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SOVEREIGN ESG INTEGRATION: A BIBLIOMETRIC AND SYSTEMATIC LITERATURE REVIEW

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Abstract:

Investments with sustainable principles that fulfil environmental, social, and governance (ESG) that stress the notion of sovereignty, with varied financing needs and criteria and jurisdictional features, have just lately begun to emerge. We intend to investigate and debate the volume and scope of research performed in that environment. Using PRISMA framework, we obtained 37 articles from 2009 to 2021 related to sovereign aspects of ESG based sustainable investment from the Scopus database. We found that the issues discussed were dominated by Sovereign Wealth Funds (SWF), particularly from Norway, which has the world's largest market value. We emphasize the need for research in developing countries that have SWFs as well as host countries, analyze sovereign investment in the climate-impacted sectors, formulate our own composite index as a common denominator, where the cross-border legal basis for SWF is strengthened.

Key words: *Sustainable investment, ESG, Systematic Literature Review, Bibliometric Analysis, Sovereign Wealth Fund*

1. Introduction

Investment plays an important role to achieve Sustainable Development Goals (SDGs) 2030. The world annually requires USD2.5 trillion to address an annual financing gap (UNCTAD, 2014) which could even reach USD4.2 trillion during the Covid-19 pandemic (OECD, 2020). These gaps should be addressed accordingly through multiple sources of financing, including sustainable investment.

Sustainable investment is a strategy and practice which includes environmental, social, and governance (ESG) factors in investment decisions to better manage risks and

to produce environmentally sustainable long-term benefits (Gasperini, 2020) and also positive social impacts (Qi & Li, 2020). Ever since it was first introduced in 2005 by the United Nations Global Compact and the United Nations Environment Program Finance Initiative, sustainable investment with ESG factors has been growing. The sustainable investment platform under the United Nations, the UN Principles of Responsible Investment (UN-PRI), has achieved collective assets under management (AUM) worth US\$121 trillion as of March 2021, 3,826 signatories (3,404 investors and 422 service providers of financial services) (UNPRI, 2021).

The ESG factors are generally viewed from the corporate side, called corporate ESG. In recent years, however, standardization has also developed at the national level, which is known as sovereign ESG (Gratcheva, *et al.*, 2021). This shift has occurred due to different results and implementation between corporate level and sovereign ESG based on scores from several rating agencies. Unlike the case with corporate ESG, sustainability indicators in Sovereign ESG tend to be more closely associated with the level of development and welfare of a country (Gratcheva, Emery, & Wang, 2021). Openness to the inclusion of ESG criteria can also be an important evolutionary step for a country's economic development (Plastun, Makarenko, Khomutenko, Osetrova, & Shcherbakov, 2020).

This study aims to review literature that discusses the extent to which Sovereign ESG, as a subset of sustainable investment, has been conducted thus far. The review is carried out in two steps. First, we search for the keyword sustainable investment, which has had many substitute terms since the idea was first developed. We filter these results using Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) as a structure, and also elaborate with bibliometric analysis after comparing search results in several databases for relevant keywords. Several previous studies searched with relatively partial keywords, such as Gao, Meng, Gu, Liu, & Farrukh (2021) and Li, *et al.*, (2021) with the keyword environment social governance (ESG), Barroso & Araújo, (2021) with the keyword Socially responsible investments (SRIs), or searches conducted several years ago, such as Widyawati (2019) with searches conducted up until April 2017. Based on particular elaboration, we examine several studies that discuss sustainable investment with its variance of terms, which are then transformed and sovereign ESG created as a subset. Second, we further filter the search results that we have discussed by adding keywords relevant to sovereign ESG for further discussion. We then use bibliometrics to identify connections and keywords that are frequently used in relevant research, and we discuss them in depth using a systematic literature review.

The following section reviews literature on the transformation of sustainable investment terms used over time as well as the integration of ESG factors. The third section discusses the analytical method used, bibliometrics as part of a systematic literature review, along with the structure of the keyword search filtering used. The fourth section discusses the search results and the network analysis using VOSViewer as well as keywords, countries, and methods used in the selected articles. Finally, this study provides conclusions and suggestions for future research.

