.33	118	2.50	0.514	**4**
G4	It is easy to transporting your cocoa from your farm to LBCs depot for weighing.	41	3.05	27	2.52	118	2.52	0.527	**2**

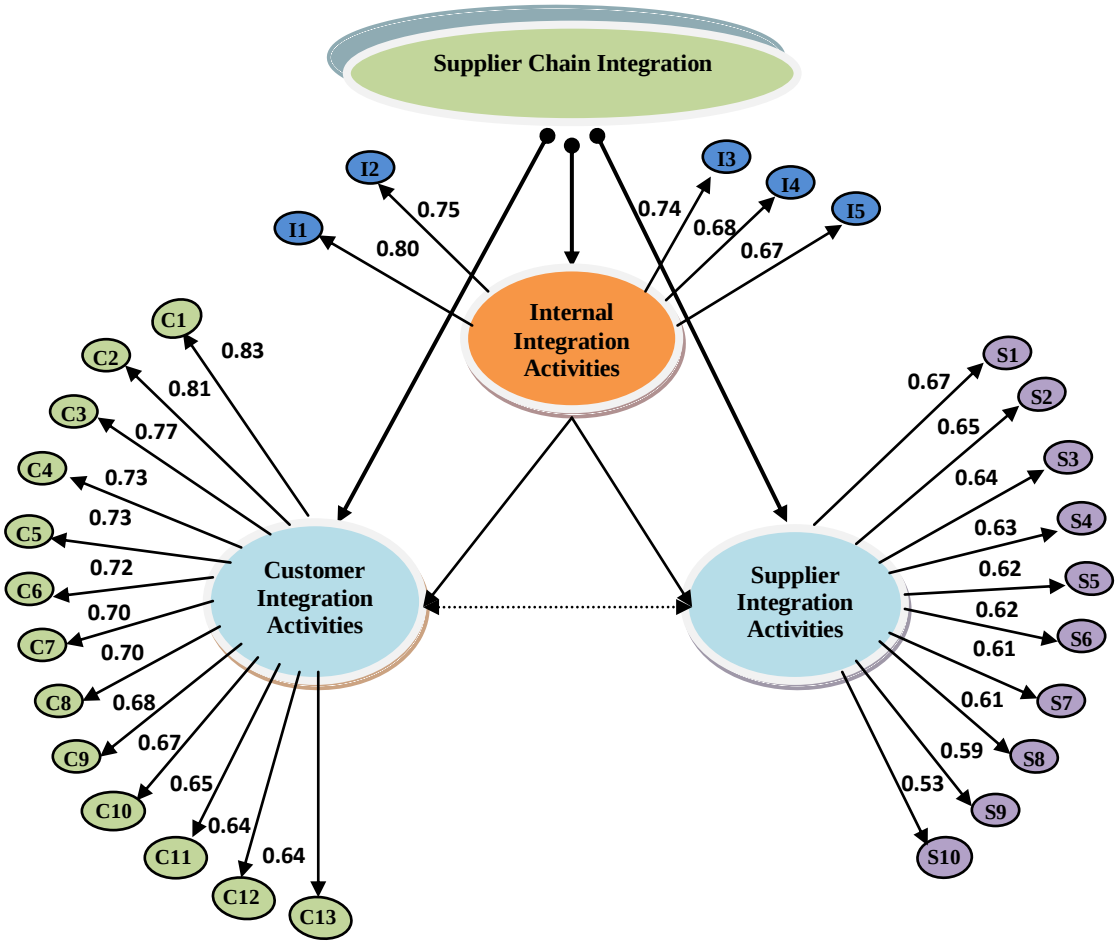
Source: Author's own field survey (2012)

Respondents were asked to rate the factors of challenges within the cocoa industry that impedes improved performance and competitive advantage. The rating was a five point likert scale, ranging from 1 = 'Strongly Disagree' to 5 = 'Strongly Agree' It is discernable from Table 4.1 that, all the mean ratings fell between 'Disagree' and 'Not certain' threshold indicating that they somehow disagree with all the factors that they were not challenging to them. 'It is easy and inexpensive to get farm inputs at the right time'= 2.92 (n=40), 2.33 (n=27) and 2.50 (n=118) was the least ranked factors for PBC, Olam and other LBCs respectively, which means it is the most challenging factor. However, the highest mean factor for farmers was accessibility of funds for farming activities' = 3.29 (41), 2.96 (27) and 2.83 (118) was the highly ranked factors for PBC, Olam and other LBCs respectively, which means it is the least challenging factor. The relative importance index (RII) confirmed that, 'It is easy and inexpensive to get farm inputs at the right time'= 0.514 was the most challenging factor and 'accessibility of funds for farming activities' = 0.590 was the least challenging factor. The individual case companies also emphasized that the most challenging factor was 'It is easy and inexpensive to get farm inputs at the right time'= 0.585 for PBC and = 0.467 for Olam. Again, 'accessibility of funds for farming activities' = 0.659 for PBC and 0.593 was the least challenging factor Olam.

