Inzinerine Ekonomika-Engineering Economics, 2024, 35(2), 169–181

The Impact of Innovation Adoption on Sustainable Business Development in China: the Role of Environmental, Social, and Corporate Governance Performance

Ching-Chi Hsu

Carbon Economy Research Center, Fuzhou University of International Studies and Trade, Fuzhou, Fujian province China, 350202, China
E-mail: chingchi@fzfu.edu.cn

https://doi.org/10.5755/j01.ee.35.2.33190

ESG as a phenomenon appears to be consistent with high quality development of economy of country like China, hence, implementation of ESG is essential to embrace sustainability. Thus, it is imperative to scrutinize the its effectiveness and, in this lieu, the study attempts to scrutinize the effectiveness of innovation adoption on the environmental, social and governance performance, and SBD of the electric vehicle industry in the context of China. Along with it, mediating role of ESG performance has also been explored in the study. Primary data was collected for the study and PLS-SEM methodology was used to evaluate the collected data. Results showcase that innovation adoption is positively correlated with ESG performance and SBD of the electric vehicle industry in China. The outcomes also exposed that the ESG performances significantly mediates the relationship between innovation adoption and SBD. In the light of the evidence, the analysis recommends that organizations must value their ESG performance in order to formulate relatable policies.

Keywords: *Innovation Adoption; Environmental Performance; Social Performance; Governance Performance; Sustainable Business Development.*

Introduction

Sustainable business development is the organizations' pressing need in order to compete and attain an exceptional place in the local markets at the national level and world market, whereas social, as well as economic awareness is at its peak. Sustainable business development is the firms' act to undertake business operations and make progress with minimal negative influences on the natural environment around them and the entities associated. These firms perform operations with security to environmental quality and well-being of society (Bai *et al.*, 2022; Thitinan & Chankoson Khunanan, 2022). The firms making sustainable business development are concerned with more than just profits. They have a consistent look at business functionality in the environment and society. These firms can contribute to the quality and productivity of the environmental and social circle where they are operating. Thus, they build a context where they can thrive and sustain their development (Baneliene & Strazdas, 2023; Cera *et al.*, 2022).

In today's competitive market, where people have better knowledge of business operations as well as environmental and social awareness, it is imperative for firms to have sustainable business development. People or stakeholders like to have dealings with firms that show care for environmental and social concerns, based on responsibility, and regulate their functions accordingly (Chien *et al.*, 2021; Reinhardt *et al.*, 2019). Sustainable business development comes from the term "Sustainability," sounded by the British consultancy founder John Elkington, while this term is based on the 'triple bottom line' model with components of society, environment, and profits (Dat *et al.*, 2022; Hudakova *et al.*, 2023). Innovation, which is the implementation of something new or a change in the business structure, ideas, resources, and disciplines, plays a critical role in achieving sustainable development. Innovation adoption leads firms to protect the environment against pollution or excessive usage, care for the well-being of social members, and implement corporate governance (the regulation of business with the objectives of transparency, fairness, accountability, and responsibility). As a result of the higher social, environmental, and corporate governance performance, innovation adoption helps achieve sustainable business development (Gupta *et al.*, 2021; Hussain *et al.*, 2022).

The present study is to investigate the sustainable business development for the firms in the electric vehicle industry of China. China is a developing nation with a middle-class economy. By 2022, there will be 1,451,432,510 people living there. China's nominal GDP is $18.32 trillion, placing it second among all countries in the world, while its GDP (PPP) is $30.07 trillion, placing it first among all countries in terms of size. There are three economic sectors: agriculture, industry, and services, which together account for 7.9 %, 40.5 %, and 51 % of the Country's GDP (Li *et al.*, 2023; Ou *et al.*, 2019). The largest electric vehicle market in the world is located in China, which has total exports of about 500,000 units in 2021. So, it creates 57.4 % of all-electric vehicles manufactured worldwide. Over 53 % of the 6.23 million "new energy" passenger vehicles sold globally in 2021 were from China, which sold 3.341 million battery-only and 0.6 million plug-in hybrid electric vehicles (Bai *et al.*, 2019; Kurniawan *et al.*, 2022).

China also controls the market for plug-in electric buses and light commercial vehicles, selling over 500,000 buses, or 98.1 % of the total stock in the world, and 247,500 commercial electric vehicles, or 65 % of the global stock, in 2019, whereas China's sale in 2021 goes to 186,000

commercial electric vehicles (Liu *et al.*, 2022; Lubis & Pratama, 2022). Plug-in electric vehicle sales in China made up 15 % of total automobile sales in 2021. By 2023, it will reach a record high of 35 %, and by 2025, new energy electric vehicle adoption will surpass the government target of 20 %, as reported by BYD Chairman Wang Chuanfu. The usage of new-energy electric vehicles increased significantly, reaching 28 % in March 2022. BYD Auto and SAIC Motor, two Chinese companies that dominated the plug-in market, took the top two rankings and five of the top seven spots, respectively (Guo e*t al.*, 2020; Mamani *et al.*, 2022).

China's commercial industries, particularly the electric vehicle industry, are making progress in their business. But, the rate of progress is slow, and it is feared that in the coming, the industry may have to face instability in their functioning with the major reason fast spreading pollution and social issues. So, there is a need to pay attention (Marin-Garcia *et al.*, 2022; Sadowski *et al.*, 2023). The objective of present study is to examine the impacts of innovation adoption on ESG performance and SBD. It is also to check the role of ESG performance between innovation adoption and sustainable business development.

The current study does not simply repeat the subject from previous literature, but it makes a contribution to the literature. First, the study captures the impact of innovation adoption on environmental performance, social performance, corporate governance performance, and sustainable business development from stakeholder perspective. Second, the only relationship between ESG performance with sustainable business development has been discussed in the previous studies. There has been no debate on ESG performance from mediating lens. Unlike this, the current article checks the mediating impact of ESG performance between innovation adoption and sustainable business development. Third, the authors proceed to examine the impacts of innovation adoption on ESG performance, and sustainable business development in China.

The paper is categorized into five parts: The following part deals with the discussion about innovation adoption's relation to environmental performance, social performance, corporate governance performance, and sustainable business development in previous studies. The third part gives a short explanation of methods for data finding and the techniques for data analysis. In the fourth part, the study outcomes are extracted from the data collected. In discussions, the research outcomes are aligned with the previous studies. The paper ends with the research conclusion, implications, and limitations.

Literature Review

Innovation Adoption and Sustainable Business Development

Innovation adoption brings a change and improvement in business resources, personnel ideas, and business structures. The improvement-oriented change improves ESG performance. This basis the pillars of society, environment, and profits; it helps achieve sustainable business development (Sriyakul *et al.*, 2022; Sousa-Zomer & Cauchick-Miguel, 2019). Different authors have dealt differently with the relation of innovation adoption with environmental performance, social performance, corporate governance performance, and sustainable business development. In further paragraphs, the previous authors' views are used to build hypotheses.

