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The Impact of Sustainable Upstream Supply Chain Practices on Financial Performance: Lessons from Moroccan industrial companies[1]

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ABSTRACT
The relationship between sustainable supply chain management practices and companies' performances has been the subject of many research studies in the past few years. Some authors showed that sustainable supply chain management doesn't contribute to the financial performance, while others found the opposite. This research paper is fully in line with this debate and aims to investigate the relationship between the financial performance and the supply chain's sustainability of Moroccan industrial companies listed on the stock exchange and belonging to three different sectors. A statistical analysis was carried out using the database of Vigeo Eiris, an international environmental, social and corporate governance research and rating agency founded in 2002, and companies' annual reports. Results show that sustainable relationships with partners in the upstream supply chain impact the financial performance of companies in different ways, depending on the characteristics of each sector. The findings of this research have financial, ecological and social implications as they can help companies understand the importance of having an efficient supply chain while being environmentally and socially responsible.

Keywords: Supply chain; CSR; sustainable supply chain; sustainable supply chain management; financial performance; multiple linear regression.

INTRODUCTION
Faced with the challenges of the escalating global competitiveness, companies must absolutely have an efficient supply chain (SC). However, with the emerging issues such as environmental protection, firm transparency, employee benefits and security concerns, firms need to transform their SC models. Instead of focusing solely on economic performance, they need to build environmentally friendly supply chains to reach harmony with nature (Hong and al., 2018). In this perspective, pressure forces companies to integrate socially responsible practices not only in their own operations, but also in their relationship with all stakeholders, especially with suppliers (Fernandez, 2020) in the upstream SC.

Corporate social responsibility (CSR) refers to a company's responsibility to implement sustainable practices. Nowadays, sustainability is seen as a measure of expectations that society has of organizations in different areas. The implementation of sustainable practices has an impact on the environment, society and on the economy. This question is practically important to industry

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since they have put significant investment in environmental and social practices over the past 20 years. Sometimes the adoption of these practices is due to external pressures, regardless of whether these practices pay off or not (Zhu and Sarkis, 2007).

In the Supply Chain Management field, the relationship between sustainable supply chain management (SSCM) practices and corporate performance has been the subject of numerous studies in the past years. Some reject the idea of sustainable supply chains because it has no impact on companies' performances (Min and Galle, 1997 ; Zhu et Sarkis, 2007), and implies an obligation to society and future generations beyond that stipulated in legal requirements of companies. Others, on the other hand, defend the importance of SSCM practices and their contribution to the overall performance of companies (Wang and Sarkis, 2013 ; Ortas and al., 2014). Therefore, firms implement the SSCM process not only for the sustainable management of their own, but also for the management of all the supply chain members. Supply chain core enterprises should improve environmental and social performance by internal as well as external SSCM to avoid and minimize the negative impact of the supply chain members in environmental and social responsibility (Wang and Dai, 2018).

In this regard, many companies are now adopting SSCM practices. World leading firms have already launched all kinds of SSCM practices to improve their sustainable advantages (Hong and al., 2018). For example, Unilever implemented one project named "The Unilever Sustainable Living Plan" in 2010 which had improved the health conditions of nearly one billion people. It reduced the impact on environment and achieved purchasing 100% agriculturally sustainable raw materials and packages. Apple Inc. promoted supplier supervisory mechanism such as "Apple Supplier Conducting Code" and "Supplier Responsibility Standard" (Du, 2012).

We found that most of the research dealing with SSCM has been done in developed countries (Shokri and al., 2014; Varsei and Polyakovskiy, 2017). However, research in developing countries is very limited given the reluctance of compagnies to implement SSCM practices (Silvestre, 2014). Therefore, improving sustainability of supply chains in developing countries bears significant values to the entire world as these are more developing countries (Hong and al., 2018).

Expanding on these limitations, we seek further understanding of the effects of SSCM practices in other contexts that are different from those in developed countries. This paper focus on Morocco, the fastest developing country in North Africa. The logistics sector in Morocco has experienced a remarkable leap in recent years, as testified by the advances made by public and private bodies (Mir and Balambo, 2019). Given the scarcity of SSCM research in Africa and in developing countries, we consider Morocco as a suitable field of research given the efforts that have been made over the past ten years to modernize its logistics sector. The progress made has prompted several largest manufacturing compagnies to relocate their industrial activities to Morocco.

The purpose of this study is to examine whether SSCM practices are associated with compagnies' financial performance in the Moroccan context, especially in the upstream supply chain which includes the relationship between the order clerk and his suppliers.

A sample from the top 45 Moroccan industrial compagnies based in different cities is used. These compagnies are listed on the stock exchange and rated by Vigeo Eiris regarding their environmental, social and governance (ESG) practices. The financial statements and the cash flow table appearing in the companies' annual reports in association with the ESG ratings of Vigeo Iris are used for a quantitative empirical analysis. This empirical study will analyze the data through multiple linear regression model.

This research targets three types of industries: the automotive industry, the pharmaceutical and biotechnology industry, and the beverage industry. The implications of this research are to provide Moroccan industrial companies with evidence on the relationship between SSCM practices and the resulting gains, and that managers should be patient to reap the benefits of these initiatives. On one hand, the results of this study illustrate that sustainable upstream supply chain practices are not linked to companies' liquidity, solvency, or even financial efficiency. Nevertheless, they have a positive impact on profitability and on market value. On the other hand, the results show that this impact differs from one industry to another.

