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Perceived value versus real value: Why can investors in sustainable companies fail in their mission?

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ABSTRACT

Business models and investors should understand the meaning of 'value' from a different perspective if the ultimate goal is to achieve the sustainable development goals (SDGs). New business strategies for pursuing the SDGs and the aptitude to set up cleaner and more collaborative production systems must replace the traditional approaches tied to a value perception that is not coherent with the actual sustainability performance of companies. This outdated but still largely used value perception is often vague, abstract, and lacks more objective models and indicators to avoid misleading choices of investments in companies with low levels of sustainability. Using a mining company in Brazil as an example, this commentary letter aims to provide insights about the need for information rooted in science, considering biophysical perspectives under a systemic approach to fully understand the meaning of value behind companies' performance and support investments in those more sustainable ones. Parameters to quantitatively assess companies' sustainability are presented to start the discussions about how investors can make better choices when putting their money on those really more sustainable companies that, besides returning profits, will support the achievement of SDGs.

1. Value perception as a booster for decisions on investments

The United Nations 2030 Agenda for sustainable development assigns to businesses a critical role in achieving the sustainable development goals (SDG). Yet, a huge challenge in implementing the Agenda lies in transforming business routines and models to adjust their practices. Changes may incorporate indicators behind the SDGs in current business decision processes, encouraging actions to achieve the 2030 Agenda's goals (UNGC, 2018). At this point, leaderships with a solid background in systemic approaches (or life cycle thinking) are of paramount importance, enabling leaderships to understand that any production and consumption system is a complex part of a network of energy interactions from concentrated to more dissipative patterns. A systemic approach perspective can be deemed fundamental to achieving such a game-changing scenario as expected by Agenda 2030), which holds growing expectations about the potential of new business strategies to achieve the SDGs and the adeptness to set up more efficient and collaborative production systems.

Very probably, one of the main features of leaderships without a systemic perspective is related to the way they understand the meaning of 'value'. Value theory involves various approaches to better understand how, why, and to what degree humans assign value to things (among several others, please see Dodds et al. (1991) and Monroe (2002) on this subject). Under the ecological economics umbrella, value theory is divided into two types: donor-type value and receiver-type value. While the receiver-type value is the main accounting method used in neo-classical economics reflected by the market value or willingness to pay, ecological economists with a more systemic background argue that real wealth is only reflected through a donor-determined or biophysical value as a measure of what was needed to make an item or generate a service (Odum, 1996). So, the receiver type, also known as perceived value, can be defined as the value of a good based on how

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much people want or need it, rather than on the real price that would be uniquely expressed by the actual effort dispended by the biosphere to make it available.

Decision makers and stakeholders, including investors, mostly judge values according to the receiver-type approaches (Whittaker, 2011), which often leads to deceptive scenarios of companies' sustainability. How can a value perception that is adherent with the actual sustainability performance of companies be achieved? This question must be the core of effective business strategies that seek sustainability. Investors seek to position themselves when they believe they have enough information about companies' effectiveness. Based on this information, investors believe they are increasing their ability to predict the stock price in the long-term future with high levels of certainty, and lower risks, and can reward truly sustainable companies with investments. Fig. 1 shows the main components related to the investment system intermediated by the stock exchange. Investors can either carry out stock exchange transactions through brokers, individuals, participants in investment clubs or acquire funds from investment (via brokers, banks, or independent resources authorized by the local regulatory agencies). Market value, defined as how much people are willing to pay, is the primary method of quantifying classical economic values. The short-term human perceptions determine this value, needs and benefits expected, and, for this reason, this type of value is represented in Fig. 1 as an external transaction control (black circle).

