

Leveraging Business Failure To Drive Eco-Innovation Adoption: An Integrated Conceptual Framework

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Abstract

Despite a growing body of research on business failure and eco-innovation, these two streams of research have developed in isolation, thus lacking an organizing framework to account for how businesses can utilize peer companies' failures as a source of eco-innovation. This study addresses this gap in the current literature by advancing an integrated conceptual framework that illuminates failure as a catalyst for learning and the mechanisms through which organizations can enhance their environmental innovation efforts and competitiveness. The study proposes a multidimensional 2 x 2 typology encompassing dimensions of process and product eco-innovation, alongside two underlying factors of business failure. These factors further elucidate the mechanisms through which organizations can learn from others' failures, ultimately becoming more resilient and adaptable in the face of new challenges. The implications of this analysis for future research and practice will be further examined, shedding light on promising domains for learning from failure and fostering innovation.

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1 Introduction

Over the past five decades, failure has remained a persistent theme in academic and practitioners' literature (Abor et al., 2022; Mellahi & Wilkinson, 2004; Vivel-Búa & Lado-Sestayo, 2023). As the pace of global competition accelerates, business failure rates in many industries have also surged, leading to the "survival of the fittest" (Amankwah-Amoah et al., 2021). This has been further amplified by waves of global changes such as advancements in artificial intelligence (AI) and other technological breakthroughs such as 3D printing, the fifth generation of wireless communication technology, and automation. In the face of the existential threat posed to businesses, there have been renewed efforts geared towards exploring business failure as a viable external source of knowledge, learning, and innovation in an attempt to outwit rival firms (Codini et al., 2023; Parida et al., 2012).

Despite the potential benefits that can be accrued from learning from failure (see Adeleye et al., 2018), innovating from parallel organizations' failure is a largely untapped valuable source of knowledge that can be harnessed by resource-poor organizations to improve their competitiveness (Rhaiem & Amara, 2021). Indeed, some practitioners suggest that failure is a better teacher relative to success and a source of innovation (The Economist, 2011; Edmondson, 2011). While a large number of scholarly works have investigated aspects of environmental (eco-) innovation (Adams et al., 2016; Klewitz & Hansen, 2014; Ghisetti et al., 2015; González-Moreno et al., 2019; Takalo & Tooranloo, 2021; Rennings, 2000) and learning from business failure (Boso et al., 2019; Mueller & Shepherd, 2016; Shepherd, 2003), there is very limited conceptualization of the mechanisms through which organizations can learn from peer companies' failure to achieve and amplify environmental innovation efforts. Despite the ambiguities and confusion that epitomize the current

streams of research in these two areas, the current literature also lacks an organizing and unified framework to account for the intersection between business failure and environmental innovation. The contemporary business failure and environmental innovation literatures have, unfortunately, developed in isolation, thereby offering very limited insight into how businesses can utilize their peer companies' failures as a source of eco-innovation.

Given that achieving environmental innovations is seen as a process to improve firm processes and a worthwhile source of competitive advantage (Forsman, 2013; see also Damanpour & Schneider, 2006), it is surprising that few studies have attempted this conceptualization. In an effort to address these deficiencies in the current literature, the objective of this article is to advance an integrated conceptual framework that illuminates the linkages between business failure and eco-innovation. Specifically, the study examines the mechanisms through which firms can learn from parallel organizations' collapse to motivate firms' green innovation efforts.

The study offers several contributions to environmental sustainability and management literature. First, by integrating the highly dispersed scholarly works on learning from failure (Edmondson, 2011; Shepherd, 2003) and green innovation (Demirel & Kesidou, 2011; Kesidou & Demirel, 2012; Zheng et al., 2023), this study offers an integrated conceptual framework of the mechanisms through which the collapse of peer organizations can motivate firms' green innovation efforts. The study further contributes to the ongoing scholarly dialogue on environmental sustainability (Esposito et al., 2023; Campra et al., 2023; Góes et al., 2023; Gu & Xie, 2022) and business failure (Mellahi & Wilkinson, 2004; Kücher & Feldbauer-Durstmüller, 2019) by deepening researchers' insights into the mechanisms through which business failure insights can be harnessed and mobilized toward

organizational innovation efforts. In addition, despite the growing interest in elucidating the consequences of business failure, such as employee layoffs and financial losses (Mellahi & Wilkinson, 2004; Simmons et al., 2014; Semadeni et al., 2008; Wiesenfeld et al., 2008), there is still a lack of clarity regarding the mechanisms through which failure experiences can be harnessed to deliver positive outcomes. The study elucidates and deepens existing knowledge on how the failure can deliver positive outcomes for surviving firms.

