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Review

# Meta-Analysis of the Relationship Between Green Entrepreneurial Orientation and Sustainable Firm Performance

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**Abstract:** The purpose of this study is to examine the relationship between green entrepreneurial orientation and sustainable firm performance. In order to examine this relationship, meta-analysis method was used and analyses were carried out with Comprehensive Meta-Analysis Software (CMA) v4 package programme. In the study, a sample of 23 articles, 42 effect sizes and 6666 enterprises was reached through a systematic literature review. The studies included in the research were accessed by searching the keywords "green entrepreneurial orientation" and "sustainable firm performance" from Web of Science, EBSCO Host, Scopus and Google Scholar databases and only articles were included without any year limit. Throughout the study, statistical analyses were performed on Fisher z values and conducted under the random effects model. The effect size, heterogeneity and publication bias analyses of green entrepreneurial orientation and sustainable firm performance and its sub-dimensions were tested separately, and the findings were interpreted by converting them into correlation coefficients. As a result of the analyses, it was found that the relationship between green entrepreneurial orientation and sustainable firm performance is positive and highly significant. In addition, the relationship between financial, environmental, social, sustainable and entrepreneurial performance, which are the sub-dimensions of sustainable firm performance, and green entrepreneurial orientation was found to be high and significant. However, it was concluded that there is no significant relationship between green innovation performance, which is another dimension of sustainable firm performance, and green entrepreneurial orientation.

**Keywords:** green entrepreneurial orientation; sustainable firm performance; meta-analysis

## 1. Introduction

Since the late 1980s until today, environmental awareness has become a source of market competition and environmentally friendly practices have started to be seen as a sustainable competitive advantage. Therefore, issues such as environmental protection, green management, geographical indication and green marketing have gained popularity in environmental management research [1]. In this direction, different international and national environmental regulations, standards and policies have started to be made for the protection of the environment. These international and national environmental regulations, standards and policies have enabled consumers to have environmental awareness. The fact that consumers act in line with this awareness and prefer environmentally sensitive companies has made it a necessity for companies to carry out environmental activities. Therefore, firms have endeavoured to differentiate themselves by meeting at international and national level. These firms have aimed to satisfy their environmentally sensitive customers, gain competitive advantage and increase their performance by complying with environmental regulations, standards and policies [1]. Thus, an increasing number of firms have started to gradually integrate environmental management into their internal strategic decisions and business activities by recognising their social responsibilities [2].

Businesses have to adopt green practices because today's consumers have also become environmentally aware and have started to demand environmentally friendly products. Businesses have started to adopt green entrepreneurial activities that help them gain competitive advantage, focus on green products and improve firm performance [3]. Green entrepreneurship enables firms to differentiate themselves from their competitors by addressing environmental concerns and thus, it can both increase firm performance and gain competitive advantage. Green entrepreneurial orientation, which has a key role in firm performance, plays an important role in promoting environmental benefits [4]. Green entrepreneurial orientation is defined as the tendency of a business to focus on opportunities and aims to generate both financial and environmental benefits through the introduction of environmentally friendly products [5]. Therefore, businesses that adopt green entrepreneurial orientation are evidence that they also aim for the sustainability of the economy, environment and society [3].

Therefore, the purpose of this study is to examine the relationships between green entrepreneurial orientation and sustainable firm performance and its sub-dimensions "financial, environmental, social, sustainable, entrepreneurial and green innovation performance". In line with this purpose, it is based on examining all empirical studies in the literature on the subject with the meta-analysis method and making a more holistic judgement. This study aims to make three main contributions to the literature. Firstly, although there is a basic body of knowledge in the literature in determining the relationship between green entrepreneurial orientation and sustainable firm performance, performance has been evaluated by different metrics such as financial, environmental, social, sustainable, entrepreneurial and green innovation performance. In this respect, the study provides a comprehensive perspective to the literature by using a multidimensional conceptualisation in terms of performance indicators. Secondly, the meta-analysis method is very important in terms of revealing the relationship between green entrepreneurial orientation and sustainable firm performance with a larger sample. Moreover, meta-analysis gives the opportunity to obtain an accurate estimation of the proposed model by minimising statistical errors such as sampling error and measurement error. Thirdly, the results of the analyses are important in terms of guiding businesses and managers in their strategic goals as well as the implications they have added to the literature.

## 2. Theoretical Background

### 2.1. Green Entrepreneur Orientation

In recent years, the worsening of ecological problems and the environmental disasters caused by these problems have led businesses to the field of environmental sustainability. In this direction, problems such as global warming, acidification of sea water, biodiversity problems, pollution, deforestation and adverse weather conditions have become important for all businesses. Therefore, increasing awareness on this issue has increased the importance of green practices for businesses [6]. With the attention to environmental issues, higher environmental requirements for businesses, markets and products have emerged and the literature has gradually focused on green entrepreneurial orientation [3]. Although there is no universally accepted definition of the term entrepreneurial orientation (EO), it is a multidisciplinary concept. Many terminologies and researchers often use the terms "*venture, intrapreneur and corporate entrepreneur*" to refer to EO [7]. EO is expressed as a precise decision-making process and a disposition that favours entrepreneurial activities. It covers the processes followed by an enterprise and EO firm behaviours are expressed as autonomy, innovation, risk-taking, proactiveness and competitive aggressiveness [5].

