

Article

The Drivers of Green Investment: A Bibliometric and Systematic Review

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Abstract: Considering the growing of high alarm signals on environmental issues, the implementation of green, sustainable, responsible investments has become a priority for each organization, in addition to maximizing profits and harmonious development with the environment. The purpose of this study is to examine the importance of implementing green investments within organizations and to identify the drivers that influence decisions for the implementation of green investments. In order to achieve this, two types of analyses were used: bibliometric analysis and systematic analysis, researching the representative studies in the field. The search was carried out for the period 1990–2020, and the analyzed sample comprised 444 articles. Following the application of the two methods of analysis, the results show that in the last 6 years the interest of companies in green investments has increased significantly, organizations being concerned with the efficient use of resources and environmental issues. This research highlights the internal and external drivers over which companies have a higher or lower control, as the case may be, in order to involve in green investments. The article offers new pathways for future research on this matter. Therefore, future research may develop a detailed description of the identified drivers for green investment. In addition, further research can calculate the level of the drivers' impact on green investment and can identify that certain drivers should be more attentively treated. Moreover, subsequent works in this field can continue to identify new drivers or new ways of promoting the already identified drivers in the present research. Consequently, green investment could produce positive effects related to the reduction of pollution and global warming.

Keywords: green investments; sustainable investments; eco-investments; eco-investing; environmental investment; drivers



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1. Introduction

In recent times, due to the noticeable environmental and climate changes, investors' interest in resource efficiency and environmental issues has considerably increased. Since 1924, the issue of corporate social responsibility [1] has been approached as a phenomenon that characterizes the activities of the organization from the environmental, social, and economic perspectives. Consequently, it is pointed out that companies are not only responsible for making a profit, but also for developing the society and the economy in harmony with the natural environment. Therefore, socially responsible investments, that have their origins in ethical and religious movements, have been made on the market [1]. The responsible and efficient social investments turned into the emergence of green investments. The long-term purpose of green investment is to achieve sustainable development. The motivation for choosing this theme is represented by the necessity to identify the factors that enhance green investments, as they generate numerous benefits for the economy, the environment, and implicitly for the private organizations. Thus, this article studies and analyzes the implications of green investments and the organizational transformations that are generated to make them. In addition, this paper underlines the way in which

the organizations that implement green investments are perceived by consumers and the inclination of stakeholders to choose the “green” organizations, to the detriment of the traditional ones. Finally, the study identifies the main drivers that influence green investment decisions.

“Green investment” is a very broad term. It can be understood as an independent concept, a subset of a broader investment theme, or closely linked to other investment approaches. The concept became increasingly used with the proliferation of concerns for the green economy and green growth, which received significant international attention in 2010–2011 as tools to approach the financial crisis of 2008. The green economy was also one of the two themes of the United Nations Conference on Sustainable Development in 2012 (Rio + 20) [2].

This has led to flourishing literature, including new publications on the green economy of a variety of international organizations, national governments, think groups, experts, and non-governmental organizations.

Green investments are also referred to as eco-friendly investment, environmental, social, and governance investing (ESG), socially or sustainable responsible investing (SRI), or responsible investing (RI) [3]. The concept defines the investment activity of companies that aim to protect the environment, reduce pollution, reduce carbon emissions, use alternative energy sources, and conserve natural resources.

Despite all the articles and research in the field, there is still no clear evidence for the relationship between environmental practices and the performance of an organization. There are numerous studies that highlight a number of positive as well as negative aspects. Better environmental performance due to green investments can lead to increased revenues and profitability of organizations. Moreover, it enhances the access to “green” markets, the achievement of a product differentiation based on the company’s environmental reputation, the reduction of material costs and energy consumption, the access to green or ethical mutual funds, the decrease of labor costs (increasing loyalty or commitment) [4,5]. However, the implementation of green technologies usually requires higher investments compared to traditional ones, and the payback period is much longer [6]. The sustainability of the green supply chain is influenced mainly by two major aspects. Firstly, green technology involves high costs that developing companies cannot afford, and secondly, organizations have to face the uncertainty of demand when they develop investments for the creation of a green product, considering that, at the level of consumers, the concept of green consumption has not yet been acknowledged [7]. Green investments do not have a great influence on the economic performance of an organization, and only improve profit [8]. Furthermore, the studies show that only limited green investments are profitable. Moreover, companies are encouraged to improve their performance related to the environment voluntarily, because environmental regulation is demonstrated to be unnecessary [8]. In addition, in the implementation of green projects, there are two major barriers: a lower rate of return and a much higher risk compared to fossil fuel projects [9]. Although the implementation of green projects is characterized by high risk, sustainable development should primarily aim at the rational use of natural resources without compromising current and future generations [10,11].

These challenges faced by companies that make green investments raise serious questions that have to be answered. What is the status of research on green investments and on the factors that influence the investment decision? How were the factors that influence green investments researched and what findings were revealed? What lessons can be learned from this knowledge? This article aims to answer these questions by providing a timely and necessary review of the green investment drivers-related literature, through a bibliometric methodology, which provides a systematic and comprehensive picture of what is already known.

The novelty of this study consists of several aspects. First of all, it brings order, clarity, and systematization on the topic of drivers of green investment, through bibliometric analysis. Data extraction and bibliometric analysis minimize subjectivity and provide

useful information to facilitate in-depth research. Another aspect is the integration of research mapping in the process of systematic literature review to visualize the relationship between investment and green/sustainable literature. In this way, the article contributes both to the literature on investment and to the literature on sustainability, integrating their findings when studying the factors that influence green investment. In addition, this study contributes to the theoretical progress of this field by organizing the findings into a research agenda, a key aspect for future researchers to carry out subsequent research on the topic of drivers of green investment. The results are expected to provide researchers and practitioners with an overview and in-depth understanding of green investment research.

After the introduction of the subject and its relevance, this study continues to explain the methods used for both the bibliometric review and the systematic review of the literature and keeps this separation in the presentation of the results. At the end, the discussion of the results and the conclusions refine the paper and show the possible areas that can be approached further.

2. Literature Review

Rapid changes in the market demand, increasing pressure from stakeholders, and rising complexity of products and services influence organizations to adopt new or different capabilities and management practices in order to remain competitive and efficient [12]. Green investments have been profoundly studied with reference to the concept's definition [1,5,7,8,10], the benefits they generate for sustainable development and for the performance of companies [6,8], and the factors that influence them [1,8,10].

Regarding the clarification of the concept, a relevant study [3], examines how "green" investments are defined in different asset classes (stocks, bonds, and alternative investments), and presents estimates of the size of these investments in different approaches. The study concludes that, given the lack of consensus on the use and definition of the term "green", the most productive approach could be to take an open and dynamic approach to definitions and standards. In a broad sense, sustainable investments are considered to be a concept that defines environmental, social, and governance investing, responsible investments, and socially responsible investments [13,14]. Government-regulated environmental policies aim to reduce the carbon emissions of businesses. Consequently, investments made by the government to protect the environment can lead to a reduction of the investments made by private organizations. If there are no proper government regulations regarding environmental practices, supply chain players will not make adequate environmental improvements [15]. Moreover, environmental policy actions strengthen social responsibility and promote resource conservation [16]. The concept of green governance has become increasingly popular, both academically and practically, consisting of taking measures to support an ecological environment (resource conservation), as well as creating mechanisms to regulate the ecological practices of companies [15,17]. Green investments are also approached as environmental investments, referring to social investments made in order to improve the environment (individual environmental donations, socially responsible enterprises, etc.) [18]. Green investments, or socially responsible investments, conform to the concept of ecological civilization [1]. Other authors define green investments as those investments that aim to reduce greenhouse gases and air pollutants, without substantially reducing the production and consumption of non-energy products [18,19].

Regarding their impact, the improvement of green systems and the construction of ecological mechanisms are important guarantees for the sustainable development of the economy [1].