The remainder of this article is organized as follows. After presenting a review of the literature on business failure and eco-innovation, we advance an integrated perspective on the subject. The penultimate section outlines the vital characteristics of the conceptual framework. The final section of the research highlights the policy and research implications alongside the directions for future research.

2 Business Failure and Eco-Innovation: Conceptual Integration

2.1 Business failure and learning

Generally speaking, business failure is a process that occurs when an organization's routines, resources, and capabilities deteriorate over time, culminating in abrupt or gradual closure (Mellahi & Wilkinson, 2004; Weitzel & Jonsson, 1989). In other words, business failure is the point at which a business can no longer sustain its operations, resulting in the termination of its activities (Hamilton, 2006; Sheppard, 1994). There are two primary perspectives on the underlying causes of business failure: deterministic and voluntaristic (Amankwah-Amoah & Syllias, 2020; Heracleous & Werres, 2016; Mellahi & Wilkinson, 2004, 2010). The internal factors (voluntaristic) arise from conditions within a company, including mismanagement and poor leadership, resource deficiencies,

and a poor organizational culture (Amankwah-Amoah, 2016). Organizational resource deterioration can be attributed to factors such as operational inefficiencies, poor leadership, and a mismatch between organizational expertise and the new demands of the external environment (Amankwah-Amoah, 2016; Morrow et al., 2007; Trahms et al., 2013). On the other hand, external factors (deterministic) are related to conditions outside the company over which the organization has limited or no control, including competition and regulations (Mellahi & Wilkinson, 2004, 2010). Research examining the external causes of business failure has identified factors such as deregulation, liberalization, and changes in government policies as possible drivers of business failure (Abor et al., 2022; Amankwah-Amoah, 2016). Recent contributions to this scholarly work have identified deteriorating economic conditions, such as high-interest rates, non-performing loans, and unfavorable exchange rates, as increasing the risk of domestic business failure (Abor et al., 2022).

2.2 Green innovation (eco-innovation)

In recent years, green innovation has rapidly emerged as a powerful competitive weapon for firms (Borsatto & Bazani, 2021) to reinforce their competitive advantages (Chiou et al., 2011). In essence, green innovation, also known as "eco-innovation" or "environmental innovation" (Forsman, 2013), represents a subgroup of sustainability-oriented innovation (Adams et al., 2016; Nguyen & Adomako, 2022; Klewitz & Hansen, 2014). This is inextricably tied to proactive engagement and utilization of insights from a diverse range of stakeholders (Watson et al., 2018; Klewitz & Hansen, 2014).

By green innovation (eco-innovation), we refer to the adoption and implementation of technological, organizational, and social practices that seek to reduce or eliminate any negative effects on the natural environment (Soewarno et al., 2019; Takalo & Tooranloo, 2021; Khattak, 2019; Martínez-Ros & Kunapatarawong, 2019). It entails the adoption of new practices and processes, such as the use of renewable energy sources and technologies, development of eco-friendly products, and waste reduction, geared towards promoting sustainability and minimizing the environmental impact of businesses (see Forsman, 2013; Takalo & Tooranloo, 2021; Khattak, 2019; Martínez-Ros & Kunapatarawong, 2019).

Green innovation can be subdivided into three components: green process innovation, green product innovation, and green managerial innovation (Chiou et al., 2011; Chen, 2008). Product innovations are exemplified by the outputs of firms' products/services, and product innovation practices include the use of recycled materials and the development of environmentally efficient products (Schilling, 2012; Marcon et al., 2017). On the other hand, process innovations pertain to the ways in which an organization conducts its activities and may be oriented towards improving efficiency through measures such as reducing product defects and improving product quantity (Schilling, 2012).