Green entrepreneurial orientation (GEO) is a trend that encourages the creation of regulations for the protection of the environment as a result of environmental destruction caused by the rapidly increasing industrialisation in the 1960s [1]. Green entrepreneurship represents the sum total of activities aimed at solving environmental challenges and problems in the process of producing exactly the products and services needed by the market for sustainable development [8]. GEO refers to the tendency of green entrepreneurs to adopt environmental sustainability [9]. In the context of

green entrepreneurship, GEO is a concept that aims to improve production processes and environmentally friendly products necessary for businesses to solve economic, social and environmental problems [10]. GEO is also defined as the proactive ability to perceive and change opportunities for environmental constraints [11]. GEO is the tendency of a business to pursue and evaluate potential opportunities that generate both economic and ecological benefits by offering environmentally friendly products and services [11,12]. As a proactive strategic orientation, GEO represents the process of considering risks and benefits by comprehensively evaluating the enterprise's environmentally friendly business opportunities [13].

Although green entrepreneurial orientation is defined to pursue sustainability [14], it has been associated with various terms with different meanings [5], such as environmental entrepreneurship, sustainable entrepreneurship, ecopreneurship [15]. Although researchers in the past [12–14] have addressed GEO in various ways, the main focus of all authors is to proactively pursue business activities through environmentally friendly methods and attract consumers by claiming to be environmentally friendly [4]. There are also various conceptualisations of the green entrepreneur concept as an orientation including eco-entrepreneur and sustainable entrepreneurship. The purpose behind these expressions is to enable businesses to generate income while reducing their harmful effects on the environment in their commercial activities [16].

GEO enhances environmental sustainability and social welfare through various mechanisms. Thus, GEO aims firstly, to realise economic value and reduce market failures by reducing environmental degradation and increasing market efficiency; secondly, to reduce toxic substances and harmful emissions so that the health and safety of business employees is not harmed [17] and thirdly, to change the structure to respond to the rapidly changing environment. In addition, GEO also contributes to financial benefits [18]. While GEO expresses the tendency of enterprises to continue economic activities, it aims to be both environmentally friendly and to add value to society. GEO consists of behaviours that are "determined to take risks, innovative, competitive and autonomous" [19]. Therefore, GEO consists of three dimensions as "green innovation, risk-taking and proactiveness" [14]. The entrepreneur's risk-taking behaviour indicates projects that are likely to fail and his/her willingness to implement them. In addition, proactiveness encourages the entrepreneur to act quickly. Innovativeness, on the other hand, is the business's creative processes, actions and practices, its preference for developing and implementing a new mechanism through research and development to bring a new product to market [20]. A business that follows the three aspects of GEO will be in a position to respond better to the external environment [1].

GEO represents a strategic approach for businesses characterised by "innovation and proactivity" to design and deliver green solutions using available new practices and resources. Such enterprises lay the groundwork for competitiveness and sustainable performance [19]. Moreover, it enables businesses to identify their capabilities, seek opportunities and renew their activities in an environmentally friendly way [4]. Although GEO is expressed as the tendency of businesses to actively implement green products, services, technologies and practices [21], it is also expressed as an environmental approach that seeks environmentally friendly opportunities to reduce pollution and improve the sustainable environment [22]. GEO is the tendency of a business to focus on opportunities and generate financial and environmental benefits through the use of green activities [5].

The development of GEO businesses has been expressed as a successful method of identifying technological opportunities that can meet consumer needs in an environmentally friendly way [4] and making profits while protecting the environment [23]. In addition, today, it is also considered as a good marketing strategy to attract consumers. As a result, GEO ensures both sustainability and profitability by enabling businesses to achieve environmental goals [16]. Therefore, it helps businesses to increase process efficiency, minimise waste and reduce costs by exploring new ideas [21].

## 2.2. Sustainable Firm Performance

Today, firm performance has become a strategically important concept and is frequently emphasised in management research. Although it is a very common concept in the literature, there is no consensus on its definition and measurement [24]. Despite many developmental criticisms over the years, performance remains a difficult concept to understand [25]. According to [25], performance is defined as the value created by an organisation using its productivity. They also stated that factors such as maximising profits, providing high returns in the long term, and realising the economic goals of the firm reveal firm performance. [26], emphasised that firm performance is an important standard for evaluating the profitability, asset operation level and solvency of firms and directly reflects the ability of these firms to develop further. [1], stated that firm performance is the ability to achieve maximum output through available resources to achieve the organisation's goals and objectives. [24], argued that a well-performing firm can bring high and long-term profits and also create employment opportunities and increase the income of individuals.

