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Has the Covid-19 pandemic jeopardized firms' environmental behavior? Bridging green initiatives and firm value through the triple bottom line approach

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Abstract

The Covid-19 pandemic has caused a significant decline in stock markets worldwide, and organizations are experiencing serious financial problems. Protecting and preserving firm value are critical ways to help organizations survive the crisis. This study analyzes a sample of 45 firms listed on the Polish Stock Market in two periods to determine the relationship among green initiatives, the triple bottom line (TBL) perspective, and firm value in the periods before and during the crisis caused by the Covid-19 pandemic. The results show that firms with higher green initiatives are more likely to obtain better TBL performance during the normal period. Economic and social dimensions of TBL positively influence firm value regardless of the period, but the same is not true of the ecological dimension. The Covid-19 pandemic's negative impact on investors' perception does not translate to firm value. This study provides the first empirical evidence on the value of organizations affected by the Covid-19 pandemic in the context of environmental management. By considering the TBL approach, this study provides a new boundary condition that explains the impact mechanism of green initiatives during a crisis.

KEYWORDS
Covid-19, green initiatives, TBL approach, value

1 | INTRODUCTION

Firms have had to face several medium- and long-term challenges during the last two decades, including socio-economic problems, such as unequal opportunities for women and men, high unemployment, and welfare cutbacks (Geels, 2013), and environmental issues (Adomako et al., 2021), such as increasing air pollution, global warming, and biodiversity loss. Crises in general—by adversely affecting the economic environment—bring additional challenges for organizations, which are seen to be responsible for several negative impacts on the environment (Lozano, 2015). Such situations were further exacerbated by the Covid-19 pandemic crisis as well as, for example, the related pandemic-driven lockdown, leading to new requirements for companies as dictated by employees, customers, auditors, the state, and other stakeholders (He & Harris, 2020; Lari Dashtbayaz et al., 2022). Previous studies have confirmed a slowdown in economic activity due to the pandemic, on the one hand, and a lowering of future forecasts, on the other (Meyer et al., 2022). In effect, the implementation of various development and investment (pro-innovation) projects may have been threatened or suspended as firms were forced to face newly emerging issues (Seles et al., 2018; Salehi & Sadeq Alanbari, 2023).

In addition to these problems, crises also affect firms' perceptions of the importance of their green initiatives, which we define as a set of firm actions (such as energy efficiency, emission reduction, waste

reduction, and recycling) aimed at minimizing the negative environmental effects caused by firms' behavior (Li et al., 2017). During an economic crisis, stakeholders' attention on environmental problems might appear to weaken (Geels, 2013), leading to firms' decision to stop or limit these activities. This behavior is due to the relationship between the Covid-19, distress tolerance and fear (Salehi et al., 2023). According to Hermundsdottir et al. (2022), less "green" firms are better able to maintain business operations after an external shock like the Covid-19 because they are less shock-prone and less future-oriented. Also, governments may reduce financial support for environmental programs/innovation to financially support economic recovery programs (Gautam et al., 2022). However, some authors acknowledge the extensive involvement of business in philanthropic actions during the pandemic, likely motivated by both utilitarianism and deontological factors (Manuel & Herron, 2020). Indeed, Geels (2013) shows that a financial–economic crisis can have both positive and negative effects on sustainability transitions. During crisis periods due to, for example, pandemics, such green initiatives could be supported by governments through various programs focused on helping firms recover from the crisis. As the empirical findings showed eco-friendly firms perform better during the Covid-19 pandemic (Zhang & Fang, 2022). These results are probably related to the efficacy of government relief programs targeted to eco-friendly SMEs which reduce their vulnerability to shocks. Moreover, firms' green initiatives could lead to customers preferring firms to provide "worse products, but ones which are environmentally friendly" (Liu et al., 2012). Firms can therefore believe that green initiatives will provide them with some kind of "insurance" to protect against economic downturns. Therefore, antagonism has been observed between positive and negative discourse.

Considering research on this topic so far, two existing research gaps have been identified (and discussed below): (i) the inconsistent and limited results regarding the effects of the crisis caused by the Covid-19 pandemic on firms' green initiatives; and (ii) the discrepancy in the perception of the influence of green initiatives and the triple bottom line (TBL) approach on firm value and performance, particularly during the Covid-19 pandemic, which has not yet been fully mapped. Therefore, the main motivation of this study is finding answer to the still unclear question (a central research question) of: *What is the relationship among green initiatives, the TBL approach, and firm value in the periods before and during the Covid-19 pandemic crisis?* Moreover, the present study aims to address these two research gaps while determining the degree of linkages among green initiatives, the TBL approach, and firm value before and during the Covid-19 pandemic crisis.

First, giving credence to our arguments, we start with the Covid-19 pandemic. Up to now, we still know little about the effects of this crisis on firms' green initiatives. Indeed, prior research focused more on the overall impact of the Covid-19 pandemic on environmental change (Saadat et al., 2020), firms' stock market behavior (Arianpoor & Naeimi Tajdar, 2022) and risk-taking (Shafeeq Nimr Al-Maliki et al., 2023), firms' survival and strategy changes (Islam & Fatema, 2023), managerial behavior involving concern about the pandemic (Salehi et al., 2022) or, for example, consumers' behavior (Cruz-Cárdenas et al., 2021). He and Harris (2020, p. 176) stated that *"[the] Covid-19 pandemic offers a great opportunity for businesses to shift towards more genuine and authentic [corporate social responsibility] CSR and contribute to address urgent global social and environmental challenges."* On the contrary, Zhang and Fang (2022, p. 2) noted that "*the pandemic accelerates uncertainty in firms' operating activities and revenue, resulting in unstable environmental behaviors*" while Hermundsdottir et al. (2022, p. 1) concluded that *"firms that were the most environmentally innovative before Covid-19 were more impacted by Covid-19 than less 'green' firms"*. Such discrepancies indicate the first research gap represented by the hitherto ambiguous (and limited) evidence on the effects of the Covid-19 pandemic on firms' green initiatives.

Second, the nexus among green initiatives, the TBL approach, firm value, and performance in times of crises is the second important issue. Existing literature has already confirmed the positive effects of green initiatives on firms' financial performance (López-Pérez et al., 2017) and value (Ammer et al., 2020; Uyar et al., 2023). Another string of studies has demonstrated the positive impact of the TBL approach on firm value (Guenster et al., 2011). Here, we define the TBL approach as a management form that pursues sustainable growth based on a harmonious foundation of economic profitability, environmental soundness, and social responsibility (Jhawar & Gupta, 2017). Despite these findings, existing literature also presents critiques of this nexus and suggests that expenditures related to green initiatives could result in reduced firm value (Manchiraju & Rajgopal, 2017). Marsat et al. (2021) argued that environmental performance appears to be an organizational constraint that may limit firms' ability to be financially resilient. This discrepancy in the conclusions regarding the perception of the influence of green initiatives and the TBL approach on firm value and performance creates an interesting gap for the current study.

Third, most existing research on the nexus described herein was carried out under so-called normal conditions while the literature has paid far less attention to crisis contexts, as noted by Seles et al. (2018) and Hwang et al. (2021), among others. Belso-Martinez et al. (2020) and Lu et al. (2022) also noted the fragmented research on this topic. For example, Lu et al. (2022) found that firms investing in environmental and social activities during a crisis have more positive economic outcomes. Therefore, considering Zhang and Fang's (2022) conclusions that eco-friendly firms could perform better during the Covid-19 pandemic (contrary to the above-mentioned results of Hermundsdottir et al., 2022), we note the need to reflect the context of the Covid-19 pandemic crisis in this research stream.

To address above defined gaps and a central research question, this study tests seven hypotheses using our original data source: a survey of 45 firms listed on the Polish Stock Market (WIG-ESG index). Poland belongs to the group of so-called "catching-up Central and Eastern European countries", which were historically considered to be countries with a lower environmental perception. Moreover, these countries were perceived as countries with a lower interest of analysts to investigate this territory, in comparison with, for example, Western advanced economies. This resulted in a lack of necessary data for public policy makers as well as for practitioners (Prokop et al., 2023). Therefore, the choice of country was due to the introduction of numerous green initiatives by Polish companies as a

catching-up country response to EU requirements in recent years. At the same time, Poland implemented a lockdown during the Covid-19 crisis, which resulted in a deterioration of the eco-economic performance and a technical recession (please also see the Section 4.1).

Our original findings go against the branch of literature expecting that firms' green initiatives are limited during a crisis. We show that green initiatives can trigger all three dimensions of the TBL approach during a Covid-19 crisis period. By contrast, our findings show that environmental performance has no impact on firm value in times of crisis and thus bring several new questions and stimuli to the academic and practical discussion. Moreover, this paper contributes to the literature in several ways. First, we link contingency theory, resource-based view, and resource dependency theory to contribute to the current state of knowledge by considering the effects of the Covid-19 crisis. We add to previous studies on environmental management, specifically those that analyzed the pandemic's impacts on other strategic variables, like value and efficiency. Our findings help illuminate the pathways through which green initiatives operate and estimate their unique effects on firm value. We show how such initiatives operate across different macroeconomic environments. We identify important differences managers should understand in the patterns and magnitudes of the effects of green initiatives in economic expansions versus contractions. To the best of our knowledge, this is the first study to apply these theoretical and methodological approaches to this subject. Second, this study is anchored on the framework of stakeholder theory to explore the role of event time and space for investors' behaviors. Similar to recessions caused by other types of crises, the Covid-19 pandemic has made investors particularly sensitive to organizational performance. This study reveals how investors' perception of a pandemic situation is linked to company value. Finally, and relatedly, managers can exploit our empirical results to strategically deploy resources and take mitigation strategies to minimize the loss of firm value due to contingency.