The remainder of this paper is organized as follows. Section 2 summarizes the previous literature on relationship between financial performance and SSCM practices and develops the research hypotheses. Section 3 discusses the sample selection and research methods. Sections 4 present the research results and discuss the implications. The paper ends with a summary of theoretical contribution, managerial implications, limitations and future research.

LITERATURE REVIEW

Sustainable Supply Chain Management

Nowadays, sustainability is seen as a measure of society's expectations of organizations in different areas. It is becoming more and more important for our planet as it is for all companies. According to Eco Canada (2021), adopting sustainable practices has a huge impact on the environment, on society and on the economy. It is true that sustainability finds its origins in the responsible use of natural resources, but it has gained popularity in terms of sustainable development and social equality. Bradford and al. (2017), point out that sustainability is not just about the environment. Sustainability is in fact a "three-legged stool" that includes economically, environmentally, and socially responsible activities.

A SC is made up of interdependent actors who can influence the reputation and performance of each other. Consequently, firms have understood the importance of working in collaboration with their partners to improve their performance. As companies today recognize the social, ethical and

environmental strengths of their SC, the need to develop sustainability strategies that extend beyond the borders of their entities becomes vital (Keating and al., 2008).

Seuring and Müller (2008) explain the difference between SC and Supply Chain Management (SCM). They state that SC include all activities related to the flow and transformation of goods from raw materials to the end user, as well as the associated information flows, while SCM aims to integrate these activities through enhanced partner relationships to achieve a sustainable competitive advantage.

The integration of sustainable practices in SCM gave rise to the concept of SSCM. It is defined as the set of skills and leverages that allow a company to structure its business processes to achieve sustainable performance (Eduardo Ortas and Moneva, 2014). It is also defined as the cooperation between all companies within the same SC for the purpose of optimizing physical, information and financial flows while considering the economic, environmental and social dimensions of sustainability. This must be done while maintaining competitiveness and meeting the needs and requirements of stakeholders. (Seuring et Müller, 2008). These definitions imply that firms adopt programs to improve the environmental and social impacts on their internal processes and initiatives to improve the impact on their suppliers' and customers' processes (Elcio and Wong, 2014).

The integration of SSCM practices is a pressure that's becoming increasingly strong every day, especially from external stakeholders such as suppliers, customers, shareholders, governments, non-governmental organizations (NGOs) and public authorities. This pressure originates from many pervasive environmental and social issues facing the world, namely climate change, biodiversity loss and child labor. Indeed, SCM involves major operations, such as material acquisition, manufacturing, warehousing, packaging, transportation and recycling, all of which can lead to negative environmental and social impacts if not managed appropriately. In addition, the responsibility of balancing the three dimensions of sustainability (social, environmental and economic) of SCM has become more complex with the introduction of environmental regulations such as the Carbon tax as well as standards and reporting frameworks such as ISO 14000, SA 8000 and Global Reporting Initiative (Varsei and al., 2014).

Moreover, we cannot talk about SSCM without evoking the concept of purchasing social responsibility which refers to the involvement of the purchasing function in SSCM. Purchasing social responsibility has five major interrelated dimensions: diversity, environment, safety, human rights and philanthropy (Carter and Jennings, 2004). A lot of authors address the concept of purchasing social responsibility as it represents one of the most important dimensions of SSCM, and aims to reduce exposure to potential risks by requiring a set of standards that suppliers must meet. (Keating and al., 2008).

SSCM is also linked to the green supply chain management (GSCM). Manufacturing organizations have begun to implement GSCM practices in response to customer demand for products and services that are environmentally sustainable and that are created through environmentally sustainable practices and in response to governmental environmental regulations. These practices require that manufacturers work in concert with suppliers and customers to enhance environmental sustainability (Green and al., 2012).

In the literature, the most important environmental concerns include greenhouse gas emissions, waste generation, energy and water consumption, and the use of hazardous and toxic substances (Varsei and al., 2014). Regarding social performance indicators, there are four main social dimensions: working conditions, human rights, community involvement and products' safety. (Varsei and al., 2014).

Financial Performance

Financial analysis is used to assess companies and determine their performance by taking an in-depth look at their financial statements, income statements, balance sheets, and cash flow statements (Tuovila, 2021). Assessing the financial performance can be carried out using either the absolute performance in terms of operating scale or the relative performance represented by financial ratios (Katchova and Enlow, 2013). In fact, financial ratios are derived from financial statements and can be used to compare between different companies or to understand a company's historical performance (Tuovila, 2021). Relative financial analysis helps to assess and analyze the financial position and progress of an entity, and includes five main categories of ratios, namely profitability, liquidity, efficiency, solvency and performance in the market. (Katchova and Enlow, 2013, Ahrendsen and Katchova, 2012).

- Profitability ratios

Long-term profitability is vital for the survival of all businesses and for ensuring that adequate profits are received by shareholders (Katchova and Enlow, 2013). Profitability ratios are a class of financial analysis used to assess a company's ability to generate profit taking into account its revenues, operating costs, assets, or equity. Gross profit margin and net profit margin are the most widely used ratios to measure profitability (Hayes, 2021).

