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performance: the role of supply chain  
controversies

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# **Boosting Sustainability and Financial Performance: The Role of Supply Chain Controversies**

## **Abstract**

In recent years, numerous scandals concerning working conditions in Asia have threatened the reputation of large companies like Wal-Mart and Inditex. Since such scandals call attention to activities harmful to sustainable development, it is very important to study the relationships between concerns for Sustainable Supply Chain Management (SSCM), sustainability, and organizations' market value. The added value of our study is, first, to explore SSCM controversies as drivers of or pressures for adopting and applying sustainability practices; and, second, to contribute to the recent but growing literature that analyzes the channels through which SSCM and sustainability practices influence the firm's value. We introduce sustainability Environmental, Social and Governance (ESG) practices as a mediator between SSCM controversies and market value to examine whether SSCM controversies with firms' stakeholders lead to improvements in the ESG dimensions of organizational sustainability. We also examine the relationships between the ESG dimensions and market value, measured as Tobin's Q ratio. The results confirm both the positive relationships of SSCM controversies to the ESG dimensions two years later and a positive relationship of the dimension of governance to Tobin's Q. We also confirm a negative and significant relationship between the social dimension and Tobin's Q, and a non-significant relationship of the environmental dimension to Tobin's Q.

**Key words:** Environment, Governance, Social sustainability, Stakeholder, Sustainable Supply Chain Management, Tobin's Q

## **1. Introduction**

Controversies in Sustainable Supply Chain Management (SSCM) can be defined as conflicts that organizations face with stakeholders because the organization's behavior throughout the supply chain damages environmental or social dimensions of sustainability (e.g., suppliers' labor exploitation, strikes, poor working conditions, pollution, destruction of natural habitats). The online fashion company ASOS and Marks and Spencer, for example, have faced SSCM controversies. As a recent BBC investigation affirmed, both firms' supply chains employed child workers who worked about 60 hours per week and were unable to attend school. At the same time, these firms exploited Syrian refugees escaping war and poverty. Both companies immediately knowledge that they had been unaware of these situations and affirmed their commitment to change: "we will do all we can to ensure that this does not happen again" (Forbes, 2016, p.2). Numerous controversies like these have forced firms such as Nike, Nestlé, Starbucks, Apple, and Mattel to implement or update their sustainability policies (Klassen and Vereecke, 2012; Kumar et al. 2012).

Stakeholder theory (Freeman, 1984, 2004; McWilliams and Siegel, 2001) proposes that managers should pay attention to any group or individual that may or does affect the purpose of an organization, as such a group can impede the firm's achievements (Freeman, 1984, p.52). As agents of social control, stakeholders who perceive that the firm is not undertaking appropriate actions will increase their skepticism and perception of the organization's hypocrisy, and controversies will emerge (Aouadi and Marsat, 2016; Du et al., 2010; Suchman, 1995). Controversies with stakeholders can thus increase the firm's operational risk, harm its reputation, decrease its present and future sales, and increase its costs (Klassen and Vereecke, 2012). Consequently, as observed in the examples of ASOS and Marks and Spencer, firms

react by improving their sustainability performance to reduce the damage, risk, and uncertainty of such controversies (Aouadi and Marsat, 2016; Klassen and Vereecke, 2012). According to previous research (Fombrun 1996; Fombrun et al. 2000; Klassen and Vereecke, 2012), since reputation is essential for firms' survival, organizations try not only to maintain public trust but also actively to get involved in actions to repair public reputation when it has been damaged by controversies. Reacting to such controversies by integrating sustainability into the firm's strategy in the way that stakeholders demand may enable organizations to generate competitive advantages (Hollos et al. 2012).

Despite the importance of integrating sustainability into the supply chain (Hall et al. 2011; Kumar et al. 2012; Mani et al., 2018; Taylor and Vachon, 2018) and the potential of SSCM controversies as stimuli for organizations, there is a gap in literature on the role of this stimulus in firms' sustainability and financial performance. Recent research (Aouadi and Marsat, 2016) has observed that general controversies such as executive board compensation, insider dealings, labor diversity, and product quality are not detrimental to financial performance if the firms have good corporate social performance (CSP). Further, although many scholars support a direct link between CSP and firm value (see Margolis and Walsh, 2003; Orlitzky et al., 2003; for meta-analysis), the results obtained in existing studies are contradictory, with different studies suggesting neutral (e.g., Garcia-Castro et al. 2010; Doh et al., 2010) positive (e.g., Aouadi and Marsat, 2016; Doh et al. 2010; Cai, 2011), or indirect (Surroca et al. 2010) effects. Only a few studies show negative impact (McWilliams and Siegel, 2001), due to the undesirable effect of social expenditures on shareholders.

In one of the most consistent reviews, Margolis and Walsh (2003) analyzed 109 studies on the relationship between CSP and CFP. Of them, 54 studies showed a

positive relationship, 20 reported mixed results, 28 obtained non-significant relationships, and 7 showed a negative relationship. Orlitzky et al., (2003) reinforces the positive relationship in a meta-analysis, confirming the influence of CSP on CFP. Finally, some studies argue contradictory results in the correlation between social and financial performance. Literature in the field thus shows that diversity of results can be attributed to different reasons: first, to lack of consistent, comparable and reliable instruments to measure CSP (García Castro et al. 2010); second, to the diverse control variables used by researchers (Aoudi and Marsat, 2016); third, to the distinction between short- or long-run financial effects (Surroca et al. 2010; García Castro, 2010); fourth, as in Aouadi and Marsat (2016), to divergent measures of financial performance, both accounting measures and market valuation proxies (García Castro, 2010); and fifth, to “missing variables,” such as R&D or advertising (Surroca et al.2010).An emerging strand of literature thus argues that the relationship between sustainability and firm value is indirect, mediated by variables such as reputation, celebrity, etc. (e.g., Surroca et al.2010).Although numerous studies have focused on analyzing the relationship between sustainability and firm value, literature that specifically tests the role SSCM controversies play in organizational success is minimal. Our research addresses this gap, focusing on the mediating effect of environmental, social and governance (ESG) sustainability practices in the relationship between SSCM controversies and firm value. We analyze whether the existence of SSCM controversies stimulates organizations and is thus related to organizations’ subsequent sustainability practices and financial performance. In particular, our research questions are twofold:

- Are SSCM controversies positively related to the ESG practices of organizational sustainability performance?
- Are the ESG practices of organizational sustainability performance positively

related to financial performance?