At the same time, the increase of green investments can indirectly lead to the development of the environmental protection-related industry and the creation of environmental protection funds [20,21]. Green investment and environmental practices play a key role in many areas, so firms need to respond to the growing concerns and challenges of stakeholders [22]. The results of research conducted at the level of 63 CDP (Carbon Disclosure Project) companies in South Africa revealed the fact that organizations that integrate ecological,

green investments designed to reduce carbon emissions can in an effective way manage financial performance [23].

In addition, investments in green technologies can lead to a reduction in the total cost of the supply chain, as well as to a reduction in carbon emissions, [24]. Following the analysis of the data obtained from 16,119 companies, the results showed that there is a positive relationship between corporate social responsibility (CSR) and the financial performance of companies. Therefore, organizations should pay much more attention to the environment, in order to retain and attract as many customers as possible [25]. Reducing greenhouse gas (GHG) emissions is a long-term problem being further analyzed by the most developed countries [26]. By promoting sustainable investments, companies not only reduce their energy consumption and carbon emissions but also improve their financial performance by increasing notoriety, operational efficiency, and maximizing new opportunities [27]. Recently, the demand for green and sustainable products has increased, and government regulations have become more and more necessary [28]. The implementation of green investments, to promote sustainable development and solve environmental problems, causes changes in consumer behavior, as more and more people prefer to buy organic products at the expense of traditional ones [7,22]. Investors are more receptive to companies where managers disclose to society the benefits of green investments implemented by them [29]. Thus, companies and implicitly the interested parties must make investments in projects and, implicitly, in ecological technologies [30]. In conclusion, the advantages of implementing green investments are numerous, including attracting funds due to government facilities, meeting customer requirements to consume green products and to protect the environment, the use of green technologies that are exempted from certain taxes, and an increase in the satisfaction of stakeholders, especially investors, who are pleased that they are investing their financial resources in a responsible way, which will attract a number of benefits to future generations as well.

A hybrid analysis [18], based on statistical data published by the Chinese Statistical Yearbook from 2003 to 2016 and on the research of over 1339 environmental policies from the official websites of the environmental protection departments, shows that the main factors influencing green investments are: political, economic, and environmental. Political factors have a major impact on green investments by creating facilities and implementing rules/laws in order to protect the environment. Among these factors are: granting subsidies to companies for green investments, discounts granted to consumers who buy organic products, environmental taxes, and fines for companies that do not comply with pollution regulations. Economic factors are some of the strongest drivers of green investment as they best reveal the practices of companies for a sound environment [8,18,22]. They refer to the relationship between carbon emissions, energy consumption, and sustainable financial development. Environmental factors are very important because avoiding environmental crises and improving the health of the environment compose the main goal of green investment. Their purpose is the creation of green technologies as well as green industries. A relevant study conducted at the level of 462 companies, analyzing over 5300 investment decisions in the field of energy efficiency revealed that companies that rely on external factors of change take more advantage of opportunities by achieving more sustainable investments [31]. The main external factors influencing green investment are: government pressure, competitors' pressure, customers' pressure, and suppliers' pressure [32]. The government has a particularly important role to play in influencing companies to implement green investment by regulating policies and rules that force companies to be proactive and grow in harmony with the environment. Competitor pressure is also essential, as they force their peers to align their activity with the green initiatives in order to maintain or to empower their competitive advantage [22]. At the same time, customers have a strong influence because if they prefer organic products and appreciate green initiatives, companies must adapt their strategy so as to meet their requirements. Public opinion tends to have a positive effect on the growth of green investment [33]. Consumers' growing desire for "green" is highlighted by the growing demand for organic products and goods

in recent years, despite the difficult financial situation [34,35]. Supplier pressure represents another significant factor that influences companies to adopt green initiatives, through their option to supply materials only to “green” organizations. In terms of internal factors, they fall into three categories: members of the organization from top managers to their subordinates, the image of an “environmentally friendly company”, and the value created (cost reduction, new revenue opportunities, etc.) through green initiatives [32].

3. Materials and Methods

3.1. Selection of Methods

In this study, there were two types of analysis (bibliometric analysis and systematic review) used to explore the main drivers that contribute to sustainable green investments in enterprises. Through preliminary research of the literature, a real interest in green investments was identified.

The bibliometric analysis was chosen as a research method to create an illustrative map of the research area. It evaluates the interest of researchers in a particular field based on quantitative methods [36,37]. Moreover, it provides a perspective on the time frame in which scientific researchers began to deepen the field. At the same time, this type of analysis objectively assesses the information that can support other researchers’ work in this specific field, while the literature review is based on the analysis of the content of selected documents [38–40], such as the number of published papers, the information about the main authors (mainly their nationality), the type of paper (article, proceedings paper, review, book chapter, etc.), but also the number of citations. Currently, this type of analysis is preponderant in papers that assess the correlations made between certain features of a research field [41–48].

The second method of analysis is applied, the systematic review, in preference to other techniques and methodologies, because empirical results could provide the solutions to this paper’s research questions. In other words, only the papers that addressed the impact factors on green investments were of interest for this research. Also, unlike other works based on a systematic review, this detailed review of the articles aims to generate an analysis and a discussion of existing publications to improve the scientific literature and systematically address the factors influencing green investment.

Systematic review is a method of analysis through which published research is evaluated using a planned and structured approach [49–53]. In order to carry out such an analysis, it is necessary to use organized, easy-to-understand, and replicable methods that can identify, select and critically appreciate the relevance of the paper to the formulated questions [49,50]. The objectivity, the easy replicability of the method, and the explicit detailing of analysis methods have led to an increase in the number of papers based on systematic reviews [51–55].

3.2. Data Collection and Preparation

In the current paper, the first step was to establish the keywords and the database within to search the papers for analysis. Given the set objectives, the keywords were selected to facilitate the identification of the main factors for green investment adoption.

Since green investment is a concept that has not been defined in only one way, there are publications in which these investments are sometimes treated as environmental, sustainable, or ecological investments [56]. Therefore, the keywords used for this phase were: “green invest*” OR “sustainable invest*” OR “eco-investm*” OR “eco-investing” OR “environmental investment” AND “drivers” in Topic.

In the early stages of drafting this paper, some of the criteria had already been pre-established, for example, the selection of papers available in the Web of Science (WoS) database (Clarivate Analytics). The motivation for choosing the Web of Science database is the international recognition of this platform for the quality of its indexed papers from all research fields [57]. The Web of Science database contains the most reputable and influential journals and is, therefore, recognized as the most authoritative source of data for studying

publications in any field of interest [58,59]. Although Scopus has wider coverage than WoS, there are significant overlaps between WoS and Scopus. Following the comparison of the bibliometric statistics collected from the two databases, shows that the papers and citations collected from the two databases are highly correlated [60]. Thus, by selecting a single database, namely WoS, there will be no significant differences in the results of the analysis performed in comparison with the ones generated if Scopus was selected. In addition, the WoS provider, Clarivate Analytics, was selected as the citation provider for Excellence in Research for Australia (ERA) 2018 by the Australian Research Council (ARC) [59], so the choice of this database data was essential so as not to alter the analysis' results.

In this analysis, the main research areas are selected and the main journals in which the concepts are studied. Moreover, we took into consideration the years of publication, the early publications, and the progress on the green investment-related publications over the years. The database was collected by searching in the "Topic" section the keywords mentioned above to obtain a wide range of information on the targeted field. The result was the extraction of 628 papers. By restricting the type of papers to select only the "article" papers was another criterion for delimiting the papers of interest and this contributed to the decrease of studies to 461. The bibliometric analysis is performed on these articles.

