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Empirical analysis of the relationship between Supply Chain Management and business performance: Case of companies in the cotton sector in Mali.

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Abstract

As part of a national policy favoring the local processing of agricultural products, several companies have been created in the cotton sector in Mali. According to the 2014 report of the National Council of the Malian Patronage, several Malian companies have difficulties in terms of performance. The reasons for this insufficiency are: (difficult access to financing, poor management, poor quality of products, lack of information, etc.). We can summarize this situation by a lack of practices in Supply Chain Management.

The objective of this section was to empirically evaluate the impact of supply chain management on the performance of companies operating in the cotton sector in Mali. We favored an approach that links four SCM practices across a variety of dimensions of performance. In our methodology, we used an econometric regression analysis.

At the end of this study, it should be remembered that the practices of the management of the supplier relationship and the exchange and sharing of information constitute the two most productive supply chain management practices in the cotton sector in Mali. In addition, among the dimensions of performance considered, financial performance and customer satisfaction are the two most sensitive variants of SCM practices.

Key words: the company, Performance, Supply Chain Management, information, customer, cotton sector.

1 Introduction

These last decades are marked by a significant development of Supply Chain Management (SCM) in Academic research and managerial practices. The rise of the SCM was born of the concern of the companies to control the costs and to improve the quality of the services offered to the customers by reducing the times of answers to their requests. In this context, the notion of supply chain, governed by an idea of inter-organizational partnership, is gradually replacing that of "isolated enterprise", thus modifying the structure of competition. This has resulted in a new competitive model that further opposes supply chains with each other.

More specifically, our work focuses on the impact of SCM on the performance of companies operating in the cotton sector. To do this, we consider four types of SCM practices on the one hand and two aspects of performance on the other. The four practices that will hold our attention are: the management of the supplier relationship, the exchange and sharing of information, the quality of the shared information as well as the management of the customer relationship. In terms of performance, we will focus on both financial and non-financial performance. The objective here is to answer the following question: what is the impact of SCM practices on the financial and non-financial performance of companies in the cotton sector?

This study is thus of particular interest for companies in the cotton sector in Mali. It provides an overview of the SCM practices adopted by companies and how these practices influence their level of financial and non-financial performance. The study is a useful tool for decision support. It will also be useful for other companies that would

like to implement SCM. It will enable them to identify the main SCM practices adopted in this sector and those that will improve their level of performance.

The present work is articulated as follows. The first section describes the methodological approach used to conduct the survey. In order to perform a rigorous analysis of the empirical relationship between SCM practices and firm performance, we adopt a two-step approach, first using a descriptive approach in the second section and then an econometric approach in the third section.

2 Literature review

2.1 Measurements and analyzes performance

The performance reflects the way in which an organization reaches its objectives set on the market like its financial objectives (Yamin etal., 1999; Li etal., 2006). In the short run, the objectives of SCM are mainly to increase the productivity and to reduce stocks and the time of the operating cycle of the organization. Whereas in the long run, it has as objectives to increase the market shares and the benefit of the various members of the chain of value (Tan 2008etal., 1998). Beyond the general standard centered on the attack of the objectives (Bourguignon, 1995), it is essential to define concrete and actionable indicators to guide the leaders in their choices.

However, to appreciate the performance only through indicators of financial nature involves a risk in the sense that, the value of the company is made up of both tangible and intangible elements. Therefore, if the financial indicators take into account the tangible elements of the value of the company, they cannot measure the part of the intangible elements. This limit in the beginning brings many criticisms relating to the incapacity of the financial indicators to apprehend the total performance of the company.

these dimensions and to make at the same time, the limits related to the financial indicators. Many theoretical developments were presented during these last years, bearing on the installation of instrument panels (Kaplan and Norton, 1992;1996 and 2001; Mendoza and Zrihen, 1999; Germain, 2005), with like objectives enriching and not supplementing financial measurements through indicators - financial (Said etal., 2003 and St-Pierre, 2005).

Brulhartet Moncef (2010) made a synthesis of the literature on the four types of criteria most commonly used to measure the company's non –financial performance.

2.2 SCM and performance: lessons from the literature

Several recent research studies have examined the relationship between SCM and performance. The conclusions are unanimous: the implementation of SCM has a positive impact on business performance. Indeed, SCM improves the financial and commercial performance of the company (Shin et al., 2000, Prasad and Tata, 2000, Li et al., 2006). In particular, it increases market share and ROA (Shin and Wilson, 2000, Prasad and Tata, 2000), and improves the competitive advantage of the investment. enterprise through price / cost, quality, reliability in delivery, time to market, and product innovation (Carr and Person, 1999, Stanley and Wisner, 2001, Li et al., 2006) . For example, a supplier partnership strategy confers specific gains on the company in terms of financial performance. A logistics relationship with suppliers provides the company with better plans (De Toni and Nassimbeni, 2000), which reduces the cost of logistics and therefore improves its financial performance (Solakivi, 2014).