Although there is no clear definition of firm performance due to the versatility of business activities, it is seen that it is handled with different variables in each study in the literature. Firm performance is evaluated with financial measurement criteria such as return on investment (ROI), market share, profit margin of sales, ROI growth rate, increase in sales, growth in market share and competitive position [27]. However, firm performance also represents the responsibilities of an organisation towards its stakeholders. In this respect, measuring firm performance on the basis of financial indicators covers a narrow perspective. From a broader perspective, performance indicators that play a role in the realisation of long-term goals of enterprises are sustainable firm performance [28]. Sustainable firm performance (SFP) refers to the environmental, social and financial performance indicators of the enterprise. While social performance defines the social improvements that occur due to the responsibility of the business towards its stakeholders [29], environmental performance refers to the improvement for the environment in terms of improving environmental degradation by reducing emissions and pollution [30]. In addition, in the existing literature, sustainable firm performance is also considered as corporate green performance, which focuses mainly on environmental efficiency [31]. Considering the existing literature, it is seen that sustainable firm performance, in which businesses take into account especially environmental factors and stakeholders' expectations, is analysed in more than one dimension. In this study, SFP was evaluated in 6 dimensions as financial, environmental, social, sustainable, entrepreneurial and green innovation performance to cover all dimensions.

In addition, the study is based on examining the relationship between GEO and SFP. Therefore, when the literature on the subject is examined, it is seen that GEO affects business performance in various ways and significantly [4]. [21], emphasised the impact of EEO on business performance and pointed out that it can help firms to develop. [22], emphasised that GEO strengthens firm performance. [20] and [1] argued that GEO has a positive impact on firm performance. From this point of view, the hypothesis H<sub>1</sub> was proposed considering that the relationship between green entrepreneurial orientation and sustainable firm performance is positive and significant.

**H<sub>1</sub>:** *The relationship between GEO and SFP is significant and positive.*

[32], revealed that GEO can improve the financial performance of the firm in a good way. Similarly, [20], argued that green entrepreneurial orientation significantly affects financial performance in terms of firm profitability, growth and competitive advantage and that GEO is an important predictor of financial performance. [14] and [1] stated that GEO leads to improved financial performance. [5], argued that there is a significant positive relationship between GEO and financial performance. Likewise, [33], stated that GEO positively affects financial performance. In the light of the findings in the literature, H<sub>2</sub> was developed.

**H<sub>2</sub>:** *The relationship between GEO and financial performance is significant and positive.*

[33], concluded that GEO positively affects environmental performance in terms of enabling the reduction of hazardous emissions and environmental pollution. Similarly, [5] argued that there are significant relationships between EEO and environmental performance. [22], revealed that GEO aims to ensure the production or supply of environmentally friendly products to improve environmental performance against environmental degradation, reduce hazardous waste and CO<sub>2</sub> emissions, improve green workplace environment, improve job satisfaction and green, and thus there are positive and positive relationships between GEO and environmental performance. [19], stated that GEO enables firms to seize green and sustainable opportunities and promotes environmental performance. Therefore, based on the findings of the relevant study, the hypothesis H<sub>3</sub> was developed.

**H<sub>3</sub>:** *The relationship between GEO and environmental performance is significant and positive.*

[14], revealed that firms adopting green entrepreneurial orientation have positive effects on social performance. [5], stated that there are significant positive relationships between green entrepreneurship and social performance. Similarly, [34] revealed that green entrepreneurial orientation activities have a positive impact on the sustainable social performance of firms. Based on the literature, the hypothesis H<sub>4</sub> was put forward.

**H<sub>4</sub>:** *The relationship between GEO and social performance is significant and positive.*

[4], explained that GEO leads to sustainability in enterprises and improves the financial health of the enterprise and stated that there are significant relationships between GEO and the sustainable performance of the firm. According to [2], green entrepreneurial orientation helps to increase sustainable business performance. [5], argued that the relationship between GEO and sustainable performance indicates a significant and positive relationship. [35], argued that green entrepreneurial orientation has positive effects on sustainable performance by stating that sustainable performance helps to manage the image of the business and also increases the satisfaction of employees, suppliers and customers. Similarly, [36] and [33], revealed that green entrepreneurial orientation affects the sustainable performance of the firm. Based on this, the hypothesis H<sub>5</sub> was developed.