First, to analyze the impact of SSCM controversies on firms' sustainability, our study incorporates the three-dimensional measure of ESG: environmental, social and governance (Manescu, 2011; Galbreath, 2013). As Gimenez et al. (2012) point out, the literature lacks studies that examine all dimensions of sustainability simultaneously. Aouadi and Marsat (2016) identify the effect of specific categories of ESG controversy on financial performance as a future topic for research. Most studies focus on the environmental dimension, some examine the social dimension, and only a few focus on the social and the environmental dimensions together (Marshall et al. 2015; Taylor and Vachon, 2018) or on the governance dimension (Michelon et al. 2013). We thus currently have only a partial view of the effectiveness of SSCM strategy in the different sustainability dimensions (Sancha et al. 2015). Our study fills this gap by analyzing the three ESG dimensions simultaneously.

Second, to contrast the effectiveness of sustainability practices, this study analyzes these practices' relationship to Tobin's Q ratio as a measure of long-term financial performance (Flamer, 2013). Tobin's Q permits us to measure the influence of a firm's policies on its market value by incorporating both tangible and intangible aspects. The Tobin's Q ratio is well suited for measuring performance because the ESG indicators of sustainability are highly recommended for evaluating intangible assets (Ortas et al. 2015).

The main objectives of this study are to determine whether a positive relationship exists between SSCM controversies and the subsequent three dimensions of the ESG focus for measuring sustainability, and whether these dimensions are positively related to a firm's market value (Tobin's Q). For this purpose, data are drawn from two well-recognized databases—Sustainalytics and Compustat—and include 432 European

and US firms, with two observations (2008 and 2010). We use two years' time lag for SSCM controversies to observe the subsequent firms' reactions through the implementation and consolidation of their sustainability programs (ESG dimensions) and associated market value (Tobin's Q). Our results show that, when SSCM controversies arise in firms, they react by developing following environmental, social, and governance sustainability practices. Developing governance practices will improve market value, whereas social practices, in contrast, will negatively affect market value. Our results did not find a strong link between environmental practices and market value.

The article is structured as follows. Following this introduction, Section 2 presents the theoretical background and development of the hypotheses. Section 3 describes the methodology employed. The study's results are presented in the fourth section. Section 5 discusses the results, and Section 6 the study's main conclusions, limitations, and suggested future lines of research.

## **2. Theoretical background and hypotheses development**

### **2.1. SSCM controversies and ESG practices**

SSCM is one of the variables linked to operations management that has received considerable attention from academics and professionals in recent years. Since SSCM is defined as "the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from sustainable development into account which are derived from customer and stakeholder requirements" (Seuring and Müller, 2008, p.1700), stakeholders play a leading role in the SSCM actions that firms develop. Organizations' unethical behaviors in such activities as exploitation of workforce, child labor, environmental pollution, managerial bribes, or use of illegal raw materials may result in SSCM controversies with

stakeholders. In this paper, we define SSCM controversies as conflicts that organizations face with stakeholders because the organization's behavior throughout the supply chain damages the firm's environmental or social dimensions of sustainability.

If SSCM behavior does not address stakeholders' interests, controversies arise, negatively affecting the firm's value (Aouadi and Marsat, 2016). According to stakeholder theory, controversies increase stakeholders' skepticism about the firm, decreasing its credibility (Aouadi and Marsat, 2016; Du et al., 2010; Godfrey et al., 2009). For instance, Krüger (2014) demonstrates that investors have negative responses to controversies, especially regarding concerns with employees, environment, and communities. For this reason, the firm should thus react by developing actions and programs to repair the reputation damaged by controversies. According to Klassen and Vereecke (2012, p.110), "the critical challenge [for sustainability in firms] is to reduce uncertainty, improve responsiveness in the event of problems, and reduce the magnitude of any negative consequences." Fombrum et al. (2000) affirm that reputation capital is the primary reason to invest in sustainability. Controversies at an Apple supplier in China or Nike's working conditions have led the firms to react by implementing supplier audits to counteract public perception (Klassen and Vereecke, 2012). Firms' reactions must consider such issues as consumers' increasing awareness of sustainability issues (Adebanjo et al. 2016; Diabat and Govindan, 2011) and suppliers' sustainability preferences (Adebanjo et al. 2016; Lee, 2008). Sustainability actions and programs can reduce the damage caused by previous controversies in terms of reputation, sales figures, risks, and costs. Next, we describe the three ESG dimensions and hypothesize that they are valid options for organizations to improve their sustainability orientation following previous SSCM controversies.



