

# **Sustainable Procurement Initiatives and Their Risk-related Costs A Framework and a Case Study Application**

Hald, Kim Sundtoft; Wiik, Sofia; Larssen, Anton

*Document Version*

Accepted author manuscript

*Published in:*

Measuring Business Excellence

*DOI:*

[10.1108/MBE-04-2020-0052](https://doi.org/10.1108/MBE-04-2020-0052)

*Publication date:*

2021

*License*

Unspecified

*Citation for published version (APA):*

Hald, K. S., Wiik, S., & Larssen, A. (2021). Sustainable Procurement Initiatives and Their Risk-related Costs: A Framework and a Case Study Application. *Measuring Business Excellence*, 25(2), 230-243.  
<https://doi.org/10.1108/MBE-04-2020-0052>

[Link to publication in CBS Research Portal](#)

**General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

**Take down policy**

If you believe that this document breaches copyright please contact us ([research.lib@cbs.dk](mailto:research.lib@cbs.dk)) providing details, and we will remove access to the work immediately and investigate your claim.

Download date: 04. Jul. 2025

# **Sustainable procurement initiatives and their risk-related costs: A framework and a case study application**

Hald, K.S., Wiik, S. and Larssen, A.

Kim Sundtoft Hald (\*)  
Professor (mso)  
Copenhagen Business School, Department of Operations Management  
Solbjerg Plads 3, 2000 Frederiksberg, Denmark  
Tel: +45 23 72 23 03  
E-mail: ksh.om@cbs.dk

Sofia Wiik  
Research Associate  
Copenhagen Business School, Department of Operations Management  
Solbjerg Plads 3, 2000 Frederiksberg, Denmark  
Tel: +46 73 05 69 458  
E-mail: sofia.garrett.wiik@gmail.com

Anton Larssen  
Director, Corporate Procurement  
H. Lundbeck A/S  
Tel: +45 30 83 49 72  
E-mail: aptl@lundbeck.com

# **Sustainable procurement initiatives and their risk-related costs: A framework and a case study application**

## **Abstract**

**Purpose** - The objective of this paper is to contribute to a better understanding of the economic consequences of aiming for sustainable procurement. The authors develop and apply a framework designed to identify and measure the risk-related cost trade-offs inherent in initiatives designed to improve sustainability in procurement.

**Design/methodology/approach** - The research uses a combined conceptual and case-based research method. A model is developed from theory; subsequently, it is applied using an action research approach and its limitations in use are identified.

**Findings** - Specifically, the authors develop and exemplify a framework designed to measure the risk-related cost impact of initiatives to improve sustainability in procurement and develop an initial list of difficulties and constraints when in use.

**Research limitations/implications** - This research presents one instance of a model that is applied in one single setting. The purpose is not to generalize, but to provide a deeper understanding of the interconnectedness between sustainability initiatives, risk mitigation, and their economic effect. The framework and its calculation methods have to be further developed and refined using more case studies.

**Practical implications** - The model can provide initial inspiration and a starting point for firms with the ambition to develop business case models to assess initiatives to improve sustainability in procurement. Its main strength is to demonstrate the multiple cause-effect relationships as well as trade-offs involved in accounting for the risk related effect of a sustainable procurement initiative.

**Originality/value** – The presented research contributes to the existing literature by conceptually developing a framework with the potential of outlining the risk related cost implications of investments initiatives designed to improve sustainability in procurement.

**Keywords:** Sustainable procurement; Supply chain; Purchasing; Business case; Risk management; Economic effects; Circular economy.

**Paper type:** Research paper

## 1. Introduction

What are the economic consequences of initiatives that are designed to increase the social and environmental aspects of sustainability in the supply chain? This is a central question for procurement, production, and distribution. Increasingly these functions are requested to play active roles in assessing the economic effects of the social and environmental initiatives they perform in the supply chain (Epstein, 2004; Figge and Hahn, 2012). Also, the 2007-2008 Global Financial Crisis and the 2020 Corona Crisis have increased the inherent frictions and dilemmas that arise when attempting to produce a supply chain that performs well on both social and environmental dimensions as well as on economic criteria (Pagell and Wu, 2009; Wu and Pagell, 2011). When does an initiative that improves social and environmental sustainability harm economic criteria? When is an initiative designed to improve social or environmental sustainability more economically sustainable than other alternative initiatives? These are fundamental dilemmas that impact firm profitability as well as the supply chain's overall sustainability. It is important for researchers as well as for practitioners to conceptualize and discuss these dilemmas, as well as how the economic effects of sustainability initiatives can be understood and assessed. This is the overall theme of the research presented in this paper.

In most businesses, procurement cost account for more than 50% of total product/service cost (Monczka et al., 2015), and a reasonable assumption is that a similar ration exists when it comes to procurement's impact on the total social and environmental performance in the supply chain. Pagell et al. (2010) for instance argue that *"evidence is growing that the field is reaching a critical tipping point where wide-scale adoption of sustainable sourcing practices may potentially become a dominant dynamic in the supply chain context"* (Pagell et al., 2010, p. 58). This supports the importance of exploring the economic consequences of social and environmental procurement initiatives, and we formulate the following research question:

What is the relation between social and environmental procurement initiatives and their economic effect, and how can it be assessed?

Research has discussed extensively the “green business case” (Figge and Hahn, 2012). Whether or not social and environmental performance leads to financial performance? (Margolis and Walsh, 2003; Orlitzky et al., 2003). However, we still know very little about the details on how the economic consequences of sustainability initiatives take their form and how they may be accounted for by a firm or by a supply chain (Epstein and Roy, 2001). The model proposed by Epstein and Roy (2001) is a notable exception; it conceptually links sustainability strategy, plans, and programs with their long term corporate financial performance.