**H<sub>5</sub>:** *The relationship between GEO and sustainable performance is significant and positive.*

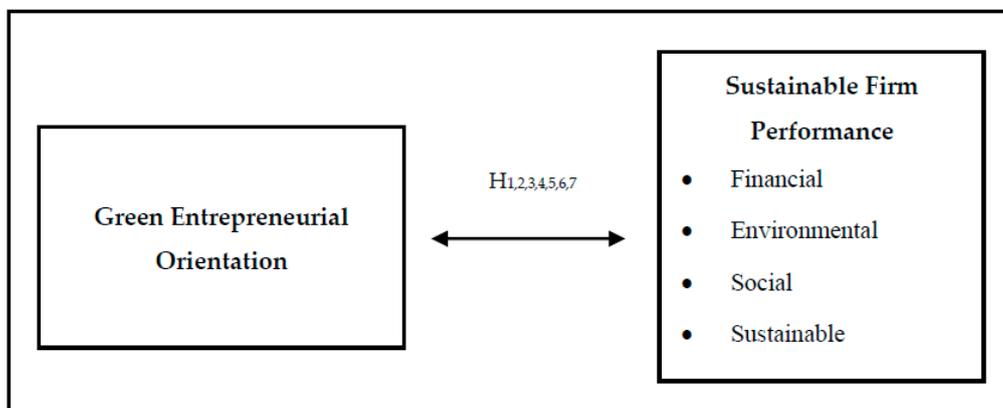
[16], argued that the adoption of green entrepreneurial orientation is necessary and beneficial for entrepreneurial firms and argued that GEO positively affects entrepreneurial firm performance. [21], explained that GEO will ensure long-term sustainable development by reducing entrepreneurial risks and improve entrepreneurial firm performance by enabling competitive advantage. Based on the findings, Hypothesis H<sub>6</sub> was put forward.

**H<sub>6</sub>:** *The relationship between GEO and entrepreneurial performance is significant and positive.*

[16], revealed that GEO has a positive impact on green innovation performance. [21], reported that green entrepreneurial orientation helps green innovation, encourages employees to new initiatives, focus their energy on green processes and green product innovation activities, which will increase their competitiveness, green product innovation will give businesses a brand image, and thus GEO will positively affect green innovation performance. [22], argued that GEO supports green innovation performance, prevents the negative effects of business activities on the company, improves the eco-system and increases organisational performance, and argues that more attention should be paid to green innovation. [34] and [14] proved that green entrepreneurial orientation has a positive impact on green innovation performance. Therefore, the current study has developed the hypothesis H<sub>7</sub>.

**H<sub>7</sub>:** *The relationship between GEO and green innovation performance is significant and positive.*

Based on the related literature, it has been observed that there are positive and positive relationships between GEO and SFP and their sub-dimensions and each study has addressed this issue separately. Therefore, this study aims to examine the relationship between green entrepreneurial orientation and firm performance by Meta-analysis method and to reach a single conclusion. The conceptual model of the research, which is based on the literature, is expressed below (Figure 1).