First, environmental management enables the firm to recover from possible damage derived from SSCM controversies because stakeholders value environmentally friendly programs greatly. Customers and other stakeholders have significantly increased their environmental expectations for the supply chain. As the demand for environmentally-friendly products and willingness to pay a higher price for them have gained importance (Altmann, 2015), firms are obliged to integrate the environmental interests of customers and other stakeholders. Ageron et al. (2012) indicate that stakeholders such as government institutions or NGOs can require companies to meet specific conditions for SSCM. Organizations that have faced important controversies with their SSCM stakeholders may choose to implement sustainable environmental programs and actions to reduce present and future associated risks (e.g. reputation damages). For instance, organizations can require suppliers to provide them with environmentally friendly materials (certified by the ISO 14001 standard) or to implement an Environment Management System (EMS) (De Giovanni, 2012; Mitra and Datta, 2014). Given the foregoing, we propose the following hypothesis:

*H1a: SSCM controversies are positively related to following environmental sustainability practices.*

Second, firms may activate social practices to reduce the negative impact of SSCM controversies. Consumers and society in general require the firms they buy from to have good social behavior, and they can boycott firms that do not comply (Altmann, 2015). Supply chain scandals due to labor exploitation, child labor, or deaths due to the collapse of buildings in Asian countries have negatively affected textile industry brands such as H&M, Zara, and Primark. These examples lead firms to seek solutions to respond to stakeholder expectations and develop sustainability strategies, avoiding

further damages for firms. Members of business associations can also pressure other members to conform to the pattern of social performance prevailing in their association (Besser, Terry, and Miller, 2011). Organizations may require their suppliers to meet a series of standards for working conditions and child labor (Luo and Zheng, 2013). Firms may also implement internal practices to improve employee motivation and satisfaction (Gualandris et al. 2014; Pagell and Gobeli, 2009) by enabling employees to work in a company with a clear social orientation (Sancha et al. 2015), reducing the negative impact of SSCM controversies. We thus propose the next hypothesis:

*H1b: SSCM controversies are positively related to following social sustainability practices.*

Finally, another potential strategy to minimize the damage from SSCM controversies involves the dimension of governance. Managers must avoid developing unethical practices such as bribery, corruption, or lack of independence in decision-making, any or all of which can cause problems with stakeholders and compound the reputational damage derived from previous SSCM controversies. Unethical behavior can lead stakeholders to boycott firms (Altmann, 2015), as in the case of the recent charges brought against Volkswagen for the automobile pollution scandal (*The New York Times*, 2015). In 2009, Greenpeace denounced brands such as “Adidas, Clarks, Nike, Reebok, and Timberland [for] sourcing leather from illegally deforested areas of Brazil, with the complicity of the Brazilian government, which was bankrolling the process” (Vurro, Russo and Perrini, 2009). To react to these controversies, firms often adopt codes to respond to or prevent reputational damage caused by the perceptions of different stakeholder groups (Sobczak, 2006). Other examples of such responses are practices connecting managerial compensation to sustainability or management policies

that fulfill SSCM objectives. Based on the foregoing, we propose the following hypothesis:

*H1c: SSCM controversies are positively related to following governance sustainability practices.*

## **2.2. ESG practices and financial performance (Tobin's Q)**

The first aspect of ESG to consider is the *environmental sustainability dimension*. Sustainable environmental practices can be associated with good financial performance (Siegel, 2009) for different reasons (see Table 1).

“Insert table 1 about here”

The first is an organization's ability to reduce air emissions, effluent waste, and solid wastes, and to decrease consumption of hazardous and toxic materials, thereby reducing costs associated with production and waste management, and fines incurred by failing to meet regulations. Second, having the reputation of an environmentally responsible organization can reduce the negative effect of environmental accidents in market evaluation of the firm (Doh et al. 2009; Godfrey et al. 2009) and benefit long-term support and relationships with a wide range of interested parties, including employees, customers, suppliers, communities, and investors (Delmas, 2001; Delmas and Montiel, 2008; Freeman, 1984). Studies by Orlitzky et al. (2003), Brammer et al. (2006), and Callan and Thomas (2009) analyze how sustainable environmental practices affect stock prices, either directly through efficient utilization of human and material resources, or indirectly through a positive image with customers, suppliers, and the community. Other studies relate sustainable environmental practices positively to financial performance (Lai and Wong, 2012; Siegel, 2009), particularly by measuring

financial performance with Tobin's Q ratio (Guenster, Bauer, Derwall and Koedijk, 2011). We therefore formulate the following hypothesis:

*H2a: Environmental sustainability practices are positively related to Tobin's Q ratio.*

As Attig, El Ghouli, Guedhami and Suh, (2013) stress, the different studies on the relationship between social sustainability practices and improvement of financial performance do not provide conclusive results (e.g., Erhemjamts et al. 2013; Margolis and Walsh, 2003; Margolis et al. 2008). Despite lack of consensus, many studies stress the ways in which investment in social practices can benefit firms financially. Baron, Harjoto and Jo (2011) establish a transversal relationship between corporate social practices and market value. Investment in social actions can be valued positively in capital markets (Graff and Small, 2005), since investors may appreciate a firm's social activities and be willing to pay a premium for its actions. Investors may also shun firms with bad social practices. Research analyzes how customers who value social performance and are motivated by the bid for socially conscious investments choose these firms over their competitors (Barker and Sinkula, 2005). Along similar lines, participation in social initiatives can lead firms to develop new and valuable technologies that provide financial and social advantages over existing processes (Porter and Van der Linde, 1995). Social investment protects organizations' reputation against the effects of legitimation from negative events (Godfrey et al. 2009). We thus formulate the following hypothesis:

*H2b: Social sustainability practices are positively related to Tobin's Q ratio.*

The global economic climate has led firms to focus on the tangible compensation they return to their different interest groups. This focus requires firms to consider

whether the bid for sustainable governance improves relations with stockholders and increases the organization's market value. The governance dimension includes such issues as committee independence, accountability, corruption, bribery, presentation of reports and disclosure, and protection of stockholders (Galbreath, 2013). Organizations' bid for governance initiatives related to the goals of their managers, or top executives encourage the firm's long-term competitiveness and financial performance (McWilliams and Siegel, 2001; Porter and Kramer, 2006; Melo and Garrido-Morgado, 2011). Sustainable governance initiatives that give priority to the different strategic interests of managers and top executives, especially those involving investments, create potential for the future growth of a firm (Fombrun et al. 2000).

Governance practices that improve the ethical aspects of the governing board (e.g., conduct codes, tax transparency, CSR reporting, or board independence) can stimulate investors' actions positively. Decisions oriented to interest groups' preferences can also influence the firm's market value (Falck and Heblich, 2007; Orlitzky et al. 2003; Michelon et al. 2013). We therefore formulate the following hypothesis:

*H2c: Governance sustainability practices are positively related to Tobin's Q ratio.*

Figure 1 integrates how the hypotheses are related in the research model.