To attain sustainability in business development, firms need resources and business techniques which do affect the environment and humans around them. When firms adopt innovation in the choice of resources and techniques, they can have sustainable business development (Moslehpour *et al.*, 2022a, 2022b; Shakeel *et al.*, 2020). Fernando et al. (2019), investigates the influences of environmental innovation adoption on sustainable business development. The research was on ninety-five Malaysian enterprises which are involved in green technologies usage. The online and postal questionnaires were used to collect data. The study implies that when the firms adopt innovation, it tries to change the energy consumption pattern by transitioning towards solar energy, applying energy-efficient technologies, and having logistics services with the least pollution. Consequently, superior environmental performance leads to sustainable business development. Asadi et al. (2020) and analyzes the impacts of innovation adoption on sustainable business development. An empirical research survey was directed to 183 hotels in Malaysia, and structured questionnaires were employed to collect responses. The analysis was performed through the PLS technique. The research made it clear that innovation adoption develops a workplace environment that is favorable for the environment and the workers. So, it sustains business development. Having said argument, we may put the following hypotheses:

H1: Innovation adoption has a positive association with sustainable business development.

Innovation Adoption and Environmental Performance

Business organizations use such substances, materials, and machines that may release harmful particles and gases polluting the environment. But innovation adoption habit results in a change in the resources applied in the organizations. Therefore, the chances of pollution emission decrease and organizations show superior environmental performance (Lin *et al.*, 2020; Xing & Tan, 2021). Singh et al. (2020), examines the impacts of innovation adoption, green transformational leadership, and EP. Under the quantitative research approach, surveys were conducted on 309 small and medium-sized enterprises in the manufacturing sector. The study implies that when organizations adopt innovation, they get ready to spend something more on their resources and processes to bring eco-friendly changes. These organizations have higher environmental performance. Seman et al. (2019) and Van Hoa et al. (2022), checks the relationship of innovation adoption and green SCM with firms' environmental performance. Questionnaires were distributed to 123 manufacturing firms with ISO 14001 certification. The study claims that the innovation adoption assures the availability of quality information and employees flourish creative ideas about the environmental elements. In this situation, it is in the hand of the organizational management to execute ecologically friendly plans easily and, thus, improve environmental performance. The discussed literature help establish the following hypotheses:

H2: Innovation adoption has a positive association with environmental performance.

Innovation Adoption and Social Performance

One of the main goals of businesses is to maintain its social reputation through social performance, in which organizations try to their responsibilities towards the stakeholders and maintain good relations with them. The innovation adoption makes the organizational personnel aware of the social requirements and enables them to meet the responsibilities towards the stakeholders (Sharma *et al.*, 2023; Wang *et al.*, 2019). Shahzad et al. (2022) and Stephan et al. (2019), was an investigation of the relationship between innovation adoption and economic performance. The 1257 Belgian firms are the population that authors were concerned about to investigate the relationship among factors. The study explains that in case business organizations adopt innovative ways to interact with the stakeholders, they can transfer their message, have their opinions, and influence their attitudes and behaviors. So, social performance can be improved with innovation adoption. In an article, Cillo et al. (2019), analyze the influence of adoption innovation on sustainable business development. A methodical strategy is used to find 69 pertinent articles. Three main perspectives—"internal managerial, external relational, and performance evaluation"—are used to organize these papers. The results showed that innovation adoption is effective in developing links and fulfilling the innovative requirements of customers and investors. So, it makes useful contribution towards firms' social performance. That is why,

H3: Innovation adoption has a positive association with social performance.

Innovation Adoption and Corporate Government Performance

Innovative technologies are agile and give more accurate outcomes. When the board of directors creates an innovative and creative organizational culture, it can have a better hold on the organization's personnel and make them perform responsibly. So, they can secure the interests of the stakeholders. Hence, innovation adoption helps the board of directors to improve corporate governance performance (Dicuonzo *et al.*, 2022; Turek *et al.*, 2023). Nazzaro et al. (2022), aims to better understand how innovation adoption contributes to the corporate governance performance and environmentally responsible transformation of wineries and, more especially, wine cooperatives. The Italian wine cooperative "La Guardiense" implemented the collaborative innovation "I mille per l'Aglianico," which was investigated using the case study technique. The investigation highlights that when organizational personnel is equipped with innovative resources specific to their jobs, it becomes more convenient for the company directors and managers to govern the corporation effectively. Hence innovation adoption is positively linked to corporate governance (Yodchai *et al.*, 2022). R. Lin et al. (2020), examines the relation of innovation adoption with corporate governance performance. The study posits that when corporations accept innovative technologies and other resources, digital technology can be used for information management. They conduct business, manage commercial operations, and ethically and accurately prepare paperwork. Adopting innovation thereby aids corporate governance. The literary arguments propose following hypothesis:

H4: Innovation adoption has a positive association with corporate governance performance.

Environmental Performance as a Mediator

Every production unit and service provider come to use materials, instruments, and technologies which have specific influences on the environment, its atmosphere, and living creatures. Innovative resources, products, and technologies are improved in quality and working. These are less likely to spoil the environment. The higher environmental performance improves the work environment and brings consistency in business functioning, making business development sustainable. That's why environmental performance creates a link between innovation adoption and SBD (Loia & Adinolfi, 2021; Phouc *et al.*, 2022). Song et al. (2019), evaluates the relationship among innovation adoption, environmental performance, and sustainable business development. The study reveals that most environmental problems are caused by the improper selection of resources, machines, and interaction methods. Through the adoption of innovation, firms are able to solve issues and make better business decisions. As a result, adopting innovations helps businesses perform better environmentally. And the higher environmental performance lays the groundwork for sustainable commercial growth. Shafi et al. (2022) and Veronica et al. (2020), identifies the connection among innovation adoption, environmental performance, and sustainable business development. The authors look at 80 SMEs in Italy's high-tech manufacturing industry for investigation. The results stated that innovation adoption helps ecologically friendly proceedings, and higher environmental performance leads to sustainability in business development. So, this hypothesis can be constructed.

H5: Environmental performance is a significant mediator between innovation adoption and sustainable business development.