- Market ratios

Market ratios are widely deployed in fundamental analysis. The most common one is earnings per share (EPS) which estimates the value of a company by indicating how much money it makes for each share. (Fernando, 2021).

- Liquidity ratios

Liquidity ratios measure a company's ability to repay short-term debts. This can done by comparing the most liquid assets (those that can easily be converted into cash) and current liabilities (Katchova and Enlow, 2013). Liquidity ratios include the current ratio, quick ratio, and operating cash flow ratio. (Hayes, 2021).

- Efficiency ratios

Efficiency ratios measure a company's ability to use its assets to generate income. They often look at various aspects of the business, such as how long it takes to collect money from customers or how long it takes to convert inventory into cash. (Kenton, 2021).

- Solvency ratios

Credit ratios are a key metric used to measure a company's ability to meet its long-term debt obligations. The greater the amount of debt held by a business, the greater the risk of bankruptcy. The main solvency ratios are the debt ratio, the interest coverage ratio, the equity ratio and the debt to equity ratio (D / E) (Hayes, 2021).

The Impact of SSCM Practices on Financial Performance

Investigating the relationship between sustainable practices and financial performance is not a recent area of study. For more than 45 years, empirical research has been carried out to study this relationship (Margolis, Elfenbein and Walsh, 2009). Regarding the study of this link in supply chain management, Min and Galle (1997) found that SSCM practices, especially the environmental aspect, reduces the financial performance of companies. They identified different costs, including those arising from environmental programs such as recycling and uneconomic reuse. In 2007, Zhu and Sarkis also found that SSCM negatively impacts the financial performance of industrial companies, but in a different way. Indeed, they found that the pressure that comes from stakeholder improves the SSCM performance but reduces financial performance at the same time.

Unlike the previous findings, Friedman (2007) found that CSR could be used as an opportunity to strengthen the existing competitive advantage of companies. Keating et al. (2008) confirmed this idea by showing that a SSCM practices improve the reputation and, therefore, the overall performance of companies. They found a close relationship between reputation and expectations of the main players in the supply chain. To reach this conclusion, Keating et al., (2008) developed a questionnaire containing 137 questions that capture information on supplier management policies and systems in the areas of governance and ethics, work standards, community involvement, environment, and market management.

According to Handfield and al., (2005), environmental management of supply chains involves the introduction and integration of environmental issues and concerns into SCM processes by auditing and evaluating the environmental performance of suppliers. In fact, intense global competition obliges companies to constantly seek new ways of thinking and improving their business. Thus, environmental initiatives and SCM go hand in hand as they make companies more efficient. For example, environmental supply chain management requires finding innovative ways to reduce waste and its associated costs, while maintaining a flexible business strategy and improving market position (Handfield et al.,2005).

In 2013, Wang and Sarkis focused on the impact of environmentally and socially responsible practices in SCM on financial performance. In their empirical analysis, a sample of the top 500 US companies were used. They found that SSCM's integrated efforts, including social and environmental SCM, are positively associated with companies' profitability.

Ortas et al., (2014) conducted an empirical study which confirmed the results of Wang and Sarkis. They used causality tests on a sample of 3,900 companies over an eight-year period to study the relationship between the performance of sustainable supply chain and the financial performance of companies. The results indicated a general two-way causality between SSC performance and firms' margins and revenues. Therefore, they concluded that the SSCM practices has a positive impact on profitability. Nonetheless, great diversity in the patterns of this relationship emerges when the sample is divided into different geographic regions and economic sectors.

Shahi, Shiva et Dia (2020) conducted a more recent study which disproved the findings of several researchers, like Min and Galle, who previously believed that SSCM practices increases costs, mainly those coming from environmental programs. The aim of the study was to explore the link between SSCM practices and business performance in the Indian textile industry by focusing not only on internal sustainability initiatives in the SC, but also on upstream and downstream sustainable practices and relationships with suppliers and customers. The results showed that an integrated approach to SSCM practices improves business performance in terms of sales and net profit.

Regarding the impact of green supply chain management on financial performance, Rao and Holt (2005) demonstrated a link between green supply chains and economic performance. They also found that GSCM practices led to competitiveness and better economic performance. Klassen and McLaughlin (1996) studied the effect of announcements of winning environmental awards by the organizations on stock prices. They found evidence that the market valued such recognition and duly awarded the firms with increased valuations as reflected by higher stock prices.

The purpose of this research is to investigate the impact of SSCM practices on the financial performance of industrial companies. The literature supporting a positive impact of the sustainability of supply chains on financial performance refers to a large part of researchers and specialists in this field. However, there is another class of researchers who have demonstrated a negative impact, or who have affirmed that there is no relationship between SSCM practices and financial performance.

In light of this debate, we will test two hypotheses as part of our Empiric investigation.
Hypothesis H0: The sustainable upstream supply chain practices don't have any impact on financial performance

Hypothesis H1: The sustainable upstream supply chain practices have an impact on financial performance

METHODOLOGY

Variable measurement

The model is structured into two sections, namely, sustainable upstream supply chain practices and financial performance.