The research presented in this paper takes the Epstein and Roy (2001) model which is inspired by stakeholder theory. and combines it with the scenario-based strategy map technique (Kaplan and Norton, 2004; Buytendijk et al., 2010) and the real options decision tree technique (Reed, 2001; Copeland and Tufano, 2004). The resulting model, that is deduced, highlights the decisions involved in forming and implementing the social and environmental procurement initiatives as well as their economic effects. The subsequent application of the model in a single case study further helps in identifying some of the difficulties and uncertainties involved when assessing the economic effects of social and environmental procurement initiatives. Finally, the case application also helps us propose a set of configurations of economic effects. These configurations suggest generic ways in which economic effects following the implementation of social and environmental procurement initiatives may take their form.

The paper is organized as follows: The next section presents the key concepts used in this study. Section 3 presents the research design and the research method. Section 4 develops a framework designed to identify involved cost trade-offs inherent in initiatives designed to

improve sustainability (hence called “sustainable procurement initiatives”). In section 5 we present an application of the framework. Section 6 discusses the framework and reflects on its application. Section 7 presents conclusions, implications, and paths for future research.

## **2. Background literature**

### *2.1 Sustainable procurement*

It is only recently that research started focusing on purchasing’s social and environmental responsibilities (Carter and Jennings, 2004), and it has been suggested that sustainable procurement is a burgeoning and current research topic (Miemczyk et al., 2012). Leading from this observation and the infancy of the discipline it is no surprise that many competing definitions have been proposed. Some researchers define sustainable procurement broadly as the pursuit of sustainable development objectives through the purchasing and supply process (Miemczyk et al., 2012, Walker and Philips, 2009), others propose more narrow definitions providing some initial detail and guidance as to the specific activities or areas that should be of concern when performing sustainable procurement (Zsidisin and Siferd, 2001; Lefevre et al., 2010). Zsidisin and Siferd (2001) for instance see sustainable procurement as a set of supply chain management policies, actions, and relationships in need of being formed, all in response to concerns related to the natural environment and social issues. Lefevre et al. (2010) see sustainable procurement as the managerial task of taking into account economic, environmental and social impacts in buying choices. Specifically, it is proposed that this broad concern more narrowly ought to include both traditional economic focused procurement objectives such as optimizing price, quality, availability, but also concerns for environmental life-cycle impact and social aspects linked to product/service origin. Still, others adopt a more emerging definition of sustainable procurement and define it as a buyer's intention to, and actual observable practices that integrate social and environmental issues into its supply chain management routines to improve the social and environmental

performance (Hald and Olsen, 2010). Following these definitions, we thus see a sustainable procurement process as the end goal, and sustainability performance in the procurement process as a measure on how far the firm is in achieving this goal.

Another contested aspect related to the definition of sustainable procurement is the question of which consecutive steps in the value chain, procurement is assumed to influence. Most research on sustainable procurement is rather imprecise in defining the scope of managing sustainable procurement. Most research seems to suggest that the sphere of procurement influence is narrowly limited to the acquisition of materials for production. A notable exception is a contribution by Zsidisin and Siferd (2001), where sustainable procurement is linked to a broad set of consecutive value chain steps, including design, acquisition, production, distribution, use, reuse, and disposal of the firm's goods and services. The Global Reporting Initiative is one example of a standard proposing to assess sustainability in the value chain, however it has also been claimed to be of limited relevance to sustainable supply as that is not its sole focus (Walker and Philips, 2009)

Although the discipline is a burgeoning and current research topic, several different themes under the broad umbrella term "sustainable procurement" have been proposed and discussed. See Walker et al., (2012) and Miemczyk et al. (2012) for recent reviews of research concerned with sustainable procurement. One conclusion is that existing research on sustainable procurement is dominated by contributions discussing aspects of environmental or green issues, whereas the theoretical framework, definitions, scope and variables for social dimensions in the purchasing field is far less developed (Miemczyk et al., 2012).

## *2.2 The measurement of economic effects of sustainability initiatives*

Although previous research provides evidence that supports expectations of immediate or long term economic benefits from social and environmental strategies and initiatives in the

supply chain, the measurement of economic effects has proven extremely difficult. First, few of those involved in the work with sustainability in corporations have financial experience, and sustainability efforts are at times so integrated into other decisions that they are difficult to separate (Reed, 2001). Second, the measurement of the economic effect of sustainability initiatives is difficult because social or environmental actions are usually linked to long time horizons, a high level of uncertainty, and impacts that are often difficult to quantify (Epstein and Roy, 2001). To succeed in measuring the economic performance of sustainable procurement initiatives, firms have to customize their quantification approach (Salzmann et al., 2005).

Epstein and Roy (2001) present a framework providing a two-way method which relates sustainability actions and their pay-offs to long-term financial performance. The framework focuses on specific actions that when combined will influence the level of sustainability in the organization. Five drivers of sustainability are included in the framework. The first intention of the framework is to move from the corporate and business unit strategy to sustainability actions. Once these actions have been established, links can be generated from the actions to sustainability performance, stakeholders' reactions and long term corporate financial performance (Epstein and Roy, 2001). Managers should quantify how the variables drive each other to create a clear link to profit. There is an important difference between intermediate results and financial outcomes. Intermediate results can, for example, be improved social and environmental performance, and boosted public image. Managers can use these results to identify levers and actions that can be undertaken to improve the sustainability and the financial performance of the corporation (Epstein and Roy, 2001). A limitation in the framework is that it does not include a quantification method of the indicated financial effects.