Shin et al. (2000) studied the role of SCM in the operational performance of suppliers and the competitive performance of buyers (cost, quality, delivery and flexibility). They tested three hypotheses associated respectively with MTS, supplier performance and buyer performance using a structural equation model. They conclude that SCM improves supplier performance and increases customer satisfaction, which is a win-win situation across the entire supply chain. Shin et al. (2000) show, however, that SCM impacts on delivery and quality performance are more significant than those on cost and flexibility performance.

Crook and Combs (2007), for their part, show that SCM reduces costs and operating cycle time, increases quality and facilitates innovation, but does not, on its own, make it possible to understand how gains can be made.

H1: *The implementation of SCM has a positive impact on the company's performance.*

However, given the plurality of the SCM concept, and beyond its overall influence on performance, it is also more appropriate to analyze the literature on the links between the four SCM practices identified and the performance.

2.3 Exchange and sharing of information, quality of shared information and performance

In general, information sharing provides key benefits to different members of the supply chain (Simatupang et al., 2002). In fact, information and knowledge are a strategic asset in the success of any organization, and play a central role in the competitiveness of companies, regions and nations (Baulant, 2007). Shared information has two aspects: a quantitative aspect and a qualitative aspect (Li, et al., 2006). All of these are important for the SCM; and previous studies (Moberg et al., 2002, Monczka et al., 1998) treated them separately.

The transaction cost theory presents a relevant theoretical framework for highlighting the positive role of information exchange. Like Williamson (1975 and 1985) and Brulhart and Moncef (2010), active and intensive communication between value chain partners reduces information asymmetry, thereby negating uncertainty issues. and opportunistic behavior.

Brulhart and Moncef (2010) studied the role of three SCM practices on the performance of 450 French industrial companies listed on stock exchanges. They find a positive link between the quality of the information exchanged and the performance of the companies. Similarly, these authors show that the exchange and sharing of information within this value system positively influences business performance. More specifically, the quality of the information exchanged, apprehended through the wealth, relevance, reliability and timeliness of information exchange, positively affects innovation capacity, efficiency and effectiveness. and timeliness, responsiveness and quality of products and services and customer satisfaction.

H2*: Exchange and information-sharing practices with value system partners have a positive impact on the company's performance.*

2.4 Partnership with suppliers and performance

Partnership management of suppliers, based on a long-term relationship between the company and its suppliers, facilitates the implementation of coordinated actions and provides sustainable gains for the various actors in the supply chain (Hahn et al., 1983, Stuart, 1997). Balsmeier and Voisin 1996, Monczka et al., 1998, Sheridan 1998, Noble 1997). It also enables companies to work effectively with a few major suppliers who are willing to share responsibility for the quality of the products delivered to the market (Yoshino and Rangan, 1995). In addition, involving the vendor early in the product design process can help the company select the best components and the right technology to ultimately build a more profitable product (Tan et al., 2002). Companies that are strategically aligned can work closely together by reducing unnecessary time and effort (Balsmeier & Voisin, 1996). For example, an effective partnership with suppliers can be an essential element in the value chain (Noble, 1997) as it appears to be a source of competitive advantage for the firm (Choi and Hartley, 1996). Indeed, for Ramsay (2001), it allows to develop a central competence, unique expertise, difficult to imitate by competitors. For Jayaram et al. (1999) and Koh et al. (2007), quoted by Brulhart and Moncef (2010), this competence contributes significantly to the competitiveness of the company in terms of cost, quality and responsiveness in the response to the end customer.

Recently, Xingxing and Yunwei (2013) studied the impact of a quality supplier partnership on the performance of Chinese manufacturing companies. They conclude that a selective partnership based on supplier quality allows companies to improve the quality of their products and their performance in inventory inventory.

H3: *Partnership management practices of the supplier relationship have a positive impact on the company's performance.*

2.5 Customer orientation and performance

The relationship with customers is the set of strategies developed by the company to manage customer complaints, build lasting relationships with them and improve customer satisfaction (Claycomb et al., 1999; al., 1998). Noble (1997) and Tan et al. (1998) consider CRM as an important component of SCM. For Moberg et al. (2002), developing good relationships with supply chain actors, including customers, is necessary for the successful implementation of SCM programs. As noted by Day (2000), engaged relationships facilitate customer

retention, which can provide a competitive advantage for the business.A close relationship with the customer also allows the firm to differentiate its products from those offered by its competitors, retain customers and increase the value created for them.

The empirical work is unanimous on the positive impact of customer relationship management on business performance. Brulhart and Moncef (2010) show the positive and significant influence of customer orientation on performance. More specifically, it positively influences financial performance, social performance, cost control, efficiency and timeliness, responsiveness and customer satisfaction. By broadening their results to non-financial measures of performance, Narver and Slater (1990), Deshpande et al. (1993), Vickery et al. (2003), Zhu and Nakata (2007) lead to the same results as Brulhart and Moncef (2010). Chen and Paulraj (2004) show the positive role of client integration within the value system on responsiveness and quality of customer service.