Social Performance as a Mediator

In order to run a business, organizations need large investments, employees devoted to performance, customer loyalty, and public support, which all come from firms' social performance. The organizations keep innovating the infrastructure, resources, and processes, in order to respond to the changing requirements of the stakeholders' requirements keeping their interests secured. The higher social performance of the firms is helpful in improving business development and sustaining it. So, social performance develops a link between innovation adoption and sustainable business development (Al-Tamimi & Al Anssari, 2022; Di Vaio *et al.*, 2020). Albert (2019), investigates the connection among innovation adoption, social performance, and SBD. According to the author's opinion, that enterprises have special obligations to related parties such as shareholders, investors, suppliers, consumer companies, final consumers, and the general public. Adopting innovations fosters the awareness of and capacity for handling responsibilities. As a result, social

performance is high, and favorable stakeholder behavior contributes to sustained performance. Haseeb et al. (2019), investigates the connection of innovation adoption, social performance with sustainable business development. Using a simple random sampling method, 500 questionnaires were delivered to SMEs' managerial staff. The results showed that the innovation adoption turns the business performance according to the stakeholders' preferences. The improved social performance opens ways for sustainability in business development. The above discussion leads to the hypothesis below:

H6: Social performance is a significant mediator between innovation adoption and sustainable business development.

Corporate Governance as a Mediator

Corporate governance is the regulation of the whole system of a particular business firm. The resources of different types and technologies applied to affect the corporate governance and business capability to achieve its objectives. In an innovation-based business model, the directors, along with the subordinates' help, can better regulate the firm as the innovative means enhance the knowledge and gives more accuracy of the business operations (Sadiq *et al.*, 2022; Tseng *et al.*, 2019). In addition, Pizzi et al. (2021) states that under corporate governance, the operations are regulated, and business effectiveness is improved at sustaining rate leading to the achievement of sustainable business development. Thus, corporate governance performance improves the association of innovation adoption with sustainable business development. Gregurec et al. (2021), claims that adopting innovation enables managers to set the company's policies, train staff on their responsibilities, and control the resources and operations of the company. In this way, enhanced corporate governance performance improves business development sustainability. Thus, corporate governance performance acts as a mediator between the adoption of innovation and the growth of sustainable businesses. Scherer & Voegtlin (2020), examines the relationship between innovation adoption, social performance, and SBD. The study reveals that the presence of employees with innovative and creative ideas can undertake business dealings with higher accuracy and transparency. The resultant corporate governance maintains business reputation, investment, and business effectiveness. Hence, the firms have SBD. In light of these studies, this hypothesis can be established:

H7: Corporate governance performance is a significant mediator between innovation adoption and sustainable business development.

Methods and Materials

The research investigates the impact of innovation adoption on ESG performance, and SBD and also examines the mediating impact of ESG performance among innovation adoption and SBD of the electric vehicle industry in China. The study used primary data for the purpose of data collection. These questionnaires were extracted from past studies. For example, innovation adoption has five questions taken from Oduro (2020), the environmental performance has four questions extracted from Shahzad et al. (2020), the social performance also has four questions taken from John et al. (2019), corporate governance performance has five questions taken from Tuan (2014), and SBD has seven questions extracted from Sheikh, Rana, Inam, Shahzad, and Awan (2018).

The projected population of the study is the employees of the electric vehicle industry in China as the unit of analysis. 695 surveys have sent to sampled data, however, authors received only 374 valid responses. These valid responses represent approximately 53.82 percent response rate. In addition, the research also used the smart-PLS for the purpose of data analysis. The PLS-SEM examines the correlation between variables and items and the association among the variables. PLS is viewed as an effective methodology that is competent enough to manage complex models as well as large and small data (Hair *et al.*, 2017). The study took one predictor named innovation adoption (INA), three mediating variables such as environmental performance (ENP), social performance (SCP), and governance performance (CGP), and also used one dependent variable such as SBD. Figure 1 illustrates the conceptual framework of study.

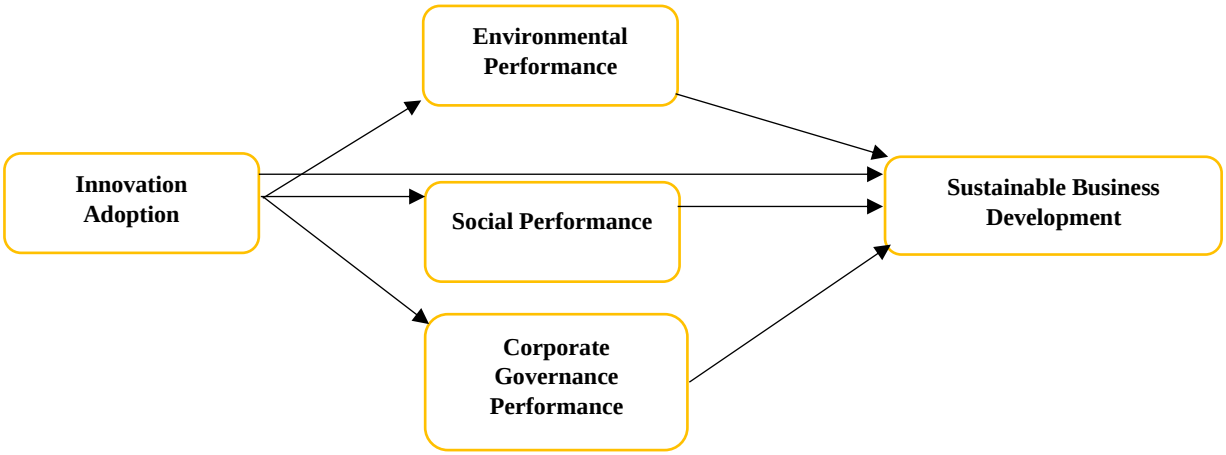

Figure 1. Research Model (Author's Estimation)

Research Findings

The research findings show convergent validity. The chron bach values are greater than 0.7, the average variance extracted are greater than 0.5, composite reliability (CR) are bigger than 0.70 and factor loadings are larger than 0.5. These figures revealed the valid convergent validity. Table 1 presents the details of measurement model.

Table 1

Convergent Validity (Source: Authors' Estimation)

Constructs	Items	Loadings	Alpha	CR	AVE
Corporate Governance Performance	CGP1	0.915	0.914	0.936	0.744
	CGP2	0.826			
	CGP3	0.829			
	CGP4	0.837			
	CGP5	0.902			
Environmental Performance	ENP1	0.919	0.892	0.925	0.756
	ENP2	0.920			
	ENP3	0.842			
	ENP4	0.789			
Innovation Adoption	INA1	0.877	0.868	0.905	0.658
	INA2	0.867			
	INA3	0.672			
	INA4	0.816			
	INA5	0.810			
Sustainable Business Development	SBD1	0.830	0.877	0.905	0.578
	SBD2	0.803			
	SBD3	0.749			
	SBD4	0.742			
	SBD5	0.682			
	SBD6	0.689			
	SBD7	0.813			
Social Performance	SCP1	0.757	0.802	0.870	0.626
	SCP2	0.812			
	SCP3	0.788			
	SCP4	0.806			

Findings also show the discriminant validity. The cross-loadings along with Fornell Larcker values exposed that the values that exposed linkage with the variable itself are larger than the values that exposed the linkage with other constructs. These figures revealed valid discriminant validity. These values are given in Table 2 and Table 3.

