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Luis Raúl Rodríguez Reyes
ITESO, luisreyes@iteso.mx

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A STRATEGIC MODEL FOR SUSTAINABILITY BASED ON THE DCF MODEL

LUIS RAÚL RODRÍGUEZ REYES
ITESO
Guadalajara, Mexico
luisreyes@iteso.mx

ABSTRACT

This conceptual paper contributes to the sustainability discussion by studying the relationship between sustainability and companies' financial performance, looking for how companies' sustainability adoption, reflected in CSR/ESG performance, can add financial value to shareholders. Results from the theoretical and literature analysis, using discounted cash flow techniques, indicate that sustainability adoption can be value-additive for shareholders, requiring fine-tuning to find financial equilibrium in three distinctive value channels: sustainability investment, financial, and revenue channels. However, managerial skills and resources may not be enough to ensure a positive result. As necessary conditions, this strategy requires achieving high performance in CSR/ESG indicators and the involvement of other key stakeholders to improve the possibility of success for the company that has decided to go sustainable. Nevertheless, if this state is attainable, shareholders' and stakeholders' interests can be aligned, and sustainability stands better adoption chances among reluctant companies.

KEYWORDS

cost of capital; ESG; finance; sustainability; strategic management

INTRODUCTION

There is increasing recognition and consensus that a sustainable world is desirable and possible. The business-as-usual paradigm, in which shareholder's primacy is paramount, must change for the good of the people, the planet, and the world's prosperity. This perspective is present in documents such as the United Nations 2030 Agenda for Sustainable Development (United Nations, 2015), the encyclical letter *Laudato Si'* (Francis, 2015), and the White Paper of the Inspirational Paradigm for Jesuit Business Education (IAJU, 2020). This paradigm change is also supported by the Business Roundtable, one of the most influential business associations in the United States of America. After 22 years of defining the principal purpose of a corporation as maximizing shareholder returns, they change it towards a more inclusive perspective of serving stakeholders (Business Roundtable, 2019).

Moreover, sustainability and its relationship with the business world have been in different forms in business science for several decades. Chang, Zuo, Zhao, Zillante, Gan, and Soebarto (2017) found hundreds of definitions for sustainability and sustainable development in the literature and four main theories linking them to firms' behavior: Corporate Social Responsibility (CSR), Stakeholder Theory, Corporate Sustainability, and Green Economics.

Nevertheless, despite these and other advances, a missing link in the equation may hinder the sustainability movement. This missing link is the generation of positive financial results when companies follow a sustainable business strategy. The evidence is not clear and definitive in this regard. For instance, Rodgers, Al Habsi, and Gamble (2019) encountered mixed results in an extensive literature review. Their analysis found studies showing a positive, negative, or no relationship between a firm's financial performance and sustainability. Other comprehensive literature reviews have depicted similar results. In this regard, Li, Wang, Sueyoshi, and Wang (2021) performed a bibliometric analysis of the ESG literature, finding research that exhibited positive, negative, indirect, or non-linear relationships between a firm's environmental, social, and governance (ESG) measures and its financial performance.

Besides these mixed results, some key issues emerged from the literature on the negative correlation between sustainability and financial performance that are particularly interesting to this research. Rodgers et al.'s (2019) review shows two things. First, some firms report negative cost-benefit issues when sustainability

strategies are conducted. Several papers in their study show that sustainability activities are cost-incurring and unrelated to profit-generating activities and that costs related to environmental actions are unnecessarily high and produce no payback after initial savings. Second, stakeholders' pressure on companies is essential to sustainability. Studies they reviewed show that companies that identified sustainability as a loss-bearing activity kept their efforts because of stakeholders' pressure. Moreover, the lack of such a stakeholder watch is one reason some companies do not practice sustainability.