Numerous studies have reported that process innovation practices encompass activities aimed at reducing materials used, enhancing process efficiency, and adopting clean and green technologies (Marcon et al., 2017). Accordingly, green products utilize "fewer resources, have lower impacts and risks to the environment, and prevent waste generation already at the conception stage" (see Commission of the European Communities, 2001, p. 3). The product design aspect of green

innovation can be achieved by modifying existing product designs with the aim of conserving resources and reducing the environmental footprint (Chen, 2008; Chiou et al., 2011).

2.2.1 Motives, determinants, and consequences

Eco-innovation differs from general innovations in terms of motives, determinants, and consequences. It tends to focus on activities geared toward curtailing the environmental footprint of organizations (Hizarci-Payne et al., 2021; Rennings, 2000). Accordingly, eco-innovation entails adopting green practices aimed at protecting and preserving the natural environment, minimizing waste, and the misuse of natural resources. This not only reduces costs but also enhances the appeal of firms' products and services (Rennings, 2000). By identifying sources for green innovations, firms can enhance their level of competitiveness (Aguilera-Caracuel & Ortiz-de-Mandojana, 2013; Kimpimäki et al., 2022; Borsatto & Bazani, 2021). There is a growing body of research that has elucidated that green innovations could be motivated by a host of factors, such as environmental regulations (Ford et al., 2014; Rennings, 2000), consumer demand for green products, and political pressures (Takalo & Tooranloo, 2021), societal expectations (Lee et al., 2018; Soewarno et al., 2019), and firm-specific resources and capabilities (Leonidou et al., 2017; Soewarno et al., 2019).

Scholars have long recognized regulatory pressures as one of the principal determinants of organizational environmental conduct (Christmann, 2004). Indeed, environmental regulatory pressures and stringent environmental regulations can compel firms to adopt new environmentally friendly practices, processes, and products toward a greener global economy (see Aguilera-Caracuel & Ortiz-de-Mandojana, 2013; Borsatto & Bazani, 2021). By seeking to preserve the natural environment through their actions, organizations can also differentiate their products and services

from competitors as well as enhance their market competitiveness (Borsatto & Bazani, 2021). A line of research highlights that green innovation has the potential to improve organizational image and enhance corporate competitive advantage (Chiou et al., 2011; Demirel & Kesidou, 2011). Green innovation also improves firm processes and resource utilization, ultimately enhancing firm competitiveness (e.g., Hart, 1995). Table 1 summarizes the different dimensions and key drivers of green innovation, along with illustrative studies.

Insert Table 1 about here

Open eco-innovation is a concept that blends the notion of open innovation (OI) with eco-innovation (EI) (Ghisetti et al., 2015; González-Moreno et al., 2019). Some researchers in this innovation domain suggest that this entails the utilization of external knowledge and expertise to generate environmental innovations within a firm (Ghisetti et al., 2015; Kimpimäki et al., 2022). This may involve harnessing the expertise, resources, and lessons of other firms to innovate. Open eco-innovation emphasizes harnessing ideas, expertise, and resources from outside the focal firm (Kimpimäki et al., 2022), including industry peers, government agencies, non-governmental organizations (NGOs), and failed firms. In line with the literature on the causes of business failures, the sources of green innovations can also be attributed to both internal and external roots (Soewarno et al., 2019; Chen et al., 2012). Although green innovation is motivated by a host of factors, it remains unclear how the experience of business failure could motivate industry peer firms to become more environmentally aware and innovative. The framework presented in Figure 1 suggests both internal and external motivations for firms to learn from failure to undertake green innovation. Firms often imitate and learn from their peers' decisions, actions, and inaction as proof of or lack of

strategic effectiveness pertaining to their decisions (Westphal et al., 1997; Lieberman & Asaba, 2006). As suggested by some past studies (e.g., Pe'er & Vertinsky, 2008), organizations can accumulate valuable knowledge from the failures of other entities by recruiting former employees.