Further, in this study, we have adopted some specific bibliometric techniques, meaning the analysis of the keywords (more specifically their co-occurrence), the co-citations of the authors, the citations made in-between countries, and the journals network. These analysis techniques have been used for bibliometric reviews carried out on various topics [61,62]. Additionally, cluster analysis has been used together with author co-citation analysis, country citations, keywords co-occurrence, and journal mapping, through which the most popular research areas are represented. Although citation clusters demonstrate the research topics of real interest to researchers, some important elements may be missing because they have not met a sufficiently high number of co-citations. Therefore, after analyzing the cluster, in some cases, the content was appreciated to identify all areas that analyze green investments. Content analysis methods include frequency, co-occurrence, and link strength. This analysis was mainly used in the analysis of keyword matching, which calculates both the frequencies of occurrence and the power of the link between the keywords. During this stage, the authors used the text mining software VOSviewer developed by van Eck and Waltman in 2009. This is a bibliometric analysis tool based on Visualization of Similarities (VOS) technology, which has important advantages in grouping fragmented knowledge from different fields according to their similarity and relationship [48].

Furthermore, because the database included papers written in other languages than those of international circulation, the English articles were selected and the total number of articles reached 444.

In order to reduce the number of papers and to select the ones relevant for systematic review, additional filters were applied. Given the fact that green investment is a new concept, the articles selected for the analysis were published from January 2015 to November 2020. This filter reduced the number of articles to 336. For these articles, we extracted and analyzed the keywords assigned by authors and keywords in addition to those assigned by WoS.

By importing the selected data into VOSviewer software, the keywords were selected at a minimum of 10 occurrences. This resulted in several keywords found from which we manually selected the following: performance (56), management (30), impact (28), sustainability (39), innovation (24), sustainable investment (33), green investment (47), corporate social responsibility (38), financial performance (17), governance (19), CO₂ emissions (18), sustainable development (20), economic-growth (13), energy (18), green supply chain (11), investment (16), renewable energy (18), risk (18), decision making (12), decisions (12), cost (13), socially responsible investment (10), strategies (10), environmental performance (10), and determinants (12).

Given the nature of this research, the next step was to identify in which of the 336 articles we could find those keywords. We manually searched the database for the key-

words, counted them, and set another criterion that the articles should contain a minimum of 3 keywords. This criterion restrained the database to a total of 125 remaining articles. Considering the main objective of this analysis, we analyzed the articles in pairs to determine their relevance and to assess whether they are empirical studies, this being a criterion for inclusion in the final group of articles. After this filtering, the database included 99 papers for review. Those that could not be accessed or that treated green investments without analyzing the factors influencing them were eliminated. The collected data used in this paper were analyzed in-depth for a better understanding of the factors that have a significant influence on green investments. In this way, important concepts were identified and meaningful conclusions were drawn based on the nowadays scientific literature.

4. Results

4.1. Bibliometric Results

4.1.1. The Evolution in Time of Research

The most recently published scientific papers indicate that there is a growing interest in topics related to green investment. The first papers dealing with green investments were published in 1992, but their level only increased significantly in 2014 (Figure 1), by 71.43% (meaning 10 more studies in 2015), culminating in 2020, where the number of papers reached the highest level ever published (103 studies).

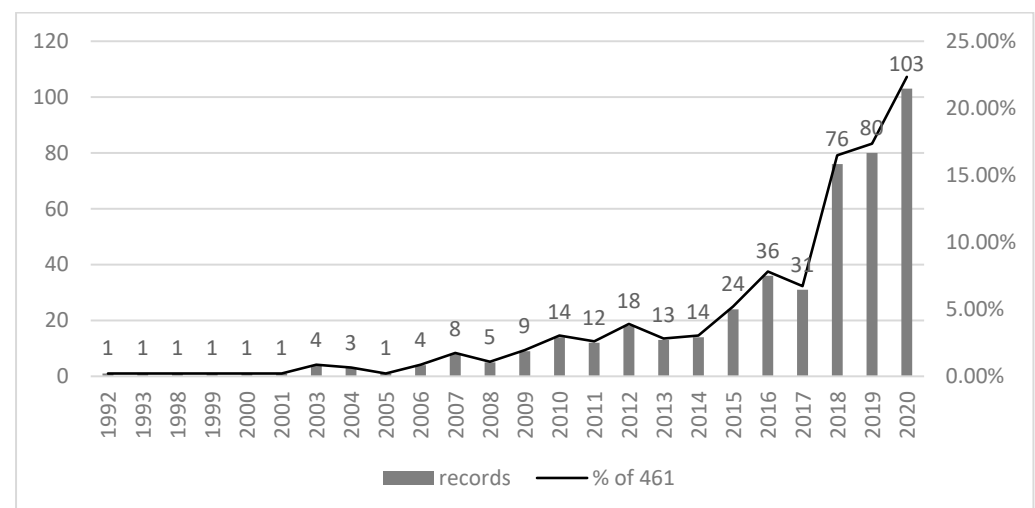


Figure 1. Publications over the years based on the keywords searched.

It is observed that, after 2008, the interest in the papers analyzing green investments increased, one of the reasons being the financial crisis of 2008 which generated an enlarged interest in the green economy and its benefits [2].

Another factor that intensified concerns for green investment was the recognition of the urgent threat represented by climate change and the irreversible effects on human societies and the planet at the 16th session of the Conference of the Parties (COP 16) of the United Nations Framework Convention on Climate Change (UNFCCC) held in 2010. The conclusive results of the summit, including the creation of a large “Green Climate Fund”, as well as the opening of a “Climate Technology Center” and a network of long-term cooperation to achieve the goal of the convention, supported the accentuating interest in this type of investment [63].

Recent years have brought significant developments in research on green investment due to significant growth in the grants allocated by the European Union, but also by other non-EU countries for such investments.

4.1.2. Journals

In terms of publications, a relevant analysis of the journals that mainly deal with this subject was considered and the position each of these journals occupies in the field of scientific research. The ranking was made according to the number of articles with which the journal contributed to the study and, where journals with the same number of articles were encountered, the separation was made according to the impact factor. The top journals that include publications dealing with the drivers of green investment are presented in Table 1 and include a total of 136 articles, of which the largest share is held by the journal *Sustainability*, followed by the *Journal of Cleaner Production*, which also has the highest impact factor from the top presented.

Table 1. List of the journals with the most contribution in researching green investment drivers.

| Name of the Journal | First Year of Publication | Year of First Issue in WoS | Impact Factor 2019 | Articles | % of 461 |
|--|---------------------------|----------------------------|--------------------|----------|----------|
| <i>Sustainability</i> | 2009 | 2016 | 2.576 | 43 | 9.33% |
| <i>Journal of Cleaner Production</i> | 1993 | 2003 | 7.246 | 26 | 5.64% |
| <i>Energy Policy</i> | 1973 | 2004 | 5.042 | 11 | 2.39% |
| <i>Ecological Economics</i> | 1989 | 2007 | 4.482 | 10 | 2.17% |
| <i>Energies</i> | 2008 | 2009 | 2.702 | 10 | 2.17% |
| <i>Journal of Business Ethics</i> | 1982 | 2003 | 4.141 | 9 | 1.95% |
| <i>Journal of Sustainable Finance & Investment</i> | 2011 | 2018 | 0 | 9 | 1.95% |
| <i>Business Strategy and the Environment</i> | 1992 | 2016 | 5.483 | 6 | 1.30% |
| <i>Energy Economics</i> | 1979 | 2014 | 5.203 | 6 | 1.30% |
| <i>Organization & Environment</i> | 1987 | 2009 | 3.333 | 6 | 1.30% |

Table 1 presents the journals of which contribution is significant in the field of green investment. The ranking of the journals was made according to the number of articles found in the present research, and the division between the journals with the same number of articles was made according to the higher impact factor. Thus, the first position is occupied by the journal *Sustainability*, with 43 articles, a journal that has been indexed in WoS since 2016. *Sustainability* also ranks first in the classifications, but this journal does not have the maximal impact factor. The *Journal of Cleaner Production* is ranked 2nd, with a total of 26 articles, being among the oldest published journals, the first of the journals present in the table indexed in WoS, and the journal with the highest impact factor (7.246). The table also includes a journal with recent publication and impact factor of 0, the *Journal of Sustainable Finance & Investment* (top 7), whose contribution is 9 articles. The journal *Energies* (top 5) counts a total of 10 articles in the field of green investments, explained by the theme of the journal which includes research in technology development, engineering, and studies in policy and management.