This conceptual paper addresses these two issues that negatively correlate sustainability with financial results from a theoretical point of view in a strategic framework. The departing point is a discounted cash flow (DCF) model of the firm's value and a basic financial principle: the lower the risk associated with a financial flow, the lower the cost of financing it. Therefore, if a sustainable strategy lowers the risk associated with the firm, the probability of this strategy being incremental in value for the shareholders increases. In this scenario, the benefit for shareholders and other stakeholders is aligned in an almost utopic way. Is this feasible? Under which conditions would that happen? Henceforward, the requirements for such a situation will be analyzed.

It is important to note that the positive financial model presented in this paper represents a transitional state between the two paradigms. In the model, shareholders still seek a business strategy that adds value for the company (business-as-usual). However, choosing sustainability-embedded strategies may work for both worlds, simultaneously increasing shareholder's value and stakeholders' well-being. That is, the conceptual model presented in this paper shows that, if done correctly, sustainability success may generate additional financial value for shareholders.

This document has four sections, including this introduction. The following section will develop the financial decision model for a company to become sustainable, and the conditions for that change to be profitable will be derived. Section 3 analyzes the roles of other stakeholders in the system to enhance the probability of financial success of a sustainability transformation of a company. In the final section, conclusions are drawn.

THE THREE CHANNELS MODEL

An essential proposition of this paper is that a sustainable company is less risky than a non-sustainable one. This is based on the idea that management in a sustainable company would mind the environmental and social footprint of its supply chain, production, distribution, and waste disposal. The company would also be mindful of its relationship with people, such as its workers, clients, suppliers, and the surrounding community. All these efforts would impact the idiosyncratic risk faced by the company. This will not mean that the risk is eliminated. Adverse outcomes such as environmental lawsuits and low productivity from a bad relationship between management and the labor force are still possible, but working towards sustainability will reduce the probability of a negative outcome. This change in risk would impact the cost of financing a company, which ought to be reflected in how such endeavor is valued in the standard financial practice.

However, is it possible that the sustainability transformation is not value-additive even when the risk is lower? To solve this, a simple DCF model is built to analyze several possible scenarios and derive conditions for attaining a profitable, sustainable strategy.

Link Between Sustainability and Risk

One critical development in the literature regarding a firm's financial performance and its relationship with sustainability is the effect sustainable practices have on a company's risk profile. In this line of thought, there is empirical evidence of a negative link between sustainability practices in companies and different measures of risk, which ultimately impact the cost of capital. For instance, Dhaliwal, Li, Tsang, & Yang (2011) found that companies with a superior CSR performance—that voluntarily disclose it—face a reduced equity cost of capital. This discovery was confirmed by Gholami, Sands, & Shams (2022), who studied Australian listed companies and found that companies with a higher level of ESG performance disclosure achieve a lower cost of capital (WACC). Moreover, they also discovered that companies with higher ESG performance disclosure achieve lower idiosyncratic risk, which is the risk intrinsically associated with the company. That leads directly to the use of ESG strategies by companies to manage risk and face lower financing costs.

This empirical evidence directly supports the idea that sustainable ventures are a less risky alternative to non-sustainable ones, and financial markets recognize superior ESG/CSR performances. That would imply that a sustainable company would have access to lower financing costs, meaning sustainable ventures may reach a higher payoff for shareholders than non-sustainable ones.

The Discounted Cash Flow (DCF) Model

The DCF model is regularly used when managers choose among capital budgeting projects. It is a good alternative since it considers the time value of money and measures the return on investment. The DCF model rationale is simple when used to value a business decision's financial value. A manager must choose to develop the project that yields the highest positive present value of the projected flows, including the initial investment in implementing it. In that way, the manager ensures shareholders gain the highest possible value. That is, if $DCF_1 > DCF_2 > 0$, then the manager should proceed to develop Project 1 since DCF_1 is larger than the alternatives.¹

This formulation may seem counterintuitive for the aim of this paper since it is about sustainability, which means that the stakeholder's well-being must be paramount, while in the DCF approach, the criterion is to get the maximum value for shareholders. These issues are discussed later, but part of the appeal of this paper is that it is shown that there are conditions in which it is in the best interest of the shareholders to pursue a path of sustainability, enhancing the stakeholder's benefits from the company activity.