In a study of 7500 French companies, Pekovic and Sylvie (2012) find a positive link between customer orientation and the company's performance. In addition, for these authors, the factors of growth, competition and market uncertainties further increase this phenomenon.

Based on 333 questionnaires collected from a city in China whose economic activities are mainly oriented towards exports, Qinghua Zhu et al. (2017) studied the impact of customer relationship management on the link between sustainable SCM (GSCM) and economic and environmental performance. Through two factors of customer relationship management including trust and cooperation and two practices of the GSCM (green innovation and green purchasing), these two authors show that customer relationship management plays an important role on the effects of the practices. of the GSCM and on environmental performance. However, for Qinghua Zhu et al. (2017), establishing a relationship of trust with customers could negatively affect the transmission of green innovation to environmental performance. In addition, according to these authors, for companies to improve their economic performance, they should establish a relationship of trust with their customers. At the same time, reciprocal cooperation with customers is needed for green innovation to improve business performance. In a similar earlier study of a sample of 119 manufacturing companies in Finland, Sini et al. (2016) show that to achieve their environmental goals, companies could improve their financial performance by engaging in collaborative relationships with their customers.

H4: *Customer orientation practices have a positive impact on the company's performance.*

3. Methodology

This section presents the methodology adopted to conduct the survey including the study population and the data collection procedure.

3.1 Data collection procedure

The approach used to conduct this study is essentially quantitative. In this framework, we used a structured questionnaire in which the questions asked are direct and closed, in order to better direct the search and facilitate the coding of the answers.

The questionnaire is administered through two methods, namely: the self-administered questionnaire designed to be filled in completely by the respondents and the questionnaire interviewer interview where we directly asked the questions and filled in the answers of the interviewees ourselves (see appendix).

To fully understand the relationship between SCM and business performance, we organized our questionnaire into several sections each consisting of several questions.

It should be noted, however, that a pilot study was conducted in advance to test the questionnaire with fifteen (15) randomly selected companies. This exercise allowed us to revise and improve the questionnaire. The final version consists of three (3) sections, namely sections A, B and C.

Section A provides general business information. Section B has two subsections. The first sub-section deals with the level of financial and non-financial performance of firms, while the second subsection deals with SCM practices. Finally, Section C examines the impact of SCM practices on the financial and non-financial performance of cotton sector enterprises. The level of performance and the degree of adoption of SCM practices are measured on a five-point scale ranging from "Very Low" to "Very High".

For each company surveyed, we sent the questionnaire to the Supply Chain Manager, the Financial Manager and the Director General. We then examined the relevance of the answers provided by the respondents before extracting the database.

3.2 The response rate

Table 1 below highlights the response rate of our survey of cotton companies.

Of the 50 companies targeted for the completion of our study, 31 finally replied to the questionnaire, a response rate of 62%. This response rate is well representative of the target population. Indeed, it is more than 50% which is often considered an acceptable threshold in social sciences (Richardson, 2005 ; Mugenda and Mugenda, 2003).

Table1: response rate

	Targeted	Made	Percentage
Respondents	50	31	62%

Source: Our calculations from our survey.

4 Econometric Analysis of the impact of SCM on the performance of cotton-sector enterprises in Mali

This section is devoted to econometric analysis in addition to the previous descriptive analysis. This is an empirical assessment of the link between different supply chain management practices and a variety of performance dimensions using a regression analysis.

4.1 Measuring variables

4.1.1 The performance

As we have shown in the section of the literature review, we prefer the combination of financial and non-financial indicators to measure performance. We refer to the balanced Scorecard of ("Kaplan et al," n.d.)Kaplan and Norton (1992, 1998, 2001) to justify the choice of variables. Because of the reluctance of companies to communicate objective data related to performance, we opt for subjective measures for all indicators.

4.1.2 Financial performance

For the financial performance indicator, we hold seven (07) items at the rate of three (03) standard profitability measures: ROA, ROI and ROS (Kaplan and Johnson, 1987), and four (04) classic indicators from management control: profit, need in Working capital, sales growth and cash flow (Tan et al., 1998; McCarthy, 2008; Brulhart and McCarthy, 2010, etc.).

4.1.3 Non-Financial performance

To enrich and complement the financial measures of performance, we mobilize twenty-four (24) non-financial measures (Said et al., 2003 and St-Pierre, 2005). In reference to the work of Brulhart and McCarthy (2010), these twenty-four (24) items are divided into six dimensions: efficiency and respect of deadlines (3 items), responsiveness and adaptivity (4 items), quality of products and services (4 items), Customer Satisfaction (7 items), cost control (2 items) and social performance (4 items).