The rest of this paper is structured as follows. In the second and third sections, a review of underlining theories is presented, followed by the development of the hypotheses to be tested. The fourth section expounds the research methodology for our study, which includes the data sources, the measures used, and the details of the performed data analyses. In the fifth section, the results of the study are presented, followed by a discussion in the sixth section. The paper concludes with a summary of the study's contributions, including practical implications, a discussion of our limitations, and future research directions.

2 | UNDERLINING THEORIES AND THEIR NEXUS

2.1 | Theory selection and mix

Our theoretical framework draws on and links several theoretical concepts, which can exist independently, but which we also believe can co-exist together. This approach allows the reader to develop a more comprehensive picture of the issue. It includes theoretical (and subsequently also empirical) analysis of firms' external ecosystem (crisis context, external stakeholder behavior) and its impacts on firms' (i) internal ecosystem; and (ii) perception of the need for all three dimensions of the TBL perspective. Next, it also allows us to analyze effects of internal and external ecosystem on firm value. We start with contingency theory, which is widely accepted as a suitable theory for analyzing firms' perspectives in crisis contexts (Seles et al., 2018). Based on this theory, firms should comply with the requirements from the external and internal ecosystem. Therefore, in our study, we follow the main ideas of this theory and contribute to its extension by examining the effects of the crisis caused by the Covid-19 pandemic. We also examine the impact of the crisis on external stakeholders and, subsequently, we analyze how firms respond to external stakeholders who are affected by the crisis (as a link between contingency theory and stakeholder theory discussed below). We then link this concept with the resource-based view (RBV) and natural RBV (NRBV) theories that have been highly infiltrated into academic dialogs to assess the business practices for environmental sustainability to achieve a competitive advantage with available resources and production capabilities (Grimstad, 2011). Thus, we reconcile stakeholder theory and RBV to explain the importance of green initiatives in the Covid-19 conditions, taking into account that: (1) it is important to build lasting relationships with stakeholders because they are crucial to the survival and success of the company in a crisis, and because it is simply the right thing to do ethically, (2) using the resource-based perspective of the firm is a powerful framework to build sustainable stakeholder relationships. This approach will help us (i) better understand how firms can gain a competitive advantage as well as environmental, economic, and social sustainability and (ii) summarize the linkage between external environment and internal resources and production capabilities.

Considering environmental, economic, and social sustainability, and to better understand firms' responses toward green initiatives, the combination of (N)RBV and stakeholder theory is recommended and has been widely applied (Moosa & He, 2021; Horbach et al., 2022), while also including the TBL perspective. This perspective adds social and environmental measures of performance to the stakeholder economic measures (Hubbard, 2009). We propose that theories aimed at stakeholders will gain instrumental resources that provide significant effects on firm value, while TBL indicators simultaneously enable us to evaluate this impact. Compared to findings so far, we expand the current state of knowledge by considering the main ideas of contingency theory, and thus also the effects of the Covid-19 crisis on firm. Moreover, since we consider that firms' green and social behavior can be positively evaluated by stakeholders in times of crisis, we newly create an original theory-mix combining contingency theory, stakeholder theory and the TBL perspective. Finally, we include (natural) resource dependency theory (RDT), which posits that firms' engagement in green initiatives can positively influence their financial performance and value (Adu, 2022). We believe that the theoretical framework constructed in this way brings new perspectives on the influence of the external environment on the firm

and its value in a period of crisis, as well as on the reaction of firms and external stakeholders to crisis situations.

2.2 | Contingency theory

Contingency theory inspires firms to incorporate strategic fit with both its internal and external business ecosystems for the best accommodations in communities to achieve sustainable ecological, economical, and social efficiencies (Martinez, 2014). Similar to the stakeholder theory, special attention is paid to the goals and requirements of different stakeholders, including non-primary stakeholders interested in sustainability. In our context, contingency theory holds as a solid theoretical background for green initiatives studies to create values for societies (Seles et al., 2018), yet we also point out the main advantage of this concept, which is that it provides a background for analyzing the consequences of a crisis in the business environment. As the effects of external events are often unpredictable, but have a major impact on firms' green initiatives, contingency theory is key because it deals with organizational management due to external events and forces firms to consider the constraints arising from these events (Alves et al., 2017). The consequences of the Covid-19 pandemic can be analyzed using the lens of contingency theory because, similar to an economic crisis, the pandemic has created uncertainties and threats within firms' environments. Contingency theory explains how the decisions and actions of stakeholders depend on the behavior of the organization in a crisis (Childs et al., 2022). Given the unexpected nature of the Covid-19 pandemic, contingency theory provides a framework to shed light on value creation for sustainably oriented stakeholders. We assume that firms oriented toward green initiatives, corporate social responsibility, and good relationships with market players will be able to rely on a certain form of loyalty from their stakeholders in times of crisis (Seles et al., 2018).

2.3 | (Natural) resource-based view

We next build our theoretical mix on the RBV and NRBV theories. RBV basically suggests that resources that are valuable, rare, difficult to imitate, and not substitutable best position a firm for long-term success (Barney, 1991). These strategic resources can provide the foundation for developing firm capabilities that can lead to superior performance over time. As noted by Haan-Cao (2023) the resource-based theory provides an opportunity to consider how different resources can be used to enhance cooperation and broaden the customer base. In "normal" conditions implementing corporate green initiatives was critical, even though they may not initially lead to higher profits (Ozbekler & Ozturkoglu, 2020). Based on this premise, firms' green initiatives could attract attention to companies (Horbach et al., 2022), thereby contributing to creating and consolidating a robust, sustainable, long-term firm reputation. Revisiting the resource-based view in the context of Covid-19 indicates that green initiatives could be a catalyst for a competitive advantage to the extent that it differentiates the firm from others (Galbreath, 2017; Wu et al., 2022). Likewise, corporate reputation contributes to trust relationships linking firms and their stakeholders, which is crucial for firms' functioning (and survival), especially in times of crisis. Green initiatives foster stakeholder cooperation and reciprocation, that may also promote more favorable attitudes toward a firm's other products. Furthermore, a firm's green initiatives can require a structural change in production and processes; this redesign involves the development, acquisition, and implementation of new technologies and may lead to economic advantages over competitors. Thus, green initiatives helped build resilience to the disruption caused by Covid-19 and even flourished at the middle of the crisis.

2.4 | Stakeholder theory and TBL perspective

As stakeholder-based values are important for bringing focus on the issues raised, as well as to ensure firm value and performance, we next consider the stakeholder theory (Harrison & Wicks, 2013). Referring to Jones (1995) and Hannah et al. (2021), a firm will gain a competitive advantage if it is able to develop relationships based on mutual trust and cooperation with various stakeholder groups. These relationships can be achieved through the nexus of (formal and informal) contracts between the firm and these groups, which can consist of both internal and external entities (e.g., employees, customers, suppliers, industry bodies, local communities, and governments), creating both external and internal pressures (Hubbard, 2009; Horbach et al., 2022). Favorable credit rates, employee effort, supplier engagement, and access to markets (some factors affecting firm market value) are some of the possible benefits of the company's efforts to build good relationships with and take care of environmental stakeholders.

In order to link this theory with the concept of sustainability, the TBL perspective based on stakeholder theory seems appropriate because the TBL perspective implies that *"the firm's responsibilities are much wider than simply those related to the economic aspects of producing products and services that customers want"* (Hubbard, 2009, p. 180). Thus, it incorporates social and environmental measures of performance into the firm's economic measures. Moreover, the TBL perspective helps expand the RBV and NRBV concepts, which neglect the social dimension in the context of firm performance but call for a dynamic and interconnected view of strategies *"to convert potential threats to the natural environment into competitive opportunities for organizations"* (Svensson et al., 2018, p. 973). Supporting stakeholder theory, Kim (2022) showed that a systemic approach to TBL during Covid-19 can benefit both stakeholders and companies by contributing to social value creation. The high awareness of companies makes them feel obliged to implement TBL activities and to be recognized as pro-social and pro-environment, even in pandemic times. They believe that commitment to TBL activities in difficult times is not only expected by society, but also provides a useful basis for positive business outcomes in the future (García-Sánchez & García-Sánchez, 2020). Firms that maximize the combination of economic, environmental, and social benefits follow a green financial management model that creates corporate value (Zhu et al., 2020). Investors invest in social status and corporate value in addition to the economic structure of

organizations. On the other hand, the Stock Exchanges rewards highly sustainable portfolios during the pandemic period. That is green company shares provide safe-haven status against shock (Koçak et al., 2022). Following the work of McWilliams et al. (2006), we focus on instrumental stakeholders to theorize green initiatives' direct effects on firm value. Stakeholders may provide favorable credit rates, employee effort, supplier engagement, access to markets, and other benefits, all increasing profits or reducing costs. Such factors can directly increase market value (Aguinis & Glavas, 2012).