The DCF valuation of a company has two main elements. The expected free cash flow generated by the project for each period $t \in (0, T)$, net of the initial investment Φ_t , and the discount rate r . The free cash flow is an estimation derived from the projected income statement, for which financial results are adjusted to represent the expected free cash that the company produces for the shareholders. For instance, if projected sales increase or projected general expenditures are reduced for a specific

¹In this paper, Discounted Cash Flow (DCF) and Net Present Value (NPV) techniques are viewed and used as equivalents, although some authors may differentiate between them. Three aspects of this modeling are crucial: (a) The recognition of the time value of money, (b) the use of the risk-appropriate discount rate, and (c) that all the cash flows are included in the calculation.

year, then expected free cash flow raises for that year. The general estimation takes the following form

$$DCF = \sum_t \frac{\phi_t}{(1+r)^t} \quad (1)$$

As can be seen in equation (1), the free cash flow is positively related to the value of DCF, while the discount rate is negatively associated with it. Notice this correlation because it will be helpful to determine the direction of the DCF when a sustainable element is brought to the project.

Assume that a company is considering updating its operations to be more sustainable in a general setting. This may be polluting the environment less, better waste management, workers and community engagement activities, redesigning its supply chain, a combination of the above, or other initiatives. Think of this company as one that complies with industry and government standards but is not particularly sustainable. They are under new management and considering going sustainable. They are enthusiastic about this project but worried about the costs of such a change. In other words, *they are not committed to going sustainable unless they get an increase in value to the shareholders.*

It seems that the last sentence makes no sense and is contradictory, at least from a normative sustainability perspective. It raises at least one question, can the shareholder's benefit maximization approach deliver sustainability behavior consistent with a broad interpretation of the stakeholder theory? Results in this paper may indicate that such a thing is possible. But this will be discussed later.

Now go back to the DCF modeling. Assume the company's strategic planning team developed two projects competing for its operational update. First, Project N is a non-sustainable, business-as-usual project. Second, Project S, a sustainable endeavor in several instances, is aligned with the stakeholder theory. Then, the manager's problem is to choose which one to implement. Both projects achieve around the same operational objectives; therefore, the final decision will be financial.

On the one hand, Project N is a good project from a financial perspective since $DCF_N > 0$. That is, Project N promises to deliver value to shareholders in the way the company has always done. On the other hand, Project S is also financially sound, with $DCF_S > 0$, and has the advantage of adopting several measures aligned with a

new paradigm in doing business, in which society and the environment are essential elements besides the profits for the shareholders. However, the chosen criterium is still shareholder's wealth optimization theory. Recall that in this instance, the manager's commitment to shareholders is to proceed with the project that promises the highest DCF. According to the working hypothesis of this paper, some conditions would generate a larger financial return in the case of a sustainable project. The hypothesis is displayed in equation (2).

$$DCF_S > DCF_N. \quad (2)$$

Henceforward, the financial conditions to be attainable for equation (2) are set.

The Conditions for Sustainability

Based on equation (1), two crucial elements determine whether equation (2) holds. The first one is the discount rate r , which represents the risk associated with how the project will be financed. Notice that it has an unambiguous negative relationship with the DCF. That is, when the discount rate diminishes, the DCF of the project rises. The second one is the estimated free cash flow of the project Φ_t , which depends on the difference between the project's flows (in and out). The effect of this second element is also unambiguous, if Φ_t increases, the DCF also increases.

To determine the conditions for a value-adding sustainability engagement, first, pay attention to the discount rate. As mentioned before, this is related to the estimated risk of the project; that is, if a project is considered less risky, r should be lower. Therefore, $r_S < r_N$ in the project used as an example. Recall that there is evidence that relates a high performance in CSR/ESG to a lower cost of capital, which would translate to a higher value for the sustainable project (Dhaliwal et al., 2011; Gholami et al., 2022).

