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## Article

# Exploring the Link between Sustainable Development Practices, Institutional Pressures, and Green Innovation

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**Abstract:** Academics, business leaders, and policymakers are paying more and more attention to sustainable development. The influence of external forces on sustainable development practices, which could predict green innovation, is, however, still unexplored. This paper seeks to explore the role of external pressures on sustainable development practices in the driving of green innovation in Saudi Arabia. We took a quantitative approach through an online survey to collect the required data from manufacturing companies in Saudi Arabia. Structural equation modelling was used to analyse the data. The results revealed that institutional pressures (i.e., governance pressure, customer pressures, and competitive pressure) are key drivers of sustainable development practices and green innovation. They also indicated that sustainable development practices (i.e., environmental sustainability, social sustainability, and economic environmental sustainability) have a significant influence on green innovation. Our findings lead us to propose that green innovation is influenced by external pressures and sustainable development practices.

**Keywords:** sustainable development practices; institutional pressures; green innovation



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## 1. Introduction

The rapid depletion of natural resources and the dangerous emissions caused by economic growth have put more pressure on the climate and environment, which are getting worse every day [1,2]. The World Commission on Environment and Development through its Brundtland report on sustainable development say that many countries have not met their environmental goals (SDGs). Increasing scientific evidence of the negative extent of this tendency has put more pressure on organisations to deal with the problems caused by environmental degradation [3]. Because of these pressures, creating green and sustainable value has become more important, and questions have been raised about whether sustainable development practices (SDPs) can solve these problems while making businesses more competitive and sustainable [4].

Some businesses have started to think about the environment as part of their business plans because they are under great pressure to do so [5]. Firms have no choice but to use strategies that focus on sustainability. In recent years, green innovation has attracted more attention as an important route to strategies that focus on sustainability [6]. Green innovation is the creation, adoption, or use of a product, process, or management method that is new to an organisation and helps it to reduce its negative effects on the environment [7].

In the last few years, retailers have been putting into place a number of practices that support sustainable development. For example, they have stopped giving out plastic bags

at checkouts, reduced CO<sub>2</sub> emissions, created internal codes of good conduct (for example, regarding child labour), improved employment practices (equal pay for men and women, hiring people with disabilities, etc.), and so on. In the UK, Tesco buys wood from certified sources only, and Sainsbury's is dedicated to fighting obesity. Since 2005, Wal-Mart has put out an annual report in the United States about its commitment to the environment (such as reducing greenhouse gas emissions) and has positioned itself as a "green and socially responsible company".

Researchers have paid great attention to corporate green innovation (CGI) in the past decade because of growing environmental problems and a lack of resources [4,7,8]. CGI enables companies to make products and processes that are good for the environment and thus practicing sustainable development [9,10]. However, green innovation is hard for retailers to achieve because they fail to use green and sustainable development practices. Horvathova [11] found that external forces are a key factor affecting green innovation and sustainable practices. The Global Innovation Index (GII) has also revealed the important aspects of external pressures that hinder innovation. Prior research indicates that green innovation in Saudi Arabia is still in its early stages [5,9]. Research on emerging economies, such as Saudi Arabia, can give us a better idea of how different strategies backed by sustainable development practices can be used to stop the degradation of the environment and make eco-friendly products that protect the environment from pollution and reduce waste. On the basis of this discussion, this study argues that external pressures form a key driver of sustainable development practices, which in turn influence the firms' green innovation. Thus, our examination is two-fold. First, it examines the influence of external pressures on retailers' green innovation. Second, it explores the mediating role of sustainable development practices in the link between external pressures and green innovation.

The next section describes the study background and hypotheses development. Section 3 concerns the research methods, while Section 4 contains the study analysis and results. Section 5 outlines the discussion and implications, while Section 6 indicates the limitations of the research and directions for further study.