### **3. Methodology**

The objective of the presented research is broadly to contribute to a better understanding of the economic consequences of sustainable procurement. Specifically, to develop and test a conceptual model designed to identify and measure cost trade-offs inherent in sustainable procurement initiatives. This is in effect a trade-off between the cost to implement and the potential expected cost of a risk occurrence. To address this objective, the research used a case-based research method. Case-based research is particularly appropriate where research and theory are at their early, formative stages (Benbasat et al., 1987) as is the case for the assessment of economic effects of sustainability initiatives in supply chains. A case study approach was deemed appropriate for understanding the complex interrelation between social and environmental initiatives and their economic consequences. Also, it was relevant as a mechanism to explain the causal links between these variables in real-life interventions that are too complex for a survey or experimental strategies (Yin, 2017). The case study approach enabled an in-depth examination of the dynamics present in a single and unique setting (Eisenhardt, 1989). The results from this case based research cannot be subject to statistical generalization or theory-testing but can be used to generate theoretical constructs, propositions and/or midrange theories (Eisenhardt, 1989; Yin, 2017).

The first step in our research approach was the development of the conceptual model. The second step was the application of an action research design which was included to test and refine the conceptual model as well as to observe the limitations of the model in use.

#### *3.1 Case selection*

The selected case firm is a large European bank (hereafter referred to as ‘the Bank’), which recently had started to work with sustainability issues in its supply chain in a structured way. The Bank was selected for three main reasons:

- It had recently begun setting up a range of managerial mechanisms to manage sustainability in its supply chain. Resources were accessible, and the Bank was willing to invest time and effort in responding to any inquiry that the research might have.
- The recent journey towards implementing sustainability mechanisms in the supply chain meant that implementation was in process. It allowed observing the obstacles and challenges that followed such implementation. Some sustainable procurement initiatives had already been suggested and implemented, but no attempt to assess their effects in economic terms had been made.
- Empirical accounts of sustainable supply chain practices in the service sector, and in particular in the financial sector, are still scarce in research. This provided a particular interesting empirical field, and the opportunity to contribute with additional insights.

### *3.2 Data collection and analysis*

The overall qualitative research strategy applied in this research was an action research approach where researchers interacted directly with the involved parties in the Bank and created an atmosphere of collaboration (Coughlan and Coughlan, 2002). An iterative cyclical approach comprising planning the research, taking action in the Bank's environment, evaluating the action and planning the research further was applied (Coughlan and Coughlan, 2002). This comprised a series of flexible cycles that allowed the researchers to continuously observe and develop revisions of the framework (Somekh, 2005).

Empirical data consisted of eight interviews, one workshop, one internal survey along with a range of onsite observations and documents. Semi-structured interviews were chosen to gather specific information relevant to sustainable procurement initiatives in the Bank. In the interviews, respondents were allowed to identify ongoing sustainable procurement initiatives and describe the decision making processes in which they were involved in their own words (Brinkmann and Kvale, 2015). Initially, three interviews were conducted to cover both

previous and current sustainable procurement strategies and initiatives. A snowball sampling method was then used to identify relevant employees involved in the sustainable procurement initiatives (Welman and Kruger, 2001) which resulted in five additional interviews directed toward the operational level of sustainable procurement. These interviews were designed to gain an in-depth understanding of how the Bank made decisions related to- and accounted for the identified sustainable procurement initiatives. Finally, a workshop was held with the interview respondents, leading to an ultimate revision of the measurement framework.

Data from interviews were transcribed and coded. To identify relationships between the theoretical framework and the obtained data, an initial categorization scheme of reference was constructed using each level in the measurement framework (Miles and Huberman, 1994). Within each level of the framework, data was organized into sub-themes. This approach helped construct a better overview of the data, and provided a mechanism from where the different responses could be matched to themes and subjects (Miles and Huberman, 1994).

#### **4. Towards a framework for measuring the cost of sustainable procurement initiatives**

The framework developed in this research takes the model of Epstein and Roy (2001) as its core structure. Although their model provides strong conceptual links between sustainable strategies, sustainability initiatives, and their outcomes, it does not specify exactly how the economic effect can be assessed. Another limitation of the model is that it does not include a comprehensible causal link between the strategy and the long-term performance of a company, and it does not include multiple scenarios that are inherent in sustainability initiatives. In an attempt to resolve these limitations, the measurement framework proposed in this paper is adjusted according to principles of “*scenario-based strategy maps*” and “*real options decision trees*”. Both offer their applicability as techniques able to construct an

overview of decisions and uncertainties of scenarios or events that can occur when working with a sustainable procurement initiative that has uncertain effects. The scenario-based strategy map technique (Kaplan and Norton, 2004; Buytendijk et al. 2010) provides an opportunity to relate the intangible sustainable procurement strategy to its long-term financial performance. It provides an opportunity to structure activities in scenarios to help procurement departments plan for future events and understand what is necessary to achieve financial pay-off. The real options decision tree technique (Reed, 2001; Copeland and Tufano, 2004) can assist procurement decision-makers in detecting the value of intangible assets. The real options method is well suited as an estimations tool in projects where more than one decision has to be made. Specifically, in each scenario, users have the option to abandon or continue a project after gaining new information. This type of decision tree is based on the characteristics of the traditional Net Present Value method, but differs on the potential amount of possible pathways or branches, that each can provide a specific scenario. Each of these scenarios represents an investment and has an allocated probability of occurring (Reed, 2001; Copeland and Tufano, 2004). The real options technique was not originally intended to calculate the long-term financial performance from sustainability drivers, but it is suitable for calculating investments with intangible assets. It provides the prospect to attribute probabilities to scenarios in the drivers, and it can calculate the costs associated with each driver. Figure 1 illustrates the resulting sustainable procurement cost impact assessment framework.