Insert Figure 1 about here

3 Towards a typology of learning from peer firms' failure to amplify green innovation efforts

Based on the above analysis, there are two dimensions of eco-innovations: product eco-innovation and process eco-innovation. In parallel, two primary causes of business failure that also serve as drivers for learning from failure are organizational and external factors. Thus, there are both internal and external motivations to learn from failure in order to undertake green innovation. As demonstrated in Table 2, potential causes of environmentally sustainable business failure can be analyzed from both external and internal perspectives. The external factors incorporate government regulations, extreme weather events (EWEs), and climate change, while firm-level factors encompass inefficient practices, poor waste management, and a lack of investment in green practices and technologies.

Insert Table 2 about here

Crossing the two dimensions for each produces a four-quadrant multidimensional framework of drivers for learning from failure to achieve eco-innovation, as demonstrated in Figure 2. The four-

quadrant framework articulates a typology of learning from peer firms' failures to spur the adoption of eco-friendly practices.

Insert Figure 2 about here

3.1 Quadrant I: Exogenous drivers of product eco-innovation

Quadrant I represents a situation where organizations develop new environmentally friendly products in response to external factors encompassing government regulatory mandates and consumer demand — external drivers of product eco-innovation. Following the failure of large businesses, deficiencies in regulations and weak industry standards often become glaringly evident (Kaufman, 2014; Strahan, 2013). This can serve as a catalyst for the implementation of new regulations and the promotion of innovation among existing firms. Often, lax regulatory frameworks can create loopholes that enable illegitimate firms to thrive and foster an environment conducive to unethical behavior. Government regulations can also hinder the entry of new competitors, ultimately protecting inefficient large firms and encouraging a continued reliance on conventional energy sources.

Following a business failure, eco-innovation efforts can be propelled by external factors such as government regulations, newly established industrial standards or certifications, and pressure from external stakeholders, which are often beyond the control of organizational leaders (Appiah et al., 2023). The potential financial repercussions of not embracing eco-friendly practices compel firms to develop products that align with new regulatory requirements and cater to consumer demands for eco-friendly products. Indeed, new regulations, competitive pressures, and government regulatory

mandates have often pushed firms to pivot towards the creation of environmentally friendly products (Khan et al., 2021; Borsatto & Bazani, 2021). Failure can also signal that existing businesses have faltered due to fundamental deficiencies in regulations and industry standards.

Given that new product development is crucial in mitigating the risk of business failure and amplifying firm performance (Atuahene-Gima & Murray, 2007), firms persisting with inefficient energy practices may incur high operating costs and decreased competitiveness. The adoption of energy-efficient practices, such as the use of energy-saving appliances and the installation of solar panels, can assist firms in reducing costs and bolstering their competitiveness. Overall, the adoption of sustainable practices can result in cost savings, an enhanced reputation, and increased customer loyalty, rendering eco-friendly business practices an appealing strategic choice for firms. Failure to comply with environmental regulations can also result in reputational damage and a loss of market share, as customers increasingly prioritize sustainability in their purchasing decisions. Indeed, external sources such as competitors, higher education institutions, and industry associations have increasingly become viable mechanisms for mobilizing external knowledge and integrating it to enhance firm competitiveness (Terjesen & Patel, 2017). Based on above analysis, we propose:

Proposition 1: *Non-compliance with environmental regulations linked to business failure can serve as catalysts prompting peer firms to adopt sustainable practices.*

3.2 Quadrant II: Exogenous drivers of process eco-innovation

Quadrant II represents exogenous drivers of process eco-innovation after a business failure. In this quadrant, peer firms' failure serves as a trigger for creating environmentally friendly processes

geared towards reducing the environmental footprint of firms. This incentivizes firms to invest in eco-innovation to avoid penalties or sanctions that can drain organizational financial resources. This can be driven by factors encompassing new environmental standards, government regulations and directives, and stakeholder pressure that motivate firms to embrace sustainable routines and processes. Indeed, eco-innovation can be driven by various factors, including breakthroughs in renewable energy technology and regulatory demands (Cai & Li, 2018; Hojnik & Ruzzier, 2016). Past studies also indicate that government incentives, such as subsidies related to price concessions and cash grants, play a crucial role in the adoption of eco-friendly technologies, which can reduce pollution and improve environmental standards (Wang et al., 2021). By integrating environmentally friendly activities such as green manufacturing and the use of renewable energy sources into the innovation activities, firms are better able to reduce the resource usage and costs of their operations. Accompanying business failure is a risk where former employees of defunct firms may bring faulty routines, poor working practices, and routes to surviving firms (Amankwah-Amoah, 2014). In light of this analysis, we put forth the proposition that:

Proposition 2: *The adoption of environmentally friendly technologies and processes following other business failures will culminate in improved firm competitiveness.*

3.3 Quadrant III: Endogenous drivers of product eco-innovation

Quadrant III represents business failure as firm-level drivers of product eco-innovation. Green product innovations (GPIs) entail the design of energy-efficient products coupled with the utilization of eco-friendly materials as inputs in the production process (Khan et al., 2021). It can be deduced that business failure can serve as a “wake-up call” and a powerful signal for

organizations to discard non-performing products and invest in the development of potentially promising products that appeal to environmentally conscious consumers. Past studies indicate that firms imitate others' actions largely due to the perceived belief that their actions provide the pathway and a set of actions to help avoid losing ground (Lieberman & Asaba, 2006) and avoid business failure. Business failure can create a sense of urgency for surviving businesses to pursue new sources of resources, expertise, and markets to fortify their current position as well as address any perceived weaknesses in the business model. In this situation, eco-innovation can be motivated by failure leading to the development of eco-friendly products. Hence:

***Proposition 3:** The association between learning from peer firms' failure and the adoption of eco-innovation is likely to be moderated by strategic imitation.*

3.4 Quadrant IV: Endogenous drivers of process eco-innovation

Quadrant IV characterizes a situation where business failure serves as an opportunity for firms to re-examine their routines and processes aimed at reducing emissions and improving efficiency. This quadrant demonstrates a shift towards the creation of sustainable and eco-friendly practices by harnessing insights from other collapsed firms to enrich their routines, processes, and practices. Peer firms' failure can elevate the strategic imperative and exert pressure on surviving organizations' internal stakeholders, such as top executives and the board, to take measures that improve environmental green credentials and practices. A stream of research indicates that business failure serves as a valuable source of learning and opportunities for existing firms to reflect on and revise their current environmental standards and practices (see Stead & Smallman, 1999). This is more

likely when the failure is attributed to and/or exacerbated by the failure to adopt green-oriented routines, processes, and practices (Amankwah-Amoah & Syllias, 2020).

Studies have hinted that other businesses' failures can incentivize surviving firms to seek to prioritize learning, stimulate a shift in organizational culture (i.e., beliefs and norms that underpin its “ways of doing things”), as well as adopt precautionary measures to help fortify the foundation of the organization (Stead & Smallman, 1999). Business failure may present concrete evidence of a failing or failed business model, which can then prompt organizations to reassess their own activities and processes (Amankwah-Amoah et al., 2022). Learning from other organizations may also entail identifying and correcting errors inherent in organizational routines (Stead & Smallman, 1999). Given the potential reputation and economic effects that can be derived from proactive environmental engagement (Li et al., 2022), peer business failure can prompt rivals to re-examine and prioritize the adoption of processes and routines towards the adoption of environmentally sustainable activities to help reduce the environmental footprint of the business. This entails the adoption of eco-friendly practices, which can encompass a range of activities, such as reducing waste, conserving energy and water, utilizing renewable energy sources, improving energy efficiency, and implementing green supply chain management. Accordingly, the failure of other firms can prompt organizations to focus on fortifying their internal processes to drive eco-innovation. Therefore:

Proposition 4: *Organizations that experience failures by their rivals attributed to a lack of green credentials can be motivated to create and embed a culture of sustainability, resulting in improved firm performance.*