Three dimensions and twenty-one items for measuring sustainable upstream supply chain were adopted from the Vigeo Eiris' rating system. Vigeo Eiris (VE) is an international social, environmental and corporate governance (ESG) research and rating agency founded in 2002. Using a meticulous methodology, VE is specialized in evaluating companies according to various ESG criteria and specifications linked to sustainable development.

Regarding the evaluation of sustainable upstream supply chain practices according to the VE's scoring system, the model shows the three main dimensions including sustainable relationships with suppliers, integration of environmental factors in the upstream SC and integration of social factors in the upstream SC. Each dimension includes the same measurement items which are: (1) visibility of engagement, (2) relevance of the engagement, (3) ownership of commitment, (4) measures implemented to manage relationships with suppliers, (5) coverage of the measures implemented, (6) stakeholder comments, (7) transparency and trends in indicators relating to engagement results.

All Measurements use VE's scores, these scores measure the degree to which companies consider and manage important environmental and social factors. Companies with higher ESG scores are stronger in managing relationships with their stakeholders. They are also less exposed to experience business disruptions or miss out opportunities due to the inability to consider and meet the expectations of their stakeholders.

For confidentiality reasons, we are not allowed to present the entire model. We have just put a few items with some of the associated scores (Appendix 1).

We have also adopted six items to measure financial performance which are:

- VD1: Gross profit margin
- VD2: Net profit margin
- VD3: Earnings per share
- VD4: Current ratio
- VD5: The turnover of net assets
- VD6: Debt ratio

These items are extracted from the financial statements and the cash flow table appearing in the companies' annual reports.

Data

This study collected Data from compagnies rated by Vigeo Eiris. We eliminated companies that had not been in operation during the years of interest, so as not to have a compromised sample. Also, we made sure that the businesses existed at least four years prior to the interest period. Data for 45 companies were collected. However, they cannot be disclosed for confidentiality reasons regarding to the data provided by Vigeo Eiris. The financial statements and the cash flow table appearing in the companies' annual reports are used to extract the data needed to calculate the financial ratios. We specify that all companies are listed on the stock exchange, which made it easier for us to collect public financial data appearing in their financial documents.

This research focuses on the specific case of three industries: the automotive industry, the pharmaceutical industry and the beverage industry. The industrial sector, chosen as the target of investigation, is a market that combines different supply chain activities, namely procurement, production, storage and transport, to produce material goods for the market. The period chosen is 2019 to 2020 (corresponding to fiscal years 2020 to 2021). The choice of listed companies will allow us to obtain all the necessary financial data.

Multiple Linear Regression

According to Leung Hui et Fun Ng (2009), statistical regression is an analysis model used for analyzing and modeling dependent variables as a function of one or more independent variables. The simplest form of regression is linear regression, which is a popular and widely accepted method for building predictive models. The application of regression analysis and multivariate techniques has been used in order to understand the relationship between the extreme values of a particular domain and other variables (Venkataraman, et al. 2019). Regression allows us to estimate how a dependent variable changes as the independent variables change. Multiple linear regression is a technique used to model the linear relationship between explanatory (independent) variables and the response (dependent) variable.

RESULTS

In order to perform the linear regression, we set an alpha value of 0.05. Therefore, coefficients with a p-value of 0.05 or less would be statistically significant (we can reject the null hypothesis). The R-squared and adjusted R-squared values tell us what percentage of the variance in the response variable is explained by our regression model. In academic research, R-squared values of 0.75, 0.50 or 0.25 can, as a rule, be described as substantial, moderate or low, respectively. The tables 1 and 2 show the results of the R-squared and the f-test values for each of the 18 regression models (Appendix 2).

Table 1. R-squared values of the 16 regression models

	VD1	***VD2***	***VD3***	***VD4***	***VD5***	***VD6***
Automobile	88,9%	83,9%	87%	30,6%	0,6%	20,9%
Pharma. & biotech.	58,8%	81,8%	92,7%	30,2%	28,5 %	3%
Beverage	73,9%	80,5%	80,4%	26,2%	47,1 %	30,7%

Table 2. F-test values of the 16 regression models

	VD1	***VD2***	***VD3***	***VD4***	***VD5***	***VD6***
Automobile	0,0000	0,0001	0,0000	0,2417	0,9955	0,4415
Pharma. et biotech.	0,0173	0,0002	0,0000	0,2477	0,2486	0,9493
Boissons	0,0015	0,0003	0,0003	0,3225	0,0628	0,2408

We observe low R2 values associated with VD4, VD5 and VD6 for all three industries. As a result, we can say that a small percentage of the variance of the current ratio, net asset turnover and debt ratio is explained by our regression model.

The F test gives values greater than 0.05 for VD4, VD5 and VD6 associated with each industry. As a result, we can say that this does not indicate statistical significance and can conclude that the R squared of the population is zero.

The empirical results show us that VD1, VD2 and VD3 are statistically significant regression models. From there we will calculate their t and p values. Indeed, to test the statistical significance of each of the regression coefficients, we form a ratio of these coefficients to their associated standard error, which gives the t-values and the p-values corresponding to the test (Tables 3, 4 and 5). Knowing that we have a two-tailed test, the null hypothesis is that the population regression coefficient is zero and the alternative is that it is different from zero with Alpha equal to 0.05.