**Figure 1.** Conceptual Model.

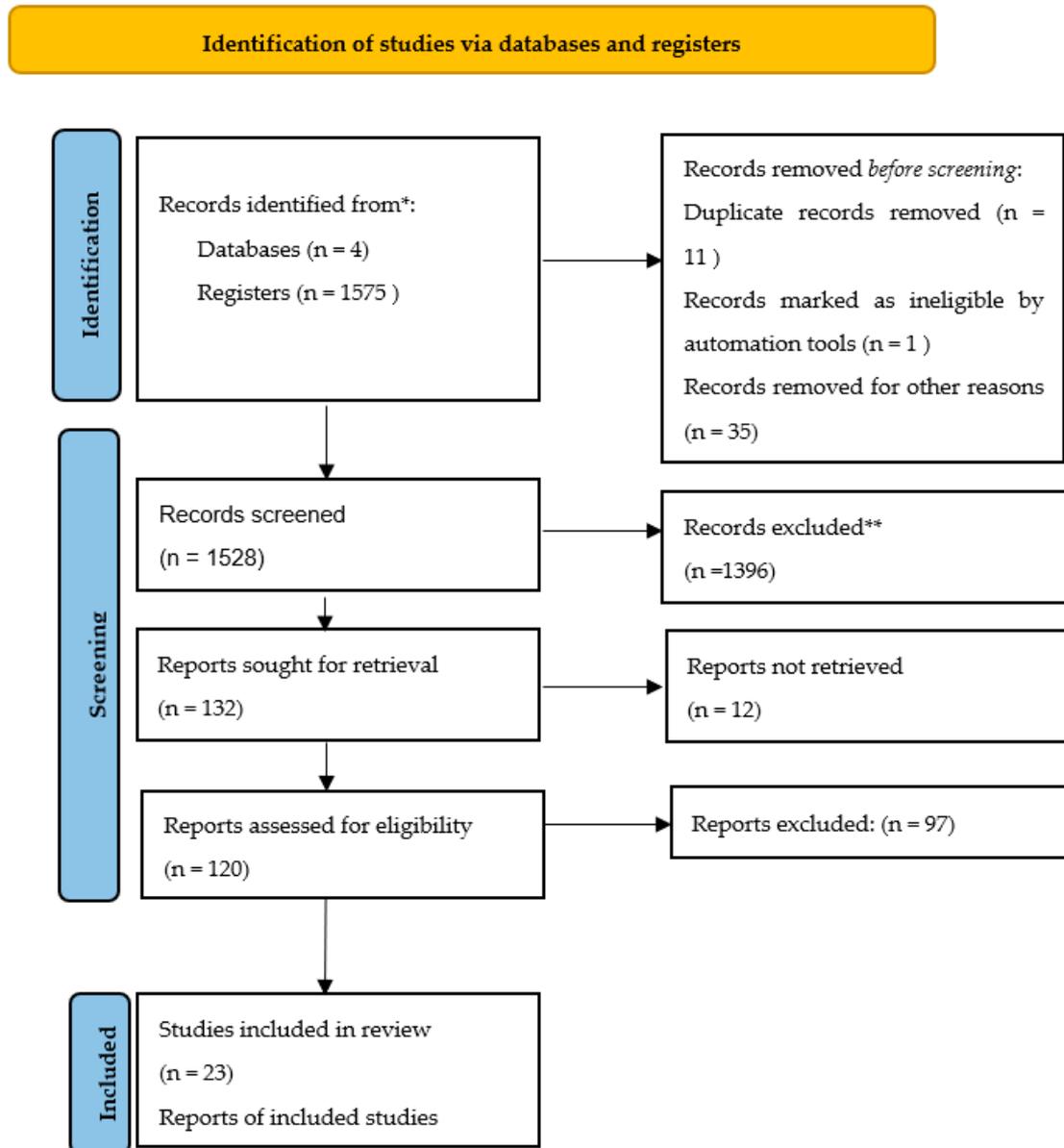
### 3. Methodology

In this study, it was aimed to examine the relationships between GEO and SFP and its sub-dimensions. Meta-analysis method was used in the study. Meta-analysis is a quantitative method used to combine the results of more than one study on the relevant subject into a single result [37]. With meta-analysis, studies containing quantitative findings in the literature on the subject are examined under a single effect size. The inclusion criteria of the studies included in the meta-analysis in the study are expressed in detail below with the PRISMA scheme as suggested by [38].

#### 3.1. Scope of the Study and Selection Criteria

In the research, quantitative studies examining the relationship between GEO and SFP were included and these studies included articles published in international peer-reviewed journals containing the keywords "green entrepreneurial orientation" and "sustainable firm performance" in Web of Science, EBSCO Host, Scopus and Google Scholar databases. In the first search made by filtering only the articles without any year restriction, 1575 studies were reached. The inclusion criteria of the retrieved studies in the meta-analysis are expressed in more detail in the PRISMA scheme (Figure 2).

PRISMA flowchart was used to obtain the data set in the research and 1575 studies were found in the relevant databases, including the relationship between green entrepreneurship orientation and firm performance. For the purpose of this study, publications such as book, book chapter, book review and the editorial material were excluded since they did not make it possible to examine the relationship between variables. In addition, the English language was filtered within the scope of the study, studies that were not compatible with the keywords and did not contain information such as correlation or regression coefficient in evaluating the relationships between the research variables were excluded. As a result of the data set obtained from the databases, 23 studies were included in the meta-analysis.



**Figure 2.** PRISMA Flow Diagram. **Source:** [38].

### 3.2. Data Coding

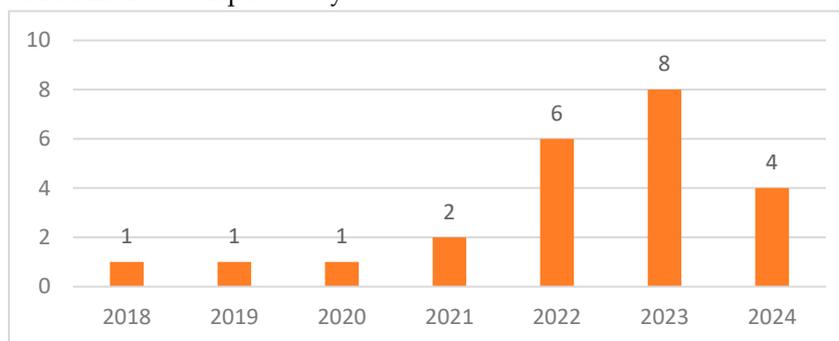
A coding form was created in Microsoft Excel to code the necessary information of the studies included in the meta-analysis. This form includes the title of the study, authors, year, sample size (n), correlation coefficient (r) information. In addition, data on 6 sub-dimensions of firm performance were transferred to the form separately in the examination of the relationship between green entrepreneurial orientation and firm performance. In the meta-analysis, 23 studies with Pearson correlation values between green entrepreneurial orientation and firm performance were included. The total number of studies included in the analysis (k=23), sample size (n= 6666) enterprises. Since secondary data were used in the research, no ethics committee decision was taken. Information about the studies included in the research is presented in Table 1