Go back to the manager's problem. If the company shows financial markets that the intended sustainability transformation is less risky than the alternative, there may be a case for implementing Project S under the shareholders' profit maximization mindset. This seems straightforward at first glance but may be a more complex issue. Showing these results to financial markets would imply affordable access to a way to signal that the new project is sustainable. Both references cited mentioned the revelation of high or top performance in CSR/ESG indicators, which

implies that the increase in sustainability indicators should be noticeable and effectively communicated to the financial market.

Changes and signaling to financial markets would not come cheap. Besides a significant shift in how business is conducted, this will require ingenuity and cash flow. By themselves, all these changes may produce a reduction in the projected free cash flow Φ_t , depicted in equation (1), jeopardizing the possibility of equation (2) holding. This is precisely the argument presented by some studies that argue a negative relationship between sustainability and financial performance reviewed by Rodgers et al. (2021).

Another critical issue is that sustainability requires more than a financial risk perspective and more actors, not just the financial markets. That will become clear in the following subsection, in which it is shown that stakeholders' actions are necessary to improve the company's possibilities for a successful sustainability transformation.

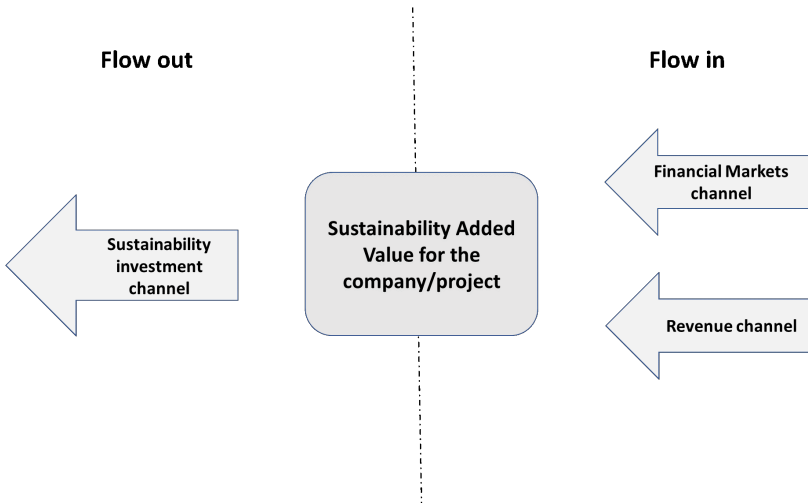


Figure 1: Cash Flow Channels Associated with Sustainability (Source: Author's elaboration based on financial modeling)

Strategic Model for Sustainability Based on Channels

To synthesize the analysis regarding the manager's financial decision shown in equation (2) and its complexity beyond financial markets, a strategic setting is

proposed and depicted in Figure 1. Think of three channels that carry cash flows adding and subtracting monetary value from the sustainability scenario, compared with the no-sustainable baseline.

First, there is the sustainability investment channel, which considers the costs associated with the sustainability transformation of the company/project. For many years, the business-as-usual paradigm viewed stakeholders' benefit as a costly, useless endeavor and a substantial obstacle, reducing the profitability of projects and companies. This is precisely one of the wrong ideas this paper disputes; by connecting the three cash flow channels, companies will find that investment in sustainability can be profitable for shareholders in addition to the morally right thing to do.

Second, there is the financial markets channel. This channel has the potential to produce a strong stream of added value for the sustainable company. That is because even a small reduction in the cost of capital for a project/company would significantly impact the present value of expected cash flows and could be enough to finance the costs of going sustainable. Another aspect to highlight is that the efficacy of this channel is overwhelmingly supported by empirical evidence; that is, financial markets tend to respond to ESG/CSR top performance revelations. Recall the results of Dhaliwal et al. (2011) and Gholami et al. (2022). Finally, the flow direction in this channel goes both ways; financial markets also punish companies that do not perform well in sustainability. When this becomes public, the financial risk associated with such companies rises. Evidence in this regard can be found in Kölbel, Busch, and Jancso (2017).