By taking alpha at the threshold of 0.05, we can say that the coefficients are statistically significant if the value in the t-test column is less than 0.05. These are the values highlighted in blue (Tables, 3,4,5).

Table 3. Regression Table (Automobile Industry)

	VD1		***VD2***		***VD3***	
	Coefficient	*t-test*	*Coefficient*	*t-test*	*Coefficient*	*t-test*
C&S2.2	0,000064	0,745	-0,0016097	0,731	0,0112923	0,342
C&S2.3	0,0007171	0,012	-0,0003331	0,678	0,0683096	0,001

C&S2.4	0,0007204	0,011	0,0039222	0,000	0,0028538	0,841
Constant	-0,241548	0,007	0,0839398	0,005	-1,540533	0,004

Table 4. Regression Table (Pharmaceutical Industry)

	VD1		***VD2***		***VD3***	
	Coefficient	*t-test*	*Coefficient*	*t-test*	*Coefficient*	*t-test*
C&S2.2	-0,0035374	-0,82	0,0088531	0,25	-0,002963	0,863
C&S2.3	0,0040733	0,48	0,005701	0,84	0,0625115	0,086
C&S2.4	0,008246	0,87	0,0050693	0,67	0,0391304	0,312
Constant	-0,2748782	0,071	-0,0919289	-0,84	-2,068227	0,003

Table 5. Regression Table (Beverage Industry)

	VD1		***VD2***		***VD3***	
	Coefficient	*t-test*	*Coefficient*	*t-test*	*Coefficient*	*t-test*
C&S2.2	0,0024904	0,049	0,0019054	0,241	-0,0367971	0,03
C&S2.3	0,0040699	0,143	0,0096034	0,020	0,0553073	0,130
C&S2.4	-0,0007021	0,802	-0,0013561	0,724	0,0815846	0,044
Constant	-0,0638559	0,387	-0,0160197	-0,872	-2,068227	0,003

Based on the results obtained, we can conclude which of the financial ratios are impacted by integrating sustainability in the upstream supply chains. On the one hand, we can say that having sustainable relationships with suppliers has a positive impact on the profitability of companies in the automotive industry. We notice also that the integration of environmental factors in SC affects positively the profitability of companies, as well as the market value of automotive companies. All these results confirm the findings of the authors (Wang and Sarkis, 2013; Ortas and al., 2014; Shahi, Shiva and Dia, 2020) who confirmed, following many studies that SSCM practices are positively associated with compagnies' profitability. These empirical results are also in agreement with the conclusions of the authors (Rao and Holt, 2005) who have demonstrated a positive link between green supply chain practices and economic performance in general. When it comes to the beverage industry, market value is enhanced by integrating social factors into the SC. Then, we confirm the results of (Keating et al., 2008) who found that supplier management policies has a positive impact on Market value.

On the other hand, the results show no relationship between financial ratios and the sustainability of SC for companies in the pharmaceutical industry. These results may be aligned with the comments of (Min and Galle, 1997 and Zhu et Sarkis, 2007) who found that SSCM practices

reduce the financial performance of companies given the costs generated by environmental programs.

All in all, we can sum the results of our regression models by saying that financial performance is impacted in different ways by having sustainable relationships with suppliers and integrating environmental and social factors into the supply chain. In addition, it is important to note that the industry plays an important role in this impact.

CONCLUSIONS

SSCM practices refer to the commitment of companies to practice environmental and social sustainability and to be good stewards of the environment and society. The study of the relationship between this commitment and overall business performance is an area of research that has existed for many decades. Recently, the increase in the number of suppliers worldwide and the complexity of SCs has prompted academics, researchers, managers and others to study not only the level of sustainability of companies separately, but globally within their SCs. Indeed, SSCM is the collaboration between companies that are part of the same SC to share, understand and work together to solve environmental and social problems.

Numerous studies have been carried out to study the relationship and the level of impact that SSCM practices have on the financial performance of companies. Some researchers have shown that SSCM lead to unnecessary additional costs that reduce profits, and therefore business performance. Other researchers disagree with this assertion by showing how SSCM can promote values, which ultimately improves customer satisfaction and gives business partners a reason to trust each other and, thus, improves competitive advantage and businesses profits.

In order to locate which of the two hypotheses is closest to reality, an empirical study was carried out using a statistical technique, multiple linear regression. The sample used was a mixture of 45 companies across 3 different sectors: automotive, pharmaceutical and beverage. We used the scores that measure the environmental and social factors of the sustainable supply chain of Vigeo Eiris. Six different financial ratios were calculated from data extracted from annual reports in order to assess the financial performance of these companies.

The results of this empirical study show that sustainable relationships with suppliers and the incorporation of environmental and social sustainability positively impact only two indicators namely profitability and market value of companies. However, we have found that the impact differs from one industry to another. Since in some cases, sustainable SCs have a positive influence on certain aspects of financial performance, companies are encouraged to establish sustainable relationships with their suppliers in order to promote environmental protection and social values.