2. Literature Review

2.1 Sustainable Investment

Sustainable investment has multiple terms which essentially incorporate ESG elements into the consideration of investment decisions. It has attracted attention since the 1960s (Doyle, 2018), starting with equity markets with religious, value-based, or thematic (environmental) investors. This concept is often referred to as sustainable investing (SI), responsible investing/investment (RI), socially responsible investing/investment (SRI), ethical investment, green investing/investment, impact investing/investment, and ESG investment, which is an investment strategy that considers ESG factors in portfolio selection and management (Cunha, *et al.*, 2020; Global Sustainable Investment Alliance (GSIA), 2020; Inderst & Stewart, 2018). Sustainable investment is increasingly expected to contribute to and have a critical role in the transition toward the achievement of sustainability targets even though our understanding of practical tools to stimulate sustainable investment is still limited. (Kölbel, Heeb, Paetzold, & Busch, 2020; Vanwalleghem & Mirowska, 2020). At the same time, successful implementation of sustainable investment in the long term requires budget compliance, satisfaction with objectives, and avoidance of risk (Pot, 2021) as well as upfront resources (Alfredsson & Malmaeus, 2019).

The numerous synonymous naming terms for sustainable investment aid in reaching and locating a larger magnitude of discussion about the concept and its implementation. Afterward, the distinction between how investment is treated in destination countries – developed and emerging – becomes an important topic to discuss, as does sustainable investment using its various instruments. The power imbalance between developed and developing countries necessitates guidelines or regulations that have a worldwide international scope.

2.2 Environmental, Social, and Governance (ESG) & Sovereign ESG

ESG as a concept has evolved along with increasing awareness of the importance of sustainable investment. Initially, ESG was used as a standard criterion accepted by investors and companies (Escrig-Olmedo, *et al.*, 2017) in their efforts to run their businesses involving aspects of sustainability that were caused by externalities generated by the company (Fama, 2021). ESG also serves as an index that helps in monitoring the performance of the three aspects in ESG that are implemented by companies (Brounen, Marcato, & Op 't Veld, 2021; Rehman, *et al.*, 2021). There are at least 16 ESG-related service providers, also known as sustainability rating agencies (Drempetic, Klein, & Zwergel, 2020), with an estimated market value of USD 1 billion (Walter, 2020).

The sudden number of service providers related to ESG is a consequence of the high demand, especially from the company or corporate side. Around the world, investors, both individual and institutional, have started to increase their attention to, awareness of, and behavior based on ESG indicators and scores (Chen & Yang, 2020; De Lucia, Pazienza, & Bartlett, 2020; Gupta & Gupta, 2020; Verga Matos, Barros, & Miranda Sarmiento, 2020) motivated by altruism and the positive influence it brings (Kölbel, *et al.*,

2020), including greater attention and more public media exposure (Liu & Hamori, 2020). The current world condition with the Covid-19 pandemic has also triggered investors to shift their assets to ESG (Ruan & Liu, 2021; Singh, 2020; Vural-Yavaş, 2021). This increase has influenced companies' transparency, particularly regarding the information and transparency of corporate reports related to ESG over the last decade (Albitar, Hussainey, Kolade, & Gerged, 2020; Alsayegh, Abdul Rahman, & Homayoun, 2020; Conca, Manta, Morrone, & Toma, 2021; Gjergji, Vena, Sciascia, & Cortesi, 2021; Oncioiu, *et al.*, 2020; Schiehl & Kolahgar, 2021; Olsen, Awuah-Offei, & Bumblauskas, 2021; Staszkievicz & Werner, 2021), including those related to Corporate Social Responsibility (CSR) activities (Badía, Cortez, & Ferruz, 2020; Do & Kim, 2020; Duque-Grisales & Aguilera-Caracuel, 2021; Martínez-Ferrero & Lozano, 2021; Oh *et al.*, 2020; Tunio, *et al.*, 2021). At the same time, this openness has also been accompanied by increasing awareness of stringent reporting standards (Schumacher, Chenet, & Volz, 2020) and integrated reporting, which is also known as the Integrated Reporting Movement (Landau, Rochell, Klein, & Zwergel, 2020) or Sustainable Reporting (Oprean-Stan, Oncioiu, Iuga, & Stan, 2020).