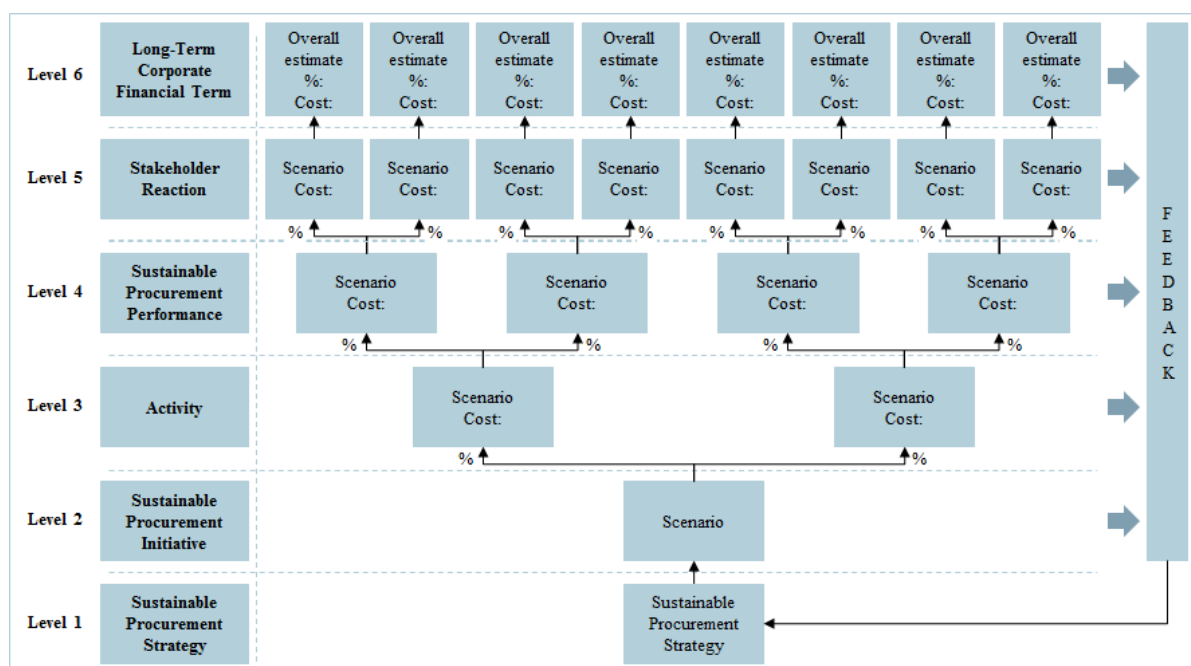


Figure 1: A sustainable procurement cost impact assessment framework

#### *Sustainable procurement strategy (Level 1)*

The first level of the framework is the sustainable procurement strategy which is related to the overall corporate strategy that directly influences the choice of the potential sustainable procurement initiatives. The level includes the first sustainability action, ‘formulating the sustainability strategy’ (Epstein and Roy, 2001). The cost can be assumed to be directly related to the employees’ activity of formulating the strategy and can be determined by time-driven Activity Based Costing (Kaplan and Norton, 2004).

#### *4.2 Sustainable procurement initiative (Level 2)*

Sustainable procurement initiatives are projects initiated to improve the level of sustainability performance. These initiatives contribute to the execution of the sustainable procurement strategy and should, therefore, be carefully planned to ensure their alignment with the strategy in level 1. For every initiative level, 2 contains two branches or two scenarios. The first scenario is to implement the planned initiative, while the other is to reject the initiative. Concerning the first scenario, initiative implementation, the cost must be accounted for as an

investment (Investment(SPI)). The investment in level 2 can be divided into resource-related costs and systems related costs. Examples of necessary investments that must be made in resources can come from planning in general, and specifically, time used on creating project plans for the initiative. Another type of investment is the cost of internal resources and external consultants needed to implement the initiative and system costs such as the cost of IT-systems required to support the initiative. The investment cost for the “reject the initiative” scenario is per default assumed to be zero.

#### *4.3 Activity (Level 3)*

Compared with the original framework by Epstein and Roy (2001), a new level termed the 'Activity level' is included. Based on our action research it was this level was included to create an overview of the initiative's underlying activities or actions. The activities included at this level are actions that employees after implementation have to perform to carry out the specific sustainable procurement initiative. Also, all the activities supporting the initiative while it is active in the company are included here. The ongoing screening of suppliers or the process of decision-making related to which suppliers to include in the screening initiative are examples of activities that must be included here. For each initiative, the associated implied activities are listed and accounted for in the framework to give an overview of the processes that are necessary to carry out the initiative as well as their total implied activity cost (Activity-cost(SPI)). This will provide an overview of the total cost associated with running the initiative. Such an overview in the framework is further beneficial since it creates an understanding of the activities that generate cost and thus may be considered as objects of potential current or subsequent process optimization.

#### *4.4 Sustainable procurement performance (Level 4)*

Functioning as an outcome note, the performance of the different scenarios and the resulting supply chain cost is assessed in level 4. A set of performance outcomes are assumed to be related to a set of corresponding probabilities. The Expected Monetary Value (EMV) (Montague, 2015) of the entire set of outcomes is then calculated by multiplying the different probabilities with the supply chain cost implications that are expected to be the result of their occurrence (EMV(SC)). Epstein and Roy (2001) suggest sustainability performance indicators such as workforce diversity or levels of ethical sourcing. Our model is designed to assess outcomes of sustainable procurement initiatives, and the performance indicators are adjusted accordingly. One example is the occurrence of child labor at a supplier location. This may cause mitigation and reaction cost internally in the procurement department as products have to be recalled and a new supplier identified and implemented in the supply chain. Each sustainable procurement initiative can further be assumed to have a different and unique sustainability demand and thus a set of unique or different sustainability performance indicators.

#### *4.5 Stakeholder's reactions (Level 5)*

Stakeholders are individuals and/or groups inside or outside organizational boundaries that affect, and/or are affected by sustainable procurement actions. The scenarios in level 5 reflect the reactions stakeholders might have to the sustainable procurement performance and the supply chain management reactions to it as identified in level 4. These reactions can lead to negative or positive consequences for the company such as lost or increased sales or other types of more long term reactions such as implications for the brand-name and future revenue streams. Each performance outcomes may thus be assumed to lead to different stakeholder reactions with different probabilities, and the resulting expected monetary value implications

for stakeholder reactions for each scenario (EMV(SR)) can be calculated. When identifying and measuring reactions to sustainable procurement initiatives it is important to make distinctions between different groups of stakeholders, since interest in sustainable procurement performances may vary between groups and therefore impact the firm's financial performance differently.