## 2. Research Background and Hypotheses Development

### 2.1. Green Innovation

In the last 20 years, there has been a big rise in research in which the words 'innovation' and 'sustainability' are combined [12]. Because of this, four main terms—eco-innovation, environmental innovation, green innovation, and sustainable innovation—have been aired [13]. It is important to know how these terms are different from one another because words and phrases can be used to shape meanings and point out areas of interest to the different communities involved [14]. Some past studies [15,16] indicate that eco-innovation, ecological innovation, green innovation, and environmental innovation refer to the same thing. For example, prior research notes that that the terms can be used interchangeably, even though sustainable innovation has both a social and an ecological dimension [17]. One bibliometric study gives us new ideas for defining the terms used to talk about innovations related to sustainability [1]. It finds overlaps between the terms 'eco-innovation' and 'environmental innovation' since both refer to innovations that aim to reduce impacts on the environment. They do so in an attempt to make the premises of sustainable development work in the real world [18,19]. However, another study made a distinction between 'eco-innovation' and 'sustainable innovation' [20], revealing that eco-innovation looks only at environmental and economic aspects, while sustainable innovation also looks at social and ethical aspects. The sustainable innovation approach has much to do with sociology, whereas green innovation has much to do with management goals and competition [21].

Traditional innovations involve making new products, materials, processes, services, and organisational forms to gain a competitive edge [22]. Unlike them, green innovations require new ideas, goods, services, processes, or management systems that can be used to

solve environmental problems [23]. Prior research reveals that meeting the environmental needs of stakeholders can lead to green innovation and better performance in the environment [24]. Previous writers' examination indicates that green innovation is not only a keyway for businesses to gain a competitive edge in the future, but is also a requirement for legitimacy [25].

## 2.2. Institutional Pressure

Institutional theory looks at how external pressures to conform affect the way in which organisations act [26]. Institutions are elements in the social game, so institutional theory says that institutions have a big impact on the actions and decision-making of a company [27]. The external institutional context in which a firm is set affects its strategic response and limits its operations [28]. Institutional isomorphism is the process by which firms' strategies and actions match what institutions want [29]. Isomorphism is a very important part of an institution's functionality. Regulatory pressures and imitative pressures are the two main ways that institutions start to look alike [30,31]. Institutions give legitimacy to organisations by putting pressure on them in different ways [32]. Imitative isomorphism is mostly about how companies try to gain legitimacy within their own industry by copying the practices and actions of their peers [33]. Regulatory isomorphism is caused by strong stakeholders, such as the government and industry groups, that have the power to require businesses to follow different rules [34]. Institutional constraints force organisations to try to improve or protect their legitimacy [35]. Many studies show that as institutional pressure rises, firms that want to be seen as legitimate become more like each other.

## 2.3. Institutional Pressures and Green Innovation

Regulatory pressure means putting limits on companies' actions by making rules, rewards, and punishments. It comes mostly from rules about who has legal authority [36]. By making laws and rules about the environment, the government makes it clear to businesses that they need to improve their environmental performance [37]. Environmental regulations, such as technical standards, environmental tax systems, and emission permit systems, force businesses to use certain resources to reduce their pollution [38]. Technical standards determine the technical choices that can be made during the production process. Taxation and emissions trading allow firms' emissions to be taxed [39]. These things all affect the costs of running a business and can help it make technological progress. Environmental laws that are very strict may push companies to invest more in technological development and management innovation to beat their competitors and improve their green innovation performance [40]. Five ways that environmental regulations help green innovation are as follows. First, environmental regulations show firms that they are not using their resources well and how they could improve their technology. Second, the collection of environmental information can make firms more aware of the environment when environmental laws are enforced. Third, these regulations make investments in the environment surer. Fourth, they create the pressures that lead to progress and new ideas. Last, regulations about the environment have made a space for corporate reform [41].