“Insert Figure 1 about here”

### **3. Method**

#### **3.1. Sample and Data**

Our sample of US and European firms was constituted by merging data from the Sustainalytics data base to measure sustainability practices, and from Compustat's North America and Europe records to measure corporate financial performance using Tobin's Q. Our final dataset is a combination of Sustainalytics and Compustat data for

432 firms, with two different observations for each firm in the years 2008 and 2010. First, we randomly selected 500 firms from the Sustainalytics database. Then, we retrieved financial data from the Compustat database for these 500 firms. We excluded observations with missing data in any database for all variables included in the model, obtaining a sample of 432 firms.

Although the analysis performed focuses on single firms, it is necessary to clarify two issues. First, the supply chain context is a given, since we are analyzing SSCM controversies involving these firms. Although the unit of analysis is each organization, what is measured by the variable “SSCM controversies” is these organizations’ behavior within their inter-organizational chains or networks. This approach justifies inclusion of the supply chain context in this study. Second, Sustainalytics’ DB precisely does not focus on single firms but includes information on the main stakeholders: environment, community, customers, employees, suppliers, business ethics, and corporate governance. Our study focuses on the category “suppliers.” Next, each subcategory is analyzed from four perspectives (public information, strategy and policies, management systems, and results and measurement), which permits us to develop a more complete and objective image than that provided by other methods that focus on a single firm only, such as questionnaires. Finally, firms and their behaviors with stakeholders are analyzed by local research partners, using a consistent methodology to rate them.

In studying the effect of SSCM controversies on sustainability practices and financial performance, we lag SSCM controversies by two years, using 2008 observations for SSCM controversies and 2010 observations for sustainability practices (ESG dimensions) and financial performance (Tobin’s Q). As in other studies (Hart and Ahuja, 1996; Callan and Thomas, 2009), we lag SSCM controversies by two years to

give time for their effect to be reflected in the firm's sustainability performance and market value. Since sustainability activities and programs—environmental management systems, green supply chain management, improving employees' working conditions, social reputation, shareholder group affiliation, board independence, and composition, among others—require time to be implemented and consolidated in organizational routines, we must take into account the influence of time. Further, including a two years' time lag between our independent and dependent variables mitigates the likelihood of bias that could arise from reverse causality (Eccles and Viviers, 2011) and endogeneity (Rust, Moorman and Dickson, 2002; Luo and Bhattacharya, 2006).

We analyze firms following the GICS methodology, commonly accepted as an industry analysis framework for investment research, portfolio management, and asset allocation. The GICS classification system currently consists of 10 sectors, 24 industry groups, 67 industries, and 147 sub-industries. According to this classification, the 432 firms included in our study are distributed as follows: 62 firms belong to Consumer Discretionary (14.35%), 33 to Consumer Staples (7.64%), 28 to Energy (6.48%), 98 to Financials (22.69%), 37 to Health Care (8.56%), 70 to Industrials (16.20%), 41 to Information Technology (9.49%), 27 to Materials (6.25%), 14 to Telecommunication Services (3.24%), and 22 to Utilities (5.09%).

By country of origin, our sample is composed of US and European firms. Of these, 231 are located in the US (53.47%) and 201 in Europe (46.53%). In the European sample, 71 firms are in the United Kingdom (16.44%), 33 in Switzerland (7.64%), 23 in Spain (5.32%), 18 in Sweden (4.17%), 15 in The Netherlands (3.47%), and 14 in Italy (3.24%). The rest of the sample (27, 6.25%) is distributed among Austria, France, Germany, Greece, Ireland, Norway, and Portugal. Approximately 21.52% of the firms have 5,000 or fewer employees, 17.82% have 5,001 – 10,000 employees, 14.81% have

10,001 – 20,000, 22.22% have 20,001 – 50,000, and 23.61% have more than 50,000. Of the sample firms, 23.14% reported annual revenues of 2.5 million Euros or less and 20.37% had annual revenues of 2.5 – 5 million Euros. Firms with annual revenues of 5 – 10 million Euros comprised about 16.20% of the final sample, firms with 10 – 20 million Euros, 16.20%; firms with 20 – 50 million Euros, 15.74%; and approximately 8.33% with 50 million Euros.

## **3.2. Measures**

### **3.2.1. SSCM controversies**

To measure SSCM controversies, Sustainalytics' analysts identify concerns and assess an organization's reputation among stakeholders based on these concerns. Since our study focuses on supply chain context, we measured SSCM controversies by a formative construct uniting three indicators that include the level of controversies and incidents related to Contractors and Social Supply (e.g., poor labor standards, health and safety concerns, use of child or forced labor, freedom of association, and strikes and lockouts); Operations, Products, and Services (e.g., pollution caused by the company's operations, fines and incidents related to poor environmental practices, waste management, toxic emissions, or environmental damage to ecosystems); and Contractors and Environmental Supply Chain (e.g., excessive emissions, spills, deforestation, destruction of natural habitats, or lack of environmental standards). Higher indicator values mean that a firm generates many controversies and incidents. To calculate our measure, following Surroca et al. (2010), we take the raw scores from the Sustainalytics database for each indicator and reformulate each item on a five-point Likert scale where 0 = non-existent, 1 = below the median, 2 = median level, 3 = above the median, and 4 = maximum. This measurement overcomes the limitations of previous measurements (e.g., Aouadi and Marsat, 2016) for controversies that used



dummy variables (1=presence; 0=absence). As a complement, we estimated the model without performing the transformation that is, keeping the original scale from 0 to 100. Since the values obtained show the same results for the hypotheses, the transformation does not significantly affect the conclusions (Controversies-Environment  $\beta=0.087^{**}$ ; Controversies-Social  $\beta=0.077^*$ ; Controversies-Governance  $\beta=0.087^{**}$ ; Environment-Tobin  $\beta=0.001$ ; Social-Tobin  $\beta=-0.102^{**}$ ; Governance-Tobin  $\beta=0.096^{**}$ ).