Table 2

Fornell Larcker (Source: Authors' Estimation)

	CGP	ENP	INA	SBD	SCP
CGP	0.863				
ENP	0.539	0.869			
INA	0.452	0.418	0.811		
SBD	0.601	0.705	0.629	0.760	
SCP	0.453	0.457	0.525	0.644	0.791

Table 3

Cross-Loadings (Source: Authors' Estimation)

	CGP	ENP	INA	SBD	SCP
CGP1	**0.915**	0.502	0.418	0.553	0.394
CGP2	**0.826**	0.430	0.386	0.496	0.391
CGP3	**0.829**	0.462	0.339	0.481	0.408
CGP4	**0.837**	0.440	0.370	0.524	0.371
CGP5	**0.902**	0.488	0.430	0.533	0.392
ENP1	0.475	**0.919**	0.378	0.604	0.407
ENP2	0.515	**0.920**	0.426	0.682	0.446
ENP3	0.489	**0.842**	0.374	0.662	0.405
ENP4	0.372	**0.789**	0.245	0.466	0.311
INA1	0.377	0.394	**0.877**	0.586	0.491
INA2	0.381	0.328	**0.867**	0.489	0.391
INA3	0.434	0.361	**0.672**	0.532	0.431
INA4	0.295	0.308	**0.816**	0.485	0.435
INA5	0.320	0.275	**0.810**	0.416	0.348
SBD1	0.434	0.680	0.374	**0.830**	0.472
SBD2	0.486	0.664	0.472	**0.803**	0.485
SBD3	0.434	0.453	0.571	**0.749**	0.493
SBD4	0.450	0.418	0.686	**0.742**	0.398
SBD5	0.515	0.381	0.446	**0.682**	0.544
SBD6	0.459	0.376	0.422	**0.689**	0.544
SBD7	0.431	0.716	0.395	**0.813**	0.509
SCP1	0.430	0.416	0.375	0.550	**0.757**
SCP2	0.283	0.311	0.418	0.400	**0.812**
SCP3	0.328	0.307	0.396	0.452	**0.788**
SCP4	0.375	0.396	0.462	0.603	**0.806**

The research findings also show the discriminant validity. The Heterotrait Monotrait (HTMT) ratio exposed that the values are less than 0.90. Table 4 presents the values of discriminant validity.

Table 4

Heterotrait Monotrait Ratio (Source: Authors' Estimation)

	CGP	ENP	INA	SBD	SCP
CGP					
ENP	0.590				
INA	0.501	0.459			
SBD	0.675	0.773	0.717		
SCP	0.524	0.527	0.618	0.760	

The outcomes showcase that innovation adoption is positively correlated with ESG performance and SBD of the electric vehicle industry in China, hence, support H1, H2, H3, and H4. These linkages are given in Table 5.

Table 5

Linkages between Constructs (Source: Authors' Estimation)

Relationships	Beta	Standard Deviation	T Statistics	P Values
CGP -> SBD	0.154	0.035	4.395	0.000
ENP -> SBD	0.397	0.039	10.182	0.000
INA -> CGP	0.452	0.049	9.235	0.000
INA -> ENP	0.418	0.049	8.602	0.000
INA -> SBD	0.258	0.042	6.147	0.000
INA -> SCP	0.525	0.046	11.348	0.000
SCP -> SBD	0.258	0.040	6.508	0.000

The outcomes also exposed that the ESG performance significantly mediate among innovation adoption and SBD of the electric vehicle industry in China and accept H5, H6 and H7. These linkages are given in Table 6.

Table 6

Indirect Path Analysis (Source: Authors' Estimation)

Relationships	Beta	Standard Deviation	T Statistics	P Values
INA -> SCP -> SBD	0.135	0.022	6.265	0.000
INA -> CGP -> SBD	0.069	0.018	3.828	0.000
INA -> ENP -> SBD	0.166	0.023	7.111	0.000

Discussions

Findings indicate that innovation adoption is positively correlated with SBD. Findings are backed up by Elmo et al. (2020), which claimed that innovation tends to change ideas, processes, or things so that improvement can be brought into the business. This change removes the problematic and destructive elements. Hence, business organizations not only accelerate but sustain business development. Moreover, Baldassarre et al. (2020) in the same lieu also highlights that innovation adoption allows businesses to evaluate the impact of business practices on the environment and associated people as well as to turn them into favorable impacts. Thus, the environment is clean, and people enjoy better well-being which determines sustainable business development.

Results also showcase that innovation adoption is positively correlated with environmental performance, hence consistent with Kraus et al. (2020), which indicates that the tendency of innovation adoption motivates the organizational management to prepare the human resources to run the modern technologies and control the creation of harmful substances. In these organizations, ecologically friendly strategies for form are implemented properly. Hence, these organizations show higher environmental performance. Alam et al. (2019) also stated that under innovation adoption, a change occurs in organizational infrastructure, logistics, technological resources, and energy patterns. These changes are often green-oriented, and organizations show higher environmental performance.

The results revealed that innovation adoption and social performance share a positive connection. Findings show consistency with Salim et al. (2019), which highlights that innovation adoption is helpful in attaining quality information and building an effective social network. With the improvement in the informative and communicative system, organizational personnel can learn about the stakeholders' requirements and the ways how to meet them. So, innovation adoption improves social performance. Bhattarai et al. (2019) also shed light on that innovation in business areas like management, accountancy, infrastructure, production, and marketing, is useful to meet the interests of stakeholders like novel and eco-friendly products and services as well as transparency of business operations. This denotes that innovation adoption improves social performance.

The results revealed that innovation adoption and corporate governance performance share positive connection. Findings are matched with the study of Haddad, Alkhodari, Al-Araj, Aburumman, and Fraij (2021), which reveals that firms that do not hesitate to adopt novel resources and techniques can adopt digital technologies for information management and data administration. The firms manage the business functions, carry its business dealings, and prepare documents with accuracy and responsibility. So, innovation adoption helps in corporate governance. Levillain and Segrestin (2019) also exposed that corporate governance is responsibly running business processes, so the business stakeholders do not have to face legal, social, economic, or environmental problems. Innovation adoption with novel and improved methods and resources facilitates the directors or management to regulate the organizations.

The results revealed that environmental performance is a significant mediator between innovation adoption and SBD. Results are in line with Murphy & Gouldson (2020), which posits that most environmental issues arise from the wrong choice of machines and resources and the techniques to interact with them. The innovation adoption enables organizations to make accurate decisions and have better business techniques. So, innovation adoption improves firms' environmental performance, and environmental performance provides a basis for sustainable business development. Zhuang et al. (2021) also implies that the organizations where the management allows employees to create and adopt innovation in business procedures, the environmental performance is high, and it assures sustainability in business development. So, environmental performance is a link between innovation adoption and sustainable business development.