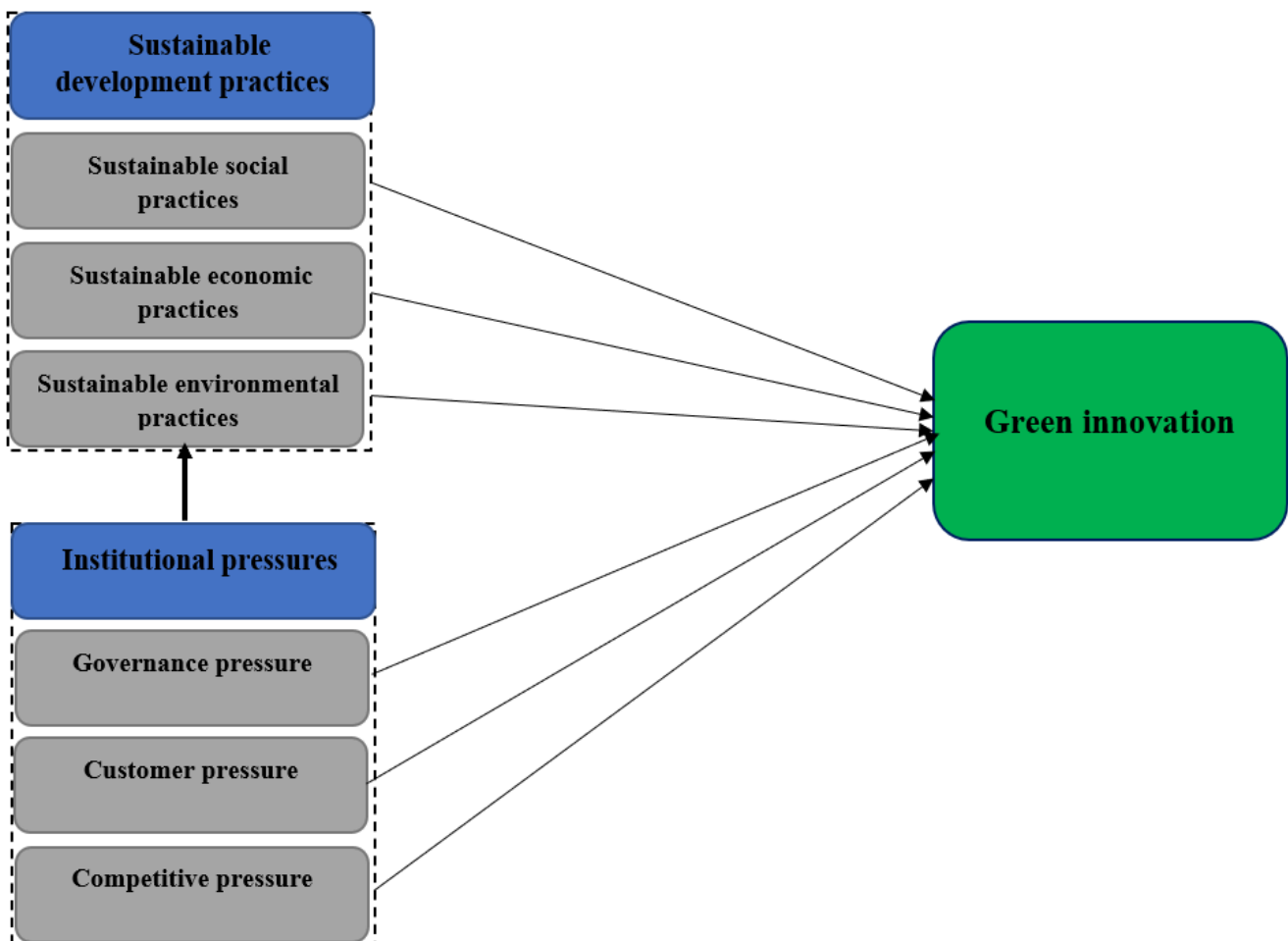
Many studies show that institutional pressure has a positive effect on green innovation [42,43]. When external institutions put pressure on a business, the business can use the technical measures and management practices that are accepted by the institutions to gain legitimacy from the outside stakeholders. Green innovation strategies can be affected not only by coercive pressure, but also by imitative pressure [10,18]. Most imitative pressure comes from a company's peers, and if more and more of a company's peers use green innovation, the company will have to do the same [44]. In fact, when the business environment is hard to understand or there are many unknowns, companies tend to copy the strategies of their peers [45]. By doing what the best companies in an industry do, other companies can lower the risk level of their decisions. When top managers are uncertain as to what their firms should do, a safe strategy is to copy what successful competitors

are doing [46]. Figure 1, below, demonstrates the study variables. Top managers have an effect on the final decisions about green innovation by learning from and comparing the choices of their peers in this area. Research has shown that peer pressure is a key factor in a company's decision of its green innovation strategy [47]. In fact, the uncertainty of green innovation is one of the reasons why some companies do not use its technology and management practices [48,49]. As more companies start to use green innovation, however, this uncertainty will diminish, and a green network will slowly form as more people use green innovations. This makes it harder for companies that fail to use green innovations to join the others and limits their ability to compete in their industries. Therefore, we propose the following hypotheses:

**H1.** *Governance pressure has a significant positive influence on firms' green innovation.*

**H2.** *Customer pressure has a significant positive influence on firms' green innovation.*

**H3.** *Competitive pressure has a significant positive influence on firms' green innovation.*



**Figure 1.** Research model.

#### 2.4. Institutional Pressures and Sustainable Development Practices

As noted above, the IT says that firms' participation in sustainable development projects may mostly be caused by pressures from outside. Since sustainable development practices in developing countries such as Saudi Arabia are not so far very well developed [9,50], institutional pressures explain better why companies in these countries take part in sustainable development projects. Sustainable development practices are often seen

as expensive for individual firms [11,51] because the environmental and social problems caused by firms affect other people. However, most firms were forced to start using sustainable development practices in the first place by government regulations [52]. Businesses must abide by government laws, regulations, and administrative documents, such as the Directive on Energy and Pollutant Discharge [53], and international laws, such as the Human Rights and International Labour Organisation Convention Statement [54]. Companies start practicing environmental and sustainable development to avoid a fine or closer governmental scrutiny if they do not. Thus, the main force behind firms' sustainable development practices is pressure from the government [23,31,55]. Even though some studies have found no strong links between governance pressure and environmental practices in places where environmental law enforcement is mature, most studies have found a positive link between governance pressure and sustainable development practices in general [29,56]. The possible explanations for this are the following:

**H4.** *Governance pressure has a significant positive influence on sustainable development practices.*

**H5.** *Customer pressure has a significant positive influence on sustainable development practices.*

**H6.** *Competitive pressure has a significant positive influence on sustainable development practices.*

### 2.5. Sustainable Development Practices and Green Innovation

Different firms may adopt green innovations for different reasons. One study which looked at how strategies for differentiating products can lead to environmental innovations [57] found a link between the strategy of differentiating products and environmental innovation, with the customer's awareness as a relevant factor. This is because the growing market demand for green products encourages companies to come up with new environmental products. Another study revealed that companies that have taken steps to protect the environment are more likely to make green products [58]. A further study indicated that a firm's environmental commitment can help it meet its environmental goals [59]. This link is also supported by the ability to follow unclear environmental regulations and environmentalism [60]. Prior research indicates that a company's sense of environmental responsibility is one of the most important factors in it choosing to make green products [18,61]. It is believed that this kind of responsibility comes either from the way a company looks at its own environment or the personal commitment of its management.

Firms' internal development plans and skills have been found to be very important for green innovation [62]. Previous studies show that dynamic capabilities are tools that enable firms to change the set-up of their operational capabilities [63]. One paper noted that a particular capacity, the ability to comply with uncertain environmental regulations and environmentalism, can help a company use its human capital efficiently and come up with new green products [64]. The development of human capital through training can help motivate employees and change their behaviour to something more environmentally friendly [65]. Research indicates that eco-innovations are helped by a company's internal knowledge flows as well as by the growth of human capital [66]. Environmental practices have been found to affect such dimensions as employee productivity and health [30,67]. Peer support helps this relationship somewhat [21]. Moreover, a study found that a company's green product innovation and green process innovation improve when the company as a whole knows more about green innovation and environmental management [68].

Previous research found that firms that eco-innovate and firms that invest in eco-innovations are driven by different things [69]. It has been established that the motivation to make eco-friendly changes comes from meeting the minimum needs of customers and society. However, pressure from cost savings and stricter rules drive more investment in eco-friendly innovations. Regulations, both those that are in place and those that are expected, are among the most talked about drivers of green innovation [11,47,70]. This suggests that the motivation for green innovation is closely tied to meeting standards [71]. Previous



examination has found that regulations are a driving force in both the developmental and spread stages of eco-innovation [23]. A study indicates that, in addition to regulations, participation in external knowledge flows and working together are important ways to encourage eco-innovation [72].