4.1.3. Countries and Citations

Figure 2 shows the cluster analysis of the countries from which the authors of the studies come, with a minimum number of five published articles. This analysis highlights on the map the presence of 32 countries, grouped in six clusters. The clusters whose share is significant are those in the red zone (Czech Republic, Finland, Italy, Lithuania, Norway, Poland, Ukraine) and the cluster in the green zone (Austria, Canada, France, Greece, Netherlands, South Africa, Turkey), closely followed by the blue zone cluster

(England, Germany, India, Japan, Russia, Switzerland) and the yellow zone (Australia, China, Romania, Singapore, USA). The lowest contributions are purple (Brazil, Portugal, South Korea, Spain) and turquoise (Belgium, Sweden, Taiwan).

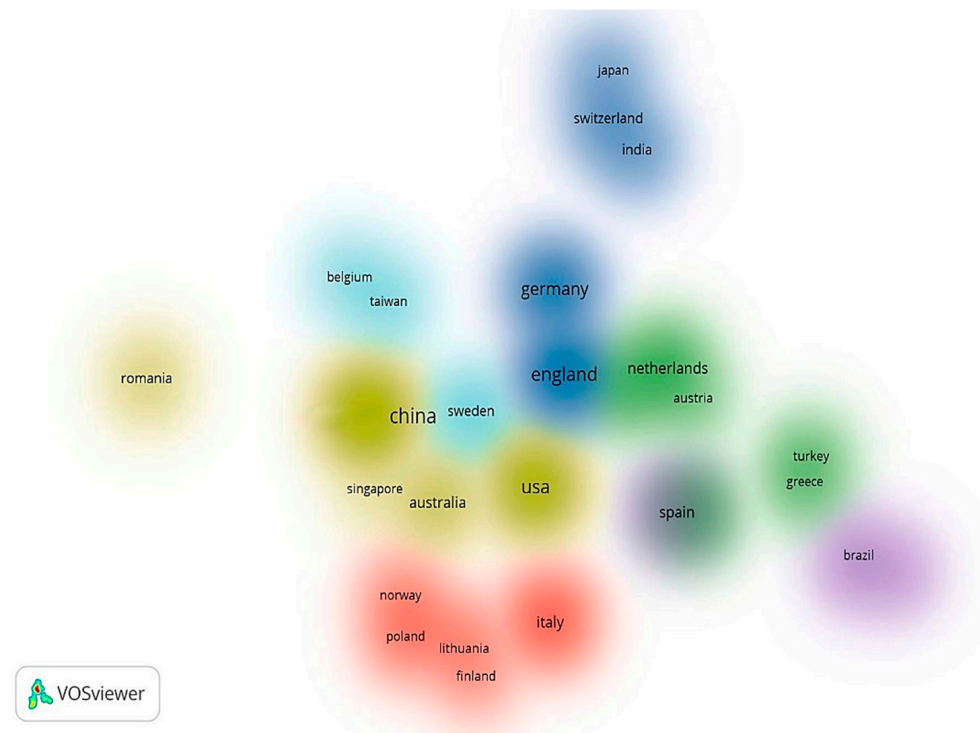


Figure 2. Cluster density based on country citations.

The positioning of countries on the map is influenced by the strength of the relationship between them, co-citations and links between articles published in collaboration with authors from different countries, and the presence of clusters more highlighted or reduced on the map is given by the number of nodes in their vicinity, as well as the strength of the connections.

It should be mentioned that there are some articles made in collaboration between authors with different nationalities, and these papers have been counted in the number of articles for each country of the authors.

Keeping the cluster groups and colors used in Figure 2, the analysis is deepened according to the strength of the link between a certain country and the others that cited it, but the number of published documents is also included and the number of citations that the respective country has. Consequently, although the clusters in the red zone and the blue zone are the largest, according to Table 2, the largest number of published articles is held by the yellow zone (193 papers), followed by the blue zone (151 papers), the green zone (92 papers), and the red zone (69 papers). Referring to the total number of citations counted by the authors of the countries grouped in clusters, another order can be found: the blue zone (2272 citations), the yellow zone (2666 citations), the green zone (2150 citations), and the red zone (581 citations).

Table 2. List of countries classified according to the link strength, number of publications, and citations.

| Country | Articles | Citations | Link Strength | Country | Articles | Citations | Link Strength |
|-------------|----------|-----------|---------------|----------------|----------|-----------|---------------|
| England | 62 | 1081 | 84 | Ukraine | 7 | 20 | 14 |
| China | 87 | 593 | 71 | Czech Republic | 6 | 21 | 12 |
| Germany | 45 | 355 | 60 | Poland | 10 | 43 | 11 |
| USA | 68 | 1290 | 58 | Taiwan | 8 | 26 | 11 |
| Spain | 27 | 221 | 37 | South Africa | 6 | 45 | 9 |
| Canada | 18 | 942 | 31 | Turkey | 6 | 47 | 9 |
| Netherlands | 23 | 336 | 31 | Greece | 8 | 120 | 8 |
| Australia | 22 | 264 | 29 | Norway | 7 | 149 | 8 |
| Austria | 7 | 283 | 29 | India | 15 | 291 | 4 |
| France | 24 | 377 | 22 | Belgium | 7 | 134 | 3 |
| Sweden | 12 | 212 | 18 | Finland | 6 | 36 | 3 |
| Italy | 27 | 245 | 17 | Japan | 6 | 16 | 2 |
| Switzerland | 17 | 524 | 17 | Portugal | 6 | 41 | 2 |
| Singapore | 5 | 220 | 15 | Russia | 6 | 5 | 2 |
| Brazil | 10 | 43 | 14 | South Korea | 10 | 94 | 2 |
| Lithuania | 6 | 67 | 14 | Romania | 11 | 299 | 1 |

A normal map includes only one type of link. In addition, between any pair of items, there can be no more than one link, and the higher the value is, the stronger the link is. In our case, the strength of the links found in Table 2 indicates the number of cited references two articles have in common.

Analyzing the countries, individually, not by their cluster formation, it can be observed that there cannot be a ranking according to the number of articles, citations, and link strength. So, considering the number of articles, the ranking is clear: China (87 articles), USA (68 articles), England (62 articles), Germany (45 articles), Spain, and Italy (24 articles each). But, according to the citation of the articles, the ranking changes to: USA (1290 citations), England (1081 citations), Canada (942 citations), China (593 citations), and Germany (355 citations).

4.1.4. Authors and Citations

The present research states that the interest in green investments is growing, but also that in the counting of the articles made by scientific researchers in a certain country there are some deviations caused by articles written by several authors of different nationalities.

Table 3 shows the centralization of the top 10 authors who have the highest contributions. The distinction between authors is made according to the number of articles and the citations that those articles counted. It should be noted that there are two German authors, Klein Christian and Zwergel Bernhard, whose affiliation is the same and who have all three metered articles written together. In their case, the presence in the table is in alphabetical order, pointed out by s“*“.