The decision among corporates to execute sustainable investments based on ESG is driven by several considerations. The main driver is ultimately the interests of the stakeholders in the company (Amankwah-Amoah, 2020; Campanella, Serino, Crisci, & D'Ambra, 2021; Hua Fan & Michalski, 2020; Martínez-Ferrero & Lozano, 2021), only then followed by other deciding factors such as efforts to minimize risk (Fiskerstrand, Fjeldavli, Leirvik, Antoniuk, & Nenadić, 2020), incentives from companies (Veldman & Gaalman, 2020), psychological and ethical factors (Vanwalleghem & Mirowska, 2020), and green innovations (Zhang, Xing, & Wang, 2020). On the other hand, there are also several obstacles before investors make their choice on sustainable investments, such as a lack of trust and confidence in the ESG ranking system (La Torre, Mango, Cafaro, & Leo, 2020), including the risk of greenwashing (Veenstra & Ellemers, 2020; Yu, Luu, & Chen, 2020), and the worrying performance of portfolios (Rehman & Vo, 2020). Priority of economic benefits over environmental goals (Gong, Kao, & Peters, 2019), also known as financialization (Narayanan, Baird, & Tay, 2021), including the costs of making a sustainable transition (Schulte, Villamil, & Hallstedt, 2020), is also still a consideration for investors and companies. A large number of authorized rating agencies, however, results in dissimilarity in the criteria and indicators used by each of these agencies. The lack of similarity is caused by the absence of a mutually agreed reference standard in the preparation and weighting of criteria and indicators used as general guidelines. Consequently, most of the agencies construct their version of metrics, which according to Doyle (2018) results in disparities caused by five reasons: (1) lack of transparency due to limitations of disclosure standardization; (2) company size bias; (3) geographic bias; (4) risk exposure and business model in industry bias; (4) inconsistencies between rating agencies; and (5) failure to identify risk.

From the public sector point of view, uncertainty, especially in climate policy, is also an obstacle for investors in making sustainable investments (Jia & Li, 2020; Monasterolo, Roventini, & Foxon, 2019). Robust governance and institutions are a necessity to achieve ESG with sustainable targets through good public policy. Good public

policy aims to achieve intergenerational wellbeing sustainably, focuses on ensuring that the capacity of capital assets that produce prosperity is maintained or enhanced and is inherited, or in other words, meets the following five conditions: sustainability, equity, social cohesion, resilience, and prosperity (Karacaoglu, Krawczyk, & King, 2019). These five conditions are in line with sovereign ESG, prerequisites for which are a more transparent framework, a shift from a sovereign ESG 1.0 towards a sovereign ESG 2.0 framework. This framework needs to include (1) clarity on investment objectives, (2) transparent methods, (3) improved data, (4) incorporation of forward-looking scenarios, and (5) unbiased by a country's level of income or ingrained income bias (IIB) (Gratcheva, *et al.*, 2021). This is why the role of good public policy is inherently significant in developing sovereign ESG with a transparent framework, while, referring to what Gratcheva, Emery, & Wang (2021) state, environmental and social data tend to be patchier or nonstandardized at the sovereign level in ways that complicate their integration into ESG analysis.

The large number of sustainability rating agencies coupled with the various weighting standards in determining the criteria and indicators of the metrics used by each provider poses a challenge to the implementation of sustainable investment. An additional challenge is that corporations as the most users capitalize it to 'greenwash' their business appearance. Countries – especially emerging ones – which are based on sovereign law, are the biggest recipients of inward investment with distinct characteristics. A sustainable investment framework with a sovereign context becomes relevant due to the urgent need for transparent and generally applicable standards that will provide benefits for the countries involved, including intergenerational welfare as its long-term goal.