2.5 | (Natural) resource dependency theory

From the perspective of RDT, corporations are influenced by the contingencies in the external environment (Dias et al., 2022) and are viewed as coalitions adjusting their behavior patterns and structure to (i) gain and maintain critical resources from external environments and (ii) ensure the flow of essential resources (Pfeffer & Salancik, 2003). Therefore, this theory aims to describe firms' behavior in terms of their contexts, as determined by two factors (Wolf, 2014): (1) the resources, defined as anything that is valuable to an organization, and (2) the dependence of one organization upon another in gaining access to valuable resources.

When considering contexts of crisis and sustainability, RDT suggests that corporations should be able to deal with uncertainty (complexity of acquiring resources from other entities) and crises arising outside yet within the ecosystem, which is assumed to contain scarce and valued resources (Nielsen & Thomsen, 2011). Emphasis within RDT is on firm survival and resilience in the face of external shocks and is therefore useful in the Covid-19 context. From this perspective, its core tenet—namely, that organizations seek to reduce uncertainty by minimizing dependence on others for resources—has become nearly axiomatic. Firms may be motivated to implement green initiatives if the result is additional freedom from dependence on others for resources. Based on this logic, green initiatives prove to be a relevant path to a certain independence and mitigation of dependence on external resources. These can be seen as additional capabilities that build the independence and resilience of the organization, even during Covid-19 as Borah et al. (2023) noted. In contrast, it can also be a way to improve firm reputation and image leading to good relationships with powerful stakeholders, thereby enabling firms to access crucial resources that are rare and hard to obtain. What a firm loses in marginal economic benefit, it can gain in the form of trust among a cadre of connected organizations, ultimately leading to financial benefits and competitive advantages (Nguyen et al., 2021).

3 | HYPOTHESIS DEVELOPMENT

3.1 | Before the Covid-19 crisis: Green initiatives, TBL perspective, and firm value

Generally, green initiatives play a major role in attracting stakeholders' interest and, thus, competitive advantages. They could also lead to additional benefits, such as increased profitability, additional growth opportunities, and better payoff in the long run (Sisaye, 2011; Ahmad et al., 2021). Such activities also represent a crucial factor for the safe and healthy business environment (Sandrin et al., 2018). Green initiatives significantly reduce costs, enhance innovativeness, and improve firms' image, thereby increasing firms' ecological, economical, and social performance (Zhang et al., 2017; Liao et al., 2018). For these reasons, despite studies rejecting these arguments and seeing green initiatives as more of a "brake" that will not allow for the use of the firm's full potential to increase its value and financial resilience (Manchiraju & Rajgopal, 2017; Marsat et al., 2021), we expect rather positive effects and hypothesize that:

> **H1.** Green initiatives positively affect economic (H1a), ecological (H1b), and social (H1c) dimensions of the TBL perspective.

The adoption and application of the TBL principles can lead to several benefits flowing not only to society as a whole, but also to the firm. As previously indicated, these benefits include, for example, building the company's reputation and image in the market (Eccles et al., 2013), stakeholders' satisfaction and trust leading to stronger relationships with firms (Baah, Jin, & Tang, 2020a), the creation of social capital (Rusinko, 2007), and the growth of companies' financial capital (Kantabutra, 2012) and business performance (Martínez-Conesa et al., 2017). As noted by Salehi and Arianpoor (2021), there is a mutual relationship between financial and non-financial sustainability performance. When consistent over time with organizational activity and stakeholders' objectives, the TBL approach boosts confidence in the organization, thereby acting as a cushion for negative events. Under these conditions, it also serves to shore up the company's financial value. Following this line of argument, we hypothesize that:

> **H2.** Economic (H2a), ecological (H2b), and social (H2c) dimensions of the TBL perspective positively influence firm value.

The proposed model summarizing our hypotheses for the period before the Covid-19 pandemic is shown in Figure 1.

3.2 | Green initiatives, TBL perspective, and firm value: How will the Covid-19 crisis be reflected?

The question thus arises as to what effect the Covid-19 pandemic will have on green initiatives and whether the influence of green initiatives on the individual dimensions of the TBL perspective will change. The pandemic may cause shifts in firms' environmental behaviors as green practices are subject to financing access and the pandemic has caused credit shortages for many firms (Zhang and Vigne, 2021). If we look at studies that have examined previous crises, we can find arguments that green initiatives can be applied as a weapon to acquire competitive advantages and sustain the business performance even

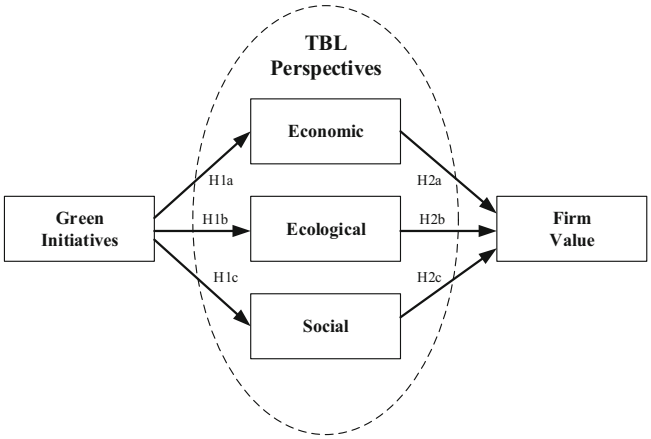

FIGURE 1 Research model for normal settings before the crisis.

during times of market volatility and uncertainty (Awan, 2017; Baah, Opoku-Agyeman, et al., 2020b). Moreover, as previously discussed herein, firms can believe that green initiatives serve as an "umbrella" against the crisis and can be appreciated by various stakeholders. Therefore, we hypothesize that:

> **H3.** The crisis caused by the Covid-19 pandemic positively affects green initiatives.

Considering the work of Chen et al. (2008), we argue that a stable and sustainable ecosystem and strong structured environmental measures ensure the operational, ecological, economical, and social efficiencies even during a crisis and environmental issues, presenting doors to new opportunities for firms (Chen et al., 2008). Therefore, in line with He and Harris (2020), who see the Covid-19 pandemic as more of a challenge to shift toward CSR and support corporate green initiatives to address environmental challenges, we lean toward this positive wave and hypothesize that:

> **H4.** Economic (H4a), ecological (H4b), and social (H4c) dimensions of the TBL perspective are positively influenced by green initiatives during the crisis caused by the Covid-19 pandemic.

Applying the optics of a crisis situation on the relationship between TBL perspectives and firm value, we refer to Baah, Jin, and Tang (2020a), who stated that the TBL approach can lead to firms' improved environmental, economic, and social performance, thereby contributing to their financial output and ensuring firm growth and survival in unstable economic situations. We argue that the TBL approach plays an important role in increasing a firm's value during conditions of market uncertainty, including the Covid-19 crisis, as Hwang et al. (2021) noted. Despite the general decline in share prices and dramatic stock market volatility worldwide (Baker et al., 2020), commentators have observed that companies with a focus on green initiatives tended to outperform others (Schroders, 2020). Therefore, we base our positive expectation and view on the study of Zhang and Fang (2022), which concluded that eco-friendly firms could perform better during the Covid-19 pandemic. We hypothesize that:

> **H5.** Economic (H5a), ecological (H5b), and social (H5c) dimensions of the TBL perspective positively influence firm value during the crisis caused by the Covid-19 pandemic.

Furthermore, we test whether the Covid-19 crisis has influenced and reshaped relationships between green initiatives and dimensions of the TBL perspective. In other words, we test the moderating effects of the Covid-19 pandemic. As this issue has only rarely been investigated so far and, to the best of our knowledge, there is no similar study investigating these moderating effects, we base our arguments on studies of Lucarelli et al. (2020) and Zebardast and Radaei (2022). Both studies examined the moderating effect of the Covid-19 pandemic on pro-environmental behavior. Considering our arguments thus far, we expect the Covid-19 crisis to be a driver (Zebardast & Radaei, 2022) that can affect the relationship between green initiatives and dimensions of the TBL perspective. We hypothesize that:

> **H6.** The crisis caused by the Covid-19 pandemic positively moderates the relationship between green initiatives and economic (H6a), ecological (H6b), and social (H6c) dimensions of the TBL perspective.

Finally, we direct our attention to the role of investors' perception during the crisis period. The relationship between corporate social responsibility growth, social responsibility disclosure and shareholders' activity was confirmed in the veil of normal-market conditions (Salehi & Alkhyyoon, 2021). But, as indicated by behavioral finance studies, investors' emotions and anxiety affect their investment decisions in stock markets (Wen et al., 2019). The perception of the economic situation (including the market situation) affects their risk assessment and investment readiness. This risk significantly increases during a crisis, generating uncertainty and fears among investors. Similarly, during the Covid-19 pandemic, volatility in financial markets has increased considerably (Mazur et al., 2021; Cheng, 2020), which has influenced investors' behavior and perceptions (Smales, 2021). Chundakkadan and Nedumparambil (2021) noted that sharp declines in stock markets were due to not only the lockdowns that restricted economic activities, but also the changes in investor sentiment. Meanwhile, investors' perceptions affect firm value (Mariana & Mahmud, 2020). Investors who believe in a company's performance and prospects are more likely to invest in it. *Investment* decisions, funding, and dividend policies impact the *firm's value* (Triani & Tarmidi, 2019) *and perception of the situation, which determines the behavior of investors. Following this argumentation, we hypothesize that*:

> **H7a.** The crisis caused by the Covid-19 pandemic negatively affects investors' perception.