Table 3. Top 10 authors with the largest contribution in researching green investment drivers.

| Name of the Author | Country of Origin | Affiliation | Articles | Citations | Journals in Which the Author Published (Number of Articles/Journal) |
|--------------------------|-------------------|--|----------|-----------|---|
| Dong Ciwei | China | Zhongnan University of Economics & Law | 4 | 44 | <i>Energies</i> (2); <i>Sustainability</i> (2) |
| Wang Ying | China | Hubei Univ of Education | 4 | 33 | <i>Discrete Dynamics in Nature and Society</i> (1); <i>Journal of Sustainable Finance & Investment</i> (1); <i>Mathematical Problems in Engineering</i> (1); <i>Journal of Cleaner Production</i> (1) |
| Shi Xiutian | China | Nanjing University of Science & Technology | 3 | 44 | <i>Energies</i> (1); <i>Sustainability</i> (2) |
| Mielke Jahel | Germany | University of Potsdam | 3 | 18 | <i>Journal of Sustainable Finance & Investment</i> (1); <i>Ecological Economics</i> (1); <i>Sustainability</i> (1) |
| Taghizadeh-Hesary Farhad | Japan | Tokai University | 3 | 17 | <i>Energies</i> (1); <i>Finance Research Letters</i> (1); <i>Plos One</i> (1) |
| Klein Christian * | Germany | Universitat Kassel | 3 | 9 | <i>Journal of Asset Management</i> (1); <i>Journal of Sustainable Finance & Investment</i> (1); <i>Sustainability</i> (1) |
| Zwergel Bernhard * | Germany | Universitat Kassel | 3 | 9 | <i>Journal of Asset Management</i> (1); <i>Journal of Sustainable Finance & Investment</i> (1); <i>Sustainability</i> (1) |
| Liu Xingxing | China | Chinese Academy of Sciences | 3 | 6 | <i>Discrete Dynamics in Nature and Society</i> (1); <i>Journal of Cleaner Production</i> (1); <i>Mathematical Problems in Engineering</i> (1) |
| Zhang Yang | China | Central South University | 2 | 34 | <i>Journal of Cleaner Production</i> (1); <i>Sustainability</i> (1) |
| Bilan Yuriy | Czech Republic | University of Social Sciences | 2 | 21 | <i>Energies</i> (1); <i>Sustainability</i> (1) |

At first analysis, it appears that most of the works were published in *Sustainability* (8 articles), *Energies* (4 articles), *Journal of Sustainable Finance & Investment* (4 articles), *Journal of Cleaner Production* (3 articles), followed by the *Journal of Sustainable Finance & Investment* (2 articles), the *Journal of Asset Management* (2 articles). The presence of a larger number of articles in *Sustainability* and the *Journal of Cleaner Production* is expected considering the ranking in Table 1.

Regarding the citations mentioned in the previous table, most of them are related to Chinese authors, of whom Dong Ciwei and Shi Xiutian are the most cited authors with 44 citations. However, the analysis of the reference section from the selected articles shows that the highest frequency of citation belongs to institutions, such as the World Bank and International Energy Agency (IEA), which represent fundamental sources for the studied papers.

Table 4. Authors, citations, methods, and sources.

| Authors | Citation | Method | Source | Impact Factor of the Journal (2019) | First Year of Publishing |
|---|----------|------------|---|-------------------------------------|--------------------------|
| Survey | | | | | |
| Falcone (2018) [5] | 12 | Survey | <i>Economics Bulletin</i> | 0 | 2001 |
| Cubas-Díaz and Martínez Sedano (2017) [62] | 10 | Survey | <i>Business Strategy and the Environment</i> | 5.483 | 1992 |
| Schmid, Olaru and Verjel (2017) [64] | 6 | Survey | <i>Amfiteatru Economic</i> | 1.625 | 1999 |
| de Lange (2016) [65] | 7 | Survey | <i>Journal of Cleaner Production</i> | 7.246 | 1993 |
| Jazairy (2020) [66] | 1 | Survey | <i>Transportation Research Part D: Transport and Environment</i> | 4.577 | 1996 |
| Taghizadeh-Hesary and Yoshino (2020) [9] | 6 | Survey | <i>Energies</i> | 2.702 | 2008 |
| Kraus et al. (2018) [67] | 24 | Survey | <i>Sustainability</i> | 2.576 | 2009 |
| Sueyoshi and Yuan (2015) [68] | 21 | Survey | <i>Energy Economics</i> | 5.203 | 1979 |
| Yadav, Han and Rho (2015) [69] | 44 | Survey | <i>Business Strategy and the Environment</i> | 5.483 | 1992 |
| Hoppmann, Sakhel and Richert (2018) [31] | 5 | Survey | <i>Business Strategy and the Environment</i> | 5.483 | 1992 |
| Teti et al. (2015) [70] | 2 | Survey | <i>Journal of Management Development</i> | 1.690 | 1982 |
| Puopolo, Teti and Milani (2015) [35] | 4 | Survey | <i>Journal of Management Development</i> | 1.690 | 1982 |
| Elheddad et al. (2020) [71] | 4 | Survey | <i>Journal of Environmental Management</i> | 5.647 | 1970 |
| Qi, Wang and Li (2019) [72] | 0 | Survey | <i>Corporate Social Responsibility and Environmental Management</i> | 4.542 | 2003 |
| Gandullia and Pisera (2020) [73] | 0 | Survey | <i>Corporate Social Responsibility and Environmental Management</i> | 4.542 | 2003 |
| Fiskerstrand et al. (2020) [74] | 0 | Survey | <i>Journal of Sustainable Finance & Investment</i> | 0.760 | 2011 |
| Case study | | | | | |
| Cheng et al. (2018) [75] | 13 | Case study | <i>Sustainability</i> | 2.576 | 2009 |
| Apostolakis, Kraanen and van Dijk (2016) [76] | 4 | Case study | <i>Corporate Governance: The International Journal of Business in Society</i> | 0 | 2001 |
| Zhang et al. (2015) [6] | 38 | Case study | <i>Journal of Cleaner Production</i> | 7.246 | 1993 |
| McInerney and Bunn (2019) [77] | 5 | Case study | <i>Energy Policy</i> | 5.042 | 1973 |
| Karlsson (2019) [78] | 2 | Case study | <i>Sustainable Production and Consumption</i> | 3.66 | 2015 |

Table 4. Cont.

| Authors | Citation | Method | Source | Impact Factor of the Journal (2019) | First Year of Publishing |
|---|----------|--|--|-------------------------------------|--------------------------|
| Zheng and Ng (2018) [79] | 5 | Case study | <i>Energy Economics</i> | 5.203 | 1979 |
| Dreyer et al. (2017) [80] | 14 | Case study | <i>Sustainability</i> | 2.576 | 2009 |
| Aboulamer (2018) [81] | 10 | Case study | <i>Thunderbird International Business Review</i> | 0.649 | 2005 |
| Li et al. (2020) [82] | 1 | Case study | <i>Sustainability</i> | 2.576 | 2009 |
| Mixed methods | | | | | |
| Yen (2018) [22] | 6 | Questionnaire and public data | <i>Business Strategy and the Environment</i> | 5.483 | 1992 |
| Stoever and Weche (2017) [83] | 9 | Case study and survey | <i>Environmental and Resource Economics</i> | 2.286 | 1991 |
| Pekovic, Grolleau and Mzoughi (2018) [8] | 13 | Survey and public data | <i>International Journal of Production Economics</i> | 5.134 | 1991 |
| Wang et al. (2018) [17] | 0 | Econometric study and public data | <i>Sustainability</i> | 2.576 | 2009 |
| Apostolakis et al. (2018) [84] | 3 | Survey and econometric study | <i>Journal of Sustainable Finance & Investment</i> | 0 | 2011 |
| Mielke (2019) [85] | 4 | Questionnaire and interviews | <i>Journal of Sustainable Finance & Investment</i> | 0 | 2011 |
| Pimonenko et al. (2020) [30] | 4 | Public data, Equation modeling (PLS-PM), content analysis, and Fishbourne methods | <i>Sustainability</i> | 2.576 | 2009 |
| Kim and Lee (2018) [86] | 1 | Econometric study and public data | <i>Sustainability</i> | 2.576 | 2009 |
| Deng et al. (2019) [87] | 0 | Q-rung orthopair fuzzy set with the multiplicative multi-objective optimization by ratio analysis method | <i>Group Decision and Negotiation</i> | 1.612 | 1992 |
| Palma-Ruiz, Castillo-Apraiz, and Gomez-Martinez (2020) [88] | 1 | Survey and public data | <i>International Journal of Financial Studies</i> | 0 | 2019 |
| Atif, Alam and Hossain (2020) [26,27] | 0 | Econometric study and public data | <i>Business Strategy and the Environment</i> | 5.483 | 1992 |
| Lozano and Reid (2018) [89] | 1 | Interviews—Grounded Theory (GT) | <i>Energy Research & Social Science</i> | 4.771 | 2014 |