4 Discussion and implications

This study was grounded in the premise that the failures of other businesses have the potential to enhance green innovation efforts in surviving organizations, including the adoption of new technologies, sustainable business practices, and innovative principles. The study presented an integrated conceptual framework accounting for how firms can leverage external knowledge from parallel organizations' collapses to motivate their green innovation efforts. The four-quadrant integrated framework articulates two drivers for learning from failure: organizational factors/drivers and external factors, and two types of innovation: product and process innovation. This resulted in a 2 x 2 typology (i.e., Quadrant I: exogenous drivers of product eco-innovation, Quadrant II: exogenous drivers of process eco-innovation, Quadrant III: endogenous drivers of product eco-innovation, Quadrant IV: endogenous drivers of process eco-innovation) of learning from peer firms' failure to amplify green innovation efforts. The four quadrants elucidated the pathways, issues, and challenges through which businesses can embrace a sustainability ethos to enhance their long-term competitiveness.

4.1 Contributions to theory and practice

From a theoretical standpoint, although scholars have been interested in exploring failure as potential sources of learning (Boso et al., 2019), relatively little attention has been directed at elucidating the processes through which peer business failure can incentivize and motivate firms to engage in (eco-) innovation activities. Building on the dialogue on environmental sustainability (see Boulhaga et al., 2023; Esposito et al., 2023; Campra et al., 2023; Góes et al., 2023; Gallén & Peraita, 2017), the study highlights how reframing business failure can foster learning towards innovation.

This study also contributes to the green innovation process literature (Foster & Green, 2000) by demonstrating how business failure can inspire innovation efforts and sets of activities to enrich the competitiveness of firms.

Moreover, despite the valuable insights offered by past studies on business failure (e.g., Kücher & Feldbauer-Durstmüller, 2019) and eco-innovation (e.g., Peng & Liu, 2016), the contemporary literature in the two domains remains mostly disconnected. By integrating the highly dispersed scholarly works on both learning from failure and eco-innovation, this study offers a unified framework that accounts for the different motives for learning from failure to enhance firm competitiveness. The integrated framework sheds light on harnessing peer firms' failure as sources of inspiration towards environmental innovations that consequently deliver an enduring competitive edge. Thus, the study contributes to the ongoing debate on eco-innovation (Adams et al., 2016; Klewitz & Hansen, 2014; Marcon et al., 2017; Zheng et al., 2023) by shedding light on the mechanisms and challenges in achieving eco-innovation.

From a practical standpoint, the analysis indicates a need for businesses to create a culture of innovation by reframing failure as a valuable opportunity for learning and business growth. Practicing managers can benefit from others' failure by identifying priorities and key areas of learning to inform environmental practices. Another managerial insight is that the failure of peer companies can offer surviving firms opportunities to explore creative mechanisms for reducing resource consumption, prioritizing proper waste management, and reducing emissions. Thus, learning from business failure can be a viable source and a key driver of organizational renewal. In addition, green innovation should not be viewed as an ad hoc response to stakeholder pressures but

must be embedded in how the organization functions to deliver enduring advantages (Kratzer et al., 2017; Singh et al., 2020).

4.2 Limitations and Directions for future research

Notwithstanding the contributions to practicing managers, there are also some limitations that suggest fruitful directions for future research. First, the conceptualization and the relationships outlined lend themselves to further empirical examination and validation in both developed and emerging countries. Future research could also examine the relationships between product and process innovation and different sources of learning from failure in diverse geographical contexts. In addition, future studies could also examine different types of failure beyond the organizational context, such as personal and professional failures. Furthermore, future research could explore how factors such as limited access to resources can hinder or facilitate learning from failure among employees of defunct firms. Such analyses would also help identify barriers to using failure as a means of learning.