3. Method

3.1 Systematic Literature Review (SLR)

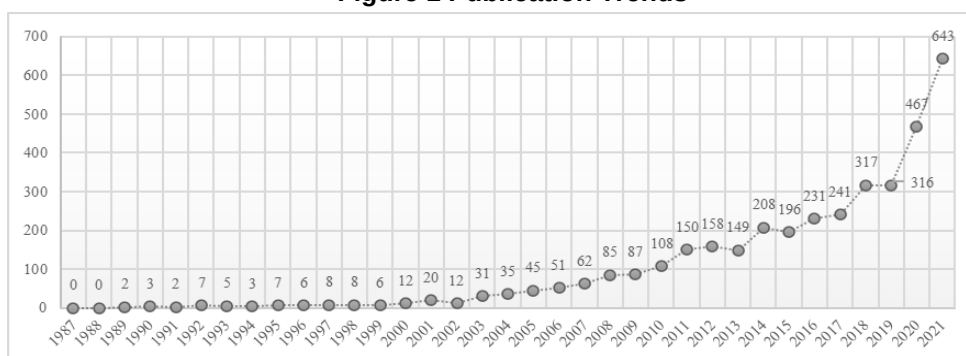
Systematic Literature Review (SLR) is a methodology that aims to search for certain patterns and themes with limited errors and biases through the identification of synthesis processes to obtain new insight, information, and to answer questions (Daugaard, 2020; Petticrew & Roberts, 2008). Aside from investigating research questions, SLR can also summarize previous studies and provide insights from a wide range of empirical findings, not only to interpret and assess the strength of earlier research but also to guide the future trajectory of various distinctive and multidisciplinary researches (Gough, Oliver, & Thomas, 2017; Fink, 2019; Snyder, 2019). SLR should be sufficient to serve as a robust platform to achieve more diverse and relevant future research without sacrificing depth of insight for potential impact, relevance to society, and future directions (Daugaard, 2020). In practice, Gurevitch, Koricheva, Nakagawa, & Stewart (2018) call for a systematic review process that involves the use of formal methodological guidelines for conducting literature search queries, screening study results (which include a comprehensive assessment of relevant articles following predetermined criteria), data collection, coding, and mostly statistical analysis (i.e., meta-analysis), as well as detailed and transparent documentation of each step.

In this study, we implement Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) as a guideline for reporting systematic reviews developed by Page, *et al.*, (2021), which offers structured and rigorous guidelines for reviewing studies using research criteria and provides four steps: identification, screening, eligibility, and inclusion, to perform the SLR (Moher, 2009). We also use VOSviewer for bibliometrics approach which quantifies literature to investigate the studies through illustrations and visualization to better conceptualize context, development hotspots, and development trends in particular fields (Liu, Wang, Li, Chen, & Sun, 2019; Xie, Zhang, Wu, & Lv, 2020).

3.2 Identification

We performed a search on the title, keyword, or abstract with the following keywords: "environmental social governance ESG" OR "ESG investment" OR "socially responsible investment" OR "responsible investment" OR "responsible investing" OR "sustainable investment" OR "sustainable finance" OR "sustainable financing" OR "impact investment" OR "impact investing" OR "green investment" OR "green investing" OR "ethical investment". Results found 3,699 documents since 1982 in Scopus, which also showing published results for 2022 with 19 publications. We then used VOSViewer to analyze the aforementioned data without further screening. This is because many publications intersect with the theme of sustainable investment and its derivative terminology, thus making it possible to eliminate publications that do not have a suitable theme by filtering, for example, by subject area. The summary of articles published annually, notably since 1987, when the Brundtland Report was published, is shown in Figure 1, based on the 3,699 published articles we obtained from the Scopus database. Throughout this period, the study themes relevant to sustainable investment show an increase that tended to be linear until 2019, since which they have shown exponential growth over the last two to three years.