**Table 1.** Study Information Included in the Study.

S.N.	Sources	N	SFP	FP	EP	SP	Sus.P.	Ent. P	GIP
1	[14]	264		✓	✓				
2	[5]	192		✓	✓	✓			
3	[39]	81			✓				
4	[40]	202					✓		
5	[34]	226		✓	✓	✓			
6	[19]	307			✓				
7	[36]	246		✓	✓	✓			
8	[41]	384		✓	✓				
9	[3]	230		✓					
10	[16]	384						✓	
11	[42]	329		✓	✓	✓			
12	[43]	369					✓		
13	[44]	424							✓
14	[45]	576	✓						
15	[46]	510			✓				
16	[47]	211		✓	✓	✓			
17	[48]	380					✓		
18	[49]	160/136		✓	✓	✓			
19	[50]	293							✓
20	[51]	424			✓				
21	[21]	288						✓	
22	[2]	416	✓						
23	[33]	248		✓	✓	✓			

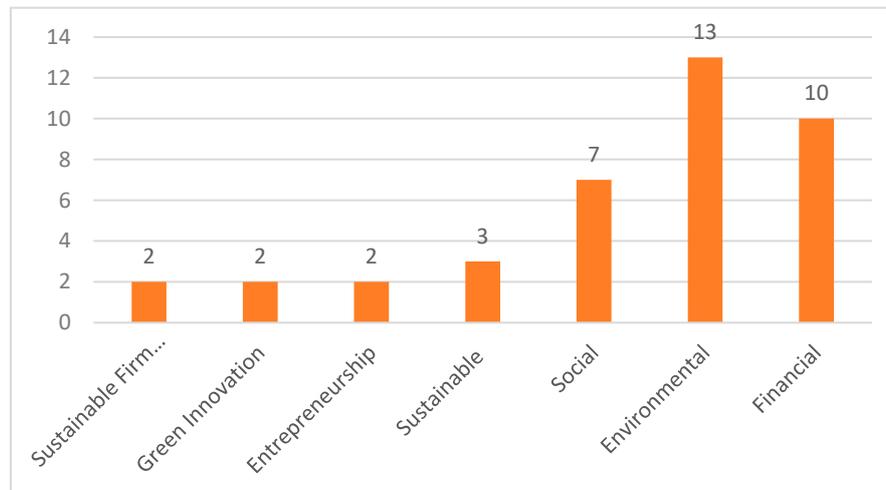
Notes: SFP: Sustainable Firm Performance, FP:Financial, EP:Environmental, SP:Social, Sus.: Sustainable, Ent.: Entrepreneurship, GIP: Green Innovation.

In this study, the distribution of the 23 studies included in the meta-analysis by years (Figure 3) and the dimensions and distribution of the SFP sub-dimensions "financial, environmental, social, sustainable, entrepreneurial, green innovation" that are generally addressed in these studies (Figure 4) are expressed in a more descriptive way.

**Figure 3.** Number of Studies by Year.

When Figure 3 is analysed, it is seen that the studies examining the relationship between GEO and SFP have increased over the years. However, it should be noted that these data belong only to the studies included in the meta-analysis and qualitative studies are not included in the graph.

Therefore, it has been observed that the subject of the study has been addressed more and more today. It is seen that the studies within the scope of the study were mostly published in 2023 (8), 2022 (6) and 2024 (4).



**Figure 4.** Number of Studies on the Sub-Dimensions of Firm Performance.

Figure 4 shows more clearly which of the SFP sub-dimensions the studies included in the meta-analysis within the scope of this study addressed the most and which performance the researchers evaluated the most. The graph shows that researchers generally conducted research on environmental (13), financial (10) and social (7) performance.

### 3.3. Data Analysis

In the study, analyses were conducted by meta-analysis method. The studies included in the analysis were tested using the CMA 4.0 programme. Pearson correlation coefficients of the studies included in the analysis were converted into Fisher z value and analyses were performed. The results of the analyses were converted back to the correlation coefficient and the findings were interpreted [52]. In meta-analysis studies where correlation was used as effect size, the values corresponding to the correlation suggested by Cohen were used. Cohen classified the correlation coefficient effect sizes as follows; 0.10 small effect, 0.30 medium effect, 0.50 large effect. In this study, the effect size was analysed through these values [37,53].

In the study, analyses were carried out based on sample size and correlation values. Therefore, Fisher's Z value, the lower and upper limits of the correlation value for 95% confidence interval, and Cochran's Q value, which is constantly used in the literature regarding the heterogeneity test, were taken into consideration. In this study, average effect size was calculated for each dimension, heterogeneity analysis and publication bias analyses were applied. The analyses were conducted under the random effect model.

### 3.4. Results

Table 2 summarises the results of the meta-analysis of the relationship between GEO and SFP and its sub-dimensions. A total of 42 effect sizes were analysed between GEO and SFP. The findings were interpreted within the framework of Cohen's suggested correlation values. The results of the analysis revealed that there was a strong ( $r=0.577$ ,  $p=0.000$ ) and significant relationship between GEO and SFP. Therefore, the hypothesis  $H_1$  put forward in the study is accepted.

Table 2. Meta-analysis Results.