Table 4. Cont.

| Authors | Citation | Method | Source | Impact Factor of the Journal (2019) | First Year of Publishing |
|---|----------|---|--|-------------------------------------|--------------------------|
| Han et al. (2020) [1] | 0 | Questionnaire and statistical analysis | <i>Environmental Science and Pollution Research</i> | 3.000 | 1994 |
| Awan et al. (2020) [90] | 0 | Questionnaire and equation modeling (PLS-SEM) | <i>Sustainability</i> | 2.576 | 2009 |
| Ferri and Pini (2019) [91] | 0 | Survey and econometric study | <i>Sustainability</i> | 2.576 | 2009 |
| Duran-Santomil et al. (2019) [92] | 5 | Survey and econometric study | <i>Sustainability</i> | 2.576 | 2009 |
| Shi et al. (2020) [93] | 0 | Questionnaire and statistical analysis | <i>Energies</i> | 2.702 | 2008 |
| Ganda and Milondzo (2018) [23] | 3 | Survey and econometric study | <i>Sustainability</i> | 2.576 | 2009 |
| Ajour El Zein, Consolacion-Segura, and Huertas-Garcia (2020) [94] | 0 | Econometric study and public data | <i>Sustainability</i> | 2.576 | 2009 |
| Du et al. (2019) [18] | 1 | Econometric study and public data | <i>Journal of Cleaner Production</i> | 7.246 | 1993 |
| Panel data—secondary data | | | | | |
| Kim, Li, and Liu (2018) [95] | 6 | Econometric study | <i>Journal of Business Finance & Accounting</i> | 1.473 | 1974 |
| Mokhov et al. (2018) [10] | 2 | Econometric study | <i>Bulletin of the South Ural State University</i> | 0 | 2008 |
| Shi et al. (2018) [96] | 7 | Econometric case study | <i>Energies</i> | 2.702 | 2008 |
| Liao and Shi (Roc) (2018) [33] | 58 | Empirical analysis | <i>Energy Policy</i> | 5.042 | 1973 |
| Segura et al. (2018) [97] | 12 | Econometric study | <i>Journal of Cleaner Production</i> | 7.246 | 1993 |
| Han (2020) [21] | 2 | Empirical analysis | <i>Environmental Science and Pollution Research</i> | 3.056 | 1994 |
| Mikołajek-Gocejna (2016) [25] | 5 | Empirical analysis | <i>Comparative Economic Research. Central and Eastern Europe</i> | 0 | 2009 |
| Escrig-Olmedo et al. (2017) [14] | 20 | Fuzzy MCDM, specifically fuzzy TOPSIS (Technique for Order Preference by Similarity to Ideal Situation) | <i>Journal of Cleaner Production</i> | 7.246 | 1993 |
| Hsiao, Zhong and Dincer (2019) [98] | 0 | Empirical analysis | <i>Sustainability</i> | 2.576 | 2009 |

Table 4. Cont.

| Authors | Citation | Method | Source | Impact Factor of the Journal (2019) | First Year of Publishing |
|---|----------|--|---|-------------------------------------|--------------------------|
| Xing, Xia and Guo (2019) [7] | 3 | Empirical analysis | <i>Sustainability</i> | 2.576 | 2009 |
| Nassani et al. (2017) [99] | 51 | Empirical study | <i>Journal of Cleaner Production</i> | 7.246 | 1993 |
| Patents | | | | | |
| Negra et al. (2020) [100] | 1 | Sectoral framework analysis | <i>Ecological Indicators</i> | 4.229 | 2001 |
| Other methods | | | | | |
| Litvinenko, Tsvetkov and Molodtsov (2020) [101] | 0 | Fuzzy set theory, entropy weights, and analytical network process analytical network process | <i>Eurasian Mining</i> | 0 | 2005 |
| Ghosh, Sarmah and Kanauzia (2020) [24] | 1 | Mathematical models | <i>International Journal of Process Management and Benchmarking</i> | 0.308 | 2005 |

As can be observed in Table 4, among the sources of the selected articles, seven of the top 10 journals have the greatest contribution.

Related to the scientific methods utilized in the selected papers, quantitative research methods are particularly used: surveys (16 articles), mixed methods (econometric studies using public data (5 articles)); surveys with econometric studies (4 articles), and panel data (7 articles). As expected, the case study is another method that is broadly applied (in 9 articles). Most commonly, the articles focus on green investments in supply chains, energy and utilities, and transport (mainly the focus is the reduction of pollution).

At the time of the selection of the data (November 2020), the most cited studies were from 2018 and 2017: Liao and Shi (Roc) (2018) [33] with 58 citations, Nassani et al. (2017) [99] with 51 citations, and Kraus et al. (2018) [67] with 48 citations. In Liao and Shi (Roc) (2018) and Nassani et al.'s (2017) papers, the authors focus on the external drivers, analyzing the impact of green investment on climate change, but in Kraus et al.'s (2018) articles, the impact of green investments through the internal drivers (organizational culture) is more evident.

4.2.2. External and Internal Drivers and Motivation for Green Investment

This section presents and characterizes all the factors relevant to the adoption of green investments identified in the studies analyzed in this systematic review (Table 5). The current study was carried out to illustrate the main drivers of green investment from the perspective of both public and private investors. The analyzed articles underline the positive impact of green investment on the sustainable development of different organizational structures. Most of the papers focus on identifying the benefits generated by green investments within private companies.

Table 5. Drivers and motivation for the adoption of green investments.

| Drivers | Definition | Source |
|---------------------------------------|--|---|
| | External factors | |
| Consumers' and stakeholders' behavior | <p>Customers are more knowledgeable and more concerned with the environmental impact of the products that they are buying.</p> <p>Despite the green investment pressure, coming from the stakeholders (consumers, investors, shareholders, NGO's) companies are still hesitant to invest in green technologies because of the higher costs and risks involved.</p> | <p>Pimonenko et al. (2020) [29,30]; Palma-Ruiz, Castillo-Apratriz, and Gomez-Martinez, (2020) [88]; Cheng et al. (2018) [75]; Aboulamer, (2018) [81];</p> <p>Jazairy (2020) [66]; Shi et al. (2020) [93]; Xing, Xia, and Guo (2019) [7]; Yen (2018) [22]; Zhang et al. (2015) [6]</p> |
| Climate change | <p>Green investments are invariably combined with climate change mitigation or adaptation. Environmentally-friendly technologies significantly reduce pollution (CO₂ emissions and fuel consumption), the abatement cost being under environmental regulations. The negative impact on the environment has influenced companies to implement innovative green ideas in order to reduce pollution.</p> | <p>Han (2020) [21]; Mielke (2019) [85]; Du et al. (2019) [18]; Deng et al. (2019) [87]; Segura et al. (2018) [97]; Lozano and Reid (2018) [90]; Hoppmann, Sakhel, and Richert (2018) [31]; Nassani et al. (2017) [99]; Yadav, Han, and Rho (2015) [69]; Elheddad et al. (2020) [71]; Liao and Shi (Roc) (2018) [33]</p> |
| Legislation & regulations | <p>Environmental regulation policies play a significant role in promoting the environmental regulation level. Much research has been done to investigate the influence of regulatory pressure on green innovations and investments, but it is important to know how such pressure motivates organizations to improve their green investment performance.</p> | <p>Han (2020) [21]; Li et al. (2020) [82]; McInerney and Bunn (2019) [77]</p> |
| | <p>The legislative impact has a direct effect on the companies' activity, sometimes generating increases in operating or financial expenses (taxes and duties).</p> | <p>Han et al. (2020) [1]; Gandullia and Pisera (2020) [73]; Kim and Lee (2018) [86]; Lozano and Reid (2018) [89]; Stoeber and Weche (2017) [83]; Sueyoshi and Yuan (2015) [68]</p> |
| Target market | <p>The target market reacts favorably to green investments. This means that the companies follow the megatrends and can do what they always do: maximize earnings.</p> <p>Adapting to the continuous market changes represents the key factor in implementing green investments. There is always the risk that the developed service/product does not satisfy the market demands or that the price is not competitive. Consequently, the companies might experience losses.</p> | <p>Palma-Ruiz, Castillo-Apratriz, and Gomez-Martinez (2020) [88]; Schmid, Olaru and Verjel (2017) [64]</p> <p>Han et al. (2020) [1]; Deng et al. (2019) [87]</p> |
| Public financing and incentives | <p>Public financial investments (PFIs) can use both traditional and innovative approaches to link green projects with finance by enhancing their access to capital, facilitating risk reduction and sharing, improving the capacity of market actors, and shaping broader market practices and conditions.</p> <p>The duration of the firm-bank relationship is associated with a higher probability of a firm's green investment strategies. Conversely, the presence of a multiple credit relationship could concretely hinder a firm's investments towards environmental innovations. With regard to the firm-financial characteristics, credit-constrained and indebted firms encounter more difficulties.</p> | <p>Taghizadeh-Hesary and Yoshino (2020) [9]; Han (2020) [21]; Du et al. (2019) [18]; Falcone (2018) [5]</p> |