The recommendations for using formative constructs suggest this type of construct to measure SSCM controversies. According to Braojos et al. (2015) and Petter et al. (2007), formative constructs are preferable if (1) changes in indicators of formative constructs lead to changes in these constructs, and not the reverse (as in the case of reflective constructs); (2) indicators are not conceptually interchangeable because their content is not similar; and (3) indicators do not have to co-vary with each other. The indicators of the three different types of controversy fulfill these recommendations, recommending use of a formative construct.

### **3.2.2. Sustainability practices: ESG dimensions**

We measured sustainability practices by disaggregating sustainability into three variables (ESG), following the Sustainalytics database (and the Global Reporting Initiative—GRI). ESG ratings provide a direct measure of sustainability practices at the company level as defined by indicators of management competence, risk management, and non-financial performance. Despite the importance of the three dimensions of ESG, according to the United Nations Environment Program Finance Initiative and Mercer Investment Consulting (2007), 85% of scholarly studies analyze a single dimension of ESG, while others study their effect simultaneously. To overcome this limitation, our study simultaneously analyzes the three ESG dimensions individually, solving the problems of aggregation noted by other researchers (Graafland, Eijffinger and

Smidjohan, 2004; Surroca et al. 2010). Each indicator yields an overall score assessing the organization's ESG practices respectively. The scores are reported on a 0–100 scale.

*a. Environmental Sustainability Practices*

To measure environmental practices, we used the rating from the Sustainalytics database, which provides an aggregate indicator related to different sections on the environment, such as environmental and purchasing policies and systems, external certifications, emissions levels, programs to reduce emissions and to report, environmental fines, use of renewable energies, and waste reduction.

*b. Social Sustainability Practices*

Social practices were measured using an aggregate indicator provided by the Sustainalytics database, which includes various social issues related to the company's stakeholders—such as employees, contractors, customers, society, and community—due to companies' putting into practice and disclosing socially responsible measures to avoid discrimination, increase workforce diversity, reduce labor risk, eliminate activities in sensitive countries, implement activities promoting local development, or prepare policies and systems to satisfy customers.

*c. Governance Sustainability Practices*

We used the Sustainalytics database to measure governance practices through an aggregate indicator that includes issues related to business ethics and corporate governance. These issues include conduct codes, tax transparency, CSR reporting, compensation of managers, board independence, and political contributions.

### **3.2.3. Corporate financial performance**

To analyze the benefits of sustainability practices, we relate them to Tobin's Q as a variable for measuring financial performance. Used frequently in the scholarly literature to measure financial performance based on market value (Cai, 2011; Choi and

Wang, 2009; Erhemjamst et al. 2013; García-Castro, 2010), Tobin's Q shows the ratio of the firm's market value to its value in the accounting record and the cost of replacing firm assets. Like other authors, we calculated Tobin's Q by dividing the total market value by the total asset value. Firms whose Tobin's Q is higher than 1 attract investors' attention, since the market value of their investment is greater than its cost; a Tobin's Q below 1 discourages investors from investing in a firm. The ratio thus reflects the premiums or discounts that the market provides for managing firms' policies. Tobin's Q also measures the incentives for making additional capital investments in the firm (Lenox, Scott and Lewin, 2010).

### **3.3. Measurement model validation**

To estimate both the measurement and structural models, we employ partial least squares (PLS)-based structural equation modeling (SEM), with Smart PLS 3 software for the estimations. PLS is a variance-based estimation technique used in prior operations management research (e.g., Peng and Lai, 2012). A full-fledged SEM approach that can test for exact model fit, PLS provides consistent estimations and runs successfully in prediction-oriented research (Benitez-Amado et al. 2016; Henseler et al. 2016). Since our analysis includes discrete variables, searches for prediction, and collects independent equations to be estimated simultaneously, it is suited to the features of PLS (Gualandris and Kalchschmidt, 2016; Peng and Lai, 2012). PLS is preferable to covariance-based SEM techniques if formative constructs are used (as in our case) because the latter may lead to identification problems (Braojos et al. 2015; Chin, 1998). Use of PLS is increasing, and similar recent operations management studies have employed it successfully for their analyses (Blome et al. 2014; Gualandris and Kalchschmidt, 2016). Table 1 provides the descriptive statistics of the variables

analyzed.

“Insert Table 2 about here”

Different steps are required for validation of formative constructs than for reflective constructs (i.e., Cronbach’s alpha, composite reliability, and average variance extracted) because validation techniques for the latter do not fit formative constructs properly (Braojos et al. 2015; Peng and Lai, 2012). For the measurement model, content validity must be assessed first. As described above, Sustainalytics and Compustat are well-recognized databases that guarantee reliable and expert analyses. The three types of controversy are clearly oriented to the supply chain, unlike controversies belonging to other categories in the database. The fit of these indicators to the SSCM controversies construct was confirmed by other previous research and by consulting two top managers who assessed the construct’s content validity positively. The same procedure was used to confirm the ESG indicators and Tobin’s Q as suitable measures for corporate sustainability practices and corporate financial performance, respectively. Second, we observe multi-collinearity through the variance inflation factors (VIFs). VIFs higher than 10 indicate serious problems of multi-collinearity in the measurement model (Petter et al. 2007). In our model, all VIFs ranged from 1.070 to 2.016, suggesting that multi-collinearity is not a threat in our measures. Finally, we check the weights and loadings for our constructs (Braojos et al. 2015; Petter et al. 2007). Weight shows the relative contribution of an indicator to a construct, while loading refers to its absolute contribution, or the bivariate correlation between indicator and construct (Cenfetelli and Bassellier, 2009). To estimate weights, loadings, and path coefficients, PLS includes the bootstrapping technique. Although the minimum recommended number of subsamples for use with this procedure is 200, we follow previous studies (Braojos et al. 2015; Chin, 1998) and run a bootstrap analysis with 500 subsamples. According to Cenfetelli

and Bassellier (2009), to retain an indicator in formative construct, either its weight must be significant or, if weight is non-significant, its loading must be significant. Since all indicators have significant loadings for our formative construct (SSCM controversies) (see Table 2), both the formative construct and the measurement model are acceptable.