Regarding the limitations of this study, it can be noted that the generalization of the results might be discussed because the sample is small. We could not extend the sample to more than 48 companies since the data transmitted by Vigeo Iris is limited to 48 companies. Nevertheless, although the sample is small, it only includes large industrial companies which are listed in stock exchange. These companies have all deployed SSCM practices and can afford to allocate a budget for sustainable SC, but this is not always possible for small and medium-sized companies. These elements could give great value to the results obtained.

Finally, to generalize the results of this study, we intend, in the context of future research, to adopt a scientific measurement scale to measure sustainability of the supply chains of Moroccan companies and to target a large sample of small and medium-sized companies from different sectors of activity.

REFERENCES

Ahrendsen, B. L., & Katchova, A. L. (2012). "Financial ratio analysis using ARMS data" Agricultural Finance Review. https://doi.org/10.1108/00021461211250492

Bradford, M., Earp, J. B., & Williams, P. F. (2017). "Understanding sustainability for socially responsible investing and reporting". Journal of Capital Markets Studies. https://doi.org/10.1108/JCMS-10-2017-005

Carter, C. R., & Jennings, M. M. (2004). "The role of purchasing in corporate social responsibility: a structural equation analysis". Journal of business Logistics, 25(1), 145-186. https://doi.org/10.1002/j.2158-1592.2004.tb00173.x https://doi.org/10.1002/j.2158-1592.2002.tb00020.x

Du Juan. (2012). "Unilever Reports on First Year's Progress against Sustainable Living Plan Targets". China WTO Tribune, (6), 81-81.

Fernandez, A. (2020). Principe du Supply Chain Management. https://www.piloter.org/techno/SCM/principe-supply-chain-management.htm

Friedman, M. (2007). "The social responsibility of business is to increase its profits". In Corporate ethics and corporate governance (pp. 173-178). Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-70818-6_14

Green, K. W., Zelbst, P. J., Meacham, J., & Bhadauria, V. S. (2012). "Green supply chain management practices: impact on performance". Supply Chain Management: An International Journal. https://doi.org/10.1108/13598541211227126

Hayes, A. (2021). Liquidity ratio definition. Investopedia. https://www.investopedia.com/terms/l/liquidityratios.asp

Hong, J., Zhang, Y., & Ding, M. (2018). "Sustainable supply chain management practices, supply chain dynamic capabilities, and enterprise performance". Journal of cleaner production, 172, 3508-3519. https://doi.org/10.1016/j.jclepro.2017.06.093

Klassen, R. D., & McLaughlin, C. P. (1996). "The impact of environmental management on firm performance". Management science, 42(8), 1199-1214. https://doi.org/10.1287/mnsc.42.8.1199

Katchova, A. L., & Enlow, S. J. (2013). "Financial performance of publicly-traded agribusinesses" Agricultural Finance Review. https://doi.org/10.1108/00021461311321311

Kenton, W. (2021). Efficiency ratio definition. Investopedia. https://www.investopedia.com/terms/e/efficiencyratio.asp

Keating, B., Quazi, A., Kriz, A., & Coltman, T. (2008). "In pursuit of a sustainable supply chain: insights from Westpac Banking Corporation" Supply Chain Management: An International Journal. https://doi.org/10.1108/13598540810871217

Margolis, J. D., Elfenbein, H. A., & Walsh, J. P. (2009). "Does it pay to be good... and does it matter? A meta-analysis of the relationship between corporate social and financial performance" And does it matter. https://doi.org/10.2139/ssrn.1866371

Min, H., & Galle, W. P. (1997). "Green purchasing strategies: trends and implications" International Journal of Purchasing and Materials Management, 33(2), 10-17. https://doi.org/10.1111/j.1745-493X.1997.tb00026.x

Mir, A., & Balambo, M. A. (2019). "Externalisation et forme organisationnelle hybride: le cas de la logistique in situ". Logistique & management, 27(3), 170-181. https://doi.org/10.1080/12507970.2019.1588079

Ortas, E., Moneva, J. M., & Álvarez, I. (2014). "Sustainable supply chain and company performance: A global examination" Supply Chain Management: An International Journal. https://doi.org/10.1108/SCM-12-2013-0444

Rao, P., & Holt, D. (2005). "Do green supply chains lead to competitiveness and economic performance?". International journal of operations & production management. https://doi.org/10.1108/01443570510613956

Shahi, S. K., Shiva, A., & Dia, M. (2020). "Integrated sustainable supply chain management and firm performance in the Indian textile industry" Qualitative Research in Organizations and Management: An International Journal. https://doi.org/10.1108/QROM-03-2020-1904

Seuring, S., & Müller, M. (2008). "From a literature review to a conceptual framework for sustainable supply chain management" Journal of cleaner production, 16(15), 1699-1710. https://doi.org/10.1016/j.jclepro.2008.04.020

Silvestre, B. S. (2014). "A hard nut to crack! implementing supply chain sustainability in an emerging economy". Journal of Cleaner Production, 96, 171-181. https://doi.org/10.1016/j.jclepro.2014.01.009

Shokri, A., Oglethorpe, D., & Nabhani, F. (2014). "Evaluating sustainability in the UK fast food supply chain". Journal of Manufacturing Technology Management, 25(8), 1224-1244. https://doi.org/10.1108/JMTM-04-2013-0031