4.2 SCM practices

In this study, we have retained through the literature four main practices of supply chain Management (SMLB): The partnership management of the supplier relationship, the exchange and the sharing of information, the quality of the shared information and the Customer Relationship Management. In total, we defined 33 items divided between these different practices.

4.2.1 Partnership management of the supplier relationship

This practice aims to create a relationship of trust between the company and its main suppliers. It groups eleven (11) items that take into account the Supplier Partnership (9 items) and the reduction of the number of suppliers (2 items).

4.2.2 Exchange and sharing of information

It is supposed to measure the degree of communication between the partners of the same value chain. Its ultimate goal is to facilitate the mutual understanding of the players on their competitive advantages. Seven (07) items are supposed to measure the exchange and sharing of information.

4.2.3 Quality of shared information

The quality of shared information measures the degree of accuracy, richness, adaptivity and relevance of information throughout the value chain. It contributes to a better coordination of the actions of the partners enabling them to reach the set objectives more easily (Anderson and Narus, 1990, Kulp et al., 2004). Five (05) items are defined to measure this practice.

4.2.4 The management of the customer relationship

It refers to the construction of a long-term relationship with the client, characterized by a willingness to listen and understand the client in order to best meet the expectations of the customer (Brulhart and McCarthy, 2010). We mobilize ten (10) items to capture this practice.

4.3 Regression model

In this part, we test our different hypotheses (H1, H2, H3 and H4) using a regression analysis. In the literature, two approaches are often used to evaluate the relationship between supply chain management and performance. On the one hand, some work uses aggregated composite measures of SCM and performance (Li et al., 2006; Chow et al., 2008, etc.). They aim to highlight a link between these two variables by integrating in the Model a performance mediator variable. On the other hand, some studies rely on the impact of a SCM practice on a variety of performance measures (Tan et al, 1998, Green et al., 2007, Brulhart and McCarthy, 2010, etc.).

Like Brulhart and McCarthy (2010), we prefer the latter approach. Indeed, given the plurality of the dimensions of our two variables of interest (SCM versus performance), we aim in our estimates to provide a much more detailed analysis of the link between the dimensions of these two variables. Thus, we assess the influence of each of the SCM's practices on each of the selected components of the performance. This approach allows the analysis to identify the most performance-generating SCM practices in the cotton sector in Mali, as well as the most sensitive performance components to the SCM's practices.

To control the potential bias that might flow from the specification of our model, we take into account four control variables that could also explain the performance of the company. This is the business sector, turnover (CA), size and experience of the company. So our model takes the following general form :

$$y_i = \beta_0 + \beta_1 \times PSCM_{1i} + \beta_2 \times PSCM_{2i} + \beta_3 \times PSCM_{3i} + \beta_4 \times PSCM_{4i} + \beta_5 \times Secteur_i + \beta_6 \times CA + \beta_7 \times Taille_i + \beta_8 \times Experience_i + \varepsilon_i$$

Where Yi represents the performance indicator for enterprise I; PSCM1i, PSCM2i, PSCM3i, and PSCM4i measure, respectively, the partnership management of the supplier relationship, the exchange and the sharing of information, the quality of the shared information and the management of the customer relationship. Then, Sectori, CAi, Sizei and experiencei represent our four control variables and measure respectively the business sector, turnover, size and experience of the company. Finally, the term Ɛ measures the error of the estimation, that is, the measurement errors and some potential explanatory variables omitted in the model specification.

At the end of the previous factorial analysis, Yi is measured by five variables : financial performance, efficiency and timeliness, responsiveness and adaptability, customer satisfaction and social performance. The last four variables are dimensions of non-financial performance.

5 Analysis and discussion of the results

We estimated five models based on the five dependent variables defined above. The models are estimated using the ordinary least squares (MCO) method with the robust option on Stata to have robust standard deviations at the heteroscedasticity.

Table 40 below summarizes the main results (models 1; 2; 3; 4 and 5). Overall, the explanatory power of the models (measured by R ²) does not exceed 50% except for Models 1 and 4 (see table 40). This means, in other words, that the proportion of variance explained by models 2, 3 and 5 is low. On the other hand, models 1 and 4 have a fairly good quality with a R ² more or less than 60%.