“Insert Table 3 about here”

## **4. Results**

### **4.1. Structural model**

A consistent PLS estimation was used to analyze the structural model. The results of the structural analysis are shown in Figure 2. First, we find that SSCM controversies are significantly and positively related to the ESG dimensions of sustainability. The path coefficients are environmental ( $\lambda=0.156$ ;  $t\text{-value}=3.585$ ), social ( $\lambda=0.172$ ,  $t\text{-value}=3.549$ ), and governance ( $\lambda=0.173$ ,  $t\text{-value}=3.751$ ), with  $p<0.000$ . Hypotheses H1a, H1b, and H1c are thus accepted. Second, since the environmental sustainability dimension is not significantly related to Tobin’s Q, we cannot verify H2a. In H2b, the results are contrary to those expected. The social dimension of sustainability is negatively related to Tobin’s Q ( $\lambda=-0.102$ ,  $t\text{-value}=1.872$ ). The governance sustainability dimension is positively related to Tobin’s Q ( $\lambda=0.089$ ,  $t\text{-value}=1.971$ ), supporting H2c. Finally, the relationships of both control variables (firm size and continent of origin: US or Europe) to the governance dimension and to Tobin’s Q were non-significant. For both control variables, the relationships are significant for the social and environmental dimensions. Thus, firms located in the EU and larger firms develop their social and environmental programs further than US and smaller firms. These results open a new line of research to identify contextual factors that describe the sustainability behavior of firms.

To analyze the model's explanatory power, we observe the path coefficients, their significance level, and the  $f^2$  and  $R^2$  values (Benitez-Amado et al. 2016). Path coefficients of around 0.20 are considered as economically significant. In our model, the coefficients of the relationships between SSCM controversies and ESG dimensions are around 0.20, and all are significant. Path coefficients for the significant relationships between ESG dimensions and Tobin's Q value are around 0.1. The  $R^2$  values for the ESG dimensions are  $R^2=0.192$  for environmental,  $R^2=0.142$  for social, and  $R^2=0.05$  for governance;  $R^2=0.017$  for Tobin's Q. These results show that the relationships between SSCM controversies and ESG dimensions have higher predictive quality for the environmental and social dimensions, and lower predictive quality for the governance dimension and Tobin's Q. Additional variables should thus be considered in future research. The  $f^2$  values for the suggested relationships in our model are included in Table 3. According to previous studies (Benítez et al. 2016; Henseler and Fasot, 2010), the effect size of our relationships—that is, the relative size of each relationship in the model—can be categorized as large for ESG dimensions and small for Tobin's Q. Finally, to evaluate goodness of structural model fit, we observe the standardized root mean squared residual (SRMR), which shows the discrepancy between the sample covariance matrix and the model covariance matrix. In our model,  $SRMR=0.031$ , a value above the maximum recommended (0.08) (Henseler et al. 2014) that suggests good fit of the structural model.

“Take in Figure 2”

“Insert Table 4 about here”

## 4.2. Additional analyses

To complete the foregoing analysis, we analyzed the mediating effect of the

three ESG dimensions for the relationship between SSCM controversies and Tobin's Q. According to the decomposition of effects methodology (Rhee, Park and Hyung Lee, 2010), the total effect of an independent variable on a dependent variable can be disaggregated into its indirect and direct effects. If a significant indirect effect exists, a significant part of the relationship between dependent and independent variable is explained through this mediating variable. First, our results show that the direct relationship of SSCM controversies to Tobin's Q is non-significant ( $\lambda=-0.034$ ,  $t$ -value=0.530). With regard to indirect effects, Hypotheses H2a and H2b were not supported, but H2c was. Consequently, our results confirm only the mediating effect of governance practices for the relationship between SSCM controversies and Tobin's Q.

To observe the effect of time lag on our research, we estimated an additional model without lagging any variable. This alternative model includes the relationships observed in the same year. The results show that none of the relationships between SSCM controversies and ESG dimensions is significant (Environmental  $\lambda=0.060$ ,  $t$ -value=0.950; Social  $\lambda=0.018$ ,  $t$ -value=0.315; Governance  $\lambda=0.063$ ,  $t$ -value=1.031). The relationships between the ESG dimensions and Tobin's Q do not differ from those in the original model, confirming its robustness (Environmental  $\lambda=-0.027$ ,  $t$ -value=0.715; Social  $\lambda=-0.102^*$ ,  $t$ -value=1.930; Governance  $\lambda=0.089^*$ ,  $t$ -value=1.880).

In addition, to confirm the robustness of our model, we followed Rhee et al. (2010). We also estimated an alternate model that included the ESG performance measures as exogenous rather than mediating variables. The SRMR fit index of this alternate model had less exploratory power (SRMR=0.044), confirming the suitability of our original model.

Finally, the time frame analyzed includes the years of the global economic/financial crisis, which could affect the performance of some organizations

and thus condition our results. For example, Brandenburg (2016) identifies a change in the trend of production indices in the automotive industry in 2008, an enormous downfall in 2009, and a significant recovery in 2010. We therefore performed a multiple linear regression analysis with dummy variables for the years 2008-2012, taking Tobin's Q as dependent variable. The results show no significant relationships between any of the years examined and Tobin's Q (see Appendix).