The results revealed that social performance is a significant mediator between innovation adoption and sustainable business development. Broadstock et al. (2020) also produced similar results and exposed that businesses have specific responsibilities towards the associated entities like investors, shareholders, suppliers, consumer firms, ultimate consumers, and the public. The innovation adoption develops responsibility consciousness and the ability to respond to these responsibilities. Hence, social performance is high, and the positive behavior from stakeholders adds to sustainable business performance.Zh ang et al. (2019) also claimed that innovation adoption brings improvement in business operations affecting the stakeholders' interests, so there is an improvement in social performance, which is a pillar of sustainable business development.

The results revealed that corporate governance performance is a significant mediator between innovation adoption and sustainable business development. These results are in line with Kurzhals et al. (2020). Authors report that innovation adoption helps the directors and administrators to define the rules and regulations for the firm, instruct the employees on the duties, and regulate the business resources and processes. In this way, improved corporate governance performance enhances sustainability

in business development. So, corporate governance performance mediates between innovation adoption and sustainable business development. Ji & Miao (2020) also proclaimed that innovation adoption brings improvement in communication structure, business operations, production, documentation, marketing, etc. So, there is better corporate governance. Moreover, when corporate governance is effective, business development can be sustainable.

Implication

Authors would find significant guidelines out of the current study's contributions to literature. the country's sustainable business development requires the sustainable development of its business organizations. The study has considerable significance for these countries as it provides guidelines on how to achieve SBD. Hence, the study guides that business management must encourage innovation adoption in business practices so that business development can be made sustainable. The study also gives guidance that the organization's personnel should have innovative behavior while performing business functions. It would create the ability for higher environmental performance. Likewise, with the encouragement of innovation adoption, social performance can be improved. The study also provides a guideline that effective policies should be implied for innovation adoption so that corporate governance can be effectively implemented. The research guides the policy-makers in making policies related to the SBD using innovation adoption, environmental performance, social performance, and governance performance. The current study also conveys that there must be effective execution of innovation adoption in order to improve environmental performance, social performance, and corporate governance performance, which would lead to sustainable business development.

Conclusion

The study was to analyze the influences of innovation adoption on environmental performance, social performance, corporate governance performance, and sustainable business development. It was also to analyze the role of environmental performance, social performance, and corporate governance performance between innovation adoption and sustainable business development. The empirical data acquired from China shows a positive association of innovation adoption with environmental performance, social performance, corporate governance performance, and sustainable business development. The results showed that the innovation adoption develops a context where sufficient natural, technological, and human resources are available, sustainable investment, and better productivity. This all provides sustainable business development. The results also showed that if the firms adopt innovation, they can find polluting elements and have the capability to mitigate emissions of these pollutants from business operations. These firms succeed in having higher environmental performance. The research findings highlighted that innovation adoption assists in acquiring quality information, developing better communication structures, and creating fairness in business dealings. Hence, innovation adoption improves social performance. The research showed that when there is a tendency for innovation adoption, the firms' regular operations, documentation, and auditing works are better regulated, and corporate governance performance is higher. Moreover, according to study outcomes, environmental performance, social performance, and corporate governance performance play a significant mediating role between innovation adoption and sustainable business development. The innovation adoption improves firms' environmental performance, social performance, and corporate governance performance, which in turn improves sustainable business development.

Limitation

Besides the implication, the study also has some limitations which are needed to be considered by future explorers. For example, authors have thrown light only specific factors like innovation adoption, environmental performance, social performance, and corporate governance performance in the area of sustainability. However, businesses also need green finances, effective management, and the supply of eco-friendly resources to attain sustainable development, which are being missed in current scenario. Moreover, future authors also must check the moderating role of ESG performance between innovation adoption and sustainable business development in future literature.

Appendix

Constructs and Measurements

Items	Statements	Sources
	Innovation Adoption	
INA1	"My firm adopts innovation to improve its R&D process."	(Oduro, 2020)
INA2	"My firm uses the innovation model to gain expertise."	
INA3	"My firm uses innovation to reduce the high cost."	
INA4	"My firm uses innovation to counterbalance our lack of capacity."	
INA5	"My firm uses innovation to secure market share growth."	
	Environmental Performance	
ENP1	"My firm participates in activities aiming to improve the environment's quality."	(Shahzad *et al.*, 2020)
ENP2	"My firm invests in creating a better life."	
ENP3	"My firm implements special programs to minimize the negative impact on the environment."	
ENP4	"My firm targets sustainable growth."	

Items	Statements	Sources
	Social Performance	
SCP1	"The employees' well-being is a high priority of my firm."	(John *et al.*, 2019)
SCP2	"The customers' well-being is a high priority of my firm."	
SCP3	"The suppliers' well-being is a high priority of my firm."	
SCP4	"The community's well-being is a high priority of my firm."	
	Corporate Governance Performance	
CGP1	"The organization follows an effective governance system."	(Tuan, 2014)
CGP2	"The firm follows the rules and regulations provided by the authorities."	
CGP3	"The firm performs well by obeying the governance regulations.	
CGP4	"The employees are also following the regulations."	
CGP5	"The firm deals with suppliers and customers according to the regulation successfully."	
	Sustainable Business Development	
SBD1	"Innovation and ESG help to decrease the cost of materials."	(Sheikh *et al.*, 2018)
SBD2	"Innovation and ESG to decrease the cost of energy consumption."	
SBD3	"Innovation and ESG become the cause of the waste reduction. "	
SBD4	"Innovation and ESG improve the environmental situation."	
SBD5	"Innovation and ESG can improve the incentives and engagement policies for employees."	
SBD6	"Innovation and ESG will help in the development of economic activities."	
SBD7	"Innovation and ESG can reduce the negative impact of products and processes on the community."	

References

Alam, M. S., Atif, M., Chien-Chi, C., & Soytas, U. (2019). Does corporate R&D investment affect firm environmental performance? Evidence from G-6 countries. *Energy Economics*. https://doi.org/10.1016/j.eneco.2018.11.031

Albert, M. (2019). Sustainable frugal innovation-The connection between frugal innovation and sustainability. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2019.117747

Al-Tamimi, S. A., & Al Anssari, M. A. (2022). Implementation Of The Comprehensive Management Control System Package To Enhance The Overall Control System Effectiveness In Iraqi Industrial Sector Companies. *International Journal of eBusiness and eGovernment Studies*, 14(3), 61–75.

