

DEVELOPING A COST MODEL FOR IMPLEMENTING ESG GUIDELINES IN A PRODUCTION COMPANY

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ABSTRACT: The paper focuses on identifying and quantifying the cost impact of the changes required by the implementation of Environmental, Social and Governance (ESG) guidelines in the case of companies active in the manufacturing sector, which have not been involved in this approach before. The study is based on a literature review of the latest proposals in the field and the development of a scenario of the typical tasks, challenges and purchases required by production firms when seeking environmental conformance, social integration and efficient governance in line with current trends in digitalization. The impact of climate impact reduction approaches and AI based decision making are the latest examples of technological instruments that complete the tableau of challenges companies must undertake in this area. The model is substantiated through a detailed calculation example for an automotive supplier company.

KEYWORDS: ESG, sustainable production, cost model

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1. INTRODUCTION

The manufacturing companies which are active in the production sector must align themselves with the new regulations and trends in order to ensure their survival and success in the globalized markets. As the challenges of sustainability and digitalization become more prominent, the prevailing frame of mind in this sector is that implementing Environmental, Social and Governance (ESG) guidelines in the form of validated frameworks can be the path to achieving these goals.

Notable among the initiatives related to ESG have been the adoption of net-zero and circular economy approaches, on the environmental side, implementing Industry 4.0/5.0 technologies and AI solutions on the digital side, and undertaking CSR programs on the social dimension. However, the governance aspects of making all these models work together in an effective manner are daunting, even for big companies, with significant resources at their disposal. This is even more difficult to approach in small and medium-sized companies, and a recurring theme in their deployment is the need to understand, monitor and manage the associated costs. The current paper aims to address this issue, by building a possible cost model related to implementing ESG in production companies.

2. LITERATURE REVIEW

Although there is a complicated relationship between ESG funding and ESG performances as mentioned by [1], in the case of manufacturing organizations the pressure to demonstrate financial viability remains one of the major barriers that companies must overcome to fully commit to this course of action. Since the competitive environment has a high degree of acuteness, choosing between survival and publicly demonstrating commitment to environmental and social sustainability must be a sound business decision, not just a trend to be followed. However, it is not only the operational focus that must change, but also the way in which cost accounting is performed that must change to reflect the real value provided by accomplishing ESG objectives, taking into account the complexity of business, ecological and social processes that are affected by the new approach to company vocation [2].

The study [3] involved a large sample of 260 Indian companies and concluded that ESG initiatives can lower the cost of debt that companies incur for their operation and development, due to their ability simultaneously satisfy a large of stakeholder requirements. This could indicate the ability of ESG approaches to remodel national business ecosystems from the inside out, leading to a positive feedback mechanism in the long run. Other researchers

investigate and demonstrate the impact of good ESG performance in reducing capital costs [4] and of poor performance or misconduct in increasing the cost of equity [5]. Most of these relationships are nuanced and discrete and their uncovering for certain fields or countries takes considerable time. Another research that investigated 493 banks from 39 countries came to the conclusion that ESG involvement, especially the social dimension, contributes to lower costs in attracting funds and disbursing loans [6]. At the same time, the authors of [7] that studied 145 Asian banks found that developed economies favor environmental projects to increase cost efficiency, while developing economies favor social and governance approaches. These insights further solidify the need to foster a

generalized, inter-sectorial, approach to adopting ESG practices and models across national or continental entities, while paying attention to their evolution-related specificities and peculiarities.

3. RESEARCH METHODOLOGY

The research methodology employed for this study is based on a qualitative approach to cost modelling, using a scenario development through brainstorming, based on the conclusions of the literature review (see chapter 2 before) and the manufacturing experience of the authors, followed by a calculation example with interpretations, that serves as a validation stage. The steps of the approach are presented below (see Figure 1).