One of the most common reasons given for green innovation is cost savings [2,19,73]. In particular, research reveals that cost savings seem to be behind product eco-innovation, process eco-innovation, organisational eco-innovation, and environmental R&D investment [74]. Previous research found that both product and process eco-innovation are driven by the need to lower the cost of energy and materials [27]. Another examination found that saving money is a major reason why people try to cut down on energy use and materials [75]. It adds that the prices of energy and raw materials, as well as taxes, are important drivers of eco-innovation. A different study calls these “supply side factors”, and finds that they are just as important as drivers of both environmental processes and organisational innovations [43]. However, the link is not so clear when it comes to new products that help the environment. One study found a kind of mixed result [38]: the profitability of a company is significantly linked to green product innovation, but not significantly linked to green process innovation. Therefore, we suggest the following hypotheses:

**H7.** *Environmental sustainability has a significant positive influence on green innovation.*

**H8.** *Social sustainability has a significant positive influence on green innovation.*

**H9.** *Economic sustainability has a significant positive influence on green innovation.*

### **3. Methods**

#### *3.1. Sampling and Data Collection*

Using the deductive method, the current research focused on testing the theories derived from the hypotheses. A self-administered online survey was used to collect data for a cross-sectional survey against which the hypotheses were tested. The people who supplied the data came from manufacturing companies. We sampled manufacturing organisations which had received ISO14001 and ISO9001 certification in Saudi Arabia. These firms are more likely to have the experience of implementing sustainable development practices [9]. We obtained a random original sample of 2007 firms. The survey was conducted online. A total of 1142 completed and useful questionnaires was collected and used for this research, with a response rate of 56.7%. The manufacturing sector was chosen because it is the one that inflicts the most damage to the environment and natural resources [76]. Saudi Arabia also has serious problems with sustainability and should work much harder on green innovations. The link to the online survey was sent to the respondents along with a cover letter that explained the main goal of the present study and promised that the data would be kept private. From May to June 2022, more than 2000 CEOs/managing directors, senior managers, supervisors, and executives were asked to respond. Only 1200 did so. Some people did not give the information that was asked for, leading to 58 responses being discarded because of mistakes in judgement. The remaining 1142 responses were functional. Nearly 47% of the people who filled out the survey were supervisors or senior managers. The largest group of those who replied (39%) had a master’s degree. Before formal data collection began, a pilot test with a sample of 60 people was carried out to make sure the content was valid and reliable.

#### *3.2. Conceptualisation of Measures*

A study by Saunila et al. [77] was used to measure the three-dimensional structure of sustainable development practices, including practices that are good for the environment, the economy, and society. Each dimension was measured with four to five items that showed how the organisation handled reducing and dealing with toxic waste, reducing the likelihood of hazards, reducing energy use, saving and making money, health and

safety, and the well-being of the community. This scale was often used in research in the past [78,79]. A paper by Saunila et al. [77] was used to make a six-item model for evaluating green innovation. This model shows how much companies have improved their green processes and products over the last three years. Finally, we used four items from Dai et al. [78] to evaluate governance pressure. We adopted a scale from Dai et al. [78] to assess customer pressure. Competitive pressure was evaluated on the basis of three items adapted from Chatterjee and Ravichandran [67].

We used the partial least squares (PLS-SEM) method with the WarpPLS 6.0 programme to validate the measurements and test the hypotheses. This method was used because what we were studying was new, and the goal of the research was to come up with a new theory, not to prove an existing one, as in Kock [79]. In addition, unlike covariance-based approaches, which need a normal distribution, a PLS approach does not [80]. This method includes both reflective and formative steps [81].

The threat of common-methods bias was ruled out by the results of a principal component factor analysis [82]. The first (and biggest) factor explained 37.16 percent of the variance, and no general factor explained more than 50 percent. This suggests that common method bias may not be a major problem in this data set. Using the method suggested by Liang et al. [83], the results show that the substantive variance of indicators was 0.8, the average method-based variance was 0.005, and none of the method-factor loadings were significant. Hence, we could argue that there was little risk of common-method bias in the data set.

#### 4. Results

Using PLS analysis calls for two steps in assessing how good a conceptual framework is. In the first step, the measurement model is looked at and judged. In the second step, the working of the structural model is evaluated.