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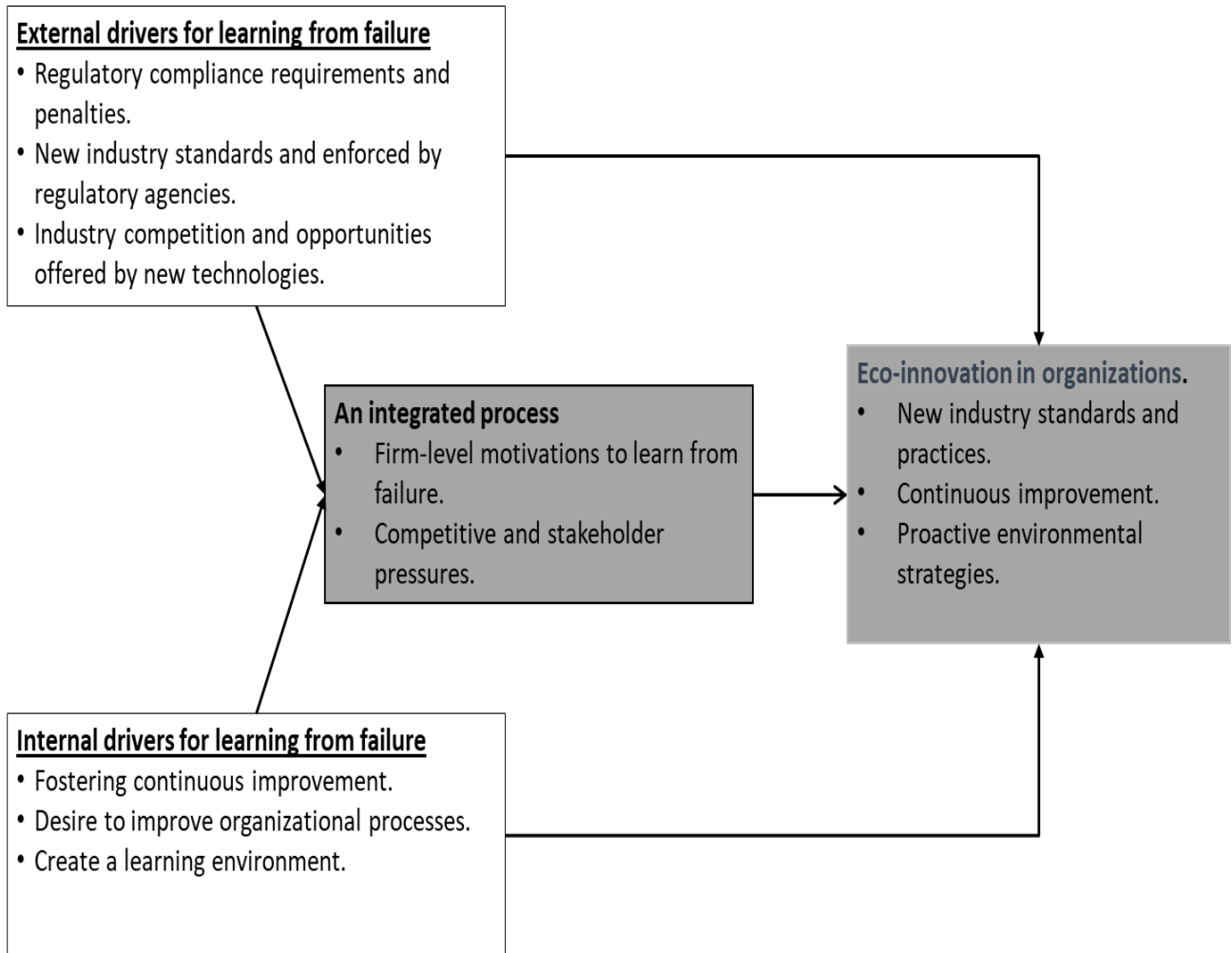


Figure 1. A Conceptual Framework for Learning from Failure.

Types of environmental innovation

Dimensions of learning from business failure motivations.

		Product eco-innovation	Process eco-innovation
Exogenous drivers		<p>Quadrant I: Exogenous drivers of product eco-innovation.</p> <ul style="list-style-type: none"> • Government mandate. • Environmental standards and certifications • Demand for environmentally friendly products. 	<p>Quadrant II: Exogenous drivers of process eco-innovation.</p> <ul style="list-style-type: none"> • Peer firm failures trigger eco-friendly process adoption. • Penalties and fines serve as deterrents to environmentally unfriendly practices. • Complying with regulations and responding to stakeholder pressure. • Government incentives drive eco-innovation adoption.
Endogenous drivers		<p>Quadrant III: Endogenous drivers of product eco-innovation.</p> <ul style="list-style-type: none"> • Failure as a catalyst to reevaluate and invest in promising products. • Failure compels surviving companies to improve product design to reduce resource usage and waste. • Integration of eco-friendly materials and eco-design principles. 	<p>Quadrant IV: Endogenous drivers of process eco-innovation.</p> <ul style="list-style-type: none"> • Prioritizing green practices and routines. • Instituting processes to avert penalties and ensure compliance with regulations.