## **5. Discussion**

### **5.1. SSCM controversies and ESG dimensions**

This study shows, first, that SSCM controversies are positively related to the ESG dimensions of sustainability two years later. These results advance the minimal prior literature that addresses the role of controversies in the supply chain and how they affect organizational sustainability. Previous supply chain literature has analyzed the role of stakeholder pressure and sustainability performance in organizations (e.g., Adebajo et al. 2016; Zhu and Sarkis, 2006). For instance, Zhu and Sarkis (2006) obtain mixed results when analyzing the role of ecological pressures and green supply chain practices to performance in Chinese manufacturing firms. Our results empirically support the theoretical proposals of these previous researches, although it is important to clarify that both concepts are not exactly equal, since controversies do not always generate stakeholder pressure. We defined controversies as conflicts that organizations face with stakeholders because the organization's behavior throughout the supply chain damages the environmental or social dimensions of sustainability, whereas pressures are normative forces by stakeholders to adopt certain practices (Adebajo et al. 2016; Scott, 1995). Organizations can face controversies without suffering any pressure from stakeholders. Our results show that firms may implement or advance their sustainability



programs without necessarily receiving additional pressures that can further damage the firm's value and reputation.

Second, our results also contribute to stakeholder theory (Freeman, 2004; McWilliams and Siegel, 2001) by indicating that SSCM controversies with organization stakeholders stimulate implementation of sustainability practices. Our study supports the theoretical approach that presents stakeholders as agents of social control, since stakeholders' skepticism and the company's lower credibility push the firm to develop sustainability practices (Aouadi and Marsat, 2016; Du et al., 2010). We thus corroborate the necessity of focusing on stakeholder management, such as customers' needs (Altmann, 2015) or the demands of different stakeholders' (Mathiyazhagan et al. 2014); and of reacting properly whenever required. According to our results, higher levels of controversy are related to higher levels of following sustainability practices, and lower levels of controversy to lower levels of sustainability practices. This situation highlights both the importance of controversies as an alert-response system for organizations and the potential risk of accommodation in firms that do not suffer these controversies. Regardless of their negative connotation, bad image, or social irresponsibility, SSCM controversies may have positive consequences for sustainability through activation of ESG sustainability practices. This conclusion makes an important contribution to stakeholder theory, since it proposes the need for stimuli from stakeholders to implement sustainability practices. This conclusion supports a reactive orientation of SSCM. Our results, in contrast, do not show that sustainability actions are developed significantly in the absence of controversies, a phenomenon that would correspond to a more proactive orientation (Ageron et al., 2012).

Third, in a complementary way, the results of our study also contribute to

legitimacy theory, which proposes that legitimacy is fundamental to ensuring long-term success (Suchman, 1995). Controversies challenge organizational legitimacy (Palazzo and Scherer, 2006), and our results show that firms opt to improve their sustainability performance significantly when there are SSCM controversies. They do so in response to stakeholders' demand, satisfaction of which will improve their competitive position (Hollo et al., 2012).

Fourth, it is important to mention the influence of time in this study. Our additional analyses show no significant relationship between SSCM controversies and ESG dimensions in the same year. As in previous studies (Hart and Ahuja, 1996; Callan and Thomas, 2009), time is necessary to implement and develop the sustainability policies. Our case lags the SSCM controversies by two years. Due to limitations on availability of data, different lags were not analyzed. Future research could address this issue and test the evolution of controversies and the practice of following sustainability strategies over time.

Finally, our results confirm a relationship between SSCM and sustainability from the multidimensional ESG perspective. According to Marshall, McCarthy, Heavey and McGrath (2015), Taylor and Vachon (2018) or Sancha et al. (2015), most prior studies found positive relationships when observing the environmental dimension only. Some obtained this result when analyzing the social dimension, and very few analyzed both dimensions simultaneously. Our results advance this line of knowledge, showing a three-way, positive relationship between SSCM and sustainability. This finding yield an important new insight: a positive relationship to the governance dimension. From the social and environmental perspective, our results reinforce the few studies that have analyzed these relationships, such as Gimenez and Sierra (2013) for the environmental dimension, Sancha et al. (2015) for the social dimension, and Gimenez et al. (2012) for

both. These studies use questionnaires to obtain data, with the attendant subjectivity and limitations. Our data thus grant more robustness to this literature.

## **5.2. ESG dimensions and financial performance**

According to Garcia-Castro (2010), most studies explain the existence of a causal link between CSP and CFP, but the relationship is still not well established in the literature. Some of the results found in previous research change, and some are even reversed when endogeneity is properly considered. García Castro et al. (2010) argue that this diversity of results is motivated by endogeneity problems and recommend that researchers improve the ways of handling this problem, providing “alternative and innovative ways to deal with the endogeneity of social strategic decisions” (p. 122). We thus include a two-year time lag between our independent and dependent variables to mitigate the likelihood of bias that could arise from endogeneity (Luo and Bhattacharya, 2006; García Castro et al., 2010). In so doing, we solve possible problems of endogeneity and provide a reliable analysis of the effect of supply chain management controversies on the ESG-CFP relationship.

Most studies included in Table 1 recommend that scholars continue to research the relationship between CSP and CFP to overcome the limitations of prior studies by analyzing the effect of new variables (García Castro et al.2010), by studying the effect of specific categories of ESG controversies on financial performance (Aouadi and Marsat, 2016) or by providing further exploration of the role of each stakeholder group on a conceptual level (Choi and Wang, 2009). We have responded to the recommendation for future research and added value in the literature by considering stakeholders’ controversies as an antecedent of ESG likely to be related to high levels of CSP. Specifically, we have analyzed the supply chain controversies and their influence

on the relationship between CSP and CFP.

Our results show that only governance practices are positively related to financial performance. This result confirms that investment in policies that improve the ethical aspects of the governing body and decisions oriented to interest group preferences can help to increase a firm's market value. Our findings acquire greater importance because the governance dimension is not usually included in studies of sustainability, as the databases most frequently used (e.g., KLD) do not evaluate the aspects usually included in the literature, such as structure of committee independence, accountability, reporting and disclosure, and shareholder rights. Additionally, our analysis shows how governance dimension mediates the relationship between SSCM controversies and Tobin's Q. Thus, being involved in SSCM controversies does not improve financial performance — Tobin's Q — per se. Rather, these controversies must be linked to governance policies within firms; only thus are they related to financial improvements.