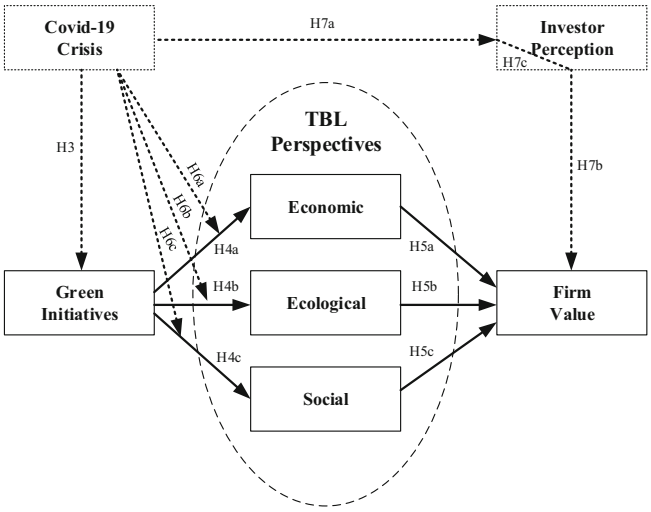

FIGURE 2 Research model for the Covid-19 crisis period.

H7b. Investors' perception positively influences firm value during the crisis caused by the Covid-19 pandemic.

H7c. Investors' perception mediates the impact of economic crisis on firm value.

The proposed model summarizing our hypotheses for the period during the Covid-19 pandemic is shown in Figure 2.

4 | EMPIRICAL STRATEGY

4.1 | Research sample and data collection

Data for our research were collected from 45 Polish companies listed on the Polish Stock Market (GPW)[1] included in the WIG- ESG index. WIG-ESG, launched in September 2019 on the Warsaw Stock Exchange, as the successor to the RESPECT Index, is a reflection of the value of a portfolio of shares of companies considered to be socially responsible, that is, those that adhere to the principles of socially responsible business, particularly about environmental, social, economic and corporate governance issues. It includes companies in the WIG20 and mWIG40 indices, that is, the largest companies listed on the Stock Exchange. WIG-ESG is an income index, which means that its calculation considers both the prices of its transactions and dividend income. The index covers 60 companies that are considered socially responsible, particularly in terms of environmental, social, economic, and governance issues. Hence a total of 60 invitations (targeted selection – all firms included in WIG-ESG) to participate in research were sent. 45 fully completed questionnaires were obtained via research platform, giving the response rate of 75%. A profile of research sample is presented in Appendix B. Most respondents were CEOs, board chairmen, or board members. To evaluate investors' perceptions, we used the opinions of two independent experts from Investment House, which provides brokerage services related to the acceptance and transmission of orders to acquire or dispose of financial instruments as well as investment advisory. Experts were selected based on their knowledge of the GPW market and their experience in decision-making investments using measurable ESG index criteria (Figure 3).

We carried out the research in two periods: normal (growth) and the crisis caused by the Covid-19 pandemic. The data for the normal period were collected from the beginning of April 2022. According to Focus Economics, Polish growth accelerated in the first quarter of 2022 (Bassetti, 2022). The well-diversified Polish economy has proven to be one of the most resilient in the European Union (EU). In 2022, industrial production expanded 13,0% year-on-year: GDP growth was 3,7%, unemployment was 4,1%, and average employment in the enterprise sector increased by 2,3%. Sold production of industry was much higher than a year earlier. A significant increase was observed in all sections of industry, with the highest being in electricity, gas, steam, and air conditioning supply. The consumer confidence indicators, which define the current and expected tendencies of individual consumption, also improved. Data for the crisis period referred to the fourth quarter of 2020. As the study involved comparisons of periods by the same group, the memory capacity of respondents posed a major challenge. Since there are no statistical tests that can be used to test memory bias, we checked whether respondents remembered events from the Covid pandemic period before starting the study. The memory of respondents conditioned their participation in the study.

Due to the Covid-19 in 2020 a partial lockdown was declared. According to the Warsaw School of Economics (Adamowicz, 2022, p. 7), "we have not seen a similar economic situation in any of the crises we have experienced since the political transformation." Only 9% of organizations did not feel the negative effects of the restrictions in economic life stemming from the pandemic, and 25% considered them to be severe.

Business climate indicators reached historical lows (Adamowicz, 2021). GDP in 2020 was in real terms 2,8% lower than in the previous year (against an increase of 4% in 2019); it was 97,2% of the previous year. Domestic demand was the main driver of the GDP decrease (Figure 3). The impact of both investment demand and consumption was negative. The situation in the labor market was more difficult than in previous years. For the first time since 2012, employment in the national economy decreased, and the average paid employment in the enterprise sector was lower than in 2019. After six years of gradual improvement, registered unemployment increased. Sold production of industry decreased in annual terms for the first time since 2009. The consumer confidence indicator defining the current trends of individual consumption was slightly more negative than in December 2020 (Statistics Poland, 2021, 2022).

4.2 | Variables' selection and research method

For the purposes of this study, a structured questionnaire was generated in line with the existing literature on the environmental

[1] https://www.gpw.pl/en-home

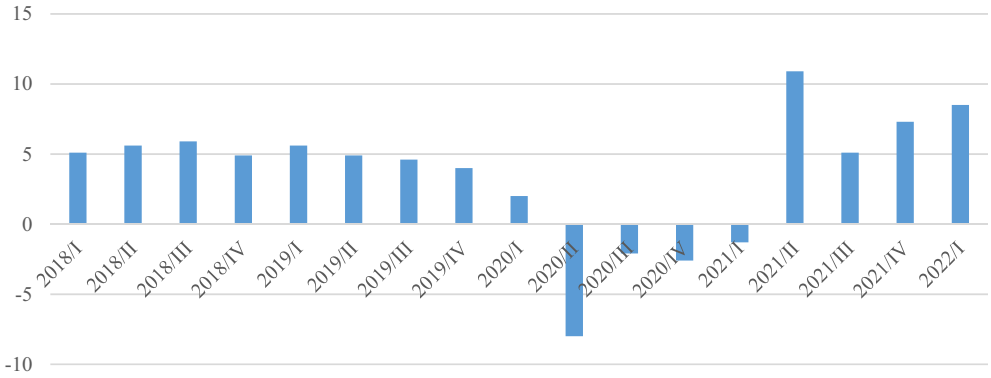

FIGURE 3 Change in Polish GDP year-on-year (percent).

management and value management (the questionnaire is listed in Appendix A). This questionnaire survey consisted of four parts. The first part surveyed green initiatives, while the second part included questions relevant to the dimensions of the TBL perspective. The third part measured related firm value. The same questionnaire, with additional sections, was repeated during the crisis caused by the Covid-19. An additional fourth part collected information about respondents' crisis perception and investors' firm perception. Participants were asked to rate their level of agreement with the statements using a 5-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Each latent variable was measured using item scales modified from the existing literature. Green initiatives were measured by the range of pro-ecological activities implemented by organizations in waste reduction, reporting, eco-marketing, and eco-innovation (8 items in total). In general, the environmental initiatives comprise the reduction of resource consumption, generation of solid waste, and polluting emissions. However, many authors have also emphasized organizational activities related to employees' learning and a firm's relationship with stakeholders (Wang et al., 2021). According to Zhu and Sarkis (2004), Li et al. (2017), and Agyabeng-Mensah and Tang (2021), firms with higher adoption levels of such initiatives accordingly experience greater improvements in environmental, economic, and social performance. The scale of environmental initiatives was based on the scale used by Kushwaha and Sharma (2016) and Yacob et al. (2018).

Synthesizing the ideas of Caiado et al. (2017), we assessed the dimensions of the TBL perspective as three main aspects. The economic dimension measured how well firms were performing. It was measured using 4 items (Alves & de Medeiros, 2015) related to production efficiency (cost production), quality efficiency (quality of product), financial efficiency, and market efficiency (sales). The measurement of the ecological dimension was adapted from Cagno et al. (2019) and Lin (2013) and focused on how well organizations were improving their environmental performance. Meanwhile, the social dimension scale was based on the work of Park et al. (2015) and Siti-Nabiha et al. (2018). Quality of life served as an indication of organizational activities' impact on local residents whereas workers' motivation addressed the same for employees. Environmental awareness evaluated the influence of environmental initiatives on stakeholders' perception, which may be relevant for their evaluation of the organization. All variables used in our models are shown in Table 1.

The commonly used accounting and market indicators were used to assess firm value (5 items in total). We chose indicators to measure profitability (i.e., ROE, ROA, EBIDTA) that provide investors with a snapshot of short-term operational efficiency, whereas those related to the value of an organization's assets (i.e., value of assets, debt) identified anticipated yields. Such an approach is compatible with the scales applied by Li et al. (2017) and Girón et al. (2021).