#### 4.6 Long-term corporate financial performance (Level 6)

The financial performance of the different sustainable procurement initiatives (SPI's) that are related to the sustainable procurement strategy and their corresponding NO sustainable procurement initiatives (NSPI's) can then be measured as the individual Expected Monetary Value (EMV) of the different scenarios using the equations below in figure 2.

Let  $Y_1, Y_2, \dots, Y_n$  represent a set of possible outcomes of some uncertain variable;  
 Let  $X_1, X_2, \dots, X_n$  represent the NPVs associated with each of the possible outcomes;  
 Let  $P(Y_1), P(Y_2), \dots, P(Y_n)$  represent the probabilities of each of the outcomes;  
 Then  $EMV(Z) = P(Y_1)X_1 + P(Y_2)X_2 + \dots + P(Y_n)X_n$   
 For the sustainable procurement initiative (n):  
 (1)  $EMV(SPI_n) = Invest(SPI_n) + Activitycost(SPI_n) + EMV(SC)_{SPI_n} + EMV(SR)_{SPI_n}$   
 For the corresponding NO sustainable procurement initiatives (n):  
 (2)  $EMV(NSPI_n) = EMV(SC)_{NSPI_n} + EMV(SR)_{NSPI_n}$

Figure 2: Expected Monetary value of SPI<sub>n</sub> and NSPI<sub>n</sub>

### 5. Applying the framework to the case of the supplier screening initiative in the Bank

Interviews identified nine sustainable procurement initiatives in the Bank (table 1). Due to issues of importance, novelty, and complexity, the sustainable procurement initiative "supplier screening" was selected to illustrate and test the framework. The supplier screening initiative was important to the Bank as an attempt to broaden the scope of sustainability to include aspects of the wider supply chain (Petersen and Andersen, 2006). Supplier screening evaluated the supplier's compliance with the Bank's sustainability demands. It was found to



be a vital process since it linked directly to the potential occurrence of reputational risk, and thus was a mechanism to identify "safe" suppliers and to mitigate the occurrence of environmental or social incidents caused by a supplier, by excluding high-risk suppliers. This could, for example, be incidents with child labor, environmental damage, and illegal labor. Second, this initiative was the most recent that had been launched within the Bank and thus it had the highest novelty and attention amongst respondents.

<b>Sustainable procurement initiative</b>	<b>Description of initiative</b>	<b>Trade-offs</b>
Environmental demands	Some product categories have environmental standards that the suppliers must live up to.	Cost: time resource cost. Benefit: reduced environmental damage reduced reputational risk.
Zero paper policy	Customers can receive all correspondence electronically from the Bank.	Cost: system cost, time resource cost. Benefit: atomization of process, faster response process, reduced mailing cost.
Supplier screening	All suppliers above a certain size are screened to ensure compliance with the Bank's environmental and social standards.	Cost: time resource cost, system cost. Benefit: reduced reputational risk.
Energy alarms	Energy alarms installed in all branches to register energy use. If an electronic device, the alarm goes off and it is possible to correct the error to save energy.	Cost: product cost, product maintenance cost, time resource cost. Benefit: reduced energy cost.
Environmental friendly coffee machines	The machines use less coffee and energy than normal coffee machines when brewing.	Cost: product cost, product maintenance cost. Benefit: reduced product cost, reduced energy cost, and reduced maintenance cost.
Consolidation of taxi use	It is possible to register the time of taxi travel as well as the number of free seats online. Other employees can sign up to join the travel.	Cost: system cost, time resource cost. Benefit: reduced travel cost, reduced CO <sub>2</sub> emission.
Tele presence equipment	Online face-to-face meetings through telepresence equipment to reduce employee traveling and CO <sub>2</sub> emission	Cost: system cost, time resource cost. Benefit: Reduced travel cost, reduced CO <sub>2</sub> emission, timesaving.
Collaborations with other banks in UNEP FI	Dialogue with banks that are members of UNEP FI to streamline the environmental and social supplier demands.	Cost: time resource cost. Benefit: streamlined processes, timesaving.
Identification control of cleaning suppliers	Control system to avoid illegal labor in the cleaning category.	Cost: system cost, maintenance cost. Benefit: reduced reputational risk, reduced risk of fines from tax authorities.

Table 1: Sustainable procurement initiatives and their trade-offs

### *5.1 The Bank's approach to sustainable procurement (Level 1)*

With the introduction of a centralized procurement department in the Bank, the need to reconsider its approach to sustainability emerged. The efforts in the management of sustainability within procurement had previously been diverse and fragmented but now efforts were made in collaboration with the CSR department to create a sustainable procurement strategy.

### *5.2 Sustainable procurement initiative in the Bank (Level 2)*

Applying the outlined approach to the supplier screening initiative produced two scenarios. Scenario 1 was the “*Supplier screening*” decision, and scenario 2 was the “*no supplier screening*” decision. The “*no supplier screening scenario*” reflected an approach where no supplier assessments were performed before contracts with suppliers were awarded and signed. The cost allocated to this scenario was zero because it implied no immediate action, and thus no immediate internal or external resource consumption.

The “*supplier screening*” scenario required an initial investment of 200,000 EUR in an IT-system designed to provide an online screening tool. It also required both internal and external resources in the form of consultants and time used by employees with a total investment of 150,000 EUR.