Asadi, S., Pourhashemi, S. O., Nilashi, M., Abdullah, R., Samad, S., Yadegaridehkordi, E., . . . Razali, N. S. (2020). Investigating influence of green innovation on sustainability performance: A case on Malaysian hotel industry. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2020.120860

Bai, B., Xiong, S., Song, B., & Xiaoming, M. (2019). Economic analysis of distributed solar photovoltaics with reused electric vehicle batteries as energy storage systems in China. *Renewable and Sustainable Energy Reviews*. https://doi.org/10.1016/j.rser.2019.03.048

Bai, X., Wang, K. T., Tran, T. K., Sadiq, M., Trung, L. M., & Khudoykulov, K. (2022). Measuring China's green economic recovery and energy environment sustainability: Econometric analysis of sustainable development goals. *Economic Analysis and Policy*, https://doi.org/10.1016/j.eap.2022.07.005

Baneliene, R., & Strazdas, R. (2023). Green innovation for competitiveness: impact on GDP growth in the European Union. *Contemporary economics*, 17(1), 92–108. https://doi.org/10.5709/ce.1897-9254.501

Baldassarre, B., Konietzko, J., Brown, P., Calabretta, G., Bocken, N., Karpen, I. O., & Hultink, E. J. (2020). Addressing the design-implementation gap of sustainable business models by prototyping: A tool for planning and executing small-scale pilots. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2020.120295

Bhattarai, C. R., Kwong, C. C., & Tasavori, M. (2019). Market orientation, market disruptiveness capability and social enterprise performance: An empirical study from the United Kingdom. *Journal of business Research*. https://doi.org/10.1016/j.jbusres.2018.10.042

Broadstock, D. C., Matousek, R., Meyer, M., & Tzeremes, N. G. (2020). Does corporate social responsibility impact firms' innovation capacity? The indirect link between environmental & social governance implementation and innovation performance. *Journal of business Research*. https://doi.org/10.1016/j.jbusres.2019.07.014

Cera, G., Khan, K. A., Blahova, A., & Belas Jr, J. (2022). Do owner-manager demographics in SMEs matter for corporate social responsibility?. Equilibrium. *Quarterly Journal of Economics and Economic* Policy, 17(2), 511–531. https://doi.org/10.24136/eq.2022.018

Chien, F., Hsu, C. C., Sibghatullah, A., Hieu, V. M., Phan, T. T. H., & Hoang Tien, N. (2021). The role of technological innovation and cleaner energy towards the environment in ASEAN countries: proposing a policy for sustainable development goals. *Economic Research-Ekonomska Istrazivanja*. https://doi.org/10.1080/1331677X.2021.2016463

Cillo, V., Petruzzelli, A. M., Ardito, L., & Del Giudice, M. (2019). Understanding sustainable innovation: A systematic literature review. *Corporate Social Responsibility and Environmental Management*, 26(5), 1012–1025. https://doi.org/10.1002/csr.1783

Dat, N. M., Dai, N. Q., & Ngoc, P. B. (2022). The impact of corporate social responsibilities (CSR), entrepreneurship, and financial factors on the financial performance of the banks in ASEAN countries. *Contemporary Economics*, 16(2), 227–240. https://doi.org/10.5709/ce.1897-9254.479

Di Vaio, A., Boccia, F., Landriani, L., & Palladino, R. (2020). Artificial intelligence in the agri-food system: Rethinking sustainable business models in the COVID-19 scenario. *Sustainability*, 12(12), 4851–4863. https://doi.org/10.3390/su12124851

Dicuonzo, G., Donofrio, F., Iannuzzi, A. P., & Dell'Atti, V. (2022). The integration of sustainability in corporate governance systems: an innovative framework applied to the European systematically important banks. *International Journal of Disclosure and Governance*. https://doi.org/10.1057/s41310-021-00140-2

Elmo, G. C., Arcese, G., Valeri, M., Poponi, S., & Pacchera, F. (2020). Sustainability in tourism as an innovation driver: An analysis of family business reality. *Sustainability*, 12(15), 6149–6158. https://doi.org/10.3390/su12156149

Fernando, Y., Jabbour, C. J. C., & Wah, W.-X. (2019). Pursuing green growth in technology firms through the connections between environmental innovation and sustainable business performance: does service capability matter? *Resources, Conservation and Recycling*. https://doi.org/10.1016/j.resconrec.2018.09.031

Gregurec, I., Tomicic Furjan, M., & Tomicic-Pupek, K. (2021). The impact of COVID-19 on sustainable business models in SMEs. *Sustainability*, 13(3), 1098–1114. https://doi.org/10.3390/su13031098

Guo, J., Zhang, X., Gu, F., Zhang, H., & Fan, Y. (2020). Does air pollution stimulate electric vehicle sales? Empirical evidence from twenty major cities in China. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2019.119372

Gupta, H., Kumar, A., & Wasan, P. (2021). Industry 4.0, cleaner production and circular economy: An integrative framework for evaluating ethical and sustainable business performance of manufacturing organizations. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2021.126253

Haddad, H., Alkhodari, D., Al-Araj, R., Aburumman, N., & Fraij, J. (2021). Review of the Corporate Governance and Its Effects on the Disruptive Technology Environment. Wseas Trans. Environ. Dev. https://doi.org/10.37394/232015.2021.17.93

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Thiele, K. O. (2017). Mirror, mirror on the wall: a comparative evaluation of composite-based structural equation modeling methods. *Journal of the academy of marketing science*, 45(5), 616–632. https://doi.org/10.1007/s11747-017-0517-x

Haseeb, M., Hussain, H. I., Kot, S., Androniceanu, A., & Jermsittiparsert, K. (2019). Role of social and technological challenges in achieving a sustainable competitive advantage and sustainable business performance. *Sustainability*, 11(14), 3811–3828. https://doi.org/10.3390/su11143811

Hudakova, M., Masar, M., Buganova, K., & Mocova, L. (2023). Fostering Entrepreneurship through the Assessment of Business Risks for SMEs in V4 countries. *Inzinerine Ekonomika-Engineering Economics*, 34(4), 384–396. https://doi.org/10.5755/j01.ee.34.4.29412

Hussain, H. I., Kamarudin, F., Anwar, N. A. M., Sufian, F., Ali, A., & Saudi, M. H. (2022). Social Globalisation and Efficiency of Microfinance Institutions Nexus: Empirical Evidence on Financial and Social Efficiency. *Inzinerine Ekonomika-Engineering Economics*, 33(1), 27–46. https://doi.org/10.5755/j01.ee.33.1.29130

Ji, H., & Miao, Z. (2020). Corporate social responsibility and collaborative innovation: The role of government support. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2020.121028

John, A., Qadeer, F., Shahzadi, G., & Jia, F. (2019). Getting paid to be good: How and when employees respond to corporate social responsibility? *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2019.01.074

Kraus, S., Rehman, S. U., & Garcia, F. J. S. (2020). Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation. *Technological Forecasting and Social Change*. https://doi.org/10.1016/j.techfore.2020.120262

Kurniawan, K., Supriatna, J., Sapoheluwakan, J., Soesilo, T. E. B., Mariati, S., & Gunarso, G. (2022). The Analysis of Forest and Land Fire and Carbon and Greenhouse Gas Emissions on the Climate Change in Indonesia. *AgBioForum*, 24(2), 1–11.