Following Becker et al. (2015) and Madrid-Guijarro et al. (2016), the crisis was assessed using the phenomena to indicate its presence. The key features of an economic crisis are a shock element, along with uncertainty regarding different factors, such as market demand and employment rate fluctuations. In the organizational field, limited development activities and wage increases are and expression of the crisis. For the subsequent analysis, the mean score of crisis was calculated based on 6 items.

To measure investors' perception, we used a 4-item construct based on the perception of corporate governance, trustworthiness, firm uniqueness, and perceived firm innovativeness. Corporate governance mechanisms have the ability to impact stock market participants' behaviors through managerial incentives and monitoring. Trustworthiness can be considered as a constellation of benevolence, predictability, and integrity (Mayer et al., 1995). For investors, it is a solution to the obligations of fairness and the analyses of power (Greenwood & Van Buren III., 2010). Uniqueness, which is a positive form of differentiation and nonconformity (in resources or strategy or products), according to RBV theory, is a source of competitive advantage. The last variable, perceived firm innovativeness, may be a key element in building shareholder equity and, ultimately, value. Because investors are focused on organizational growth, they may use perceived firm innovativeness as a critical piece of information to judge the value and potential of the organization. In combination, these variables are expected to have a positive, additive effect on investors' valuation. Accordingly, we used the questions from Bell et al. (2014) and Kunz et al. (2011) as well as a 5-point Likert scale (1–5).

We conducted a pilot test with three managing directors. This group included respondents with characteristics coincided with those of the target group (managers of listed organizations in the ESG index). The number 3 was based on the desire not to deplete the pool

TABLE 1 List of items.

Variables	Items	Abbrev. (Normal period)	Abbrev. (Crisis)
Green initiatives	Energy efficiency	GI1	GIC1
	Emission reduction	GI2	GIC2
	Waste reduction	GI3	GIC3
	Recycling	GI4	GIC4
	Env. training, EMS	GI5	GIC5
	Eco-innovations	GI6	GIC6
	Reporting	GI7	GIC7
	Ecological marketing, ecolabels	GI8	GIC8
Covid-19 crisis	Number of workplaces		Crisis1
	Market demand		Crisis2
	Scale of projects, investments		Crisis3
	Innovation activities		Crisis4
	Volume of production		Crisis5
	Salaries		Crisis6
Economic TBL dimension	Quality of product	EconE1	EconEC1
	Cost production	EconE2	EconEC2
	Sales	EconE3	EconEC3
	Financial performance	EconE4	EconEC4
Environmental TBL dimension	Environmental results	EcolE1	EcolEC1
	Impact on the environment	EcolE2	EcolEC2
Social TBL dimension	Quality of life	SocE1	SocEC1
	Workers' motivation	SocE2	SocEC2
	Ecological awareness	SocE3	SocEC3
		SocE4	SocEC4
Firm value	Price earnings ratio P/E	Value1	ValueC1
	ROE ROA	Value2	ValueC2
	Debt	Value3	ValueC3
	Value of assets	Value4	ValueC4
	EBIDTA	Value5	ValueC5
Investors' perception	Perception of corporate governance		Inv1
	Trustworthy		Inv2
	Firm's unique		Inv3
	Innovativeness		Inv4

of potential respondents, while retaining the recommendations for pre-testing (Bowden et al., 2002). The aim was to review questions for inclusion, revising, intended meaning. After receiving feedback, some modifications were made to improve the wording of the measurement items (dropping, changing the questions). Pilot test respondents were not included in the final sample. The data for the survey were collected following Malhotra and Grover's (1998) methodology, which provided a normative perspective on good survey research practices guaranteeing the high quality of research. We selected Survey Monkey as the platform for survey distribution because it has been widely utilized (Pinheiro et al., 2022), and the data collected through this channel provide fitted samples that are more advantageous over other sampling methods.

SEM was applied to conduct analyses and assess the quality of the measurement model. This methodology is widely accepted in the academic literature (Reinartz et al., 2009) and considered appropriate for the early stages of theory development, where the interest of the research lies in predicting dependent variables, not in confirming a previously accepted theoretical model (Gefen et al., 2011). SEM is a method that can address several restrictions and provide a robust technique for studying interdependencies among a set of correlated variables. This modeling is a suitable method, as it does not require a normal distributional assumption and is capable to handle multiple dependent and independent variables simultaneously. Moreover, it can handle relatively small sample sizes and multicollinearity problems among independent variables. Reinartz et al. (2009) argued that

PLS-SEM should be the method of choice for all situations in which the number of observations is lower than 250. Numerous studies used SEM to figure out direct and indirect effects of the relationship between factors and performance (i.e., Barforoush et al., 2021). Therefore, PLS is an especially good fit with our study. There are two step approaches that are adopted in SEM for the construction of the measurement and testing the structural model (Anderson & Gerbing, 1988). First, we assessed the measurement model and the reliability of the constructs. Second, we tested the direct effects using a 95% confidence interval and mediating effect for normal and crisis periods and moderating effect for crisis. This study employs the SPSS for confirmatory factor analysis and AMOS for path analysis.

5 | EXPERIMENTAL RESULTS

5.1 | Model verification

5.1.1 | Confirmatory factor analysis

A confirmatory factor analysis (CFA) was adopted to check the convergent validity and discriminant validity of the model. The CFA results showed that the baseline model (normal period) produced a good fit with the data: $\chi^2/df = 1.891$, GFI = 0.913, CFI = 0.978, TLI = 0.973, SRMR = 0.025, and RMSEA = 0.053. We then performed a CFA to assess the fit of the crisis model. The results were: $\chi^2/df = 6.797$, GFI = 0.811, CFI = 0.843, TLI = 0.825, SRMR = 0.060, and RMSEA = 0.135.

Next, we employed the Harman single factor test to identify common method variance (Kock, 2015). An exploratory factor analysis (EFA) is used to examine the unrotated factor solution to determine the number of factors necessary to account for the variance in the variables. If a single factor emerges or one general factor accounts for most of the covariance among the measures, it suggests the presence of a substantial amount of common method variance. As a diagnostic technique (and not a statistical control for the method effects), it is commonly assumed that common method bias is not problematic when the variance of the first factor is less than 50%. Our test result shows that the first factor explains only 44.625% of the variance. Thus, the common method bias concerns are not significant.

5.1.2 | Measurement model

The internal reliability of the measurement model was investigated using Cronbach's alpha (α) and composite reliability (CR). Cronbach's alpha coefficients exceeding 0.7 (Peterson, 1994) prove internal consistency. For CR, the accepted value is 0.7 (Hair et al., 2014). As shown in Table 2, Cronbach's alpha and CR for all constructs were above the threshold values. Convergent validity was then evaluated. It was confirmed through average variance extracted (AVE) values, which indicate the degree to which the indicators reflected or represented the construct. AVE values were above 0.5 for all scales (Fornell and Larcker, 1981), ensuring convergent validity. Table 2 indicates that all AVE values are equal to or greater than 0.5, reaffirming that the items adequately reflect the constructs.

TABLE 2 Measurement properties.

Variables	Items	Alpha	SLF	AVE	CR
Green initiatives	GI1	0,797	0,711	0,500	0,888
	GI2		0,698		
	GI3		0,673		
	GI4		0,766		
	GI5		0,689		
	GI6		0,724		
	GI7		0,685		
	GI8		0,707		
Economic TBL dimension	EconE1	0,764	0,798	0,515	0,808
	EconE2		0,614		
	EconE3		0,759		
	EconE4		0,686		
Ecological TBL dimension	EcolE1	0,806	0,916	0,839	0,912
	EcolE2		0,916		
Social TBL dimension	SocE1	0,701	0,740	0,558	0,791
	SocE2		0,714		
	SocE3		0,786		
Firm Value	Value1	0,717	0,837	0,596	0,879
	Value2		0,603		
	Value3		0,863		
	Value4		0,776		
	Value5		0,757		
Covid-19 crisis	Crisis1	0,704	0,781	0,500	0,852
	Crisis2		0,509		
	Crisis3		0,749		
	Crisis4		0,496		
	Crisis5		0,744		
	Crisis6		0,878		
Investors' Perception	Inv1	0,749	0,797	0,570	0,841
	Inv2		0,731		
	Inv3		0,750		
	Inv4		0,739		

Finally, a discriminant validity analysis determined whether each construct in the model was significantly different from the others. By comparing the square root of AVE for each construct with the correlation between variables (Barclay et al., 1995), we confirmed the existence of discriminant validity between constructs. The discriminant validity was tested for normal and crisis periods separately.

Based on these results, we believe that the reliability and validity of the measurements in this study are within an acceptable range.

We report the correlations among the main constructs in this research in Tables 3 and 4. Positive correlations occur among the variables, from the average correlation (GI-SocE, EcolE-Crisis) to high

(EconE-Value). The results show that the constructs are suitable for further analysis.