##### 4.1. Measurement Model

Table 1 summarises the statistics of the variables. The item loadings, internal consistency, and discriminant validity of the scales were used to judge their psychometric properties (Table 2). Fornell and Larcker [84] indicated that item loadings and internal consistencies that are higher than 0.70 are usually acceptable. The scales used in the present study mostly follow these guidelines, as shown by the results of the factor analysis (Table 1) and the composite reliability scores. We used the guidelines suggested by Chin [85] to figure out how well the measures can discriminate between people: (1) indicators should load more strongly on their own constructs than on other constructs in the model; and (2) the square root of the average variance extracted (AVE) should be greater than the correlations between constructs. The constructs follow these rules, as shown by the results of the factor analysis and the comparison of the inter-construct correlations and AVE (shaded leading diagonal). These results show that discriminant validity is supported.

Multicollinearity tests were performed because of the relatively high correlations between some of the constructs. All the constructs had variance inflation factor (VIF) values below 2.1, which is within the cut-off level of 3.0.

##### 4.2. Structural Model

The hypothesis testing results using PLS are demonstrated in Table 3. All the hypotheses were supported. Specifically, the three dimensions of external pressure (i.e., governance pressure, customer pressure, and competitive pressure) all had strong positive effects on green innovation ( $\beta = 0.368, 0.590, 0.263, p < 0.001$ ), thus supporting H1, H2, and H3. These results revealed the significant role of external pressures in improving and implementing sustainable development practices in the manufacturing firms surveyed. Therefore, governance pressure, customer pressure, and competitive pressure can be seen as important precursors to the successful implementation of sustainable development practices for Saudi Arabian manufacturers. Our analysis revealed that governance pressure, customer pressure,



and competitive pressure have a significant effect on sustainable development practices ( $\beta = 0.697, 0.440, 0.491, p < 0.001$ ). In this way, H4, H5, and H6 are confirmed. Finally, the results indicated that environmental sustainability, social sustainability, and economic sustainability have a significant effect on green innovation ( $\beta = 0.266, 0.510, 0.388, p < 0.001$ ). Thus, H7, H8, and H9 were supported. Hence, our study suggests that environmental sustainability, social sustainability, and economic sustainability are key drivers of green innovation for Saudi Arabia manufacturers.

**Table 1.** Measurement statistics of construct scales.

Construct/Indicators	SFL	Mean	Standard Deviation	Cronbach's $\alpha$	CR	AVE	t-Values	Skewness	Kurtosis
Green Innovation (GIN)									
GIN1	0.973	0.319	1.204	0.918	0.932	0.608	12.304	−1.23	1.87
GIN2	0.918	3.403	1.327				14.029	−1.47	1.73
GIN3	0.925	3.219	1.410				9.245	−0.98	1.42
GIN4	0.929	2.394	1.214				21.203	−0.92	1.08
GIN5	0.905	3.093	1.431				11.039	−1.17	2.07
GIN6	0.914	3.231	1.029				28.145	−1.07	1.02
Sustainable environmental practices (SEP)									
SEP1	0.942	3.425	1.038	0.939	0.961	0.579	12.345	−1.034	1.84
SEP2	0.899	2.903	1.219				17.340	−1.120	1.16
SEP3	0.953	3.129	1.227				11.309	−1.409	1.67
SEP4	0.919	3.540	1.207				22.128	−1.576	1.89
SEP5	0.932	3.128	1.348				16.023	−1.457	1.40
Sustainable economic practices (SCP)									
SCP1	0.939	3.145	1.087	0.910	0.935	0.597	21.289	−1.12	2.08
SCP2	0.910	3.249	1.421				22.124	−1.46	2.12
SCP3	0.926	3.780	1.308				11.540	−1.27	2.89
SCP4	0.897	2.784	1.074				27.094	−1.48	3.07
Sustainable social practices (SSP)									
SSP1	0.915	2.784	1.329	0.938	0.950	0.617	23.120	−1.31	1.43
SSP2	0.948	3.061	1.672				19.893	−1.37	2.03
SSP3	0.921	3.278	1.190				15.348	−1.04	1.12
SSP4	0.907	2.985	1.439				17.126	−1.07	1.07
Governance pressure (GOP)									
GOP1	0.921	3.127	1.034	0.917	0.938	0.588	19.038	−1.07	1.31
GOP2	0.938	3.073	1.126				14.120	−1.21	1.82
GOP3	0.910	3.278	1.327				23.127	−1.20	2.08
Customer pressure (CSP)									
CSP1	0.948	3.083	1.127	0.942	0.972	0.516	27.120	−1.16	1.73
CSP2	0.936	3.127	1.389				11.892	−1.34	1.26
CSP3	0.927	2.340	1.081				17.036	−1.87	1.89
Competitive pressure (COP)									
COP1	0.895	3.372	1.043	0.921	0.959	0.607	15.302	−1.90	1.45
COP2	0.923	2.783	1.154				19.126	−1.43	2.13
COP3	0.910	2.991	1.610				21.450	−1.3	1.82