Under the neo-classical disciplines of economics, the abstract market perception forces traders to decouple the natural environment from trading operations, but the real biophysical flows of energy and matter is what makes it possible to sustain trading operations (see Georgescu-Roegen, 1971) in this regard), which can be perceived from a systemic perspective. At this point, there is an ongoing debate on whether or not, based on biophysical perceptions of reality, it is possible to escape from subjective values contaminated by advertising campaigns that aim solely at profits. The market controls the ups and downs of stocks, and investments are made disregarding the biophysical world, which often results in an economic meltdown (Brown and Ulgiati, 2011). The psychological valuation-based market value is a solid push into delinking the main objective of promoting investment in stocks of genuine sustainable companies. Thinking of tangible goals, the virtual guesses or traditional value perception by investors should be replaced by the biophysical one; business-as-usual should be replaced by the biophysical economy to avoid an ecological collapse. To face the current worldwide environmental, social, and economic issues, a paradigm shift from infinite growth to sustainable growth constrained by the availability of renewable resources is needed to result in happiness and well-being for society (Odum and Odum, 2008), besides reducing income disparities risk that would increase polarization and resentment within societies (WEF, 2022). As investors are the owners of monetary capital and as the most important decisions in the world are based almost exclusively on the monetary aspects, systemic thinking must be rooted in investors' decisions, allowing them to better understand the meaning of value based on the donor side (or donor-type). If so, this would provide a solid perspective on how things work on the planet, including the thermodynamics laws, transformation, production chains, nature's effort to make a good or resource available, and/or diluting concentrated by-products. The black box in Fig. 1 must be replaced by a white box.

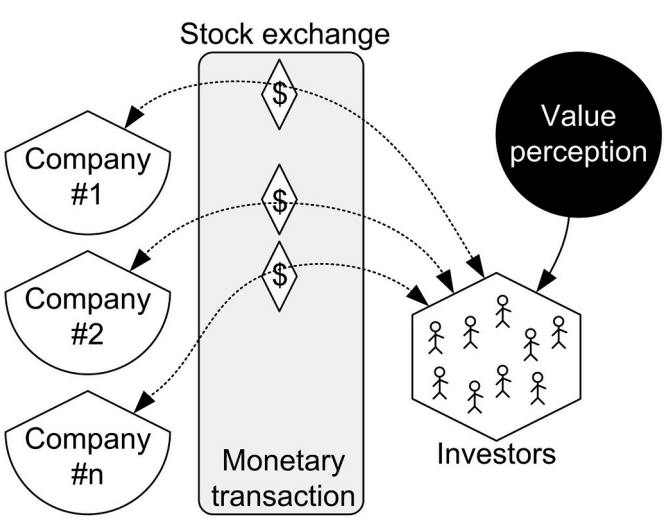

Fig. 1. Representation of capital flows (dashed lines) by the stock exchange, based on the value perceived by investors.

Although in its infancy, the market seems to head in this direction by starting to scrutinize companies' biophysical sustainability indicators before making decisions on which ones should receive investments. From a macro-governmental level, an important step towards this direction is the global risk reports from the world economic forum, which identify the risks from tensions that would result from divergent trajectories within and between countries; in the 2022 report (WEF, 2022), the health of planet dominates people's concerns, including climate action failure, extreme weather, and biodiversity loss. From a micro-company level, Rojas-de-Gracia et al. (2021) discussed the importance of governance in building a corporate reputation that would reflect on the recommendation for investments by analysts; Bhutta et al., 2022 analyzed the importance of green bonds to obtain funding for the so-called real green projects instead for the greenwashing ones; Farrell and Beer (2019) emphasized the importance of considering flow-fund fiduciary criteria to evaluate the ecological economic performance of investments by comparing with alternatives, and Alfredsson and Malmaeus (2019) called attention to fit investments within a shrinking carbon budget, and about the importance in considering the trade-offs between economic growth and sustainability in investment decisions. All these are examples of the importance of really understanding the meaning of value to achieve the SDGs.

2. The stock market of sustainable companies can be misleading

Events in the interconnected global market are indispensable guides for sustainable investment decisions. What happens in Brazil and elsewhere globally, mainly in terms of social and environmental trends, is relevant for investors in New York or Shanghai. This is one of the reasons why stock exchanges around the world are pursuing sustainability indices, with a clear trend towards criteria standardization. This phenomenon started in the 1990's with the Domini Social Index 400 (2021) and the New York Stock Exchange by the Dow Jones Sustainability Index (DJSI, 2021). Then came the FTSE4good (2001) in London, the Socially Responsible Index in Johannesburg in 2003 (Ngwakwe and Netswera, 2014), and the Corporate Sustainability Index (ISE B3) in the Sao Paulo Stock Exchange in 2005 (ISEB3, 2021). Another action for sustainability is the corporate social responsibility (CSR), defined as the set of corporate activities that aim to contribute to the achievement of sustainability, including the economic, environmental, and social dimensions of the present by considering the objectives of both companies and stakeholders (Lozano, 2012). All these approaches are seen as positive attempts to achieve sustainability as expressed by the SDGs, but malpractices are still present. For example, Gonçalves et al. (2021) argue that in periods of economic difficulty, the CSR is used opportunistically by companies that hide their earnings management practices behind their sustainable policies, an unethical behavior to deceive investors.