Figure 1 Publication Trends



3.2 Screening & Inclusion

Using the previous bibliometric analysis results, we re-screened adding two keywords from the previous search results. In the title, abstract, or keywords column, the

keyword is "AND (sovereign OR sovereignty)." The screening yielded an additional 40 publications published between 2009 and 2021 as a result of the keywords used as seen in Figure 2. Figure 3 depicts the outcomes of the identification, screening, and inclusion processes using the PRISMA framework. We present these 40 articles in detail in Table 1. After searching for the related articles, we managed to obtain 37 articles while the other three articles were not retrievable.

Figure 2 Publication Trends of 'Sovereign' or 'Sovereignty' ESG

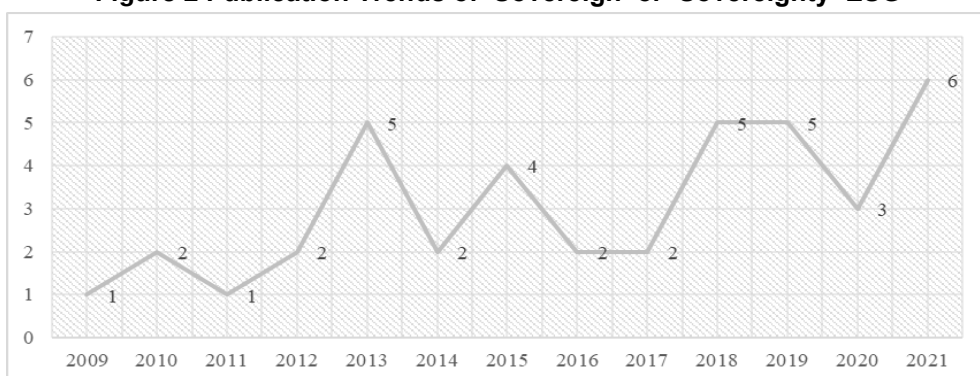


Figure 3 PRISMA Framework

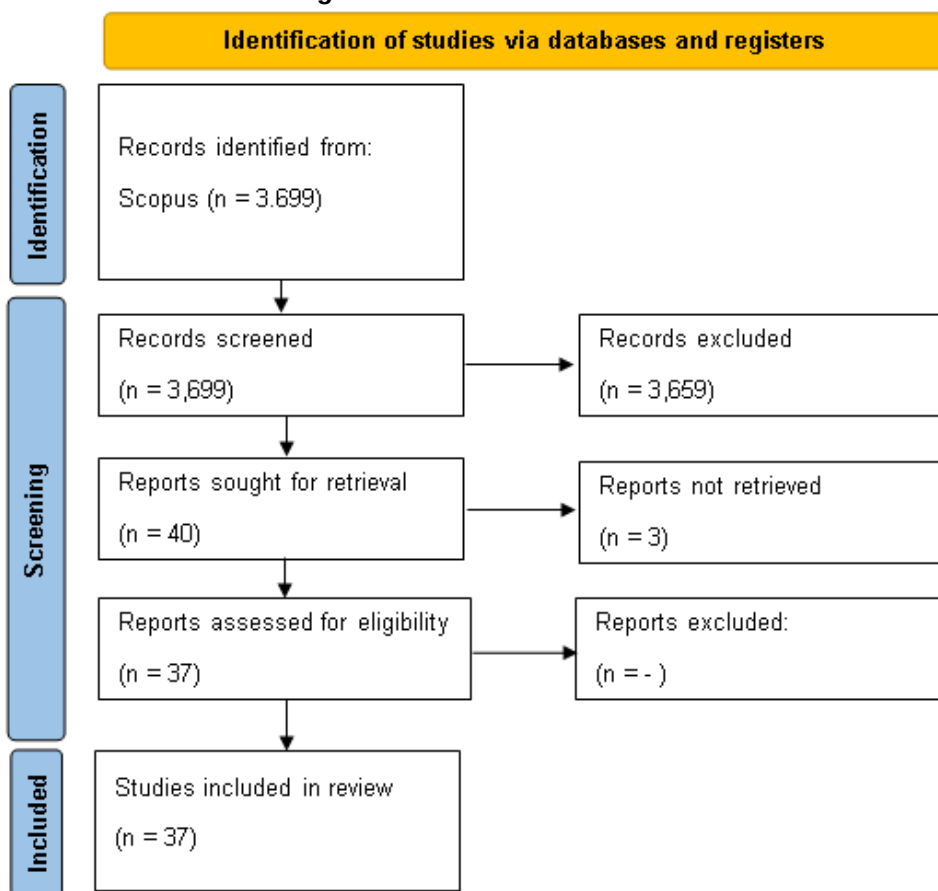


Table 1 Keywords on Sovereign Aspect of Sustainable Investment and ESG

No	Keywords								
	All	Oc	C	Author	Oc	C	Index	Oc	C
1	Sovereign Wealth Funds	11	1	Sovereign Wealth Funds	11	1	Investment	5	2
2	Sustainability	7	1	Socially Responsible Investment	4	1	Sustainability	4	3
3	Investment	5	2	Sustainability	4	1	Economic Policy	3	3
4	Norway	4	3	Ethical Investment	3	3	Sovereignty	3	3
5	Socially Responsible Investment	4	1	Norway	3	1	United States	3	1
6	Economic Policy	3	2	Socially Responsible Investments	3	4	Debt	2	1
7	Ethical Investment	3	3	Sovereign Wealth Fund	3	3	Financial Crisis	2	1
8	Socially Responsible Investments	3	5	Sustainable Finance	3	2	Investments	2	2
9	Sovereign Wealth Fund	3	3				Norway	2	2
10	Sovereignty	3	3				Risk Assessment	2	2
11	Sustainable Finance	3	4				Sustainable Development	2	1
12	United States	3	2				Uncertainty Analysis	2	1