Tachizawa, E. M., & Wong, C. Y. (2014). "Towards a theory of multi-tier sustainable supply chains: a systematic literature review". Supply Chain Management: An International Journal. https://doi.org/10.1108/SCM-02-2014-0070

Tuovila, A. (2021). Financial Analysis. Investopedia. https://www.investopedia.com/terms/f/financial-analysis.asp

Varsei, M., Soosay, C., Fahimnia, B., & Sarkis, J. (2014). "Framing sustainability performance of supply chains with multidimensional indicators" Supply Chain Management: An International Journal. https://doi.org/10.1108/SCM-12-2013-0436

Varsei, M., & Polyakovskiy, S. (2017). "Sustainable supply chain network design: A case of the wine industry in Australia". Omega, 66, 236-247. https://doi.org/10.1016/j.omega.2015.11.009

Venkataraman, V., Usmanulla, S., Sonnappa, A., Sadashiv, P., Mohammed, S. S., & Narayanan, S. S. (2019). "Wavelet and multiple linear regression analysis for identifying factors affecting particulate matter PM2" 5 in Mumbai City, India. International Journal of Quality & Reliability Management. https://doi.org/10.1108/IJQRM-06-2018-0150

Wang, J., & Dai, J. (2018). "Sustainable supply chain management practices and performance". Industrial Management & Data Systems. https://doi.org/10.1108/IMDS-12-2016-0540

Wang, Z., & Sarkis, J. (2013). "Investigating the relationship of sustainable supply chain management with corporate financial performance" International Journal of Productivity and Performance Management. https://doi.org/10.1108/IJPPM-03-2013-0033

Yuen, K. F., & Lim, J. M. (2016). "Barriers to the implementation of strategic corporate social responsibility in shipping" The Asian Journal of Shipping and Logistics, 32(1), 49-57. https://doi.org/10.1016/j.ajsl.2016.03.006

Zhu, Q., & Sarkis, J. (2007). "The moderating effects of institutional pressures on emergent green supply chain practices and performance" International journal of production research, 45(18-19), 4333-4355. https://doi.org/10.1080/00207540701440345

APPENDIX 1

Dimension 1: Sustainable Relationships with Suppliers

Visibility of engagement

Score1: No information or commitment to build sustainable relationships with suppliers.

Score 2: The company made reference to building sustainable relationships with its suppliers in its reports.

Score 3: The company is formally committed to establishing sustainable relationships with its suppliers.

Score 4: The company is formally committed to establishing sustainable relationships with its suppliers and to setting specific objectives.

Ownership of commitment

Score1: No information or no commitments / It is not clear who is responsible for the commitment of the company or to which parts of the company it applies.

Score 2: The commitment applies to the whole company, supported by the general management.

Score 3: The commitment applies to the whole company, supported by the general management. In addition, other employees are directly involved.

Score 4: The commitment applies to the whole company, supported by the general management. In addition, other stakeholders are involved.

Dimension 2: Integration of environmental factors with suppliers

Relevance of the engagement

Score 1: No information / No commitment

Score 2: The company's environmental requirements for suppliers are general and refer only to applicable laws or company environmental policies. Or: The company's environmental requirements vis-à-vis suppliers only address some of the relevant issues in the sector.

Score 3: The company's environmental requirements vis-à-vis suppliers meet the main relevant issues of the sector.

Score 4: The company's environmental requirements for suppliers address all relevant issues in the sector.

Implementation:

Score 1: No information / The company has not put in place significant measures to include environmental factors in the management of SC.

Score 2: The company has put in place measures to include environmental factors in the management of its SC.

Score 3: The company has implemented significant measures to include environmental factors in the management of its SC.

Score 4: The company has implemented many measures to include environmental factors in the management of its SC.

Dimension 3: Integration of social factors with suppliers

Coverage "coverage"

Score 1: No information / The company has not implemented significant measures to include social factors in the management of its CS.

Score 2: The company has allocated such measures to suppliers representing a limited part of the purchases / suppliers of the company.

Score 3: The company has allocated such measures to suppliers representing a significant portion of the company's purchases / suppliers.

Score 4: The company has allocated such measures to suppliers representing a significant portion of the company's purchases / suppliers as well as to indirect suppliers.

Implementation:

Score 1: No information / The company has not implemented significant measures to include social factors in the management of its CS.

Score 2: The company has implemented measures to include social factors in the management of its SC.

Score 3: The company has put in place important measures to include social factors in the management of its SC.

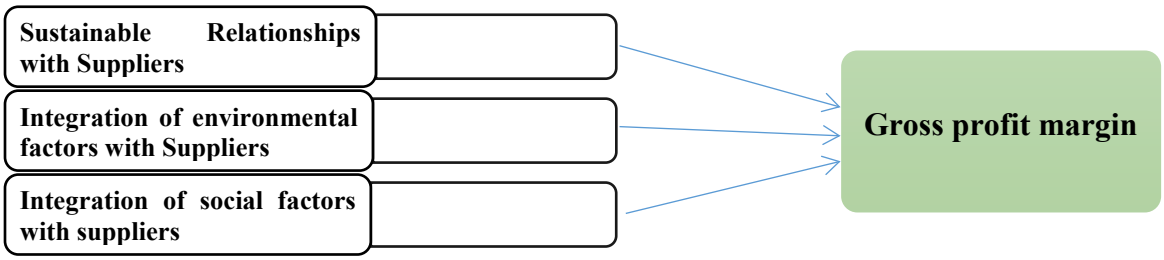
Score 4: The company has extensive measures in place to include social factors in the management of its SC.