5. Discussion and conclusions

5.1 Examining the scope of integration within cocoa supply chain

Figure 5.1 the scope and relationship between various aspects of integration and values of Relative Importance Index.



Source: Adopted from Otchere et al. 2013 with modifications based on Author's own field survey, 2012)

Comparing the means of all the factors of internal, customer and supplier integrations, their ratings indicated that almost all the factors were important from the responses of the farmers for the entire LBCs fig 4.1, 4.2 and 4.3; Since almost all the mean ratings fell between 'Neutral' and 'very important' threshold. The relative importance index from fig. 5.1 confirms that all the factors for the internal, customer and supplier integrations were important falling between the range of (0.531 and 0.830). Although, the mean ratings put PBC slightly ahead of Olam and all others. Generally, it seems there is no statistically significant difference between the ratings for PBC, Olam and all others as far as the relative importance index was concerned.

5.2 To evaluate the process of implementing SCI mix in the cocoa industry.

Ghana cocoa value chain (GCVC) follows an implementation process of SCI that goes through three different stages. In stage I, there is 'no' to 'very low' integration; in stage II companies internally integrate all functional units in the industry, such as logistics, purchasing, marketing and other units; through delivery, information Sharing, technology, product Quality, agility, customer Service and partnership. Finally, in stage III, the internal integration achieved in stage II is extended to other supply chain members, such as customers and suppliers. The result of this study confirms existing literature and aligned with organizational theory as proposed by Gimenez & Ventura (2005), Koufteros et al, (2005), Zhao et al (2011) and Flynn et al (2010), which suggests that, there are three levels of integration that leads to improved performance and competitive advantage. They are low integration, medium (partial) integration, and full (complete) integration. Their conclusions were drawn from very strong empirical evidence after testing a set of hypotheses. The results were also consistent with existing published literature by many experts in the field of supply chain. Such as Frohlich and Westbrook, 2001 Kim, 2006; Kannan and Tan, 2010; Vickery et al. 2003; Kahn, 1998; and Pagell, 2004, who argue that performance improvements are not assured with just one aspect of SC integration, and have therefore proposed that implementing complete integration both upstream (SI), operations (II), and downstream (CI) is better than concentrating on only one aspect. Furthermore, the result was consistent with the conceptual framework and the theory developed for this study based on the literature review.

5.3 To assess the major SCI challenges in implementing integration mix.

According to Hussain and Nassar, (2010) there are many challenges in implementing SCI as enumerated in the literature. The SCOR model also looks at plan, source, make, deliver, and return. The implementation process adopted in this research was as follows: delivery, information Sharing, technology, product Quality, agility, customer Service and partnership. It should be noted that, there are challenges at each stage in the implementation process. Looking at the means and relative importance index of all the factors of challenges of SCI, it was clear that the industry was saddled with most of the problems enumerated by Hussain and Nassar, (2010) and others stated in the literature. These included integrated database and information networking across the entire supply chain within the cocoa sector, inefficient transportation within the industry, poor road network, and difficulty with provision of farm inputs to farmers at the right time, difficulty in sourcing funds for farming activities etc.

5.4 Conclusion

The findings from the studies indicates that all the factors were important since they were above (0.5) threshold. The study again revealed that, the relative importance index for all the factors of integration were very important. There was however, not much statistically significant difference between the ratings for PBC, Olam and all other LBCs as far as the means and the relative importance index was concerned. Even though, PBC seems to be slightly ahead of the rest. Secondly, The Ghana cocoa industry follows an implementation process of SCI that goes through three different stages. Functional, internal and external integrations, also, there are three levels of integration that leads to improved performance and competitive advantage. They are low integration, medium (partial) integration, and full (complete) integration. Experts in the field of SCM have proposed that implementing complete integration both upstream (Supplier Integration), operations (Internal Integration), and downstream (Customer Integration) is better than concentrating on only one aspect. Thirdly, the cocoa industry in Ghana was faced with several challenges. These include integrated database and information networking across the entire supply chain within the cocoa sector, inefficient transportation, poor road network, and difficulty with provision of farm inputs to farmers at the right time; These among others have impede competitiveness in the cocoa industry in Ghana.

Finally, it is recommended that: The Ghana's Cocoa industry should adopt pragmatic approach to implement all the three aspects of supply chain integration to improve their performance to achieve sustainable competitive advantage in the world cocoa industry; Drastic measures should be taken to adopt an innovative technology that could integrate their computer-based systems for smooth and agile information flow; The bad nature and some instances lack of access roads to cocoa growing communities (hinterlands) needs an urgent attention from the government to make the industry more vibrant.

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