Third, there is the revenue channel that can be positively related to financial value creation for the sustainable company. This channel may produce an additive revenue effect if companies effectively communicate that they make their products and services following sustainable standards. In a good scenario, this effort can be recognized by sustainability-aware and engaged customers and rewarded with additional sales. The manager's fundamental problem is locating those customers, communicating the company's changes, and delivering. Empirical evidence in this regard is less clear than in the financial markets channel and sometimes contradictory. For instance, in consumers markets, Van Doorn, Risselada, and Verhoef (2021) report that even if sustainability is an important issue for consumers and has

risen significantly as a share of the market, the relationship between sustainability claims in new products and their sales is not as simple and one-directional. In their empirical study, they find that, in general, new consumer product launches with a sustainability claim produced fewer sales than their regular counterparts. However, a high CSR reputation of the brand/company can reduce those sustainability new product effects. That is, there is an opportunity for companies that work on a high CSR reputation.

In sum, the strategic play for the sustainable company and its management is to connect the channels and balance the flows to increase the financial value of a sustainability transformation. This would increase the likelihood of reaching a state in which the financial results of a sustainable company are larger than an unsustainable, business-as-usual strategy. According to the empirical evidence reviewed, a high CSR/ESG company reputation and results are essential in the expected success connecting the channels. Therefore, that should be the start of any company from a positive financial perspective. That is, under this modeling, there is a possible equilibrium in which the positive financial interest of shareholders matches those under the stakeholder theory. This also means that positive analysis and normative perspective coincide; sustainability is not only a moral quest but also can be good for business.

Finally, going back to the manager's problem used as an example in this paper, this company's sustainable transformation would be a long-term effort. Implementing changes would require funding before reaching the necessary level of credibility and accomplishments in the CSR/ESG arena. Evidence suggests that this struggle would be temporal and, sometime in the future, will be able to connect and balance the three channels depicted in this model.

STAKEHOLDER'S ROLE

Companies' strategic sustainable path, connecting and balancing the financial flows among them in a way that sustainability is value-additive, will be highly problematic if they launch on their own without the support of a sustainability ecosystem fostered by other stakeholders. This section describes the role of some of these critical stakeholders.

The Role of Normative Institutions

The normative environment is essential to the development of sustainability. Managers, financiers, marketing executives, and consumers' values regarding a new paradigm in business aligned with sustainability will not occur spontaneously. Introducing these values in the business world is a job for normative institutions. The change in what society, particularly the business community, finds valuable, worthwhile endeavors can be achieved via education, mass communication, and other means devoted to creating conscience among people regarding the importance of sustainability. The objective of this approach is that over time these actions will reach a critical mass of people, effectively changing consumer preferences and the general way people conduct businesses, both towards a more sustainable culture.

As an example of the importance of normative institutions in economic decisions, consider the general environment in microeconomics textbooks to describe the mechanism of cultural change (Varian, 2003). Divide the available goods in the economy into two groups, sustainable (x_s) and non-sustainable (x_n). This classification assumes that the type of goods is visible to consumers. The consumer will decide how to combine both groups to suit its budgetary limits and reach its highest satisfaction level, mathematically represented by a utility function. The consumer would prefer a particular combination of the two types of goods and, in the margin, will substitute some quantity of one for another without losing a given level of satisfaction. The ratio at which this exchange occurs is called the marginal rate of substitution. When this ratio equals the slope of the budget constraint, we have an optimal decision and a way to build the consumer demand for both types of goods. Therefore, a desirable change induced by conscience-driven education can ultimately modify the shape of the consumers' demand for products.