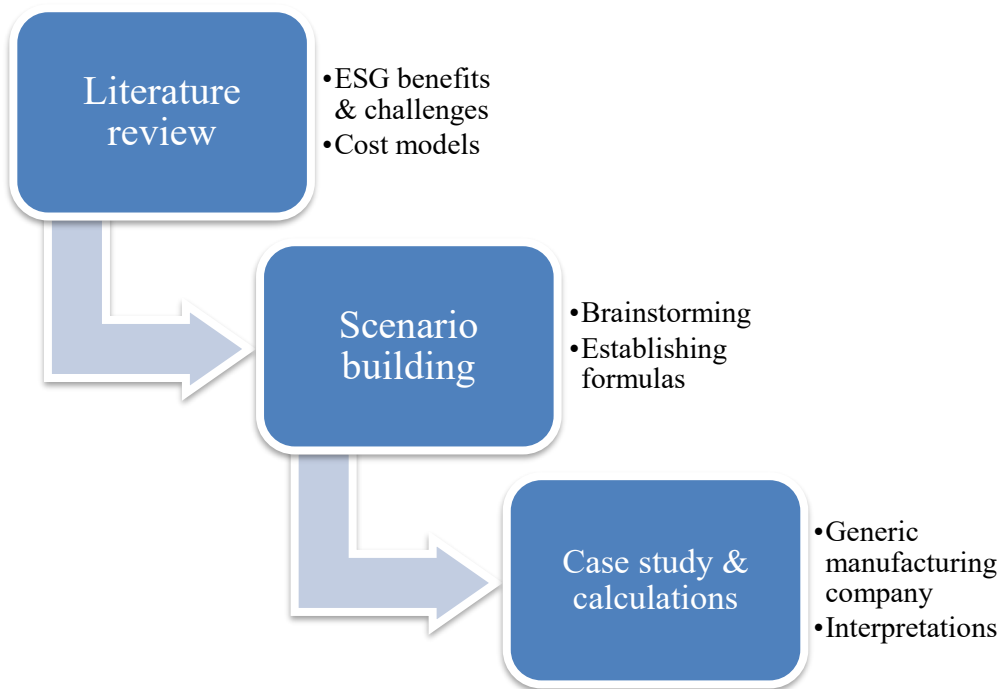


Figure 1. Research methodology for developing an ESG implementation cost model

The Literature review performed above presents a cursory overview of the topic, discussing some of the benefits and challenge of ESG approaches, especially in terms of financial costs or gains. Also, aspects related to cost modelling in this area are observed to determine good practices.

The Scenario building is focused on establishing the most relevant traits of ESG initiatives in a production sector setting, and their associated impact on the companies' budgets and cash flows. It is acknowledged that a complete assessment must consider both investment and operational costs, as well as savings and improved performance. Since the target is to obtain a generic model of a manufacturing organization, the main categories involved are sales, distribution & marketing, product development and design, purchasing, production, and storage and transportation. For each of these types of processes, environmental and social actions are envisioned, that

can be bound together by proper governance, administrative and managerial processes. A straightforward mathematical model is established using formulas based on positive inputs, negative inputs, partial contributions and actual results reported to the production and sale capacity of the organization towards a B2C market.

Finally, as presented in the following chapter 3, the case study is completed with the necessary details and the formulas are used for calculations in the case of the generic manufacturing company, in terms of orders of scale. In the case of specific firm, these calculations could be adapted to use precise financial information and arrive at detailed results about the success of the ESG framework being implemented. The interpretation of the outputs is further included in the methodology, to support the management of the companies in determining the best course of action

for correcting or boosting the impact of their strategic decisions.

4. CASE STUDY AND CALCULATIONS

In the first step, the sources of income and the sources of expenditure related to generic ESG

projects have been identified, as presented in Figure 2 below.

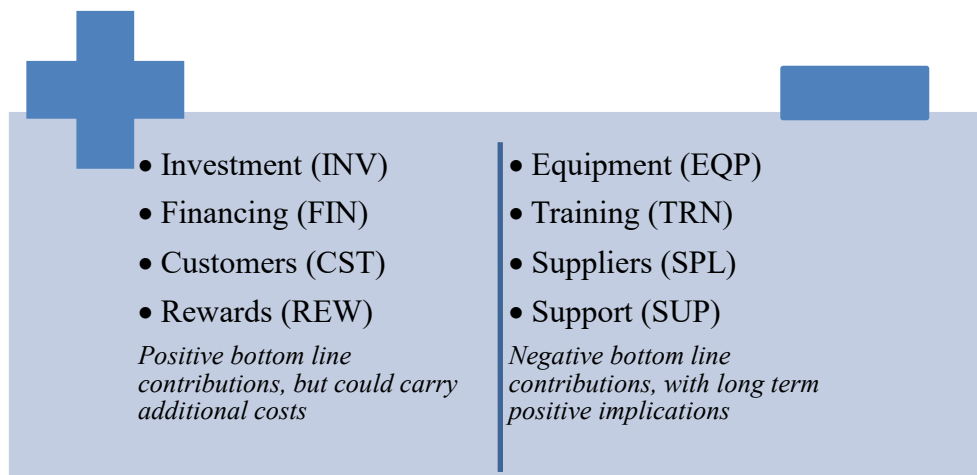


Figure 2. Cost and rewards related to implementing ESG approaches

In the positives' column, the research identified the following sources of additional income (on top of doing business as usual), which could carry their own additional known or hidden costs (negative side-effects NSE):