As to the environmental dimension, our results did not find a strong link between environmental practices and financial performance. This finding is consistent with other studies suggesting that profitability can be eroded by the higher cost of environmental initiatives, or even that the effects of environmental strategy on economic results are insignificant (Gilley, Worrell, Davidson and El-Jelly, 2000). Some meta-analyses that aggregate results from individual studies have concluded that environmental practices and financial performance are weakly related (Margolis and Walsh, 2003; Orlitzky et al. 2003). Our research provides direction for new studies that analyze the environmental dimension individually in the SSCM context.

Contrary to expectations, our results confirm a negative relationship between social practices and financial performance. This result provides some continuity to the

line of inquiry in the literature (Ioannou and Serafeim, 2011; Orlitzky, 2013) that identifies numerous contingencies explaining significantly divergent results on the relation between social sustainability practices and financial performance. These contingencies include differences in sampling, contextual factors, firm size, industry, economic conditions, and regulatory environment (Peloza, 2009). Other authors found a negative influence of social sustainability on financial performance (Brammer et al. 2006; Lopez, García and Rodriguez, 2007). For example, when social sustainability practices are measured by the commercial practices of firms in South Africa (Meznar, Nigh, and Kwok, 1994), the relationship has a negative tendency. When social performance is measured as mutual fund screens, the relationships are equivocal. Our study shows that markets value social practices negatively (expressed as firm value). The market does not compensate firms with higher social indices of ESG by granting higher evaluations; rather, the reverse is true. This result may be due to the so-called trade-off hypothesis (Vance, 1975), which asserts that implementation of social programs within and from a firm involve investments and costs that investors do not identify positively with maximization of shareholders' wealth—a firm's main objective (Friedman, 1970). Such firms are thus compensated by a lower expected return from investors. Introducing social programs and measures can increase manufacturing costs, for example, due to increase in adaptation and production time after the implementation of certain safety measures or problems in managing production lines that can arise after introducing flexible working hours (Gimenez et al. 2012). This type of measure could reduce some productivity ratios in the short term and be perceived by investors sensitive to it, reducing the firm's attractiveness on the market.

To conclude, the variety of these results—a positive relationship for the dimension of governance, a non-significant one for the environmental dimension, and a

negative one for social dimension—explains perfectly the controversy associated with the sustainability and financial performance debate in literature. Further, our study advances the literature by studying mediating variables (the specific ESG dimensions) that can affect the relationship between sustainability and firm value, measured as SSCM controversies and Tobin's Q, respectively.

As to managerial implications, this research clearly reaffirms the importance of being sensitive to SSCM controversies and responding to stakeholders properly for the firm's development of organizational sustainability and market value. This study enables us to recommend that managers make strategic decisions to improve their ESG performance when facing controversies generated by the firm. They should work to satisfy stakeholders and shareholders by undertaking investments that improve their ESG. For instance, they could develop programs to improve organizational culture, such as strengthening processes of transparency in their board of directors or conduct codes as these actions will improve their market value due to investors' interest. Managers should pay attention so that they can perceive whether the market places positive value on the fact that firms with controversies react positively and strategically, carrying out measures that improve their ESG performance. An orientation to interest groups can develop resources and capabilities that generate competitive advantages, which are key in responding to controversies (Ageron et al. 2012; Altmann, 2015). It is important to note, however, that our study analyzes controversies associated with SSCM. As mentioned above, these controversies generate a response from a company's perspective, a reactive orientation. Achieving differentiation or advantage only by responding to stakeholders' controversies may be insufficient. This reactive focus, which establishes minimums to compete, must thus be accompanied by actions that permit a firm to differentiate itself and obtain competitive advantage. The two focuses

are complementary, and both are needed to obtain competitive advantages.

The results obtained from analyzing the relationship between social practices and financial performance reveal the difficulty managers encounter when making decisions that improve their companies' social dimensions, as managers are unable to assess the advisability of orienting their companies' policies in this direction (McWilliams and Siegel, 2001). Managers may limit their investment in social strategies for fear of undermining financial performance, creating unnecessary social damage. Further, in an effort to capitalize on popular feeling, they may overinvest in social strategies and damage shareholder evaluation.

## **6. Conclusion and future research**

This investigation concludes that higher levels of SSCM controversy are beneficial for corporate sustainability. These controversies increase firms' sustainability practices (ESG) two years later. This conclusion contributes to the SCM literature by describing a reactive sustainability orientation that may benefit firms' relationships with stakeholders. This study also contributes to the literature by showing that a firm's investment in responsible policies related to corporate governance has a positive impact on its Tobin's Q. Additionally, our results show that environmental practices do not necessarily result in increased market value for the firm (Tobin's Q). Finally, our evidence suggests that organizational policies attempting to create better social practices reduce firms' market value—in other words, are valued negatively by investors.

This study has some limitations that must be taken into account. First, it does not include the possibility of a two-directional relationship between the ESG variables and Tobin's Q. Future studies should analyze more thoroughly how investors take ESG indicators into account when making investment decisions that call for analyzing the

effect of each dimension—particularly the social—in greater depth, and its relationship to financial performance (Pomering and Dolnicar, 2009; Vanhamme, Lindgreen, Reast and Van Popering, 2012). Unlike other studies (Margolis and Walsh, 2003; Surroca et al. 2010), ours does not consider the role of other variables, such as R&D or reputation, that may act as mediating variables between ESG and financial performance. Future studies should extend research in this direction. Subsequent research could also analyze the impact over longer periods to attempt to compensate for the increase in manufacturing costs due to social programs for periods longer than three to five years. Finally, control variables such as firm size and country of origin are significant for social and environmental dimensions. These results demand analyses of how contextual factors affect sustainability and financial performance.

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