In 2005, the term environmental, social, and governance (ESG) was coined by the publication entitled "Who Cares Wins" (UNGC, 2018), which is gaining more and more space in the agendas of companies worldwide. Although the ESG should not be confused with corporate social responsibility or sustainability itself, it can be considered part of the same umbrella of meanings and purposes. Investments focusing on ESG seek, in addition to financial return, to mitigate environmental risks and improve the governance for the company's value protection

(Martí-Ballester, 2021). Although recognized as an important tool for investments in sustainable companies, Aich et al. (2021) claim that studies are needed to determine how social and governance ESG factors such as good governance, human rights, employee relationships, and corporate policy have an influence on investments focused on environmental concerns, in other words, whether the three ESG factors are balanced or the focus is given uniquely to one or two factors.

Taking the Brazilian stock market as an example, despite the existence of a growing interest of companies in the implementation of sustainable practices and social responsibility, only 18% of companies listed initially in the Brazilian ISE B3 - which registered themselves voluntarily and were classified as suitable for ISE – have remained since its birth sixteen years ago (ISEB3, 2021). Some reasons leading companies to leave the ISE B3 are related to corporate reorganization (acquisition, merging, spin-off, and incorporation), non-compliance with legal requirements, environmental and social disasters. Although recognizing ESG rating as a vital step to better reflect a company's sustainability, and that companies show noteworthy differences in the economic volume traded among those that have ESG rating and those that do not (Zumente and Lace, 2021), the existing sustainability indices in the stock exchanges need further developments and standardization to create a transparent and biophysical-rooted value perception for investors. In short, belonging to the ISE B3 portfolio is not a strong sign that a given company will maintain itself over time. At this point, the ESG appears as an advancement towards a more robust indication of companies' sustainability. In addition to the global trends involving aspects related to ESG issues and the importance of the ESG score for investors and companies (Zumente and Lace, 2021), there is a robust supranational incentive especially from the UN Global Compact (UNGC, 2018) for companies to adopt natural environment protection practices.

Under the regulatory sphere, the adoption of responsible practices can also be perceived at the government and public level by implementing laws for controlling and inspecting polluting activities (Santamaria et al., 2021; Plastun et al., 2020; Kweh et al., 2017). In Brazil, the legal requirement for environmental impact studies was launched in 1988 by the Brazilian National Constitution, which made it mandatory to carry out and publicize studies on environmental impacts as a result of mining activities, besides executing the ecological recovery of impacted areas and mitigation plans. As an example, within the mining sector, the Brazilian company VALE SA belongs to ISE B3 portfolio and proudly claims to be one of the most sustainable companies stating that " … being part of the new ISE portfolio is a recognition that we practice sustainability at each stage of our processes" (VALE, 2018). VALE SA is certified by environmental management systems (ISO14001) and quality (ISO9001). Eligibility for certification requires companies to adopt compliance goals and demonstrate their mission in achieving them, however, exclusively internal processes are considered for certification, and the company is seen as often ignoring the commitment to reduce environmental impact risks under a systemic perspective (Delmas, 2001; Aravind and Christmann, 2011). Being certificated is not necessarily associated with a company's infallibility in eliminating or mitigating its negative impacts (Vilchez, 2017). The above-mentioned VALE SA mining company, for example, was recently held responsible for two socio-environmental disasters (Milanez et al., 2021; Gonzalez et al., 2022).