In Figure 2, two examples of consumer behavior are shown. Both types of consumers face the same relative prices and budgets. The only difference is how they assign subjective value to sustainability. The non-sustainable consumer does not allocate a high value to sustainability, while the sustainable consumer shows more subjective appreciation for consuming sustainable goods. Therefore, facing the same conditions, the sustainable consumer has a higher demand for goods that are sourced, produced, distributed, and disposed of in a sustainable way. That is, at least in the basic model, education can change how people value sustainability, hopefully to a point in which the global demand for sustainably produced goods is

relevant to firms. A business revolution is possible if the number of sustainability-aware consumers is large enough.

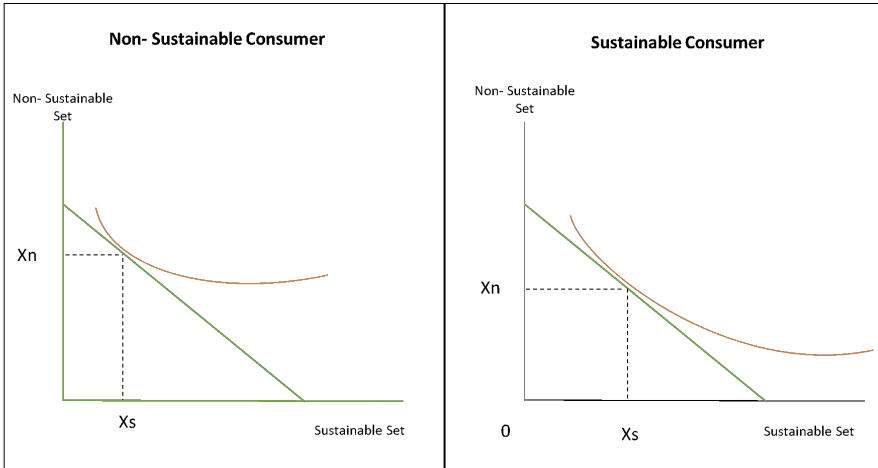


Figure 2: Sustainable vs. Non-sustainable Consumer (Source: Author's elaboration based on Varian, 2003)

These results directly relate to the revenue channel modeling discussed before. According to the empirical evidence on demand for new sustainable products in the market shown by Van Doorn et al. (2021), this channel still lacks clear, positive results. Therefore, changing consumer values will increase the possibility for this channel to become an important source of revenue and foster companies' adoption of sustainable strategies. Of course, if those entrepreneurs also go to business schools where the sustainability message is reinforced, the change may be supported by the two sides in the market.

That is the reason behind the proposal of a positive approach that complements the normative system, developing a new economic perspective that shows that being sustainable is also positively rational and that a sustainable firm can produce higher profits than a non-sustainable firm.

The Government, Regulators, and NGOs

Besides the necessary normative institution's impulse to change the economic culture in the world, other institutions need to contribute from a positive perspective in a way that companies can recognize in at least three ways.

First, stakeholders must keep the pressure on companies to achieve sustainability goals. One major issue Rodgers et al. (2019) mentioned for companies that continue efforts towards sustainability, even though they viewed it as a loss-bearing operation, was stakeholder pressure to comply. Also, one reason cited in their study for companies that make no sustainability efforts was the lack of stakeholder pressure. Then, key stakeholders such as government agencies and industry regulators must keep producing up-to-date regulations and sanction their compliance. Other stakeholders, such as communities, workers, clients, supply chain companies, and investors, should demand sustainability credentials from companies.

Second, there is the need to foster a financing ecosystem that funds the sustainability transformation of firms. As mentioned before, the sustainability change process in any company can be a long and costly affair mainly because a necessary condition for companies to connect with the financial markets and revenue channels effectively requires top performances in sustainability to be communicated. Therefore, the path to sustainability can include some years in which costs would increase without a better side. Would it be possible to fund such ventures ex-ante? That is, financially supporting the transformation with interest rates like those CSR/ESG accomplished companies face with the confidence that sustainability achievements will come. A social insurance mechanism may be needed, but it seems feasible.