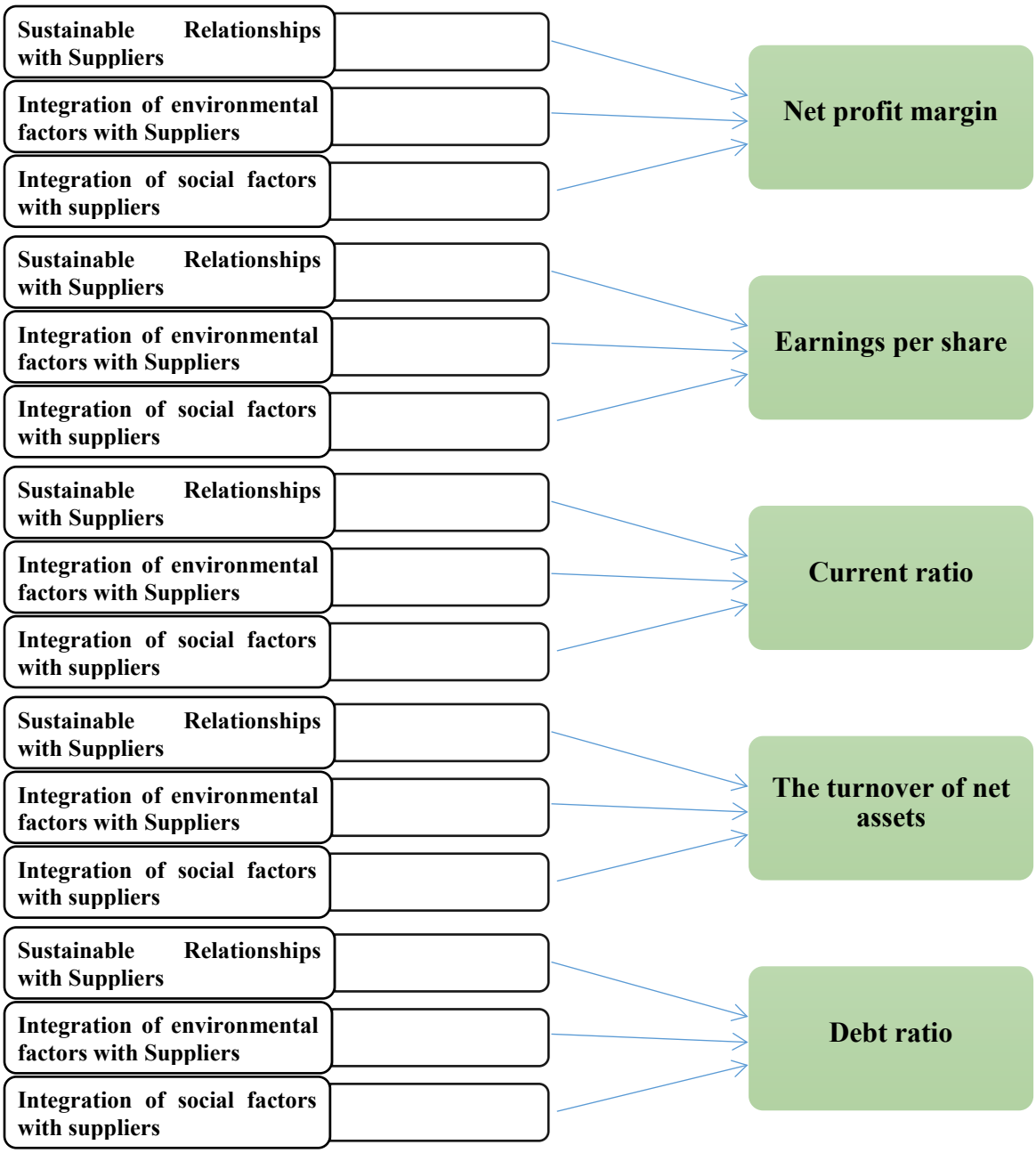
Financial Performance Measurement

Regarding the measurement of financial performance, we use the following ratios:

- VD1: Gross profit margin
- VD2: Net profit margin
- VD3: Earnings per share
- VD4: Current ratio
- VD5: The turnover of net assets
- VD6: Debt ratio

APPENDIX 2




Sustainable Relationships with Suppliers
Integration of environmental factors with Suppliers
Integration of social factors with suppliers
Net profit margin
Sustainable Relationships with Suppliers
Integration of environmental factors with Suppliers
Integration of social factors with suppliers
Earnings per share
Sustainable Relationships with Suppliers
Integration of environmental factors with Suppliers
Integration of social factors with suppliers
Current ratio
Sustainable Relationships with Suppliers
Integration of environmental factors with Suppliers
Integration of social factors with suppliers
The turnover of net assets
Sustainable Relationships with Suppliers
Integration of environmental factors with Suppliers
Integration of social factors with suppliers
Debt ratio