Notes:

Oc = Occurrence(s)

C = Citation(s)

4. Results & Discussion

4.1 Bibliometrics

Our analysis includes searching at the distribution and connection of keywords, the productivity and impact of publications by authors discussing the theme with relevant keywords, the most frequently referenced published documents based on the number of citations, and the sources and countries most frequently mentioned in the documents we collected. VOSviewer's bibliometric visual analysis is based entirely on the fractional counting method.

We conducted a keyword analysis without specifying a minimum criterion and the outcomes with a minimum of one occurrence. The results were then classified into all keywords (231), author keywords (153), and index keywords (91). We then filtered all of them into at least two occurrences with the results of all keywords (35), author keywords (23), and index keywords (12). Figures 4 through 6 depict the interactions in each keyword category. Meanwhile, the appearances in Table 1 earlier have been reduced to a minimum of two occurrences, particularly for all keywords and author keywords.

The keyword Sovereign Wealth Fund(s) (SWF) appears the most frequently in all keywords and author keywords. There are also, albeit minor, Santiago Principles keywords, referring to a mutually agreed voluntary code among SWF motivated members to 'maximize risk-adjusted financial returns in a manner consistent with its investment policy, and based on economic and financial grounds' (International Working Group of Sovereign Wealth Funds, 2008). The three keyword categories also all mention Norway and two of them mention the United States as a country relevant to this SWF issue.