- investments attracted as a consequence of the new ESG involvement: direct investment from sources outside the company, increase in the values of shares for publicly traded companies on the stock market, increase of the value of the company's brand – these could lead to hostile takeover attempts which can plummet the share or brand values; also, they can lead to changes in board composition and strategic direction;
- financing opportunities opened up by the adherence to ESG guidelines, either in the form of more accessible bank loans or public sources for supporting development, human resources or research and innovation, such as European Structural Funds, national strategic programs or private foundations programs – these usually carry with them additional costs related to financing the cash flow and also the cost of missed opportunities, when company efforts are directed towards them instead of the markets;
- the improved activity towards customers is probably the largest possible benefit, as ESG can significantly increase sales, especially in a B2C setting, with younger generations interested in the environmental and social sustainability of the companies they buy from – there is also an operational cost of achieving more sales, related to marketing, distribution, and customer service, but such a cost appears at any increase of sales;

- various rewards, prizes and recognitions of prestige can add a little tangible benefit, but considerably higher intangible benefits to the company's operations, usually at no additional costs.

In the negatives' column, the study also pinpointed four sources of expenses that can also have positive side-effects (PSE) on the long term, through the engagement of the company with its stakeholders in an ESG rich environment:

- equipment needed for environmental conformance and performance, which tends to be more expensive, but could also have positive impacts in the future, such as increased productivity, lower scrap rates, and lower costs of achieving quality;
- personnel need to be trained in the usage of new technologies, the implementation of new projects and the ESG concepts, with significant potential to yield better company performance in the long run by diminishing errors, absenteeism and churn;
- the relationship with suppliers and supporting them to become ESG compliant can bring about significant costs, while, at the same time, yielding a stronger support ecosystem for the business, leading to future collaborations and financing opportunities that can be approached together;
- ongoing support to internal processes and employees, as well as external partners and collaborators, across the implementation of ESG projects is another cost category in the area of operational costs, with possible positive returns later.

Including these considerations into a mathematical model, the following ESG bottom line (BTL) formula is derived for the case study presented further:

$$\text{BTL} = \text{INV} + \text{FIN} + \text{CST} + \text{REW} - \text{NSE} - \text{EQP} - \text{TRN} - \text{SPL} - \text{SUP} + \text{PSE} \quad (1)$$

For an automotive dashboard plastic component manufacturing company with a turnover of ca. 8 million Euros per year, that engages in one major project dedicated to replacing its consumption of plastic with biodegradable alternatives and one minor project that supports the development of community-based trade schools for youth, the result form for a fiscal year can be summarized as follows:

$$\begin{aligned} \text{BTL} = & 2 \text{ mil Euros (private equity investment)} + 1 \text{ mil Euros (R\&D projects)} + 1.5 \text{ mil Euros (increased sales)} + 0.1 \text{ mil Euros (Chamber of commerce prize)} - 0.5 \text{ mil Euros (0.4 mil cost of new sales} + 0.1 \text{ mil project financing)} - 1 \text{ mil Euros (annual depreciation of new equipment for bioplastics costing 10 mil Euros)} - 0.4 \text{ mil (engineering training in circular economy and bioplastic molding and injection)} - 0.8 \text{ mil Euros (cost of acquiring new suppliers of raw material)} - 0.2 \text{ mil Euros (financing of the trade school CSR project)} + 0.6 \text{ mil Euros (0.5 mil improvement of scrap rate to almost zero} + 0.1 \text{ better employee and supplier performance)}. \end{aligned} \quad (2)$$

This leads to a bottom line for ESG implementation in the case study (which is based on real companies that the authors are collaborating with), of 3.3 mil Euros, or a percentage of 28,75%. Although theoretical in nature and with considerable simplifications factored in, this result is encouraging for refining the model further and also can be an incentive for companies to engage in ESG initiatives.

5. CONCLUSIONS

Although the importance of ESG is recognized by most companies and academics, the actual practical achievement of the framework's goals depends heavily on applicable models and the justification of expenses related to it. The work presented in this paper is based on empirical considerations from actual manufacturing organizations and on scientific analyses related to strategic management and cost accounting. The formula proposed forms the basis of a mathematical model for carrying out a cost-benefit analysis that can support the decision-making process in these companies.

By following this course of action, it becomes easier for firm leadership to gauge the impact of ESG and to promote its contributions throughout its business

network, not just towards customers who are already aware of it.

Employees, suppliers and other stakeholders have the possibility to improve their involvement and speed up the transformation of the organization and its collaborators with respect to their environmental and social performance, within a mature governance approach. Through dissemination and generalization, a similar impact can be envisaged for policy making organizations and authorities that steward the development of the production sector.

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