**Table 2.** Discriminant validity of the correlations between constructs.

Construct	Correlations and Square Roots of AVE						
	GIN	SEP	SCP	SSP	GOP	CSP	COP
GIN	<b>0.779a</b>						
SEP	0.429b	<b>0.761</b>					
SCP	0.338	0.367	<b>0.773</b>				
SSP	0.410	0.419	0.323	<b>0.758</b>			
GOP	0.312	0.328	0.409	0.389	<b>0.767</b>		
CSP	0.399	0.412	0.418	0.420	0.401	<b>0.718</b>	
COP	0.408	0.329	0.377	0.376	0.378	0.510	<b>0.779</b>

Note: **a** Composite reliabilities are along the diagonal; **b** Correlations.

**Table 3.** Results of hypotheses testing.

Path	$\beta$	Result
GOP → GIN	0.368	Supported
CSP → GIN	0.590	Supported
COP → GIN	0.263	Supported
GOP → SDP	0.697	Supported
CSP → SDP	0.440	Supported
COP → SDP	0.491	Supported
SEP → GIN	0.266	Supported
SCP → GIN	0.510	Supported
SSP → GIN	0.388	Supported

## 5. Discussion and Implications

Institution theory is usually invoked to explain why sustainable development practices are followed, especially when the natural environment and social community are taken into account [34,61,86]. Our results back up the idea that firms mostly use sustainable development practices because they think that institutions want them to. Government rules, customer demands for social and environmental responsibility, and the success of competitors who have adopted sustainable development practices all add to this kind of pressure. These results are similar to what other studies [36,41,56] have found, which is that institutional pressure and sustainable development practices are linked in a positive way. The environment is one part of sustainable development practices, but our results also back up what other studies [11,19,31,87] have found: that regulatory, customer, and competitive pressure are the main forces that push firms into using environmentally sustainable development practices. These results are interesting because they show that governance pressure has a much greater effect on sustainable development practices than pressure from customers and competitors. This may be because sustainable development practices have started to take off in Saudi Arabia, the location of our study, only recently [54,71,88]. Few companies have experience with sustainable practices that work, and customers may not put environmental and social needs at the top of their list when looking for suppliers. As a result, most companies may not choose to initiate sustainable development practices but may be compelled to do so by government regulations. Institutional theory and previous studies provide much theoretical support for these results, and they are in line with the results of previous studies [22,73,89].

This study has shown that some aspects of sustainability lead to green innovation being used, and to money being put into it. First, as regards what encourages green innovation, the research shows that economic sustainability and institutional sustainability are the

most important factors. The willingness to implement green innovations is explained by social sustainability. Companies seem to invest in them because customers put pressure on them to do so [23,49,71,90]. Green innovation has also been seen as a strategic need for firms because it gives them a good chance to meet customers' needs without harming the environment [47,83,91]. The results are also similar to those of prior studies, which suggest that, in green innovation, the social dimension of sustainability can be highlighted through organisations' economic productivity, competitiveness, respect for the environment, and socioeconomic process, while paying attention to human capital development, job creation, and the development of health and safety measures [17,34,65,92]. It looks as if social sustainability puts great weight on the green innovations that an external outside service provider offers.