### *5.3 Activity in the Bank related to the initiative (Level 3)*

It was possible to allocate costs for merchandise suppliers in the scenarios that were related to high-risk suppliers. The data were based on observations as well as estimations from the Bank's category manager responsible for merchandise. The time it took for the category manager to ask the suppliers to register data, to perform the screening and all other activities a category manager needs to clear before entering into contract discussions with a chosen supplier, was multiplied with the hourly wage of the category manager. For all the activities

that needed to be performed on all the included suppliers in the review period a total activity cost of the supplier screening initiative was calculated to 250,000 EUR.

#### *5.4 Sustainable procurement performance (Level 4)*

Level 4 in the measurement framework includes scenarios related to the sustainable procurement initiative's performance indicator in the Bank. The sustainable procurement performance in the supplier screening initiative depends on the number of environmental or social incidents that the supplier has been involved in. Two sustainability incidents in the Bank's history were identified. The first incident was related to illegal labor used by a cleaning supplier. The second incident was related to a supplier that had contracted a sub-supplier involved in illegal labor.

No known supplier incident within the merchandise category had occurred, which meant that we were not able to calculate an exact probability of the occurrence of a supplier incident within this category. Instead, the previous two known incidents were used to estimate a probability of 1% that a supplier will cause an environmental or social incident. Through interviews with the responsible category manager, it was found that a possible incident that could occur in the merchandise category was child labor since many of the products were produced in low-wage Asian countries. If this would occur, all merchandise products would be recalled by the procurement department and the price initially paid to the supplier would be reclaimed. However, according to the category manager, it can be complicated to reclaim the cost. There is uncertainty whether or not the cost will be recovered, and therefore potentially incur a direct cost. The latest purchase was estimated to 1,100.000 EUR which was included as a potential direct cost in Level 4. Another direct cost that was included as a potential supply chain cost following sustainable procurement performance was 2,500,000 EUR with a corresponding estimated probability of 3%. This cost was an estimate of the cost of potential disruptions and the cost associated with finding and implementing new suppliers

following directly from the failure to comply with the Bank's environmental and social standards. For the NO supplier screening initiative, the likelihood of incidents and disruptions following non-compliance was expected to be higher (4%) as no screening was performed. Also, the likelihood and magnitude of added supply chain costs were estimated to be higher (see figure 3). The estimation of cost in this example is more uncertain than in previous levels since the history of past occurrences of failure to comply with social and environmental standards was short and incomplete.

#### *5.5 Stakeholder's reactions to the supplier screening initiative (Level 5)*

Level 5 reflects the stakeholders' reactions toward the sustainable procurement performance of the supplier screening initiative. Through observations and interviews, along with increased media focus on banks after the financial crisis and other recent scandals, it is possible to identify customers, investors, and media as the external stakeholders with the highest influence on the Bank's reputation. The media can reach and influence customers directly and investors both directly and indirectly. It was observed that the procurement department had not reported any incidents to the operational risk department which evaluated all reputational risk. The probability that the stakeholders will react to an incident in this level is difficult to calculate since only one out of two identified incidents that we know of has attracted media attention. The cost of a negative reputation could here be calculated by investigating how many customers left the Bank, or how many investors decided to withdraw their investments because of the incident. However, this requires an analysis of other factors that might have contributed to the customers and investors leaving the Bank. We cannot calculate the cost of this incident since it is unknown. The cost and probability estimates in level 5 in figure 3 are therefore fictive and based on an assumption that several customers terminate their engagement with the Bank as a direct result of the negative reputation. However, there is a difference between the two scenarios, as the likelihood of incidents

reaching stakeholders and affecting them negatively is higher in the NO supplier screening initiative.

### 5.6 Long-term corporate financial performance of the supplier screening initiative (Level 6)

As can be seen from figure 3 this simplified and illustrative example finds that the financial performance measured as the expected monetary value of the supplier screening initiative (SPI's) is -736,000 EUR and the corresponding financial effect of the NO supplier screening initiative (NSPI's) is found to be -809,000 EUR. However, results here should be taken with caution, as there are many uncertain variables and assumptions involved. We now turn to discuss these and the other implications of our framework and its application.

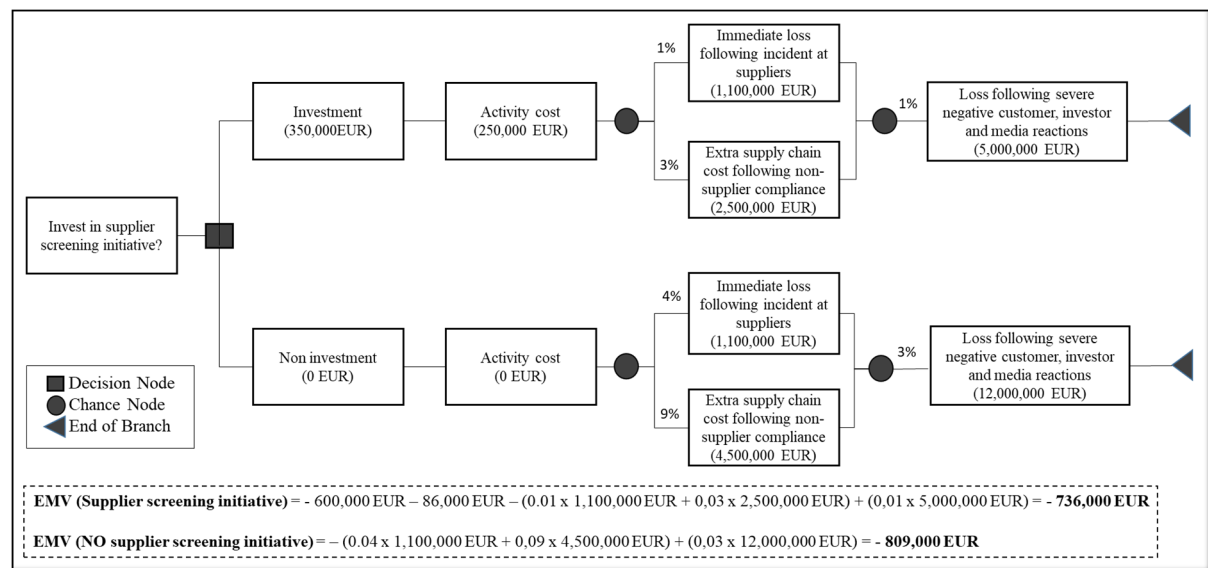


Figure 3: Simplified and illustrative example of application of the framework.