Kurzhals, C., Graf-Vlachy, L., & Konig, A. (2020). Strategic leadership and technological innovation: A comprehensive review and research agenda. *Corporate governance: an international review*, 28(6), 437–464. https://doi.org/10.1111/corg.12351

Levillain, K., & Segrestin, B. (2019). From primacy to purpose commitment: How emerging profit-with-purpose corporations open new corporate governance avenues. *European Management Journal*, 37(5), 637–647. https://doi.org/10.1016/j.emj.2019.07.002

Li, P., Bastone, A., Mohamad, T. A., & Schiavone, F. (2023). How does artificial intelligence impact human resources performance. evidence from a healthcare institution in the United Arab Emirates. *Journal of Innovation & Knowledge*, 8(2), 100340. https://doi.org/10.1016/j.jik.2023.100340

Lin, R., Xie, Z., Hao, Y., & Wang, J. (2020). Improving high-tech enterprise innovation in big data environment: a combinative view of internal and external governance. *International Journal of Information* Management. https://doi.org/10.1016/j.ijinfomgt.2018.11.009

Lin, Z., Wang, S., & Yang, L. (2020). Motivating innovation alliance's environmental performance through eco-innovation investment in a supply chain. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2020.122361

Liu, Z., Yin, T., Surya Putra, A. R., & Sadiq, M. (2022). Public spending as a new determinate of sustainable development goal and green economic recovery: policy perspective analysis in the Post-Covid ERA. *Climate Change Economics*, https://doi.org/10.1142/S2010007822400073

Loia, F., & Adinolfi, P. (2021). Teleworking as an eco-innovation for sustainable development: Assessing collective perceptions during COVID-19. *Sustainability*, 13(9), 4823–4839. https://doi.org/10.3390/su13094823

Lubis, H., & Pratama, K. (2022). HR related antecedes to Sustainability reporting in Indonesian public listed firm: The mediating role of employee committeemen. *Cuadernos de Economía*, 45(128), 87–97.

Mamani, W. C., Manrique, G. M. L., Madrid, S. D. P. C., Herrera, E. E., Acosta, D. B., Rivas-Diaz, R. R., ... & Ramos, F. S. S. (2022). The Role of Entrepreneurship and Green Innovation Intention on Sustainable Development: Moderating Impact of Inclusive Leadership. AgBioForum, 24(1), 134–143.

Marin-Garcia, A., Gil-Saura, I., & Ruiz-Molina, M. E. (2022). Do innovation and sustainability influence customer satisfaction in retail? A question of gender. *Economic Research-Ekonomska Istrazivanja*, 35(1), 546–563. https://doi.org/10.1080/1331677X.2021.1924217

Moslehpour, M., Chau, K. Y., Du, L., Qiu, R., Lin, C. Y., & Batbayar, B. (2022b). Predictors of green purchase intention toward eco-innovation and green products: Evidence from Taiwan. *Economic Research-Ekonomska Istrazivanja*. https://doi.org/10.1080/1331677X.2022.2121934

Moslehpour, M., Chau, K. Y., Tu, Y. T., Nguyen, K. L., Barry, M., & Reddy, K. D. (2022a). Impact of corporate sustainable practices, government initiative, technology usage, and organizational culture on automobile industry sustainable performance. *Environmental Science and Pollution Research*, 29(55), 83907–83920. https://doi.org/10.1007/s11356-022-21591-2

Murphy, J., & Gouldson, A. (2020). Environmental policy and industrial innovation: integrating environment and economy through ecological modernisation. *The Ecological Modernisation Reader*, 5, 275–294. https://doi.org/10.4324/9781003061069-19

Nazzaro, C., Stanco, M., Uliano, A., Lerro, M., & Marotta, G. (2022). Collective smart innovations and corporate governance models in Italian wine cooperatives: the opportunities of the farm-to-fork strategy. *International Food and Agribusiness Management* Review. https://doi.org/10.22434/IFAMR2021.0149

Oduro, S. (2020). Exploring the barriers to SMEs' open innovation adoption in Ghana: A mixed research approach. *International Journal of Innovation Science*, 12(1), 21-51. https://doi.org/10.1108/IJIS-11-2018-0119

Ou, S., Hao, X., Lin, Z., Wang, H., Bouchard, J., He, X., . . . Lv, R. (2019). Light-duty plug-in electric vehicles in China: An overview on the market and its comparisons to the United States. *Renewable and Sustainable Energy Reviews*. https://doi.org/10.1016/j.rser.2019.06.021

Phuoc, V. H., Thuan, N. D., Vu, N. P. H., & Tuyen, L. T. (2022). The Impact Of Corporate Social And Environmental Responsibilities And Management Characteristics On Smes'performance In Vietnam. *International Journal of Economics and Finance Studies*, 14(2), 36–52.

Pizzi, S., Corbo, L., & Caputo, A. (2021). Fintech and SMEs sustainable business models: Reflections and considerations for a circular economy. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2020.125217

Reinhardt, R., Christodoulou, I., Gasso-Domingo, S., & Garcia, B. A. (2019). Towards sustainable business models for electric vehicle battery second use: A critical review. *Journal of Environmental Management*. https://doi.org/10.1016/j.jenvman.2019.05.095

Sadiq, M., Ou, J.P., Duong, K.D., Van, L., Ngo, T.Q., & Bui, T.X. (2022) The influence of economic factors on the sustainable energy consumption: evidence from China. *Economic Research-Ekonomska Istrazivanja*. https://doi.org/10.1080/1331677X.2022.2093244

Sadowski, A., Misztal, A., Kowalska, M., Jedrzejczak, R., Engelseth, P., Bujak, A., & Skowron-Grabowska, B. (2023). The impact of environmental taxes on transportation and storage enterprises' development-the case of Balkan countries. *Technological and Economic Development of Economy*, 29(5), 1477–1495. https://doi.org/10.3846/tede.2023.19531

Salim, N., Ab Rahman, M. N., & Abd Wahab, D. (2019). A systematic literature review of internal capabilities for enhancing eco-innovation performance of manufacturing firms. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2018.11.105

Scherer, A. G., & Voegtlin, C. (2020). Corporate governance for responsible innovation: Approaches to corporate governance and their implications for sustainable development. *Academy of Management Perspectives*, 34(2), 182–208. https://doi.org/10.5465/amp.2017.0175