RANDOM Model	Total studies	Tot		Effec		95% CI of r		Q-statistic	Z value	P value	Fail safe N	
		al	Samp	t	size	Lower	Upper				Rosenth	Orwi
		effect	le size	(r)	rd error	t	t				al	n
H1->SFP	23	42	11.424	0.577	0.054	0.502	0.642	1341.949	12.164	0.000	2084	7883
H2->FP	10	11	2.626	0.569	0.109	0.408	0.696	304.533	5.940	0.000	3138	7350
H3->EP	13	14	3.818	0.605	0.099	0.467	0.713	454.876	7.107	0.000	6280	9782
H4->SP	7	8	1.748	0.574	0.107	0.416	0.697	136.698	6.102	0.000	1522	5288
H5->SusP	3	3	951	0.665	0.348	0.121	1.450	220.118	2.310	0.021	488	2531
H6->EntP	2	2	672	0.537	0.105	0.373	0.667	7.212	5.702	0.000	124	1832
H7->GIP	2	2	717	0.465	0.441	-	0.878	133.522	1.142	0.253	108	1748

Notes: Total effect: Effect size used in each analysis, SFP: Sustainable Firm Performance, FP:Financial, EP:Environmental, SP:Social, Sus.:Sustainable, Ent.:Entrepreneurship, GIP:Green Innovation.

The relationship between GEO and financial performance was tested with an effect size of 11. The results of the analyses revealed that this relationship is highly significant ( $r=0.569$ ,  $p=0.000$ ). From this point of view, it is possible to say that green entrepreneurial orientation can increase financial performance by significantly affecting financial performance in terms of creating profitability, growth rate and competitive advantage for firms [3,20]. The results of the analyses were found to be in line with the literature and therefore, the hypothesis H<sub>2</sub> was accepted.

The relationship between GEO and environmental performance was tested with an effect size of 14. The results of the analyses show that this relationship is very high and significant ( $r=0.605$ ,  $p=0.000$ ). Thus, it can be said that GEO reduces hazardous emissions and environmental pollution [33], enables the production or supply of environmentally friendly products, reduces hazardous waste and CO<sub>2</sub> emissions [5], enables firms to seize green and sustainable opportunities and promotes environmental performance [19]. Therefore, the hypothesis H<sub>3</sub> put forward in the research is accepted.

The relationship between GEO and social performance was tested with an effect size of 8. As a result of the analysis, it was found that this relationship was highly significant ( $r=0.574$ ,  $p=0.000$ ). A result similar to [14] and [34] was obtained. Thus, it can be said that firms adopting GEO have positive effects on social performance. According to these results, the H<sub>4</sub> hypothesis put forward in the research is accepted.

The relationship between GEO and sustainable performance was analysed with an effect size of 3. The results of the analysis showed that this relationship is very high and significant ( $r=0.665$ ,  $p=0.021$ ). Hence, GEO leads to sustainability in enterprises and improves the financial health of the enterprise [4], it helps to increase sustainable business performance [2], it enhances the image of the enterprise and also increases the satisfaction of its employees, suppliers and customers [35], therefore,

GEO affects the sustainable performance of the firm [33,36]. Similar results have been obtained in line with the relevant literature and the hypothesis H<sub>5</sub> put forward in the research is accepted.

The relationship between GEO and entrepreneur performance was tested with an effect size of 2. As a result of the analysis, this relationship was found to be highly significant ( $r=0.537$ ,  $p=0.000$ ). Thus, it is possible to say that GEO provides long-term sustainable development by reducing entrepreneurial risks and improves entrepreneurial firm performance by enabling firms to gain competitive advantage [21] and benefits firms [16]. Therefore, the hypothesis H<sub>6</sub> put forward in the research is accepted.

The relationship between GEO and green innovation performance was analysed with an effect size of 2. The results of the analyses show that this relationship is high but insignificant ( $r=0.446$ ,  $p=0.253$ ). In the literature, GEO has a positive effect on green innovation performance [16], GEO helps green innovation, encourages employees to new initiatives and focuses their energy on green processes or green product innovation activities, which increases their competitiveness, green product innovation will give businesses a brand image [21], that GEO supports green innovation performance, prevents the negative effects of business activities on the company, improves the ecosystem and increases organisational performance [34] and thus green entrepreneurial orientation has a positive effect on green innovation performance [14]. However, the current study departed from the literature and obtained an insignificant finding. It is thought that this may be due to regional or global differences, management differences between enterprises, or sectoral differences. Therefore, H<sub>7</sub> put forward in the research is rejected.