## 6. Discussion

Following Epstein and Roy (2001) we developed and exemplified a conceptual model designed to identify and measure cost trade-offs inherent in sustainable procurement initiatives. Our application of the model provides some empirical support for its usability to identify and measure the cost implications of the involved social and environmental risk events with and without an investment in a sustainable procurement initiative. Further, our

single case application indicates some of the areas that might be in particular difficult to assess in practice situations in specific empirical contexts.

A first reflection is related to the design of the model. This study demonstrates how by incorporating theories from finance (Copeland and Tufano, 2004) and strategic management (Kaplan and Norton, 2004), it is possible to construct a model that may be found useful in a real-life practical context, to identify and manage trade-offs inherent in risk management situations. In this regard, our model bears some similarity to other models which can be found in the risk management literature. However, what is different is its specific applicability to the analysis of sustainable procurement initiatives.

In regards to how the developed model can help identify cost trade-offs inherent in sustainable procurement initiatives, we can say that the main generic cost-trade-off in the model is the one between prevention cost or insurance cost and potential risk event impact cost. This is a classical trade-off in general management and one already identified and discussed in sustainable procurement practices. By insisting on both calculating an investment cost (level 1, level 2, level 3) and a potential risk event impact cost (level 4, level 5) the model seeks to balance in one calculation prevention cost versus risk occurrence cost. It asks; which of many scenarios, where there is a trade-off between prevention cost and occurrence cost, is the expected most costly? One extreme is no investment to protect the firm which would imply that no sustainable procurement initiatives and practices could be found in the firm and its supply chain. In the screening of suppliers' initiative, this is the scenario of "no screening". Another extreme is full coverage of insurance, which may be too costly in the end, compared to its risk-reduction effect. Whether a full coverage of insurance scenario in sustainable procurement can exist in sustainable procurement is another interesting question. Such a scenario would imply that no incidents can happen and that all aspects and complexities in the wider supply chain are under full control. Thus the model

seeks to identify an optimal balance between investment in sustainable procurement initiatives and resulting risk occurrence cost. While seeking to calculate, the model requires input data, and thus to some extent assumes that these data are both available and reliable.

In particular, a finding from our application is that investments in sustainable procurement initiatives may take many forms, and maybe displaced over space and time. Specifically, and related to the screening of suppliers initiative, investments originate from the resources used to perform the activities involved with the supplier screening task, and both employee time and IT-system cost are resources that were used. An issue here is that time spent on an activity can vary depending on who executes it. It is, therefore, preferable to be able to observe many employees conducting the same task to be able to conclude an average and a variance. Table 1 reveals that of the initiatives identified in the Bank, time resources cost, system cost, product cost, product maintenance cost were the most dominant resource cost drivers. However, involved resources may include actors and systems that are displaced over time and space in the firm and its supply chain. Thus when adopting a more general and wider supply chain view, we may think of investments as spread across firms' boundaries, which makes them difficult to identify and thus to summarise in one equation. What was the supplier's specific investment in this initiative? Where and when were these investments taken?

Another set of data needed to calculate the involved cost trade-off pools was the involved probabilities, and here the model assumes that we can identify probabilities at different levels. Our empirical account illustrates that these probabilities may take many forms and may be extremely hard to assess (table 1). Specifically, the performance of the sustainable procurement initiative should according to our measurement framework be linked to indicators, such as the 'number of supplier incidents'. The empirical account shows how it was difficult to identify supplier incidents that related directly to the Bank, and that this

difficulty stemmed partly from the fact that incidents had not been properly registered, and partly from the fact that many of the respondents could not recall any incidents. Thus it may seem that it is important to have systems and procedures in place to collect, continuously, information on “risk occurrence events”, and hereby to establish some sort of collective memory. However, another reflection that stems directly from the observation of the difficulties of identifying and accounting for the “number of incidents” is a set of questions related to the definition and management of incidents: What defined an incident? How big must an incident be for it to be categorized as an incident (that counts)? Who identified incidents? These are all important questions and even general dilemmas, ones that must be dealt with in this case by the Bank if it should enable itself to calculate for cost trade-offs involved in sustainable procurement initiatives.

## **7. Conclusion**

In this research, we have focused on how the inherent cost trade-offs following the implementation and operation of sustainable procurement initiatives can be understood, identified and assessed. A new measurement framework based on the model by Epstein and Roy (2001) was developed. The model developed by Epstein and Roy (2001) was operationalized by including scenario-based strategy maps from strategic management theory and real options decision trees from financial theory. The measurement framework was exemplified on the supplier screening initiative in a single case study in a European bank. The framework can illustrate a path from a sustainable procurement strategy toward the cost effects of the sustainable procurement initiative.

We contribute to the literature by creating a new measurement framework providing a platform from where to identify and measure the financial effects of sustainable procurement initiatives. However, through the application of the measurement framework to empirical



data from the Bank we conclude that level 4 and level 5 in the framework require additional strengthening by new theory and/or empirical research. The framework includes a possibility to work with different scenarios that can give companies ideas on how to obtain a mix of the elements in the triple bottom line that works for them. However, as always, there are also limitations to our study. In this research, we only use data from one firm and exemplify its usage on only one sustainable procurement initiative. This is a highly simplified example and to validate the generic function of the measurement framework, future research should apply the measurement framework to other empirical contexts and to sustainable procurement initiatives that differ from the supplier screening initiative. In addition to empirically test it, it needs multiple homogeneous and in dealt applications.

