

GENDER AND GREEN TRANSITION GAPS IN SMALL AND MEDIUM-SIZED ENTERPRISES (SMEs)

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ABSTRACT

As global climate change concerns intensify, businesses bear a critical responsibility to develop effective strategies to mitigate environmental risk. This paper examines the vital role of Small and Medium-sized Enterprises (SMEs) in the green transition and investigates whether female leadership presents a plausible solution. We address gender discrepancy in environmental concern and leadership, arguing that narrowing the gender gap in business leadership could positively influence the design and implementation of corporate environmental policies. Analysis of available data reveals a significant gender gap at various organizational levels, suggesting that increased representation of businesswomen leaders might enhance environmental protection efforts within SMEs. We highlight specific social and political measures implemented in Romania relevant to this context. The paper concluded by discussing future implementation strategies, particularly by examining the digital sector of the economy where women are drastically underrepresented at multiple levels. We conclude by emphasizing the potential impact of women leaders on environmental sustainability, while also flagging the "gender-greenwashing" risk, defining it as a risk of appointment of a woman to a leadership role without corresponding substantive environmental or organizational change.

KEYWORDS: *Small and Medium-Sized Enterprises (SMEs), gender gap, environment, gender-greenwashing.*

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1. INTRODUCTION

Despite the scientific consensus that global climate change is a measurable reality with identifiable causes, many countries lack the political involvement to effectively transfer environmental values and information to its citizens (Večkalov et al., 2024). Potential areas of discussion include financing green innovations for start-ups in SMEs (Mukherjee et al., 2024), how owner-managers' dual role could enhance the green transition (Tan et al., 2025), or how a well-developed business model could facilitate a faster transition (Gallina et al., 2024). While these other avenues show promising results,

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we focus on the potential role of a women leader in tackling environmental challenges specific to SMEs.

We will begin by highlighting the global environmental challenge and the role SMEs play in this context. Environmental challenges have been the focus of the Paris Agreement (United Nations Framework Convention on Climate Change [UNFCCC], 2015) signing countries. The commitment is to limit global warming to less than 2°C. Following the Paris Agreement, the European Union (EU), through the European Commission has developed the Green Deal, an elaborate plan to create a climate neutral EU by 2050. This is supported by a legal framework and specific action plans for different EU countries. The important elements of the green transition envisioned through the Green Deal are emissions reduction, sustainable development, green transport, environment and circular economy. For a global approach both large corporations or enterprises and SMEs need to transition to a green economy.

In 2022, The European Commission published a report on the impact SMEs have on the environment through gas emissions (Gorgels et al., 2022a). In the report it is shown that SMEs are responsible for 63,3% of CO₂ and greenhouse gas (GHG) emissions from the total amount of all emissions. The average SMEs emission of CO₂ is 67 tons and 75 tons of greenhouse gas. One feature of the SMEs impact is that even if the average individual amount of gas emissions is not significant, the total amount of gas emissions constitutes more than 50%, and it is greater than the impact of large enterprises. To reach the desiderata of climate neutrality established by Green Deal, SMEs must work on three levels for a green transition: reducing CO₂ and greenhouse gas emissions, circular economy and resource efficiency.

Another important aspect of the report concerns the economic ecosystems in which SMEs contributes with more than 50% of the GHG Emissions: construction (>70%), textiles (70%), cultural and creative industries (>65%), retail (>60%), proximity, social economy and civil security, agrifood (>55%), mobility, automotive and transport (>55%), digital (50%) (Gorgels et al., 2022b, p. 52).

As we can see, the impact of SMEs on the environment is substantial, and politics towards a green economy must address the specifics of SMEs regarding the environment. Wildnerova, L. et al. (2024) conducted a survey over SMEs listed in OECD-Orbis database countries, measuring the transition to a green economy. Of course, the sample studied differs from the EU's sample. Some of the relevant aspects investigate the possible reasons SMEs are less green than large enterprises. For instance, micro and small enterprises are less green than medium enterprises. The study identifies as a plausible cause the financial costs needed for the transition to a green economy. Second, SMEs that have been on the market for a longer period are more likely to adopt green transition. That is, the older the SME is, the more likely it is to transition to a green economy. One explanation for this is also linked to the financial stability of the company. Once they stabilize from a financial point of view, and there are no other crises or challenges, the enterprise can start to implement green measures that are both a financial and organizational effort.