Table 2: Results of the regression analysis

Explanatory Variables	Model 1	Model 2	Model 3	Modèle 4	Modèle 5
Pratiques SCM :					
Partnership management of the supplier relationship	**0,609***	0,0931	0,278	**0,512***	0,301
	(0,292)	(0,266)	(0,456)	(0,293)	(0,218)
Exchange and sharing of information	**0,405***	0,0158	0,291	0,0865	-0,138
	(0,219)	(0,190)	(0,260)	(0,204)	(0,207)
Quality of shared information	-0,184	0,126	-0,378	-0,0386	-0,0138
	(0,253)	(0,241)	(0,248)	(0,234)	(0,121)
Customer Relationship Management	-0,253	0,261	0,649	0,0241	**-0,419***
	(0,270)	(0,274)	(0,420)	(0,200)	(0,236)
Control Variables :					
Sector (Reference = Fabric)					
Oil	1,912	-0,254	0,868	-0,621	1,243
	(1,180)	(2,398)	(1,845)	(1,375)	(1,656)
Turnover (Reference = less than 1 million)					
5 to 10 million	3,616	-0,751	**6,265****	0,865	-1,675
	(2,675)	(2,251)	(2,886)	(2,430)	(1,831)
10 to 50 million	**4,648****	-1,044	2,928	**-4,534****	-1,773
	(2,150)	(1,793)	(2,648)	(1,977)	(1,841)
50 to 100 million	2,315	-0,964	5,581	0,777	-2,755
	(2,890)	(2,345)	(3,340)	(2,450)	(2,043)
More than 100 million	4,689	0,295	**4,667***	1,811	-1,010
	(3,221)	(2,557)	(2,511)	(2,275)	(1,737)
Size (Reference = Small)					
Average	1,629	-0,233	**-1,931***	**-2,914****	0,757
	(1,727)	(1,304)	(1,008)	(1,264)	(0,534)
Great	**3,468***	0,768	1,242	**-4,591*****	0,543
	(1,717)	(2,133)	(3,005)	(1,489)	(1,419)
Experience (Reference = Small)			0,445		
Great	0,229	-0,410	(1,468)	1,584	-0,0800
	(1,558)	(1,216)	-2,370	(1,198)	(0,853)
Constant	**8,657****	4,865	(5,935)	1,489	**16,05****
	(3,880)	(3,585)		(3,478)	(6,032)
Observations	31	31	31	31	31
R-Square	0,766	0,451	0,448	0,592	0,441

(...) : Standard deviation ; *, * * and * * * significance at the respective thresholds of 10%; 5% and 1%.

Model 1 : Dependent variable : « Financial performance »
Model 2 : Dependent variable : « Efficiency and respect of deadlines »
Model 3 : Dependent variable : « Responsiveness and Adaptivity »
Model 4 : Dependent variable : « satisfaction client »
Model 5 : Dependent variable : « Social performance »

Our results show that some SCM practices actually influence business performance to varying degrees. Indeed, model 1 (see table 40) allows us to conclude a validation of our hypothesis H1 concerning the positive influence of the SCM, apprehended by the combination of the practices of partnership management of the supplier relationship and the exchange and sharing Information about the company's financial performance. However, the SCM does not seem to have a significant influence on the company's non-financial performance. Indeed, there is no combination of SCM practices that has a significant effect on the four non-financial performance indicators (models 2, 3, 4 and 5).

By independently focusing on the influence of each of the constituent practices of the SCM on each of the selected components of the performance, the results allow to validate the hypothesis H2 for one of the five models tested: The Practice "exchange and information sharing "has a positive effect on the financial performance of the company but it does not seem to play any role in the efficiency and respect of deadlines, responsiveness and adaptability, customer satisfaction and the social performance of The company.

The theory of transaction costs can then be mobilized to explain these results. According to this theory, the lack of communication between the company and its partners in the value chain increases the asymmetry of information resulting in problems of uncertainties and opportunistic behaviour. Better integration of information would help the various members of the chain to reduce these uncertainties and facilitate decision-making. This remains the guarantor of a better efficiency in the respect of the deadlines, the responsiveness and the creation of value for the customer.

In Mali, companies have not yet reached this level of maturity which wants information to be shared with their main partners (customers and suppliers). The information is rather internalized and reduced to the strict circle of companies, which means that they can win in terms of financial performance because of their profit maximization behaviour, but remain indifferent when it comes to the Value creation for their customers.

Furthermore, our results also allow us to validate the H3 hypothesis for two of the five models tested by showing the positive and significant impact of the partnership management of the supplier relationship on performance. In a more specific way, the partnership management of the supplier relationship positively influences the financial performance and customer satisfaction. With regard to financial performance, our results confirm the contributions of Tan et al. (1998), Carr and Person (1999), Pressuti (2003) and Chen and Paulraj (2004) that show that long-term relationships with suppliers boost financial performance and value creation for the shareholder. Similarly, our results are consistent with the findings of Tracey and Tan (2001) and Brulhart and McCarthy (2010) that highlight the positive impact of partnering with suppliers on customer satisfaction.

On the other hand, some of the results are unexpected compared to our initial assumptions. The first concerns the negative impact of the management of the client relationship on the company's social performance (model 5). However, a close relationship with the client provides the company with many advantages (Tan et al., 1998 ; Day, 2000; Chen and Paulraj, 2004): Product differentiation, customer loyalty, customer service improvement, increased confidence in the relationship. This result could be explained by the existence of internal conflicts of the company helping to curb employee satisfaction. However, if employees are less satisfied, a relationship conflict could adversely affect the performance and productivity of the company. In Mali, especially in the cotton sector, the well-being and satisfaction of the employee at the workplace is not well taken into account by employers. As a result, the lack of motivation and commitment on the part of the staff will inevitably fail any practice of managing the customer relationship.