## References

- Benbasat, I., Goldstein, D.K. and Mead, M. (1987), 'The Case Research Strategy in Studies of Information Systems', *MIS Quarterly*, Vol.11 No.3, pp.369–386.
- Buytendijk, F., Hatch, T. and Micheli, P. (2010), 'Scenario-based strategy maps', *Business Horizons*, Vol.53 No.4, pp.335–347.
- Carter, C.R. and Jennings, M.M. (2004), 'The Role of Purchasing in Corporate Social Responsibility: A Structural Equation Analysis', *Journal of Business Logistics*, Vol.25 No.1, pp.145–186.
- Copeland, T. and Tufano, P. (2004), 'A Real-World Way to Manage Real Options', *Harvard Business Review*, Vol.82 No.3, pp.90–99.
- Coughlan, P. and Coughlan, D. (2002), 'Action research for operations management', *International Journal of Operations & Production Management*, Vol.22 No.2, pp.220–240.
- Eisenhardt, K.M. (1989). 'Building Theories from Case Study Research', *Academy of Management Review*, Vol.14 No.4, pp.532–550.
- Epstein, M.J. (2004), 'The identification, measurement, and reporting of corporate social impacts: Past, present, and future', *Advances in Environmental Accounting and Management*, Vol.2, pp.1–29.
- Epstein M.J. and Roy, M-J. (2001), 'Sustainability in action: Identifying and measuring the key performance drivers', *Long Range Planning*, Vol.34 No.5, pp.585–604.
- Figge, F. and Hahn, T. (2012), 'Is green and profitable sustainable? Assessing the trade-off between economic and environmental aspects', *International Journal of Production Economics*, Vol.140 No.1, pp.92–102.
- Hald, K.S. and Olsen, M.A. (2010), 'Supplier incentives to invest in buyer promoted sustainability activities in the supply chain', *17th International Annual EurOMA Conference*, Porto.

- Kaplan, R.S. and Norton, D.P. (2004), *Strategy Maps: Converting Intangible Assets into Tangible Outcomes*. Chapter 6: Regulatory and social processes. (pp. 163-195). Harvard Business School Press, Boston, MA.
- Brinkmann, S. and Kvale, S. (2015), *Interviews: Learning the craft of qualitative research interviewing* (Vol. 3). Thousand Oaks, CA: Sage.
- Lefevre, C. Pellé, D., Abedi, S., Martinez, R. and Thaler, P-F. (2010), 'Value of sustainable procurement practices'. INSEAD, Ecovadis, and PWC.
- Margolis, J.D. and Walsh, J.P. (2003) 'Misery Loves Companies: Rethinking Social Initiatives by Business', *Administrative Science Quarterly*, Vol.48 No.2, pp.268–305
- Miemiczyk, J., Johnsen, T. E. and Macquet, M. (2012) 'Sustainable purchasing and supply management: a structured literature review of definitions and measures at the dyad, chain and network levels', *Supply Chain Management*, Vol.17 No.5, pp.478–496
- Miles, M.B. and Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage.
- Monczka, R. M., Handfield, R.B., Giunipero, L.C., and Patterson, J.L. (2015). *Purchasing and supply chain management*. Cengage Learning.
- Montague, R (2015), 'De-risking your supply chain', *Industrial Engineer: IE*, Vol. 47 No. 8, pp. 40–45
- Orlitzky, M., Schmidt, F.L., and Rynes, S.L. (2003), 'Corporate social and financial performance: A meta-analysis', *Organization studies*, Vol.24 No.3, pp.403-441.
- Pagell, M., and Wu, Z. (2009), 'Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars', *Journal of supply chain management*, Vol.45 No.2, pp.37-56.
- Pagell, M., Wu, Z. and Wasserman, M.E. (2010), 'Thinking differently about purchasing portfolios: An assessment of sustainable sourcing', *Journal of Supply Chain Management*, Vol.46 No.1, pp.57-73.
- Petersen, E.R and Andersen, M. (2006), 'Safeguarding corporate social responsibility (CSR) in global supply chains: how codes of conduct are managed in buyer-supplier relationships', *Journal of Public Affairs*, Vol. 6 No.3-4, pp.228-240.
- Reed, D.J. (2001). *Stalking the elusive business case for corporate sustainability*. World Resources Institute, Washington, DC.
- Salzmann, O., Ionescu-Somers, A., and Steger, U. (2005). The business case for corporate sustainability: literature review and research options, *European Management Journal*, Vol. 23 No.1, pp.27-36.
- Somekh, B. (2005). *Action research: a methodology for change and development: a methodology for change and development*. McGraw-Hill Education (UK).
- Walker, H., Miemiczyk, J., Johnsen T., and Spencer, R. (2012), 'Sustainable procurement: Past, present and future', *Journal of Purchasing & Supply Management*, Vol.18 No.4, pp.201-206.
- Walker, H. and Phillips, W. (2009). Sustainable procurement: emerging issues. *International Journal of Procurement Management*, Vol.2 No.1, pp.41-61.
- Welman, J.C. and Kruger, F. (2001), *Research methodology for the business and administrative sciences*. Oxford University Press Southern Africa, Cape Town.
- Wu, Z. and Pagell, M. (2011), 'Balancing priorities: Decision-making in sustainable supply chain management', *Journal of Operations Management*, Vol.29 No.6, pp.577-590
- Yin, R.K. (2017). *Case study research and applications: Design and methods*. Sage publications.
- Zsidisin G.A. and Siferd, S.P. (2001), 'Environmental Purchasing: a framework for theory development', *European Journal of Purchasing and Supply Management*, Vol.7 No.1, pp.61-73.