On the other hand, when it comes to micro enterprises, we have the green "new-born". That is, there is a higher rate of newly founded micro enterprises that go directly into a green economy. The highest predictor for a green transition for SMEs, this study shows, is financial performance (Wildnerova et al., 2024, p. 26,27) translated into: productivity, higher wages (but employee growth rate is rather associated with fewer green transitioning measures), increases of revenue between 2016-2019 (turnover growth rate). The study (Wildnerova et al., 2024, p. 27) also points to the correspondence

between green organizational policies and the increase of revenue. On a medium and long term, greening an enterprise is correlated (even though a causality is not established) with an increase of profitability explained as follows: access to new markets, distinguishing from traditional products, an increase in customer concerns about the environment, decrease of costs production (Wildnerova et al., 2024). I think the relevant aspects to be highlighted from this study are the growth rate variable and the financial resources. Transitioning to a greener economy implies initial costs and investments that depend on the financial power. However, investments in a green transition determine important revenue growth. Connecting this information with the European Commission findings (Gorgels et al., 2022b, p. 52), we can see that the proposed and implemented green policies by the relevant political institutions accelerate the transition. For instance, from the sample studied, Wildnerova et al. (2024, p. 23) shows that EU countries such as Belgium, France and Greece are more committed to a greener economy.

2. GENDER DISCREPENCIES TOWARDS ENVIRONMENTAL CONCERNS

Since the 90s, we have empirical data to back up the fact that women express higher levels of concern for environmental and technological risks (Davidson & Freudenburg, 1996). Several articles examine valid correlations between the gender diversity of a company's board and its economic performance. For example, Galbreath (2011) found a relation in a number of Australian listed companies between the presence of women on companies' boards and economic growth, but no relation between women and companies' environmental sustainability strategies. Several mechanisms may explain this dichotomy. Women possess higher and enhanced social responsiveness which in turn facilitates a higher degree of cooperation, contributing ultimately to economic growth, whereas the absence of a direct link to environmental strategy adoption may result from the marginalization or dismissal of their initiatives due to pervasive organizational biases. In intense export industries, like Australia, women leaders manage to positively moderate green innovation (Galbreath, 2019).

Other empirical studies shows that the correlation between women leaders and the level of green transition for sustainability is more problematic. This is especially the case for developing countries where cultural factors may also pose a significant challenge for women business leaders. Many women from developing countries encounter significant hurdles, despite their recognized role as environmental actors (Ahmad et al., 2025). In other culturally problematic countries for women, such as Saudi Arabia, research showed a lack of correlation between women leaders and their role in tackling complex environmental challenges (Abdelwahed et al., 2025). However, the same study (Abdelwahed et al., 2025) also proposed a strategy that could quickly and effectively enhance women's participation and skills through an increase of opportunities.

In the report conducted by Bloomberg (2020) it was identified a correlation between gender diversity and climate innovation. One important finding is that economic enterprises (both large companies and SMEs) having more than 30% women board members are more likely to adopt climate innovation initiatives. The study concentrates on two aspects related to gender balance: climate governance and climate innovation. The sample of the study is impressive, i.e. more than 11,700 economic enterprises in the Bloomberg report (2020, p. 1). A short systematic review show that boards with more than 30%-woman members have a strong correlation with climate governance (initiatives and implementation of green commitments), this leads to a greater climate performance and an increase

in climate innovation measures although in the latter case the correlation is slightly weaker as shown in Bloomberg's report (2020, p. 1). The study measures the correlation between gender and greening policies but concedes that there may be additional factors that contribute to the correlation, without necessarily having a direct causation.