Considering its 30 years of respecting the legal obligations, obtaining environmental certifications and international recognition, were the recent socio-environmental disasters caused by dam failures occurring at VALE SA mining sites in Brazil to be expected? In 2015 occurred the failure of the 'Fundão' mining tailings dam, under the legal responsibility of Samarco, VALE SA Company, and BHP Billiton, followed by the 2019 incident with the named 'B1' mining tailings dam under the responsibility of VALE SA Company (Milanez et al., 2021). Both are examples of a sad contradiction. The Brazilian federal laws proved to be insufficient in guaranteeing an efficient reparation for the affected families, and the company refused to accept independent advice to deal with such a significant problem. This resulted in judicial decisions based on questionable legal processes led by trial and error. The 'B1' dam disaster (including 19 human deaths, and 44 million m^3 of tailings under 670 linear km alongside the 'Doce' river watershed) repeated the usual delay in repairing losses and damages. So far, the information made available to society and investors is exclusively related to the monetary values invested in repair and compensation agreements with the State (VALE, 2021). Clear information on objective and transparent values of the losses and damages estimated from scientific-based approaches and additional remediation measures to be taken are still missing (Scarpelin et al., 2022). This is a clear example of the abyss between the company's image as environmentally responsible sold to society and investors and the reality, a chasm filled with uncertainties, lack of information, and impunity, which raises doubts about the objectivity of the existing sustainability indicators for companies that, in the end, feed investors with misleading information.

3. Are there objective parameters sustaining perceived value to invest in actually-sustainable companies?

According to Meadows (1998), one of the most efficient ways to change the behavior of a system is to change the existing indicators, as they can change one's perspective about reality. For example, the scientific literature holds a plethora of information that would be useful in making ESG more than simply a model of good practices, transforming it into an effective way of communicating the commitment and progress made by companies towards sustainability. The transformation should be inspired by many of the indicators behind the seventeen sustainable development goals (SDGs) and under a systemic perspective, molding business practices through the adoption of cleaner production[1] and circular economy[2] concepts to offer a more objective, contemporary, and unconventional view for those facilitators. Changing investors' perceptions from a traditional and narrow approach to a systemic one is fundamental to effectively achieve the SDGs, which Chatzitheodorou et al. (2019) coined as the investors' dichotomy, as while someone cares exclusively about economic profits, someone else aims at economic returns while protecting the environment and society.

In this context, a suggestion to be made is to examine the ESG value drivers using a scientifically rooted sustainability model that can evaluate and monitor the progress towards sustainability under a broader view. Fig. 2 combines the value drivers within ESG with indicators that can provide an overview of sustainability under a systemic perspective, based on the Five Sectors Sustainability Model (5SenSu; Giannetti et al., 2019). The model proposes a different interpretation of sustainability and stems upon: (i) a multi-dimensional approach embracing social, economic, and environmental dimensions or capitals; (ii) multiple perspectives, by considering both the donor (environment) and receiver (society) sides of different forms of capital; (iii) a multi-metric approach allowing the use of different indicators; (iv) a multi-criteria approach that allows the use of weighting techniques and composite indicators. Based on objectively driven parameters as those examples provided in Table 1 – anyhow, the choice of indicators feeding the 5SenSu should be a result of participative meetings –, the model can show investors how far a company is from the sustainability targets under the SDGs perspective. At this point, a more robust and objective (despite the inherent subjectivity existing for any multi-criteria approach as a result

[1] Cleaner production is the continuous application of an integrated preventive environmental strategy to processes, products, and services to increase overall efficiency, and reduce risks to humans and the environment (UNEP, 2006).

[2] A systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution. It is based on three principles, driven by design: eliminate waste and pollution, circulate products and materials (at their highest value), and regenerate nature (EMF, 2022).