The second unexpected result affects the lack of impact of the quality of the shared information on any dimension of the performance. This result further confirms the conclusion that there is no link between Exchange and information sharing and the different dimensions of non-financial performance. Such a result could be explained by not only the presence of information asymmetry within the value system, but especially the unreliability of the information exchanged. Malian companies in the cotton sector do not yet have a reliable and relevant data collection system that provides information on the expectations of their main customers.

Conclusion

The objective of this study was to evaluate empirically the impact of supply chain management on the performance of companies operating in the cotton sector in Mali. We favored an approach that links four SCM

practices across a variety of dimensions of performance. In our methodology, we used an econometric regression analysis. We tested our four hypotheses using an econometric regression analysis.

In the econometric regression analysis, it is obtained that the supply chain management, apprehended by the combination of the practices of the partnership management of the supplier relationship and the exchange and the sharing of information, has a positive influence on the performance financial position of the company. This result validates our hypothesis H1. By independently looking at the influence of each of the MSC constitutive practices on each of the selected components of the performance, the results allow to validate the hypothesis H2: the practice "exchange and sharing of information" has an effect positive on the financial performance of the company but it does not seem to play any role in efficiency and timeliness, responsiveness and adaptability, customer satisfaction and social performance of the company. Our results also validate the hypothesis H3 by showing the positive and significant impact of the partnership management of the supplier relationship on performance. More specifically, the partnership management of the supplier relationship has a positive influence on financial performance and customer satisfaction. However, our tests show some ambiguity about our hypothesis H4.

Contrary to our expectations, the tests have identified a negative impact of customer relationship management on non-financial performance, notably social performance, a result that could be explained by the existence of internal conflicts within companies operating in companies. the cotton sector. These conflicts would have slowed employee satisfaction, which is considered a potential vector of performance and productivity. Finally, the quality of shared information does not yet play a role in any dimension of the (non-financial) performance of companies operating in the cotton sector.

At the end of this study, it should be remembered that the practices of the management of the supplier relationship and the exchange and sharing of information constitute the two most productive supply chain management practices in the cotton sector. in Mali. In addition, among the dimensions of performance considered, financial performance and customer satisfaction are the two most sensitive variants of SCM practices.

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Conflicts of Interest: The authors declare no conflict of interest.

Annexes

Questionnaire

A. The following questions relate to your organization's demographic profile. Please identify the appropriate characteristics of your company.

Please tick in the appropriate box / column or write your answers as appropriate

Company Description:	**Number of employees:**
Textile ☐ Oil ☐ Soap ☐ Cattle food ☐ Yarn ☐ Other: …… …… …… …… ……	Less of 50 ☐ 50 – 100 ☐ 100 – 250 ☐ 250 – 500 ☐ More than 500 ☐
The annual sales of this company are:	**Years of operating experience of this Company:**
Less of 1 million ☐ 1 - 5 million ☐ 5 – 10 million ☐ 10 – 50 million ☐ 50 – 100 million ☐ More than 100 million ☐	Less of 1 year ☐ 15 years ☐ 5 - 10 years ☐ 10-15 years ☐ 15 - 20 years ☐ More than 20 years ☐

B. Please indicate your level of agreement on the following statements based on your experience working in this company. The rating is 1 = Extremely disagree to 5 = Strongly agree

Variables	Title	Extremely disagree	disagree	Neutral	agree	Extremely agree
Financial performance	**1. How do you rate your performance against your competitors in the following areas ?:**	1	2	3	4	**5**
	1-The profitability of the assets (ROA)					
	2-Return on Investment (ROI)					
	3-Creating value for the shareholder (ROE)					
	4-Commercial Performance (ROS)					
	5-Improvement of the working capital requirement					
	6-The average profit					
	7-Sales growth					
	8-Improved cash flow					
Non-financial performance	**How do you evaluate your performance compared to your competitors in the following areas ?:**	1	2	3	4	5
	Efficiency and respect of deadlines:					
	Efficiency in the production of offers					
	respect for delays					
	Speed of delivery					
	Reactivity and adaptability:					
	Speed in the adjustment of the capabilities					
	Speed in changing production volumes					
	Speed in the change of the product mix					
	Speed in design change offers					
	Quality of products and services:					
	Quality improvement					
	The default rate					
	The return rate					
	Product quality					
	Customer satisfaction:					
	The quality of customer service					