When it comes to climate governance, the correlation between environmental disclosure and gender balance may be determined by the following drivers according to Bloomberg's report (2020, pp. 6–9): strict legislation, pressure from stakeholders, different international initiatives. For instance, the study mentions France as an example of both gender balance and climate governance in economic enterprises. However, one reason behind this is the fact that France has already been implementing a strict legislation for environmental disclosure since 2013 (at least for large enterprises). Pressure from stakeholders is an important driver, stakeholders (both non-governmental organizations and customers) may pressure both gender balance and environmental disclosure. International initiatives such as TCFD, Climate Action 100+ and science-based targets that bring together different companies have had a positive impact on the climate reporting of those companies that adhered to those initiatives.

Climate performance (ex. reduction of emissions) is also correlated with gender balance. At least, the growth rate of emissions is lower in companies with more than 30% women board members. One explanation of the authors is the previous correlation between climate governance and gender diversity. Their explanation pertains to the fact that climate governance sets the stage, and it is necessary for better climate performance.

An important concluding remark of the study points to a cluster of aspects that seem to be interrelated and boost each other: technological innovation, corporate culture, sustainability and gender diversity policies according to Bloomberg's report (2020, p. 19).

3. PINPOINTING THE GENDER GAP IN BUSINESS AND MORE

The authors from the volume edited by Susan Madsen (2024) express both an enthusiastic and cautious attitude towards the advances that were made in bridging the gap between women and men. A careful examination of the status of women leaders worldwide shows us that significant progress has been made, but it lacks, in certain aspects, a universal approach and determination in the context of understanding the general motivation of women as leaders. We now turn to the role of women in business leadership, as discussing women representatives as political leaders is outside the scope of this paper.

In the Global Gender Gap Report from 2025, designed by the World Economic Forum (WEF), an index was designed to consider four subindexes (Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment), which gathered relevant data from 148 economies, comparing their evolution since 2006 for at least 100 economies. The gender gap is 68.8% close as of 2025, while no individual country managed, according to the criteria from the index, to fully close the gap. Iceland is closest to fully closing the gap at 92.6%. But as related to Economic Participation and Opportunity, the total woman's workforce participation globally is 42.2% in 2024, but with a segregation on gender-based industries: Healthcare and care (58.5%) and Education (52.9%). Between 2015 and 2024, the share of women in top management rose from 25.7% to 28.1%, but progress has slowed post-2022. Women outperform men at tertiary

education levels. Despite this, they remain underrepresented in the workforce and in leadership roles — only 29.5% of tertiary educated senior managers are women.

Alongside the World Economic Forum (WEF), the United Nations (UN) and the World Bank monitor the gap between men and women leaders, alongside other organizations. Deloitte and Morgan Stanley Capital International (MSCI) also stress in their reports that if this gap were closed, then markets would benefit.

In one of the most comprehensive studies for SMEs (Small and Medium-sized Enterprises), which included 48 countries and 160,000 respondents (Nicolás & Rubio, 2016) the gender and development gaps were studied in relation to social entrepreneurship. Social entrepreneurship is seen by the authors as an alternative to commercial entrepreneurship in the sense that through economic means, people try to solve societal problems by identifying sustainable solutions. Meanwhile, commercial entrepreneurship is seen as a means of identifying profitable investment opportunities, the whole purpose of which is to increase capital. The study contained three stages depending on the level of development of the countries as seen in Fig 1.