Third, CSR/ESG reporting accuracy and transparency are crucial for the sustainability ecosystem. The existence of simple, transparent, accurate frameworks available to every stakeholder is a must. That requires independent institutional actors that ensure it and government and regulatory bodies that supervise the information generation process. These institutions may seem burdensome, but they are necessary to ensure a healthy sustainability ecosystem that stakeholders can trust.

CONCLUSIONS AND DISCUSSION

The sustainability transformation of a company benefits the people and the planet and promotes prosperity, which is a desirable endeavor. If efforts in this direction are fruitful, economic activity becomes a driving force for a world where extreme poverty can be eradicated and an inclusive future for humanity's life on this planet is possible. However, is this elevated state of affairs feasible? Can the interest

of shareholders align with the interest of other stakeholders? This paper develops a channel model showing that a positive answer may be feasible.

Three channels are identified: the sustainability investment, financial markets, and revenue channels. In them, distinctive financial cash flows run, and their interaction and balance determine the financial result for the company that embarks on a sustainability transformation. A company failing to connect the channels and find a cash flow equilibrium will not be sustainable and as profitable as the business-as-usual scenario.

The presented analysis indicates that when the gains for the risk reduction faced by the sustainable strategy (the financial markets channel) surpass its associated negative cash flows (sustainability investment channel), the sustainability transformation is financially valuable for the company. However, risk reduction may not be enough to ensure a higher payoff. In that case, the sustainable strategy also requires attracting a significant positive cash flow from consumers' demand for its sustainable products to benefit the company (the revenue channel).

The working hypothesis of this paper is that under certain conditions, sustainability transformation for companies can bring additional financial value to shareholders, higher than following a business-as-usual long-term strategy. This hypothesis is represented by equation (2) of the DCF model built to find such conditions.

Then, to ensure the company can successfully engage sustainability and get a higher payoff to its shareholders, the following needs to be attained to balance the cash flow among the three channels. First, the company should go for changes that imply a significant transformation, consistent with a sustainable stand for people and the planet, and effectively signal it to financial markets. Evidence indicates that for this transformation to reduce the company's cost of capital, it should be enough to result in a high CSR/ESG index performance. Second, in following this strategy, the company needs to be efficient, going for the high ESG impact initiatives, with maximum ingenuity and minimum cost, lean innovation, to have the lowest possible impact on the bottom line. Third, the company also needs to signal its transformation to consumers and engage them to sustain a stable increase in demand that helps improve the bottom line to cover the costs of going sustainable.

However, companies belong to a larger sustainability ecosystem, and other stakeholders' actions are required to improve the possibility of success of the company that has decided to go sustainable. Universities, business schools, and other NGOs must keep the normative transformation of the prevalent values in the business world, showing the ills of the business-as-usual paradigm and that a sustainable future is possible. At the same time, governments and industry regulators, consumers, workers, and communities must pressure companies to comply with the ESG/CSR normative and other standards. Finally, financing ex-ante transformation goals and warranting an accurate and transparent CSR/ESG reporting ecosystem may incentivize sustainability as a long-term business strategy.

As a closure, a reflection is shared. It needs to be understood that sustainability is a normative and a positive issue, and both perspectives need to work in tandem to produce the desired changes in society toward a different, sustainable world.

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Luis Raúl Rodríguez Reyes is Full Professor of Economics and Finance at ITESO, Guadalajara, Mexico. He obtained his Ph.D. Economics at the University of Essex in 2005 and M.Sc. Economics at CIDE (Centro de Investigación y Docencia Económicas, A.C.). He has worked for more than 14 years in the financial sector and is a Fellow of Mexico's National Research System since 2018. He is a member of the Editorial Board of this journal and a member of the Board at ITESO's Social Science Ph.D. Program. His main research interests are financial economics, public policy, and sustainability.