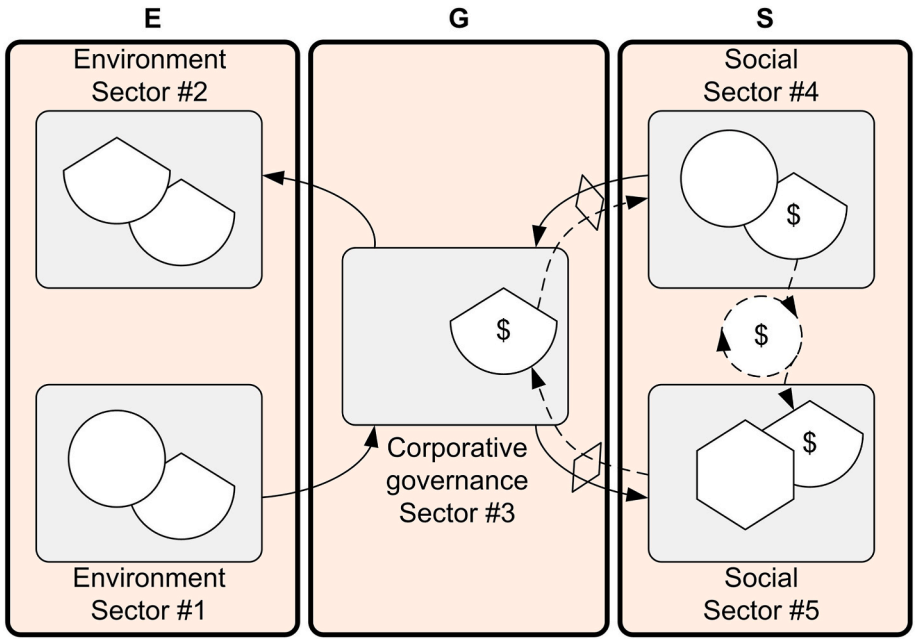

Fig. 2. 5SenSu model as the basis for an alternative interpretation of a company's ESG. Based on Giannetti et al. (2019).

Table 1
General example of sectors and their indicators based on the 5SenSu model (Fig. 2) to identify the more sustainable companies.

(E – environment) Benefits from/to environmental sector
Environmental Sector #1
• Use of renewable and biodegradable resources;
• Renewable energy and energy efficiency;
• Combating deforestation and preserving natural biomes;
Environmental Sector #2
• Reduction of toxic releases and waste;
• Reduction of GHE and actions to mitigate climate change;
• Waste reduction.
(G - governance) Benefits from/to corporate governance
Corporative governance Sector #3
• Transparency and environment-social-financial accountability, which would lead to reputational risks if not managed properly;
• Audit committee structure and independence of auditors;
• Management of corruption and bribery issues;
• Proactive environmental programs such as cleaner production, sustainable consumption and circular economy.
(S - social) Benefits from/to social sector
Social Sector #4
• Promoting diversity and inclusion of employees;
• Safe and healthy workplace;
• Promotion of employee education.
Social Sector #5
• Consumer responsibility;
• Ethical supply chain sourcing;
• Government and community relations in the context of operations in developing regions.

of (iv)) scientifically rooted and systemic perspective-embracing model can provide information to create a real perception value for investors, allowing investments in those really identified as more sustainable companies under lower risk. This is only an example among others that applies scientific information to business decisions, linking the well known ESG concept with the more objective and systemic perspective of identifying value.

4. A call for advancements on quantifying companies' sustainability

Why can investors in sustainable companies fail in their mission? Despite the inspirational nature of global initiatives such as the ESG, the heterogeneous and abstract interpretation of value by stakeholders calls for further efforts to improve the understanding and scientific resonance of future initiatives. Rather than providing a single answer to solve the misleading concepts behind the traditional way of creating a perception of value from a receiver-side perspective, this commentary letter attempts to draw attention to the future efforts to be required to better understand companies' sustainability, supporting more scientific-based and objective decisions for investors that are waiting for these types of indicators. The idea is to reduce risks and make plans for long periods, avoiding the measures that WEF (2022) recently identified for the post-COVID-19 recovery, which neglects the green transition in favor of short-term stability. Although there are helpful ideas available in the literature, some queries persist and can guide alternative trails towards really sustainable companies: (i) How deep and precise are the current legal requirements to protect the natural environment? (ii) How to ally value perception to sustainability and align this perception to achieving the SDGs? (iii) Are the available indices designed for companies enough/adequate to encourage cleaner production practices within companies targeting the SDGs achievement? (iv) Are the available indices designed for companies enough/adequate to assure sustainable environmental, social, and governance?

This commentary letter aims to leave these persisting queries, among others, as a source of ideas for reflection. The fact is that techniques, metrics and objectively driven indicators capable of quantifying sustainability under a systemic perspective are plentiful in the scientific literature. Which one to use is still a discussion topic, but regardless of one's choice, it would provide more reliable parameters for decision than the abstract receiver-side in perceiving value that lacks an epistemological base. As an example, the 5SenSu model presented represents a first step in organizing information under a biophysical point of view, including the processes and operations within companies and their relationship with society and nature. As a final take home message, we emphasize the importance of seeking indicators objectively coupled with nature and society under a systemic approach to guide a joint effort to pursue the SDGs. Only under such approach will investors be fed with reliable indicators in perceiving value, and will support those more sustainable companies, otherwise, the beautiful discourse about future and sustainability without solidity will remain as dust in the wind.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

Data availability

No data was used for the research described in the article.

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