Table 1. Countries from where the data was gathered

Level of development	Countries	Sample size
Underdeveloped countries (stage 1)	Algeria, Guatemala, Lebanon, Jamaica, Morocco, Saudi Arabia, Syria, Uganda, Venezuela and the West Bank and Gaza Strip.	19,203
Developing countries (stage 2)	Argentina, Bosnia and Herzegovina, Brazil, Chile, China, Colombia, Croacia, Dominican Republic, Ecuador, Iran, Jordan, Letonia, Malaysia, Panama, Peru, Romania, Russia, Serbia, South Africa and Uruguay.	48,405
Developed countries (stage 3)	Belgium, Finland, France, Germany, Greece, Iceland, Israel, Italy, Republic of Korea, Netherlands, Norway, Slovenia, Spain, Switzerland, United Kingdom, United Arab Emirates and United States.	89,747

Source: adapted from Nicolás & Rubio (2016)

The authors, based on the data they gathered, managed to extract the gender gaps in commercial and social enterprises based on the intervals of activity of 0 to 42 months or more than 42 months, as seen in Table 2. We can observe that the highest gaps between women and men are in developed countries at the level of commercial enterprise, reaching 52.94% for the interval of more than 42 months, slightly decreasing to 48% for the interval of 0 to 42 months.

However, looking at the data in another way, all the percentages in terms of gender gaps increase across all three country stages (developed, developing, and underdeveloped) when the time interval increases from 0–42 months to more than 42 months. This increase is observed: (i) from 48% to almost 53% in the case of developed countries; (ii) from 32.7% to 47.22% in the case of developing countries; (iii) from 33.8% to a staggering 52.52% in the case of underdeveloped countries.

When we focus on the case of social enterprises, with only one exception (underdeveloped countries), the percentage is lower in the longer time interval. The exception is underdeveloped countries, with

an increase from 23.50% to 50%. Meanwhile, in developed countries, there is a considerable reduction of the gap from 40% to 30.7%, and in developing countries, the gap is reduced from 32% to 25%.

The authors concluded that, based on the studied data, social entrepreneurship could represent the best option for women who want to engage in such an activity.

Table 2. Gender gaps

	Commercial Enterprise with 0–42 months of activity (%)	Social Enterprise with 0–42 months of activity (%)	Commercial Enterprise with more than 42 months of activity (%)	Social Enterprise with more than 42 months of activity (%)
Developed countries	48.00	40.00	52.94	30.77
Developing countries	32.70	32.00	47.22	25.00
Underdeveloped countries	33.80	23.50	52.52	50.00

Source: adapted from Nicolás & Rubio (2016)

4. A BRIEF ANALYSIS OF TRENDS AND POTENTIAL PATHS FOR ROMANIA

Romania lunch at least one call for projects to encourage businesswomen leadership. For example, the Ministry of Economy, Entrepreneurship, and Tourism (IMM) has launched a specific funding opportunity, "Femeia Antreprenor 2024", dedicated exclusively to supporting women entrepreneurs. This program features a total budget of 40 million EUR for the 2024 fiscal year. It is strategically structured to provide financial assistance to the largest possible number of businesses, aiming to support approximately 1,000 beneficiaries. Individual projects can receive a maximum grant amount of 40,000 EUR. The program is highly sought after, as demonstrated by the previous 2022 edition. That year, 9,520 applications were submitted, confirming extremely high interest and resulting in intense competition—with approximately 10 proposals competing for every single funding spot.

At the level of civil society there are least two active organizations in Romania that offer their support for women leaders who want to start a business `Women’s entrepreneur association in Romania` and the `Organization of Women Entrepreneur`. The organizations provide networking and community opportunities by organizing frequent events, consultancy and mentorship for a varied category of business, information regarding funding opportunities both national and European, and finally they advocate for better public policies and overall, a more inclusive business climate and supportive for women entrepreneurship.

In Figure 1 created by the Global Entrepreneurship Monitor (GEM) from below we can observe that Romania is placed in group B given its Total early-stage Entrepreneurial Activity (TEA) by men and women in percentages (TEA % men and TEA % women). Compared to other countries Romania is only above Poland, and it is significantly behind other countries. In the rest of the report we can

conclude that men are 1.5 times more likely to start a business compared to women in Romania (Hill et al., 2025). But given its low scores we can say that the difference is not significant in the sense that women face major barriers in particular but more that all entrepreneurs, no matter their gender and age face significant challenges compared to other countries.