	Customer satisfaction					
	The processing of customer complaints					
	Innovation					
	The development of new processes or new technologies					
	The development of new products or new services					
	Process improvement					
	Cost containment :					
	Cost reduction					
	The productivity					
	Social performance:					
	Employee engagement					
	Employee motivation					
	Staff satisfaction					
	The respect of environment					
Partnership management of the supplier relationship	**Please comment on your level of agreement with the following statements about your value system / supply chain partners:**	1	2	3	4	5
	Supplier partnership:					
	We work hand in hand with our suppliers to solve problems					
	We help suppliers improve the quality of their products					
	We view our suppliers as an extension of our business					
	We give a fair share of our profits to our key suppliers					
	We hope that our relationship with the key suppliers of the company will last a long time					
	Our key suppliers are responsive to our demands					
	Key suppliers make the effort to help us during emergencies					
	When an agreement is reached, we can always rely on the key supplier to meet our requirements					
	We associate our main suppliers in the setting of our objectives					
	Low number of suppliers:					
	We trust a limited number of suppliers					
	We have a relationship with a limited number of suppliers					
	Please comment on your level of agreement with the following statements about your value system / supply chain partners:	1	2	3	4	5

Exchange and information sharing	***Exchange and share informations :***					
	Our partners keep us fully informed about events impacting our business					
	We exchange information with our partners to help improve business planning					
	In the relationship with our partners, it is understood that any information useful for the other party will be communicated					
	In the relationship with our partners, the content of the information exchanged is not limited to the content specified by the agreements					
	With our partners, we share sensitive information (finance, production, competition)					
	The exchange of information with our partners takes place frequently in a formal and informal way					
	We share with our partners proprietary information					
	Quality of information:					
	The exchange of information with our partners is at the right time					
	The exchange of information with our partners is accurate					
	The exchange of information with our partners is complete					
	The exchange of information with our partners is sufficient					
	The exchange of information with our partners is reliable					
Customer relationship management (customer focus)	**Please comment on your degree of agreement with the following statements:**	1	2	3	4	5
	We interact very regularly with our customers					
	We constantly measure and evaluate the satisfaction of our customers					
	We are always looking for more satisfaction from our customers					
	We allow our customers to have access to our assistance when needed					
	We have a relationship of trust with our customers					
	Our customers considers us reliable and credible					
	Our relationship with customers deserves our full attention					
	We work on building long-term relationships with our customers					
	We work on the formal and informal complaints of our clients					
	We follow with our customers the feedback regarding the quality of products and services					

C. Determining the Impact of SCM Practices on Performance

To what extent do you agree with the following statement regarding the impact of chain management practices on your organization's financial performance? The scale below will be applicable: 1 = very weak 2 = weak 3 = average 4 = high 5 = very high

The practices of the management chain	1	2	3	4	5
Does the management of the supplier relationship have an impact on the financial performance? **1 yes ☐ 2 no ☐** **If so, how do you rate this impact?**					
Does partnership management of the supplier relationship have an impact on non-financial performance? **1 yes ☐ 2 no ☐** **If so, how do you rate this impact?**					
Does the exchange and sharing of information have an impact on financial performance? **1 yes ☐ 2 no ☐** **If so, how do you rate this impact?**					
Does the exchange and sharing of information have an impact on non-financial performance? **1 yes ☐ 2 no ☐** **If so, how do you rate this impact?**					
Does Customer Relationship Management Have an Impact on Financial Performance? **1 oui ☐ 2 non ☐** **If so, how do you rate this impact?**					
Does Customer Relationship Management Have an Impact on non- Financial Performance? **1 yes ☐ 2 no ☐** **If so, how do you rate this impact?**					

Table 17 : Summary of variables measurements

Variables	**Item description**	**Alpha the Cronbach**
Financial Performance	**How would you rate your performance against your competitors in the following areas?:**	Alpha = 0,842
	Roa : The profitability of assets	
	ROI : The profitability of investments	
	ROE : The creation of value for the shareholder	
	ROS : Commercial performance	
	pf5 : Improving the need for working capital	
	pf6 : The average profit	
	pf7 : Sales growth	
	pf8 : Improving the cash flow.	