Figure 2: A multidimensional framework of business failure as driver eco-innovations

Table 1: Studies on Drivers of Green Innovation

Drivers of green innovation	Description and relevant insights	Illustrative Relevant Studies
National government policy and regulatory pressures.	Government regulations and policies can mandate the adoption of sustainable practices such as carbon reduction technologies and renewable energy adoption. Stringent environmental regulations and higher environmental standards also foster green innovation.	Aguilera-Caracuel and Ortiz-de-Mandojana, 2013; Berrone et al., 2013; Fan et al. 2022; Sun et al., 2019; Borsatto & Bazani, 2021.
Consumers' demand for environmentally friendly products.	Environmentally conscious consumers are increasingly demanding firms tailor their strategy towards providing environmentally friendly products and services.	Huang, Chang, Wang & Li, 2023; Kesidou, & Demirel, 2012.
Reputational gains of green innovations.	Companies are motivated to adopt green initiatives to enhance their green brand and reputation.	Chen, 2008.
Environmental awareness.	Growing general public demand for sustainable products and services.	Peng & Liu, 2016.
Sustainability and environmental certification standards.	Certifications and standards, along with their associated legitimacy and reputation effects, can incentivize companies to adopt green practices.	Demirel & Kesidou, 2011.
Strategic partnerships and supply chain pressures.	Strategic alliances and supply chain collaborations can drive partner firms to embrace sustainable business practices, products and practices.	Seman et al., 2012.
Societal and other stakeholder pressures.	Stakeholder groups such as climate investors and NGOs can impose pressures on business to seek to minimize demand to the environment via green innovation.	Kesidou & Demirel, 2012.
Competitive advantage.	Cost advantages and differentiated advantages seen as driver of green innovation. Driven by opportunities to improve the quality of existing and new products.	Demirel & Kesidou, 2011. Keskin, Diehl & Molenaar, 2013; Rennings, Ziegler, Ankele & Hoffmann, 2006.

Table 2: Potential environmental sustainability-induced causes of business failure

Causes of business failure	Understanding the dynamics of the shift towards business failure	Level of analysis
Lack of compliance with environmental regulations or non-compliance.	Failure to adhere to national governments' environmental regulations and laws can lead to penalties and lawsuits, which can deplete the firm's resources and capabilities.	Attributed to organizational actions and decisions.
Astronomical increase in compliance cost.	High compliance costs of environmental regulations can also force exit of resource-poor and financially weak firms.	Externally imposed by governments and regulators.
Changing consumer preferences.	A mismatch exists between the growing consumer preferences for sustainable and eco-friendly products and services and firms' failure to alter their strategy towards environmentally sustainable practices.	Strategic misalignment between internal and external conditions.
Extreme weather events (EWEs) and climate change.	EWEs such as hurricanes, floods, and wildfires are increasingly depleting firm resources, leading to disruption and financial losses. Small firms in a host of industries such as agriculture and farming, energy and utilities are significantly vulnerable to weather extremes and consequent business failure.	External environmental driver.
Inefficient practices and waste management.	Inefficient practices pertaining to waste management can lead to increased business costs and reputational damage. Business failure has the potential to incentivize organizations and managers to reduce costs and improve efficiency.	Attributed to organizational actions and decisions.
Firm failure to invest in green practices and technologies.	Lack of investment can lead to failure to meet minimum standards for environmental regulations and bear high costs due to inefficient technologies.	Organizational decisions.

Data sources: Synthesized by the authors from: Amankwah-Amoah, 2016; Amankwah-Amoah & Syllias, 2020; McWilliams, 2009; Wedawatta et al., 2011.



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