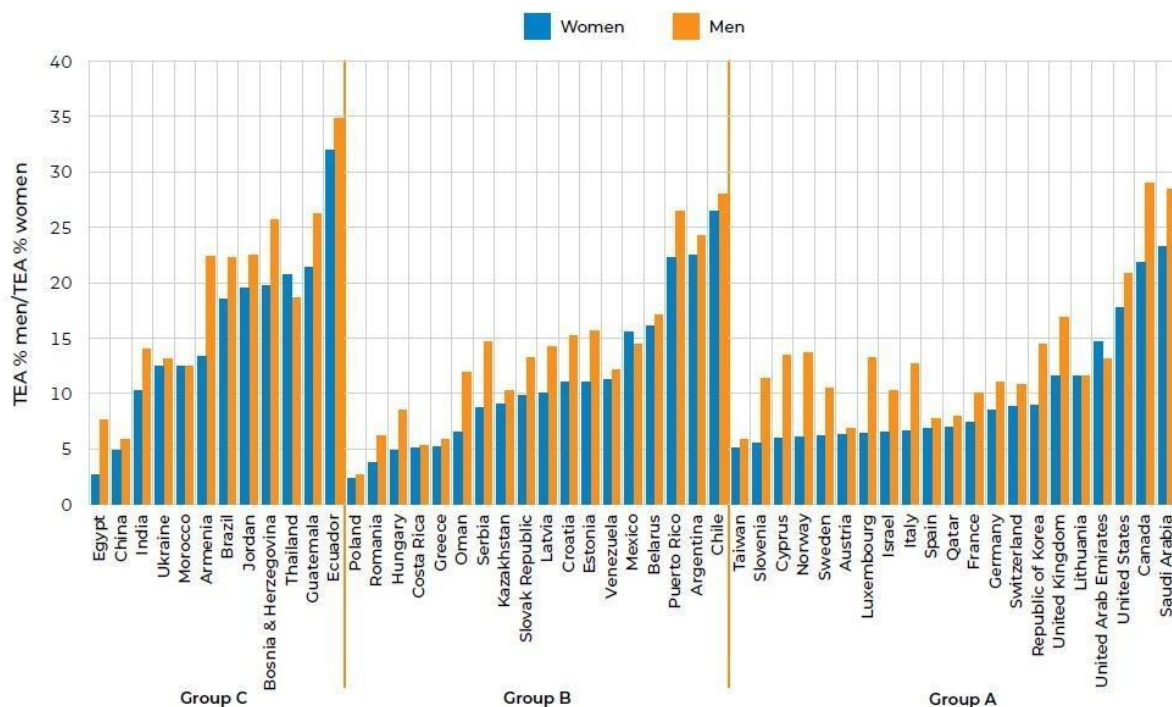


Figure 1. Early-stage Entrepreneurial Activity (TEA) by men and women in percentages
 Source: Hill et al. (2025, p. 248)

5. WOMEN'S LEADERSHIP IN THE DIGITAL SPHERE: A CATALYST FOR SUSTAINABLE OUTCOMES?

New emerging power intensive technologies like Artificial Intelligence (AI) accelerate the demand for energy especially through its rapid data centers expansion. We should not be surprised that in the future this sector could be seen as a decisive playground for tackling environmental challenges. If our arguments proved to be valid and women leadership could mitigate environmental risks and enhance sustainable development then the digital sphere, big tech business alongside SMEs should change their approach. Also, the digital sector attracts a lot of well-paid jobs and independent sustainable projects depend in itself on the digital sector (Channi & Kumar, 2024).

We should begin by analyzing if there is any gender discrepancy when it comes to access to internet worldwide. According to the data from Figure 2 provided by International Telecommunication Union (ITU), and United Nations (UN) agency specialized in digital technologies and communication, women have similar access to internet technologies over the globe, with notable bigger gaps in Africa, 12%, and Arab States, 11%. So, we can conclude that in terms of access there are not so many major discrepancies. But when it comes to attitudes toward technology, we can observe significant

differences, men lagging behind when it comes to digital communication while women to abstract digital reasoning (Campos & Scherer, 2024).