Seman, N. A. A., Govindan, K., Mardani, A., Zakuan, N., Saman, M. Z. M., Hooker, R. E., & Ozkul, S. (2019). The mediating effect of green innovation on the relationship between green supply chain management and environmental performance. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2019.03.211

Shafi, M., Szopik-Depczynska, K., Cheba, K., Ciliberto, C., Depczynski, R., & Ioppolo, G. (2022). Innovation in traditional handicraft companies towards sustainable development. A systematic literature review. *Technological and Economic Development of Economy*, 28(6), 1589–1621. https://doi.org/10.3846/tede.2022.17085

Shahzad, M., Qu, Y., Javed, S. A., Zafar, A. U., & Rehman, S. U. (2020). Relation of environment sustainability to CSR and green innovation: A case of Pakistani manufacturing industry. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2019.119938

Shahzad, M., Qu, Y., Rehman, S. U., & Zafar, A. U. (2022). Adoption of green innovation technology to accelerate sustainable development among manufacturing industry. *Journal of Innovation & Knowledge*, 7(4), 100231. https://doi.org/10.1016/j.jik.2022.100231

Shakeel, J., Mardani, A., Chofreh, A. G., Goni, F. A., & Klemes, J. J. (2020). Anatomy of sustainable business model innovation. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2020.121201

Sharma, E., Sharma, S., Al-Qudah, M. A. H., Yildiz, C., Adom, D., Ferdinand, D., ... & Afhami, R. (2023). Measurement invariance, validity, reliability, and factor structure examination of the creativity nurturing behaviour scale for teachers: comparisons across gender in thirteen countries. *Creativity Studies*, 16(1), 274–296. https://doi.org/10.3846/cs.2023.16085

Sheikh, A. A., Rana, N. A., Inam, A., Shahzad, A., & Awan, H. M. (2018). Is e-marketing a source of sustainable business performance? Predicting the role of top management support with various interaction factors. *Cogent Business & Management*, 5(1), 1–22. https://doi.org/10.1080/23311975.2018.1516487

Singh, S. K., Del Giudice, M., Chierici, R., & Graziano, D. (2020). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change*. https://doi.org/10.1016/j.techfore.2019.119762

Song, M., Fisher, R., & Kwoh, Y. (2019). Technological challenges of green innovation and sustainable resource management with large scale data. *Technological Forecasting and Social Change*. https://doi.org/10.1016/j.techfore.2018.07.055

Sousa-Zomer, T. T., & Cauchick-Miguel, P. A. (2019). Exploring business model innovation for sustainability: an investigation of two product-service systems. *Total Quality Management & Business Excellence*, 30(5-6), 594–612. https://doi.org/10.1080/14783363.2017.1317588

Sriyakul, T., Chienwattanasook, K., & Chankoson, T. (2022). Does Industrialization And Renewable Energy Consumption Determine Economic Growth? Empirical Evidence From Asean Countries. *International Journal of Economics and Finance Studies*, 14(03), 264–279.

Stephan, U., Andries, P., & Daou, A. (2019). Goal multiplicity and innovation: How social and economic goals affect open innovation and innovation performance. *Journal of Product Innovation Management*, 36(6), 721–743. https://doi.org/10.1111/jpim.12511

Thitinan, T. S., & Chankoson Khunanan, S. (2022). Modelling the impact of e-government on corruption for the covid-19 crisis. *International Journal of eBusiness and eGovernment Studies*, 14(3), 26–45.

Tseng, M. L., Wu, K. J., Chiu, A. S., Lim, M. K., & Tan, K. (2019). Reprint of: Service innovation in sustainable product service systems: Improving performance under linguistic preferences. *International Journal of Production Economics*. https://doi.org/10.1016/j.ijpe.2019.09.013

Turek, J., Ocicka, B., Rogowski, W., & Jefmanski, B. (2023). The role of Industry 4.0 technologies in driving the financial importance of sustainability risk management. Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 18(4), 1009–1044. https://doi.org/10.24136/eq.2023.032

Tuan, L. T. (2014). Corporate governance and brand performance. *Management Research Review*, 37(1), 45–68. https://doi.org/10.1108/MRR-08-2012-0183

Van Hoa, N., Van Hien, P., Tiep, N. C., Huong, N. T. X., Mai, T. T. H., & Phuong, P. T. L. (2022). The Role of Financial Inclusion, Green Investment and Green Credit on Sustainable Economic Development: Evidence from Vietnam. *Cuadernos de Economia*, 45(127), 1–10.

Veronica, S., Alexeis, G.-P., Valentina, C., & Elisa, G. (2020). Do stakeholder capabilities promote sustainable business innovation in small and medium-sized enterprises? Evidence from Italy. *Journal of business Research*. https://doi.org/10.1016/j.jbusres.2019.06.025

Wang, W., Zhao, X.-Z., Chen, F.-W., Wu, C.-H., Tsai, S., & Wang, J. (2019). The effect of corporate social responsibility and public attention on innovation performance: Evidence from high-polluting industries. *International journal of environmental research and public health*, 16(20), 3939–3953. https://doi.org/10.3390/ijerph16203939

Xing, M., & Tan, T. (2021). Environmental attitudes and impacts of privatization on R&D, environment and welfare in a mixed duopoly. *Economic Research-Ekonomska Istrazivanja*, 34(1), 807–827. https://doi.org/10.1080/1331677X.2020.1804968

Yodchai, N., Ly, P. T. M., & Tran, L. T. T. (2022). Co-creating creative self-efficacy to build creative performance and innovation capability for business success: a meta-analysis. *Creativity Studies*, 15(1), 74–88. https://doi.org/10.3846/cs.2022.13852

Zhang, Y., Khan, U., Lee, S., & Salik, M. (2019). The influence of management innovation and technological innovation on organization performance. A mediating role of sustainability. *Sustainability*, 11(2), 495–516. https://doi.org/10.3390/su11020495

Zhuang, Y., Yang, S., Razzaq, A., & Khan, Z. (2021). Environmental impact of infrastructure-led Chinese outward FDI, tourism development and technology innovation: A regional country analysis. *Journal of Environmental Planning and Management*. https://doi.org/10.1080/09640568.2021.1989672

Author's Biography

Ching-Chi Hsu is working as a Professor of Finance at the School of Finance, Fuzhou University of International Studies and Trade. She has done PhD and continuously participating in the field of research. She has vast experience of teaching and research publications in reputed journals such as Resources Policy, Finance Research Letters, Technology In Society, Journal of Environmental Management, Environmental Science and Pollution Research, Economic Research etc.

The article has been reviewed.

Received in January 2023; accepted in May 2023