5.1.3 | Structural model assessment

Structural equation modeling (SEM) was applied to test the hypothesized models. SEM is distinctive for its advantages of accounting for all covariance in the data, allowing for the simultaneous analysis of correlations, shared variance, path coefficients, and their significance when testing for main effects (Bollen, 1989). Table 5 presents the results of the structural model assessment. The relationships among the latent variables suggested that the fit of the models is good for both periods (R2, adj. R2). Based on these results and the CFA results, it can be assumed that the crisis could have an impact on the model. We also checked the variance inflation factor (VIF); the values did not exceed 4.0, and tolerance was higher than 0.2 (Hair et al., 2010). Thus, the endogenous variable (value) can be explained by exogenous variables.

5.2 | Testing direct effects

As displayed in Table 6, green initiatives (EI) have a significant positive effect on all dimensions of the TBL perspective in the normal period. They affect the economic ($\beta = 0.49$), ecological ($\beta = 0.64$) and social ($\beta = 0.35$) dimensions, providing support for hypotheses H1a, H1b, and H1c (Figure 4). The economic dimension of the TBL approach showed a significant positive effect on firm value ($\beta = 0.56$), supporting H2a. In the case of social and ecological dimensions, results were also obtained at a significant level ($p < 0.05$); however, the strength of dependency was not as high as originally assumed. All path coefficients of the relationships among the items were supported and significant, thereby supporting H2b and H2c as well.

In the context of the crisis caused by the Covid-19 pandemic, the results confirmed that green initiatives had a significant positive effect on all dimensions of the TBL perspective ($\beta = 0.50$; 0.61; 0.45), validating and confirming hypotheses H4a, H4b, and H4c (Table 7; Figure 5). We also demonstrated that the crisis affected ongoing green initiatives ($\beta = 0.56$; H3) as well as investors' perception ($\beta = 0.61$; H7a). However, the relationship between investors' perception and value was statistically insignificant, providing no support for H7b. Due to contradictory result of H7b, H7c also was not supported, indicating that investors' perception does not indirectly affect firm value.

TABLE 5 Model assessment.

	VIF (tolerance)	R2	Adj. R^2
Normal period			
EconE →Value	1,32 (0,75)		
EcolE →Value	1,71 (0,58)		
SocE →Value	1,55 (0,64)		
Model fit		0,59	0,56
Covid-19 Crisis period			
EconEC →ValueC	1,72 (0,57)		
EcolEC →ValueC	1,71 (0,58)		
SocEC →ValueC	1,94 (0,50)		
Inv → ValueC	1,09 (0,91)		
Model fit		0,73	0,71

Note: *$p < 0.05$, **$p < 0.01$.

TABLE 3 Mean, SD, and correlations (normal period).

	GI	EconE	EcolE	SocE	Mean	Min	Max	SD
GI					3,64	2,50	5,00	0,58
EconE	0,458**				3,61	2,50	4,75	0,62
EcolE	0,487**	0,476**			3,85	2,00	5,00	0,77
SocE	0,339*	0,382*	0,567**		3,77	1,67	4,67	0,62
Value	0,491**	0,740**	0,484**	0,479**	3,71	2,60	4,80	0,56

Note: *$p < 0.05$, **$p < 0.01$.

TABLE 4 Mean, SD, correlations, and discriminant validity (crisis period).

	GIC	EconEC	EcolEC	SocEC	ValueC	Mean	Min	Max	SD
GIC	0,707					2,62	1,38	3,75	0,65
EconEC	0,492**	0,717				2,50	1,75	4,38	0,68
EcolEC	0,513**	0,460**	0,915			2,55	1,50	4,00	0,77
SocEC	0,444*	0,581*	0,611**	0,746		2,57	1,33	3,67	0,66
ValueC	0,440**	0,709**	0,472**	0,793**	0,772	2,46	1,00	4,37	0,64
Crisis	0,437**	0,575**	0,288*	0,547**	0,661**	2,55	1,81	3,77	0,55
Inv	0,241*	0,265*	0,118	0,085	0,234	2,56	1,00	5,00	0,89

Note: *$p < 0.05$, **$p < 0.01$.

The positive link between economic and social dimensions of the TBL perspective and firm value during the crisis caused by the Covid-19 pandemic can be confirmed, indicating that this relationship occurs in both studied periods. We found positive and significant relationships between the economic dimension and firm value ($\beta = 0.34$) as well as between the social dimension and firm value. Thus, we can confirm H5a and H5c ($\beta = 0.62$). However, the link between the ecological dimension and firm value is insignificant (H5b is not confirmed).

5.3 | Testing moderating effects

In the last step, we used the latent moderated effect model to test the moderating effect of the crisis. To this end, we added the interaction term of crisis x green initiatives (EIC) into the model. As illustrated in Table 8, all EIC interaction terms showed statistically significant moderating effects. The Covid-19 crisis positively moderated the relationship between green initiatives and all dimensions of the TBL perspective, thereby supporting H6a, H6b, and H6c.

TABLE 6 Results of direct effects (normal period).

Structural path	Path coeff.	T value	Conclusion
GI → EconE (H1a)	0,497**	3,47	Supported
GI → EcolE (H1b)	0,640**	3,69	
GI → SocE (H1c)	0,359*	2,39	
EconE →Value (H2a)	0,564***	6,34	
EcolE →Value (H2b)	0,05*	0,59	
SocE →Value (H2c)	0,19*	2,14	

Note: *$p < 0.05$, **$p < 0.01$.

TABLE 7 Results of direct effects (Covid-19 crisis period).

Structural path	Path coeff.	T value	Conclusion
GIC → EconEC (H4a)	0,503**	3,62	Supported
GIC → EcolEC (H4b)	0,608**	3,91	Supported
GIC → SocEC (H4c)	0,446**	3,23	Supported
Crisis → GIC (H3)	0,561**	3,55	Supported
Crisis → Inv (H7a)	0,609*	2,69	Supported
EconEC → ValueC (H7b)	0,345**	4,41	Supported
EcolEC → ValueC (H5a)	−0,10	−1,51	Not supported
SocEC → ValueC (H5b)	0,617**	7,7	Supported
Inv → ValueC (H5c)	0,06	1,15	Not supported

Note: *$p < 0.05$, **$p < 0.01$.

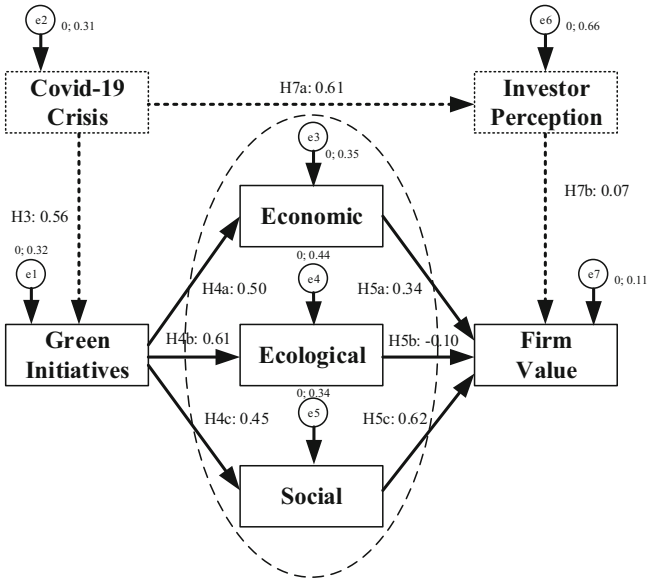

FIGURE 5 Results of the structural model (Covid-19 crisis period).

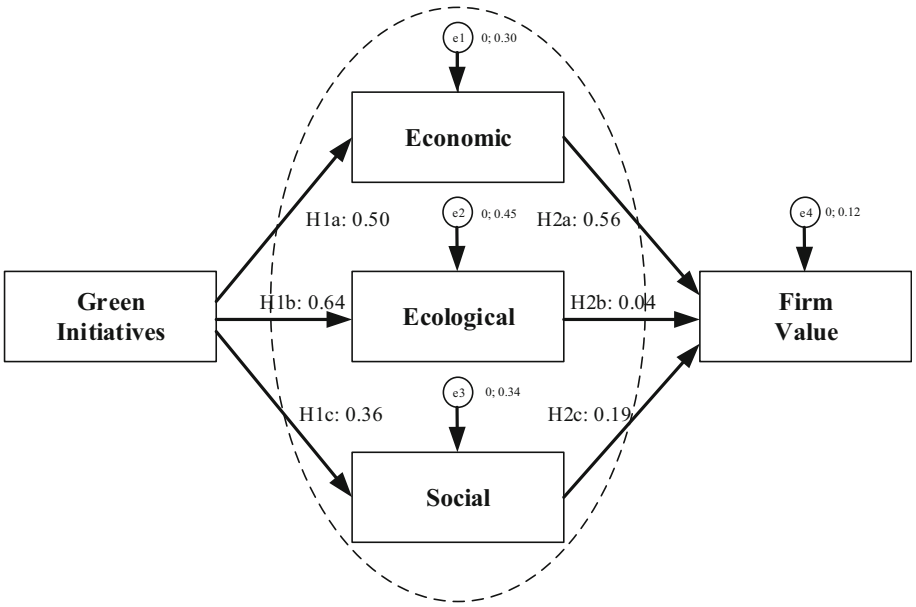

FIGURE 4 Results of the structural model (normal period before crisis).