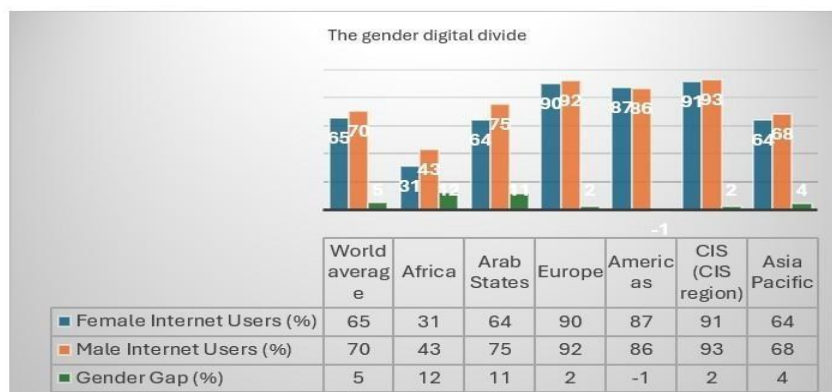


Figure 2. The gender digital divide

Source: ITU data (2023)

Despite this relative equality, if we now focus on female leaders in the digital industry, we can observe a slightly improved presence in the last 9 years (2014-2023) according to figure 3 with a stagnation from 2022 to 2023.

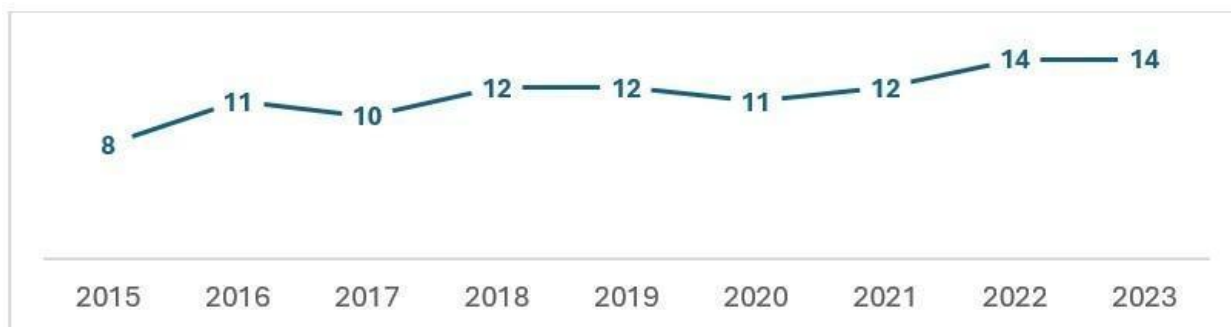


Figure 3. Percentage of female leaders in digital industry

Source: Digital Leadership Report 2023

But women are still drastically underrepresented at the level of big tech companies varying on the profile of the company. The biggest tech company based on an approximation of market capitalization as of September 2025, Nvidia (4.47 trillion dollars), has the lowest percentage of female leaders, 12%. While Microsoft, second biggest tech company as of September 2025, declared that 25.9% of executive positions are occupied by women.

Table 3. Female representation in leadership/management positions in big tech companies in 2022

Company	Share of leadership/managerial positions
Nvidia (leadership)	12%
Broadcom (people managers)	13.9%
Samsung (managerial)	16.9%

Company	Share of leadership/managerial positions
Cisco (leadership and people managers)	24%
Amazon (leadership)	24.5%
Microsoft (executive)	25.9%
Oracle (managerial)	27.43%
Alphabet - Google (leadership)	28.1%
Apple (leadership)	32.3%
Meta - Facebook (leadership)	36.7%

Source: adapted from Statista (2025)

If we couple this information with the data from the literature that women leaders in SMEs are less likely compared to man to adopt IT tools in companies (Orser & Riding, 2018), and assuming that this study is still relevant for our days, then the industry should design new approaches in order to encourage more women to adopt disruptive technologies and hopefully to use them in order to meet sustainable and environmental targets.