Table 5. Cont.

| Drivers | Definition | Source |
|-----------------------------|--|---|
| | Internal factors | |
| Investors' preferences | Environmental damage is the main concern for investors, which firms need to address in the process of improving environmental performance. Nowadays, it seems that investors must choose between "traditional" investments (strictly financially oriented) or sustainable investments. | Pimonenko et al. (2020) [30]; Palma-Ruiz, Castillo-Apr aiz, and Gomez-Martinez (2020) [88]; Lozano and Reid (2018) [89]; Escrig-Olmedo et al. (2017) [14]; Apostolakis, Kraanen and van Dijk (2016) [76]; Yadav, Han, and Rho (2015) [69] |
| | There are specific risks on financing a green investment and, consequently, the need for investors to have a minimum investment security based on indicators is growing. At present, indicator-based tools for incorporating sustainability values are being developed without adequate engagement by scientists. | Fiskerstrand et al. (2020) [74]; Taghizadeh-Hesary and Yoshino (2020) [9]; Negra et al. (2020) [100]; Ferri and Pini (2019) [91]; Mielke (2019) [85]; Kim, Li, and Liu (2018) [95]; Mokhov et al. (2018) [10]; Zheng and Ng (2018) [79]; Dreyer et al. (2017) [80]; Mikołajek-Gocejna (2016) [25]; de Lange (2016) [65] |
| Organizational culture | Entrepreneurs tend to derive their will to act more sustainably from their personal values or traits. To increase an organization's chances of becoming more sustainable, sustainability efforts must be integrated internally, and vertically, within a firm and between departments, plans, and divisions. | Kraus et al. (2018) [67] |
| | The financial motivation of managers is one of the best indicators of the market value of firms and sustainable investment projects. Internal contextual variables (manager's attitude, supply chain relationship, digitization capability) have little effect on promoting value co-creation in the green supply chain. | Shi et al. (2020) [93]; Atif, Alam, and Hossain (2020) [26,27]; Hsiao, Zhong and Dincer (2019) [98]; Wang et al. (2018) [17]; Lozano and Reid (2018) [89]; Apostolakis, Kraanen and van Dijk (2016) [76]; |
| Financial performance | There is a strong relationship between financial returns and sustainability, explained by the level of performance for all the metrics analyzed (Carhart's alpha, Sharpe, net return, reduced cost). | Ghosh, Sarmah, and Kanauzia (2020) [24]; Li et al. (2020) [82]; Duran-Santomil et al. (2019) [92]; Kim and Lee (2018) [86]; Ganda and Milondzo (2018) [23]; Teti et al. (2015) [70]; Yadav, Han, and Rho (2015) [69] |
| | With responsible management and strategy, the firms can use tools to optimize their performance, improving sustainability while not necessarily sacrificing financial outcomes and making the company more profitable and more likely to survive in the long run. | Pekovic, Grolleau, and Mzoughi (2018) [8]; Cubas-Díaz and Martínez Sedano (2017) [62] |
| Reputational considerations | As a solution to develop environmentally-friendly technologies and increase their level of CSR (corporate social responsibility), the mutual funds could put pressure on the firm when peer firms in the investment network pay more attention to CSR practices. | Litvinenko, Tsvetkov, and Molodtsov (2020) [101]; Qi, Wang and Li (2019) [72] |
| | The more sustainable a company is, the higher its brand equity value is. Companies that invest more resources and capabilities to both manage the environmental impact of their activity and to respect environmental rules in force, create considerably higher financial value in the medium- and long-term. | Ajour El Zein, Consolacion-Segura, and Huertas-Garcia (2020) [94]; Han et al. (2020) [1]; Awan et al. (2020) [90]; Yadav, Han and Rho (2015) [69]; Teti et al. (2015) [70] |
| Efficiency gains | Sustainability has been an important issue for several decades because companies want to secure competitive advantages for their future such as cost savings, consumer demand, risk mitigation, tax incentives, and using resources efficiently in saturated or competitive markets. | Han et al. (2020) [1]; Karlsson (2019) [78]; Kim and Lee (2018) [86] |
| | The cooperation mode of value co-creation can guide the partners to invest in green technology and distribute benefits. | Li et al. (2020) [82] |

Environmental issues, such as pollution, resource depletion, and ecological degradation have become major concerns of researchers being analyzed globally. Both economically and politically, their approach is becoming crucial for social development and human survival [87]. Considering that more and more consumers are turning their attention to green products [29,30,75], stakeholders of organizations have begun to focus more and more on green projects. Thus, the utilization of green technologies and making green investments have become essential conditions that must be met by companies that want to obtain a superior competitive position on the market. This happens because many consumers are worried about the impact of their purchased products/services on the environment. [69,81].

Consumers' inclination towards green products could explain the appetite for CSR (corporate social responsibility) [88], as the market reacts favorably to firms making social and responsible investments.

Regarding the public authorities' role in accomplishing the SDG (Sustainable Development Goals) "adopted by United Nations Member States in 2015, as part of the 2030 Agenda for Sustainable Development which set out a 15-year plan to achieve the Goals" (UN, 2015), several measures have been implemented by the majority of the Members. The government together with the other public authorities have started to intervene by providing incentives for the implementation of green investments and by creating environmental taxes that must be borne by companies that negatively influence the environment [86]. As a snowball effect, the manufacturers have started to influence the suppliers' investment strategies along the supply chain. Consequently, in order to satisfy the demands of environmentally concerned consumers, the relationship between enterprises and other partners in the supply chain becomes a key factor [82].

Regarding the advantages brought by green investments for the common welfare, there is no doubt that they have a considerable contribution to coping with the imminent effects of global warming, poverty, and limited resources. Therefore, this type of investment is indispensable for countries all over the world. On the same note, public authorities should demand accountability for the measures taken to fight against the catastrophic scenarios that might become reality if environmentally sound investments are not implemented.