The results of this study can be used to explain the following things. First, this research suggested a conceptual model based on institutional theory. It offered a number of new correlations that have not been shown hitherto in the green innovation literature. This study is one of the first to show that outside pressures could help to improve sustainable development practices and green innovation, especially in the manufacturing industries. Second, this study helps us to see that all the aspects of sustainable development practices, such as the environment, economy, and society, are important for making green innovation better. Because stakeholders share and use their knowledge more, companies change the way in which they make things by introducing sustainable development practices. They can also figure out how and where waste can be used to make a by-product or lessen their impact on the environment [93,94]. Third, this study measured the role that sustainable development practices play in bringing about a balance between cost-effectiveness and damage to the environment. These practices also suggest ways to fix both problems, which will improve green performance in the long run. For example, the fact that electric and hybrid cars are becoming more popular around the world shows that sustainable development practices can turn an industry with heavy carbon emissions into one that is green, sustainable, and cost-effective.

Addressing the gap in the existing literature on green innovation, the present study proposed a conceptual model predicated on a resource-based view, and one which supplied a number of novel correlations. This study is ground-breaking because it is one of the first to propose the idea that external forces can facilitate efficient resource acquisition and use, thereby enhancing green innovation and sustainable development practices, especially in the manufacturing sector. Second, the research shows that sustainable development practices in all areas (environmental, economic, and social) are important for the development of green innovations. As more information is disseminated and put to use, more businesses learn to implement sustainable development practices in their production methods, finding by-products and lessening the negative impact of waste on the environment.

Environmentalists and world leaders are putting heavy pressure on emerging countries to improve their sustainable development by adopting new, cleaner production technologies in light of the United Nations' sustainable development practices. There is a chance for Saudi Arabia to correct the environmental degradation caused by insufficient industrial actions through learning from the experiences of other developed countries. The government should, at the same time, actively promote a green business environment and work to make it easier for businesses to cut back on their use of fossil fuels and increase their use of renewable energy sources. That will help green businesses thrive by increasing environmental awareness and fostering more green product development.

The research has a number of practical contributions that show how important external pressures are in realising the potential benefits of sustainable development practices undertaken in their effort to become more environmentally friendly. First, after recognising how important outside forces are, policymakers should be watchful and start specific training and development programmes for workforce development, with a view to creating sustainable organisations that follow the green growth agenda, thereby making more money and decreasing impact on the environment. Second, this study encourages top management

and professionals to use sustainable development practices. However, they can do so only if they learn, remember, and use what they know, contributing to a strong system for penalising manufacturing companies that break environmental laws. Regulatory bodies should give tax breaks and low-interest loans to the people who need them so that they can use sustainable practices in their organisations.

The study has several useful implications, all of which emphasise external pressures as a mechanism for realising the potential benefits of sustainable development practices when firms strive to become more environmentally friendly. The first step in developing sustainable organisations that follow the green growth agenda is for policymakers to recognise the importance of external pressures and launch targeted training and development programmes for workforce development.

## 6. Conclusions

The goal of this paper was to look at what drives green innovation in terms of outside forces and long-term viability. This paper mostly concerns how companies value the different aspects of sustainability and pressures from the outside, and how these relate to green innovation. As a theoretical contribution, the study clarifies how sustainability and pressure from the government and consumers drive green innovation. The study makes three main points, showing, first, that a company is more likely to invest in green innovation the more it cares about economic, institutional, and social sustainability; second, that when institutions and economies are valued highly, people are more likely to invest more in green innovations; and third, that the people's response to outside pressures affects their willingness to invest in green innovation. In the end, the study's results suggest that investment in green innovation is in line with the evaluation of a wide range of sustainability factors and the effect of regulatory, government, and consumer pressures on businesses.

The study has some limitations that make it hard to extend the results to other situations. First of all, the data came from Saudi Arabia, so elements that are unique to the country should be taken into account. Still, countries that are part of developing markets can use the results of this study. Second, economic sustainability is likely to be the most important effect of green innovation in a number of sectors. This means that the results can be used in a number of industries other than manufacturing. The cross-sectional nature of this research might be a weakness of the research method used. In addition, when the "key informant" method is used, common-method bias can cause problems. Future studies could help deal with these problems and build on what was learned in this one. Future studies can explore the role of pressures of investors and the financial reward in influencing sustainable development practices. More research should look into a wider range of the factors that lead to green innovation.

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