TABLE 8 Testing the interaction effects.

Structural path	Path coeff.	T value	Conclusion
GIC × Crisis → EconEC (H6a)	0,167**	5336	Supported
GIC × Crisis → EcolEC (H6b)	0,105**	2734	Supported
GIC × Crisis → SocEC (H6c)	0,159**	5064	Supported

Note: $^{**}p < 0.01$.

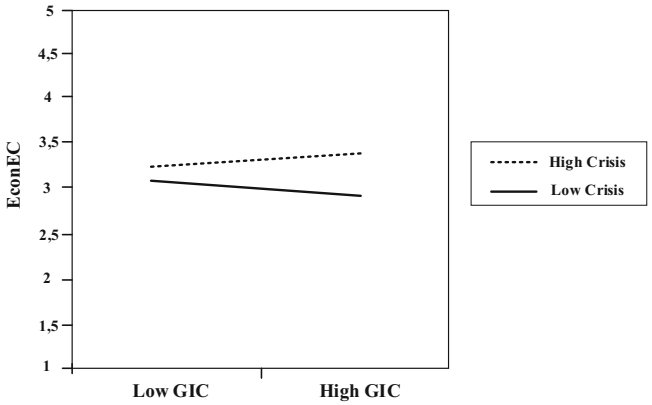

FIGURE 6 Interaction between GIC and crisis on EconEC.

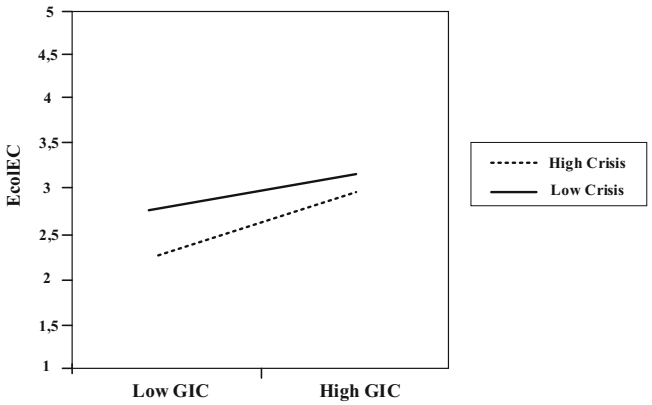

FIGURE 7 Interaction between GIC and crisis on EcolEC.

We followed Dawson's (2014) method to visualize the moderating effect in a plot diagram. Figure 6 shows that the relationship between green initiatives and the economic dimension strengthened when the crisis increased.

Analogously, the Covid-19 crisis strengthened the positive relationships between GIC and SocEC (Figure 7).

Figure 8 shows that the relationships between EcolEC and GIC were higher when the crisis was less intense, which is consistent with the results for the normal period.

5.4 | Endogeneity assessment

Hausman's (1983) two-step approach was suggested by various studies (e.g., DeMaris, 2014) to analytically test for endogeneity problems.

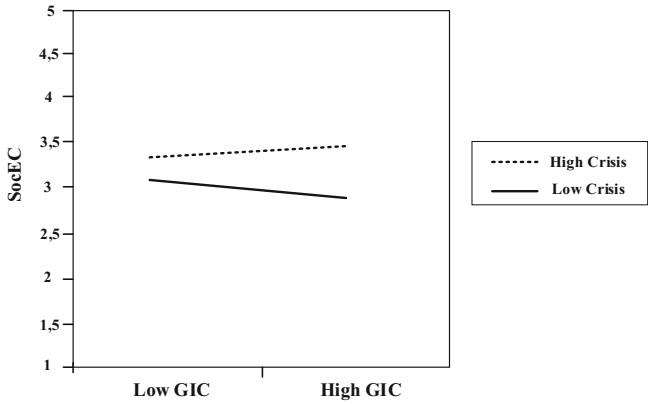

FIGURE 8 Interaction between GIC and crisis on SocEC.

Hence, possible endogeneity problems in the relationships between variables green initiatives, TBL dimensions, and firm value were examined for crisis period. The first step is concerned with regressing green initiatives on all the exogenous variables. Then, the second step uses the residuals resulting from the first step along with other predictors and conducts an ordinary least squares (OLS) regression to explain the firm value. The coefficient for the residual values were insignificant ($\beta res = 0,227$, $p = 0,13$; $\beta res = 0,128$, $p = 0,25$; $\beta res = 0,377$, $p = 0,35$), indicating that reverse causality is not a serious issue in the relationships between EconE, EcolE, SocE and value. The same two-step approach was used to analytically test for endogeneity problems in the relationship between green initiatives and TBL dimensions. The coefficient for the residual values for all relationships were insignificant ($\beta res = 0,153$, $p = 0,24$; $\beta res = 0,383$, $p = 0,25$; $\beta res = 0,267$, $p = 0,19$), lending no support for reverse causality. An analogous procedure was used for the normal period. The results indicate that endogeneity issue does not appear to be a serious concern.

6 | DISCUSSION

Challenging prior literature confirming the positive effects of green initiatives on firms' value and performance (e.g., Kushwaha & Sharma, 2016, proposing a general link between green initiatives and firm performance), this study asked a central research question to determine what the relationship is among green initiatives, the TBL perspective, and firm value. Thus, we are the first to use the TBL perspective as a bridge between green initiatives and firm value while comparing periods before and during the crisis caused by the Covid-19 pandemic.

Our analysis of the effects of green initiatives on all three dimensions of the TBL perspective produced findings consistent with previous studies and confirmed the positive effects of such initiatives on the economic (Graham & Potter, 2015), ecological (Muñoz-Villamizar et al., 2018), and social (Anser et al., 2020) dimensions. It was interesting to discover how the Covid-19 crisis affected these effects given the limited research on this issue so far. First, we showed that green initiatives are not limited during a crisis, which indicates that

organizations do not immediately reduce expenditures on environmental protection. Second, although we cannot say that relationships between green initiatives and the dimensions of the TBL perspective were stronger in the normal/growth period, it is quite interesting to have empirically demonstrated that, in the crisis caused by the Covid-19 pandemic, the cause–effect relationship was still positive. Therefore, we can basically say that green initiatives can trigger all three dimensions of the TBL approach during a Covid-19 crisis period, even if this relationship is weaker than in the normal period.

These results confirm He and Harris's (2020) expectations that the Covid-19 pandemic could offer a great opportunity for businesses to shift toward environmental behavior. More generally, regarding firms' behavior during crisis periods, our findings could be considered consistent with the studies of Yelkikalan and Köse (2012) and Moneva-Abadía et al. (2019), which showed positive links between green initiatives and firm performance during a crisis. As Moneva-Abadía et al. (2019) argued, CSR (and its green activities) constitutes an opportunity to come through crises successfully. These initiatives strengthen the organizational resilience and could be treated as a kind of protection that allows firms to receive compensation when facing severe business crises.

Moreover, we found support for the hypothesis that green initiatives would attenuate the decline in the TBL approach during the crisis. This finding goes against expectations that some organizations limit their environmental activity during a crisis (Panwar et al., 2015; for a literature review, see Seles et al., 2018). Our results show a positive interaction coefficient, indicating that the two-variable effect is greater than the sum of the single-variable effects. In this case, organizations with higher green initiatives are more likely to obtain better TBL performance during the crisis, which expands the understanding of win–win situations (Garcés-Ayerbe & Cañón-de-Francia, 2017). These findings lead us to conclude that green initiatives may not be negatively affected by a crisis due to their specific potential to be a safety cushion (Sakunasingha et al., 2018). This happens when these initiatives lead to complementarities with other resources.

Next, considering the relationship between the TBL perspectives and firm value, we helped illuminate the pathways through which different dimensions of the TBL perspective operate on firm value. We confirmed that two of the three dimensions (economic and social) are closely aligned with firm value during both the normal and Covid-19 crisis periods. We can therefore conclude that the economic dimension increases firm value regardless of external economic conditions. This finding is in line with Hannah et al. (2021), who found that CSR prompts investors to directly support the firm and increase demand for its shares. Similarly, we demonstrated that the social dimension could boost firm value in both periods, which is in line with López-Pérez et al. (2017). However, these results contradict the findings of Mikial et al. (2020), who found a negative influence of the TBL perspective on firm value. Our results indicate that adherence to the TBL perspective ensures the quality of products, optimizes the cost of production, and increases productivity, providing greater benefits to customers and building the market value, as Galindo-Manrique et al. (2021) also noted. We theorize that these effects occur during periods of both prosperity and crisis.

Interestingly, contrary to our initial expectations and in line with the statements of Hermundsdottir et al. (2022), the ecological dimension of TBL perspective was significant only for the normal period, while being statistically insignificant during the crisis. These results confirm the findings of previous research suggesting that environmental performance has no impact on firm value in times of crisis (Muhammad et al., 2015) and investors do not target ecological performance. There may be several reasons for these results. First, it is possible that, during a crisis, investors become more sensitive to economic performance. Thus, excessive investment in environmental initiatives is questionable as it is economic irrational. Considering that slack resources are limited, expanding such initiatives is justified only in organizations driven by ecological values. Second, organizations may be failing to effectively communicate the positive effects of their environmental activity to investors, and stakeholders do not notice the benefits from it as a result.