In order to adopt a sustainable entrepreneurial orientation that promotes sustainable investments, a significant role belongs to the organizational culture [67]. In addition, employees who work in companies that implement sustainable investments are positively influenced and have improved morale, motivation, and commitment. Moreover, they benefit from advantages like improved health and safety, labor standards, and employee well-being [90]. Another category of stakeholders that strongly influence the companies' strategies is represented by investors, which refuse to deal with unfair green companies [30]. Hence, the CEOs (Chief Executive Officers) have to take into consideration the current attitude of the investors toward corporate sustainability strategies. Investors assess companies through the following four dimensions: economic, environmental, social, and time [89]. Therefore, considering that environmentally friendly organizations tend to be the investors' favorite collaborators, green companies experience a significant stock price increase [26,27].

Compared to the linear paradigm (take, use, waste), all the changes in consumer preferences for green products/services [81] contribute to investments made in green technology, investments that enhance the reduction of the total supply chain cost [20]. Furthermore, green investments facilitate the diminution of different categories of the companies' current and potential costs. Hence, the manufacturers that choose to invest in environmentally sound technologies benefit from an entirely revamped production process and, therefore, experience a significant decrease in the energy consumption, packaging weight of products, transportation cost, and the overall production cost [69]. Consequently, in the long-term, these manufacturers obtain economic advantages such as increased corporate income and profits, superior financial and economic performance, and "financial value creation, expressed in terms of medium- and long-term stock returns" [35]. Moreover, companies that invest more resources and have the necessary capabilities to manage the

impact of their activity on the environment but also comply with all environmental rules and regulations, obviously create a reputation and a considerably higher financial value in the medium and long-term [70]. Thus, companies that implement green investments fulfill their goal of obtaining a higher return on investment [1].

5. Discussion

The aim of this paper is to identify and analyze the relevant factors that determine interested parties to allocate their financial resources in engaging green investments. After carrying out a bibliometric analysis and a systematic review, based on scientific articles that employ empirical studies, these factors were grouped into internal and external drivers for adopting green investment.

Firstly, after selecting the main papers of interest, based on the keywords “green invest*”, “sustainable invest*”, “eco-investm*”, “eco-investing”, “environmental investment” and “drivers” in Topic, the bibliometric analysis was conducted. This analysis consists of evaluating the interest in the domain and reveals that the main focus on this topic has increased significantly since 2018, predominantly among the Chinese authors, American authors, and English authors. A justification for this fact may be the state of economy validated by the GDP per capita reached in the USA, China, and Great Britain. As expected, the main journals which took interest in this topic are the ones aligned with the theme: *Sustainability*, *Journal of Cleaner Production*, *Energy Policy*, *Ecological Economics*, and *Energies*. The annual evolution of the published papers treating the subject of green investments underlines the interest of the authors as starting from 1992 until December 2020 (representing the date of the data collection). The evolution concentrates the researchers’ attention on the importance of deepening this field since 2020. The collected database allowed a further analysis of the articles containing the topic of green investments. The analysis reveals that most of the published articles used surveys or mixed techniques as research methods. The articles that analyze the impact of green investments can be divided into two main categories: those that expose external drivers and the ones that describe internal drivers.

Furthering the analysis with the systematic review based on the multiple filters applied to the database, in which 59 articles were included, led to the identification of 5 external drivers, respectively: Consumers’ and stakeholders’ behavior, Climate change, Legislation and regulations, Target market, Public financing and incentives, and 5 internal drivers: Investors’ preferences, Organizational culture, Financial performance, Reputational considerations, Efficiency gains.

Considering the external drivers, since global warming and pollution have become seriously discussed and broadcasted issues, worldwide consumers [29,30,69,81,86,88] have begun to express their preferences for environmentally-friendly products and for services offered by companies that promote and develop CSR activities. Consequently, more and more companies started to invest in environmentally sound technologies, eco-products, and social and environmental projects, in order to adapt to the new trend. Moreover, environmental regulations have been established to diminish the environmental risks caused by global warming and pollution. In addition, tax incentives and economic preferential policies, applicable for companies that make sustainable investments, have been implemented to stimulate the engagement of the private companies in this matter [1].

When it comes to the target market, another positive effect of sustainable investments is the competitive advantage that companies develop on the market by using environmentally sound technologies and producing green products. In this way, the companies differentiate themselves from their competitors [1,64,87,88].

Related to the internal drivers, despite the fact that a significant number of authors associate green investment with higher costs and a negative influence on the profit of a company, the studied articles demonstrate that green investment accelerates the profits’ increase and cost savings [23,69,70,82].

Among the drivers of green investments is the enhanced reputation of firms that demonstrate being socially and environmentally responsible. This image improves the

companies' "relations with different stakeholders such as customers, investors, bankers, suppliers, and competitors" [81], whereas the companies that do not have a corporate sustainability strategy are penalized by investors and avoided by consumers.

Furthermore, one of the major concerns of investors is the harmful effect on the environment [69], therefore companies need to improve their entire production process so that it does not have a negative impact on the environment.

Referring to the organizational culture as an internal driver, according to Atif et al.'s (2020) [27] study carried on 1500 USA companies, there is a well-marked, positive relationship between female directors and sustainable investments implemented. Moreover, the study recommends the involvement of more female representatives in boards in order to enhance sustainable projects.

All the previously described drivers have not been yet included in a guide, in which every driver may be explained in detail and new ways of empowering their impact on green investments may be recommended. Therefore, the present article offers the foundation for future research on this matter.

6. Conclusions

Illustrating the most important drivers for the adoption of green investments, the present article contributes to empowering the development of environmentally sustainable projects and therefore, to cope with the imminent global warming and pollution-related issues. According to the studied articles, it really pays off to invest in green investment if a long-term scenario is taken into consideration. The payback may take longer, but the effects are significantly advantageous for the private and public entities.

The theoretical implications of the present research provide the specialized literature with important findings of drivers that have a crucial influence on the enhancement of green investment. Therefore, the research contributes to the enrichment of the concept of green investment and the drivers associated with it.

Related to the practical side of the research, there is clear evidence that knowing the drivers of green investments, the entities concerned about the imminent effects generated by climate change and pollution, can exploit them in practice and promote green investment in order to control these effects.

The trend of deciding to invest in green requires considerable support from the government as without tailored policies and incentives, companies are tempted to choose brown investments due to the long payback period connected with green investments.

The policy instruments that public authorities can use to stimulate green investments are guaranteed credits, the decrease of the paid taxes, grants offered in order to procure green technology, and free courses about the importance of green investments dedicated to private organizations.

By centralizing and summarizing the scientific articles written on the topic of green investments, this study facilitates access to researchers' findings and identifies some of the experts in the field and the main journals in which they were published. In addition, it contributes to future analyses as a database of articles that can be filtered by the region in which the future researchers want to focus their studies or it can be filtered to analyze the 10 drivers (5 internal and 5 external) in order to promote green investment.

Due to the fact that multiple filters were applied, one limitation of the present research is the elimination of some articles that might offer additional important drivers for enhancing green investments. The research did not take into consideration the articles that the database indicated as covering the topic of green investments but could not be accessed in their full version. In addition, the study does not include the scientific papers that were associated with the researched topic but were not written in English. Another limitation is the selection of the articles from a single database (WoS), but that decision was based on the fact that the papers and citations collected from the WoS and Scopus databases are highly similar.

Nevertheless, the paper enlarges the research area in this matter, as further studies might identify the most suitable ways of promoting these drivers to enhance green investments and, therefore, to diminish the destructive effects of pollution and climate change. Furthermore, forthcoming works on this matter can focus on describing the identified drivers more accurately and can calculate the level of these drivers' impact on green investment. Moreover, new drivers may be identified in future research articles and innovative ways to use them in order to enhance green investment. In this way, green investment will produce positive effects on the urgent issue concerning pollution and global warming.

An important result of the present research is the relatively current appearance of an ascending trend of more and more entities and researchers from all over the world interested in these urgent global issues. This trend signifies that “actors” from private and public entities will continue to be involved in research on this matter until they will undoubtedly identify innovative ways to deal with these environment-related problems. The present research represents a modest but important contribution in this whole process and hopefully, will stimulate new researches to be carried out on green investment and other related topics.

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