6. GENERAL REMARKS AND SUGGESTIONS

It is important to highlight the dynamic between one's behavior in different settings. Of course, when choosing a job our own personal preferences determine us to choose a certain professional path and not another but what we are more interested to see is if people (women and men alike) with the same kind of interests have different kinds of outputs. Otherwise, the fact that in general women are inclined to be more interested in the environment and choose jobs according to their interest does not translate as a significantly different capacity.

The empirical data we currently lack concerns the existence of a direct and demonstrable link between the presence of female leaders and the advancement of the green transition. In other words, although several studies suggest that women in leadership positions often display stronger personal commitments to sustainability and socially responsible practices, we still do not possess sufficient evidence to confirm whether these commitments translate into concrete, measurable actions that accelerate a green transition within their organizations. This gap in knowledge makes it difficult to determine causality rather than mere correlation. It is also important to note that gender and green policies are not studied within the SMEs ecosystem. We've seen that financial potency is an important aspect that allows for a green transition, and not necessarily gender balance.

There are, however, several ways to explain why a correlation may appear between female leadership and green-oriented outcomes. One line of reasoning relates to organizational culture. Companies that intentionally cultivate cultures grounded in values such as corporate social responsibility, ethical accountability, and long-term stewardship tend to promote both gender balance and environmental awareness. These values often go hand in hand, shaping an organizational identity that is more attentive to the needs and expectations of diverse stakeholders.

A second explanation involves stakeholder pressure. Organizations today are increasingly expected to respond to stakeholder demands for greater responsibility, transparency, and sustainability. Leaders who are more sensitive to such pressures—female leaders included—may be more inclined to integrate environmental initiatives into their strategic decisions.

A third factor concerns the influence of legislation. In many contexts, stricter regulations regarding gender balance, sustainability reporting, and green economic policies create structural incentives that push organizations toward both more inclusive leadership and more sustainable business practices. These parallel legislative trends may reinforce each other, contributing to the appearance of a link between gender diversity and environmental performance.

A fourth factor concerns rather a cluster of interconnected aspects that appear to reinforce and accelerate one another. These include technological innovation, the shaping of corporate culture, the adoption of sustainability practices, and the implementation of gender diversity policies. Together, these elements create a mutually supportive framework that strengthens an organization’s overall commitment to responsible and forward-looking governance according to the Bloomberg report (2020).

Unfortunately, such empirical data is still lacking within the Romanian ecosystem. Most of the existing research, especially the most comprehensive analyses, focuses on OECD countries, whereas Romania remains only a candidate, leaving a significant gap in local evidence and comparative understanding.

Greenwashing is a concept used in the literature to denote a particular kind of ethical washing, exaggerating or outright fabricating a company’s transition to a sustainable and green economy (Santos et al., 2024). While underpinned by many theories (Bernini et al., 2024; Bernini & La Rosa, 2024), at its core lies an ethical evaluation of business, their attitude towards their clients, investors and many other stakeholders and shareholders. We would like to propose in our article the concept of *gender-greenwashing* for SMEs and address its potential ethical implications.

While current data is inconclusive regarding whether gender diversity in leadership (specifically women's leadership) inherently leads to better sustainable and greener transitions, many organizations advocate for equal representation. This advocacy is valid on normative grounds—that men and women deserve equal opportunities in business—even without supporting data. However, we must acknowledge the serious risk that a company's image of women's leadership could be exploited to "gender-greenwash" its less-than-sustainable actions. If this risk materializes, it could undermine the value of women's leadership and expose female leaders to unjustified criticism, jeopardizing their legitimate efforts.

Furthermore, using the ethical endeavor to increase female representation in business, including at a leadership level, as a means of ethical washing could undermine both its environmental and gender-equity agendas. We argue for special caution regarding this deceptive practice, necessitating the development of managerial tools for its swift detection and mitigation. A true and unambiguous strategy is needed to tackle complex ethical challenges.

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