7 | CONCLUSIONS

7.1 | Contributions

This study offers several contributions for practitioners, theorists, and public policymakers. The findings provide the following theoretical contributions to both the growing crisis management and the Covid-19 literature, as well as the environmental management literature. Primarily, this study provided a conceptual model based on several management theories, offering a variety of innovative connections by filling a gap in the prior literature on green initiatives and organizations' value. Building on an original theory mix linking core managerial concepts, we contribute to the theory by extending current knowledge of analyses comparing firms' environmental behavior and its effects on various dimensions of the TBL perspective and firm value in periods before and during a crisis. For these purposes, we investigated the effects of the most recent significant crisis associated with the Covid-19 pandemic, for which a limited amount of empirical evidence currently exists. From the perspective of the contingency theory, we examined firms' reaction to the crisis and showed that the Covid-19 pandemic proved to be a trigger for firms' green initiatives.

Moreover, we demonstrated that firms with higher green initiatives were more likely to obtain better TBL performance during the crisis, expanding the understanding of such theoretical links described herein. In contrast, considering the knowledge of (natural) resource dependency theory, which assumes that firms' engagement in green initiatives can positively influence their financial performance and value, we confirmed that these statements are valid only for the normal period. Therefore, the study contributes to the literature by demonstrating how crisis works as a barrier and slows down firm value despite green practices. From a stakeholder communication perspective, the results show negative effects of environmental TBL dimension on value, not by a lack of green practices, but rather from

misaligned communication and a shift of stakeholder focus to economic and social issues. These results are also beneficial for public policy makers, especially around Central and Eastern Europe, where, so far, there has been a limited amount of information and relevant empirical research on this issue.

7.2 | Implications

Based on the findings, there are some practical implications. First, we empirically showed that companies that do not limit green initiatives during a crisis achieve positive economic, environmental, and social results. Discussions on green initiatives have recently intensified, yet findings about whether such initiatives lead to financial performance are inconsistent. This paper's findings suggest that green initiatives are not just expenditures, but also provide benefits during a crisis. Arguably, green initiatives emerged as appropriate instruments to help organizations get through the crisis as a guarantee of TBL effectiveness. Second, the effect of green initiatives on firm value is indirect. Hence, firms are likely to reduce their commitment to green initiatives during a crisis because allocating resources to non-core business activities is difficult to justify. Trevino and Nelson (2011) suggested that organizations should practice such altruism beyond value. We propose such decisions should be made transparent to key investors, specifying how expenditures on green initiatives affect the value and performance in the short and long term. The results suggest that firms are failing to communicate the positive effects of green initiatives to their investors. Another explanation may be that the industries included in our database may not have had high failure costs associated with the absence of such initiatives. In such industries, investments in green initiatives do not create sufficient value and should be clearly explained to investors, particularly during a crisis period.

Although our results did not confirm the significant role of environmental performance during a pandemic, in our opinion they should not be marginalized, but highlighted through better external signaling. Following Banfield (1985) and McWilliams and Siegel (2001), we argue that pure responsiveness to external conditions, undertaken on economic calculus, is not a moral choice but simply cost behavior. View that value-maximization only through social and financial dimensions may lead managers to treat TBL strategies instrumentally ignoring the mitigating effect of green initiatives. To capitalize on their effects, firms need to ensure their stakeholders are able to recognize and assess green initiatives and performance. Firms encounter at least two problems here. First, the relative observability of an organization's environmental performance is generally low due to stakeholders' dominant orientation on economic performance. Second, the varying importance of green initiatives to stakeholders, some of whom may contest their importance. The above mean that companies that have not signaled favorable environmental performance may not have seen an increase in valuations. In our opinion, better signaling on environmental performance could reduce information asymmetries and change their perception as an additive and less valuable.

Next, organizations should focus more effort on social efficiency (employee well-being, community issues, etc.). Our results support the risk-buffering role of social efficiency on firm value before and during a crisis. Therefore, we believe in the reputational effect signaling that, due to green initiatives, an organization can retain human resources to fuel its growth and maintain customers' support, thereby enhancing strategic flexibility, which builds its value. It is also necessary to focus on managerial skills and dynamic capabilities because such capabilities can increase firms' ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments, which arise in a crisis (Klöckner et al., 2023). Moreover, for practitioners, the most important implication is the question of the desirability of green practices in times of crisis. Our research confirms their positive impact on TBL performance, which may be important for reporting, maintaining compliance and the social legitimacy of the organization during this period. On the other hand, even though the results indicate that the environmental dimension is irrelevant to the firm value during the Covid-19, we also observe some support for the strategy that financial and social performances (dimensions) can be mitigated by increasing attention to green practices.

Finally, public policy makers should encourage firms to follow all three TBL dimensions, even though the ecological dimension did not bring expected positive results in our case. That is why it is necessary to encourage the green behavior and perception of firms more in times of crisis, especially within analyzed territory, which faces a lower perception of the need for such steps on the part of firms and society (Prokop et al., 2023). Public policy makers could help make these processes more efficient, for example, by simplifying administrative processes and providing clearer information about technology, regulations, and opportunities for financing. This generally creates obstacles to the green behavior of firms (Trianni et al., 2014).

7.3 | Limitations and future research

This study is not without limitations, and their analysis would create interesting streams for future research. First, we relied on the Polish Stock Market (ESG index) database to select organizations for our sample, but this database only covers firms from one country. It might be particularly interesting for future research to expand the geographical scope. In this context, an examination of the organizational reaction to policy announcements (e.g., economic stimulus packages) signaled by the government might provide valuable insights. Second, from a methodological perspective, respondents' memory bias may have interfered with our results, although we attempted to minimize this bias. Quantitative research based on real stock market results combined with a qualitative approach would increase the credibility of our findings. In addition, we touched upon a small aspect of economic, environmental, and social measures as a proxy for the TBL approach and explored their impact on firm value. Other more complex and nuanced scales may also offer interesting avenues, which we leave for

future studies. Finally, future research could update the results and even add data from 2022 to investigate the effects of the Ukraine War and subsequent waves of Covid-19. In addition, as this is a less mapped area, future research could also focus on owners' behavior, managerial characteristics and risk-taking practices, and diversity of the board of directors and their effects on green initiatives (Cucari et al., 2018; Lagasio & Cucari, 2019).

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APPENDIX A: Research questionnaire

Item	Question
Energy efficiency Emission reduction Waste reduction Recycling Eco-innovations Environmental training and EMS Reporting Ecological marketing and ecolabels	To what extent are activities aimed at improving energy efficiency carried out in the organization? To what extent are the activities aimed at reducing gas or dust emissions/waste reduction/ recycling activities/ related to the introduction of product or process eco-innovations carried out in the company? To what extent does the organization carry out activities in the field of environmental training for employees or introduce the environmental management system? To what extent does the company report environmental performance? To what extent does the company carry out ecological marketing or eco-labeling activities?
Number of workplaces Market demand Scale of projects, investments Innovation activities Volume of production Salaries	During the last 6 months the number of jobs (workplaces)/ market demand, etc.: Is significantly reduced/ Is getting smaller/ Remains unchanged /Is growing /Definitely rises
Cost production Sales Financial performance	During the last 6 months in our organization the quality of the products has increased/ the production costs in the organization decreased, etc.: I completely disagree with/I tend to disagree with/I neither agree nor disagree/ I tend to agree/ I fully agree
Environmental results Impact on the environment	During the last period the organization's environmental performance has improved: I completely disagree/I tend to disagree/ I neither agree nor disagree/ I tend to agree/I fully agree
Quality of life Workers' motivation Ecological awareness	During the last period the quality of life of local residents has improved/ employee motivation has improved, etc.: I completely disagree/I tend to disagree/ I neither agree nor disagree/ I tend to agree/ I fully agree
Price earnings ratio ROE /ROA Debt Value of assets EBIDTA	During the past period, the price / earnings ratio has improved/ the profitability ratio (ROE, ROS) improved, etc.: I completely disagree/ I tend to disagree/ I neither agree nor disagree/ I tend to agree /I fully agree
Investors' perception	Mean value of experts' opinion in scale 1–5. Is, in your opinion, the organization trustworthy? How do you assess: (1) the innovativeness, (2) unique of organization? What is your opinion about the quality of corporate governance?

APPENDIX B: Profile of research sample

Category	Frequency	Percentage
Sector		
Manufacturing	8	17,7
Construction	2	4,4
Production and distribution of electricity, gas, steam and cold air	5	11,1
Finance, insurance and related service activities	10	22,2
Extraction industries	2	4,4
Transport, storage and mailing	2	4,4
Trade	7	15,5
Information, communication, informatics	5	11,1
Collection, treatment and distribution of water, sanitation, waste management	1	2,2
Services	2	4,4
Graphic design	1	2,2
Size		
Up to 1000 employees	12	26,6
1001 to 10,000 employees	17	37,7
Over 10,000 employees	16	35,5
Job position		
CEOs	18	40
Board chairman	3	6,6
Board member	4	8,8
Others	20	44,4