#### 4. Conclusion and Discussion

In this study, it was aimed to examine the relationship between GEO and SFP by meta-analysis method. For this purpose, the findings of quantitative studies in the international literature on the relationship between GEO and SFP were included in the meta-analysis and a more general result was obtained with a larger sample. In addition, the relationships between SFP sub-dimensions and GEO were analysed separately and similar results were obtained with the literature. Within the scope of the study, analyses were performed with an effect size of 42 and a total sample size of 6666 from 23 studies included in the study. The publication bias of the studies included in the study was analysed separately with Rosenthal's fail-safe  $n$  value and Orwin's fail-safe  $n$  value and no publication bias was found. The heterogeneity test was applied to determine which model would be used in the meta-analysis method, and as a result of this test, it was seen that the studies showed a highly heterogeneous distribution. Therefore, the random effects model was used in the meta-analysis. The results of the analysis showed that the relationship between GEO and SFP was highly significant ( $r=0.577$ ,  $p=0.000$ ). The relationship between GEO and financial performance ( $r=0.569$ ,  $p=0.000$ ), the relationship between GEO and environmental performance ( $r=0.605$ ,  $p=0.000$ ), the relationship between GEO and social performance ( $r=0.574$ ,  $p=0.000$ ), the relationship between GEO and sustainable performance ( $r=0.665$ ,  $p=0.021$ ) and the relationship between GEO and entrepreneurial performance ( $r=0.537$ ,  $p=0.000$ ) were found to be high and significant. However, the relationship between GEO and green innovation performance ( $r=0.465$ ,  $p=0.253$ ) was found to be insignificant.

##### 4.1. Theoretical Implication

The current research has multiple theoretical implications that enrich the GEO literature. Recent literature on GEO emphasises the need for clarity on the antecedents and consequences of the GEO concept, suggesting that this developing literature lacks a clear understanding [54,55]. Therefore, there is a need to synthesise, research and analyse existing knowledge in order to provide a comprehensive view of the existing body of knowledge in the GEO literature. Accordingly, this study extends the existing literature by evaluating the relationships between GEO and SFP, especially the sub-dimensions of firm performance within the scope of all dimensions in the literature. The meta-analysis method is extremely important in terms of providing a more holistic perspective on the relationship between GEO and SFP. With this method, the findings and sample of many studies were brought together and a larger effect was obtained. Therefore, this study has revealed the relationship

between GEO and SFP with a more generalisable result. In addition, examining the relationship between GEO and SFP with the meta-analysis method provides a theoretical basis for studies on this subject by showing that the existing knowledge in the literature is handled consistently. Finally, through this study, researchers and academics interested in this field can learn about the state of GEO-SFP research and the prevailing perspectives and research trends.

#### *4.2. Practical Implication*

Since there is no previous meta-analysis study examining the relationship between GEO and SFP, the current study contributes to the literature in terms of providing a broader inference on the subject. In addition, the present study has revealed very specific results for managers and organisations considering today's conditions. This study has shown that if firms adopt GEO, they can differentiate themselves from their competitors by addressing environmental concerns, gain competitive advantage [4], sustainability of the economy, environment and society [5], profitability and growth of the firm [3], reduction of hazardous emissions and environmental pollution [33], producing environmentally friendly products, reducing hazardous waste and CO<sub>2</sub> emissions [5], seizing green and sustainable opportunities, improving financial health [4], improving sustainable business performance [2], enhancing business image and increasing the satisfaction of employees, suppliers and customers [35], so it is recommended for every firm to adopt GEO. Moreover, since the COVID-19 pandemic, businesses are increasingly exposed to environmental problems such as environmental pollution and global warming. At this point, it suggests that policymakers should develop and support policies that help businesses achieve sustainable development goals in a changing business environment. For example, policy makers can support businesses in terms of their green enterprise orientation by providing additional resources or funding, or raise awareness among start-ups to be green-oriented, which ultimately helps economic, social and environmental development that enhances sustainability.

#### *4.3. Limitations and Further Research Directions*

The present study has some limitations. The first of these is that the studies included in the meta-analysis in the literature on the subject examine the relationship between GEO-SFP and the correlation coefficients and sample data that enable the calculation of the average effect size required for the meta-analysis to be carried out. Studies that did not contain these data could not be included in this analysis. In addition, it should not be neglected that the studies included in the meta-analysis study are cross-sectional. Secondly, only international studies were included in this study and sectoral and regional differences were ignored. Therefore, it is suggested that future researchers should include national studies in the analysis, as well as revealing sectoral or regional differences by taking into account the demographic characteristics of the enterprises, and more explanatory results can be obtained. The upper echelons perspective suggests that internal and external environmental conditions are effective in the decision-making processes of senior managers [56]. Accordingly, the socio-cultural characteristics of an entrepreneur, the entrepreneur's past experiences, demographic characteristics and network play a major role in the decision-making mechanism and business success. Therefore, the orientations of green entrepreneurs and business managers in this direction are also affected by these factors. In future studies, the effect of these factors arising from the entrepreneur, which may be effective on green entrepreneurship orientation, on business performance can be evaluated together. In addition, the mediator or moderator effect of factors such as entrepreneur's characteristics, sectoral differences, internal and external environmental factors in the relationship between green business orientation and business performance can be examined. Although the explanations of the current study are close to the stakeholder theory, the factors affecting entrepreneur characteristics can be evaluated in different perspectives such as upper echelons perspective, natural resource-based view, environmental policy perspective, dynamic capability perspective, and the contribution of these different perspectives to the literature can be evaluated in future studies.

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