Non-financial Performance	**How would you rate your performance against your competitors in the following areas? :**	
	Efficiency and respect of deadlines:	Alpha = 0,879
	Pnf1 : Efficiency in the production of offers	
	Pnf2 : Meeting Deadlines	
	Pnf3 : The speed of delivery	
	Responsiveness and adaptability:	
	Pnf4 : The speed in adjusting the means capability	Alpha = 0,922
	Pnf5 : The speed of change in production volumes	
	Pnf6 : The speed in the change of the mix-product	
	Pnf7 : Speed in the design change of offers	
	Quality of products and services:	
	Pnf8 : Improving quality *	
	Pnf9 : The default rate *	
	Pnf10 : The return rate *	
	Pnf11 : The quality of the product *	
	Customer Satisfaction:	
	Pnf12 : Quality of service to the customer *	
	Pnf13 : Customer Satisfaction *	
	Pnf14 : Customer Claims Processing *	
	Pnf15 : Innovation	Alpha = 0,897
	Pnf16 : The development of new processes or new technologies	
	Pnf17 : The development of new products or new services	
	Pnf18 : Improving processes *	
	Maîtrise des coûts :	
	Pnf19 : Reducing costs *	
	Pnf20 : Productivity *	
	Social Performance:	
	Pnf21 : Employee engagement	
	Pnf22 : Employee motivation	
	Pnf23 : Staff satisfaction	Alpha = 0,854
	Pnf24 : Respect for the environment *	
Partnership management of the supplier relationship	**Please comment on your degree of agreement with the following statements about your value/supply chain partners:**	
	Partnership Suppliers:	
	Pnf25 : We work hand in hand with our suppliers to solve problems	
	Pnf26 : We help suppliers improve the quality of their products	
	Pnf27 : We consider our suppliers to be an extension of our company *	
	Pnf28 : We give our key suppliers a fair share of our profits *	
	Pnf29 : We hope that our relationship with the company's key suppliers will last a long time *	
	Pnf30 : Our key suppliers are responsive to our requests *	
	Pnf31 : Major suppliers make the effort to help us during emergencies	
	Pnf32 : When an agreement is reached, we can always count on the key supplier to satisfy our requirements *	
	Pnf33 : We associate our main suppliers in setting our objectives	
	Low number of vendors:	Alpha = 0,797
	Pnf34 : We trust a limited number of suppliers	
	Pnf35 : We have a relationship with a limited number of suppliers	
	Please comment on your degree of agreement with the following statements about your value/supply chain partners:	
	Echange et partage d'informations :	

Exchange and sharing of information	Pnf36 : Our partners keep us fully informed about events that impact our business	Alpha = 0,807 for the 7 items
	Pnf37 : We exchange with our partners any information that would help to improve the planning of the activity	
	Pnf38 : In the relationship with our partners, it is understood that any information useful to the other party will be communicated	Alpha = 0,799 Items (pnf36, pnf37, pnf40 et pnf42)
	Pnf39 : In the relationship with our partners, the content of the exchanged information is not limited to the content specified by the agreements	
	Pnf40 : With our partners, we share sensitive information (finance, Production, R&D, competition)	Alpha = 0,717 items (pnf38, pnf39 et pnf41)
	Pnf41 : The exchange of information with our partners takes place frequently in a formal and informal way	
	Pnf42 : We share with our partners industrial property information	
	Quality of information:	Alpha = 0,859
	Pnf43 : The exchange of information with our partners is at the right time	
	Pnf44 : The exchange of information with our partners is accurate	
	Pnf45 : The exchange of information with our partners is complete	
	Pnf46 : The exchange of information with our partners is sufficient	
	Pnf47 : the exchange of information with our partners is reliable	
Customer Relationship Management (customer orientation)	**Please comment on your degree of agreement with the following statements:**	
	Pnf48 : We interact very regularly with our customers	Alpha = 0, 906
	Pnf49 : We continually measure and evaluate the satisfaction of our customers	
	Pnf50 : We are constantly looking for more satisfaction from our customers	
	Pnf51 : We allow our customers to have access to our assistance in case of need	
	Pnf52 : We have a relationship of trust with our customers *	
	Pnf53 : Our client considers us to be reliable and credible *	
	Pnf54 : Our relationship with customers deserves our full attention *	
	Pnf55 : We are working on building long * term relationships with our customers	
	Pnf56 : We are working on the formal and informal claims of our customers *	
	Pnf57 : We follow with our customers the feedback on the quality of products and services *	

Items accompanied by a star (*) were eliminated at the end of the procedure Purification of scales.

Table: Extraction of the components related to the 6 remaining measures of management of the supplier relationship after purification of the scales.

Component	Initial own values			Extraction are squares of the factors selected		
	Total	% of the variance	% Cumulative	Total	% of the variance	% Cumulative
1	3,299	54,978	54,978	3,299	54,978	54,978
2	1,210	20,174	75,152	1,210	20,174	75,152
3	,687	11,455	86,607			
4	,363	6,051	92,658			
5	,314	5,234	97,892			
6	,126	2,108	100,000			

Table:Factorial Contributions of the remaining 6 measures of supplier Relationship management

component Matrix[a]

	component	
	1	2
pnf25 : « We work hand in hand with our suppliers to solve problems »	,886	-,198
pnf31 : « Major suppliers make the effort to help us during emergencies »	,804	-,309
pnf33 : « We associate our main suppliers in setting our objectives »	,722	
pnf35 : « We have a relationship with a limited number of suppliers »	**,690**	**-,565**
pnf28 : « We give a fair share of our profits to our main suppliers»	**,676**	**,635**
pnf30 : « Our key suppliers are responsive to our requests »	**,642**	**,593**

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