Figure 4 Network Analysis – All Keywords

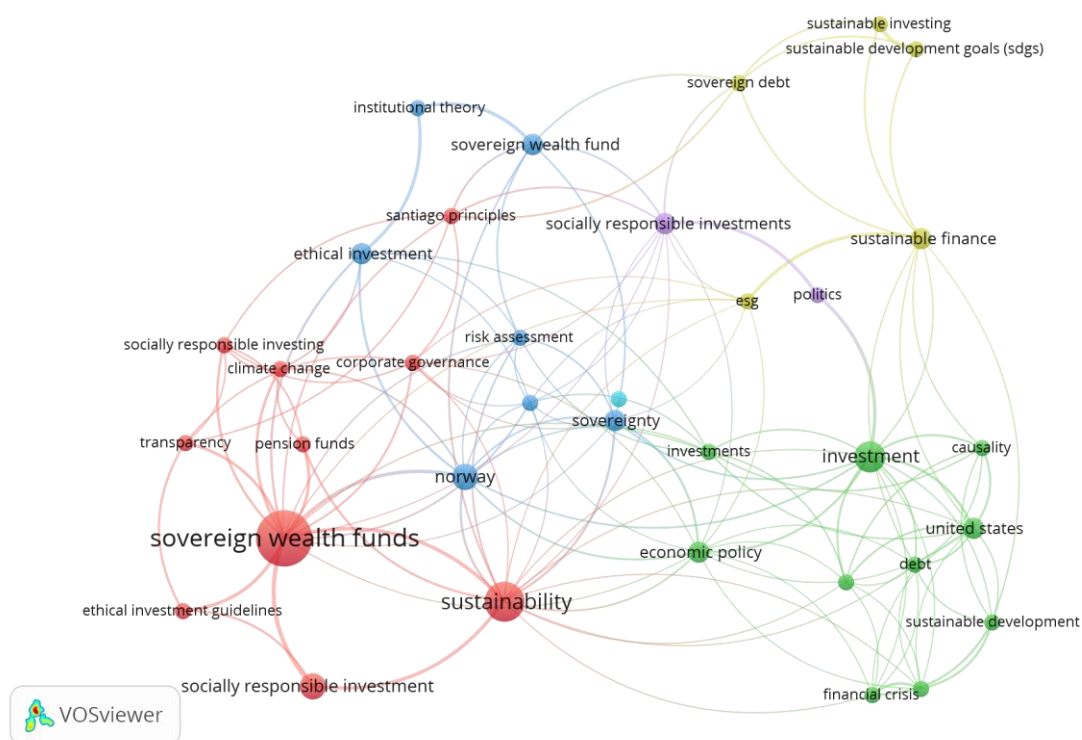


Figure 5 Network Analysis – Authors Keywords

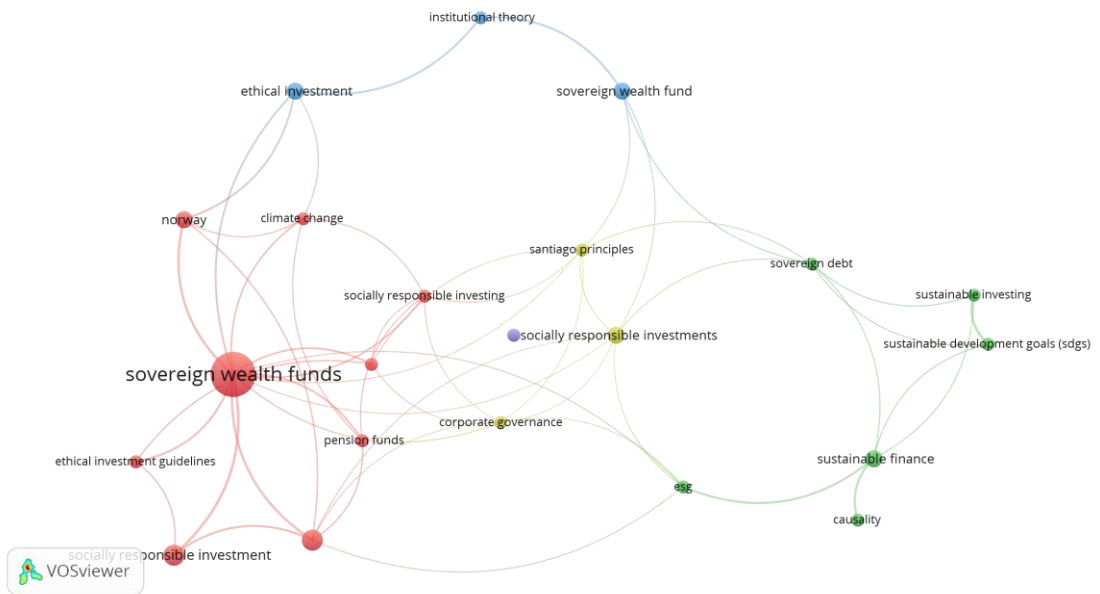


Figure 6 Network Analysis – Index Keywords

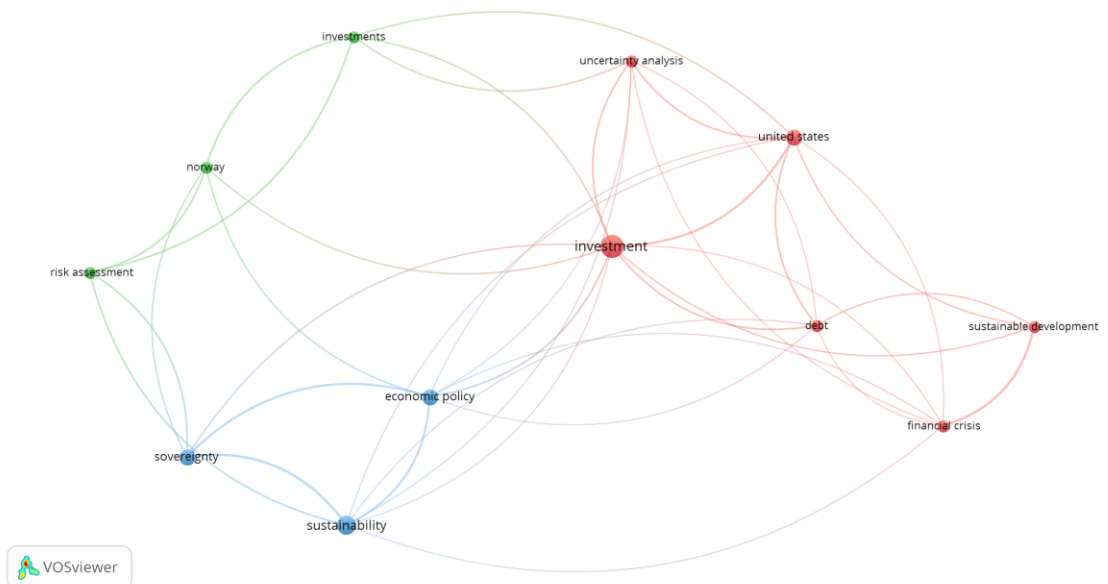


Figure 7 Word Cloud



4.2 Systematic Review

In this section, we examine the articles listed in the table above for further analysis in a variety of discussion categories. We were only able to retrieve 37 articles from the 40 listed above, excluding Richardson (2013), Bönning (2017), and Chambers, *et al.* (2021) from the discussion. First, we discuss the 37 articles obtained in terms of themes or topics that frequently appear in them, and then deepen the analysis of the keywords that appear above. Second, we discuss each of the articles we cite based on the method used in the analysis. Third, we look at the research locus to see how it is divided between developed and developing countries. We then discuss potential topics for future studies.

4.2.1 Keyword Depth Analysis

Sovereign Wealth Fund (SWF) is a very dominant keyword, as evidenced by the results of the bibliometrics keyword analysis in the previous section. The SWF Institute defines SWF as 'a state-owned investment fund or entity that is commonly established from the balance of payments surpluses, official foreign currency operations, the proceeds of privatizations, governmental transfer payments, fiscal surpluses, and/or receipts resulting from resource exports'. Karametaxas (2017) defines it as 'government-owned

investment entities acquiring and managing assets to achieve a variety of macroeconomic purposes'. Liang & Renneboog (2020) defines SWF through five characteristics: (i) investment funds rather than operating companies; (ii) entities wholly owned by a sovereign government, yet organized separately from a central bank or ministry of finance; (iii) funds making both international and domestic investment in different risky assets; (iv) funds with the pursuit of a commercial return as their main objective; and (v) wealth funds rather than pension funds, in the sense that the proceeds do not stem from pensioners' contributions and that these have hence no liabilities to the individual citizen. SWF is also an effort for a country with abundant financial resources to avoid being trapped in the Dutch Disease, which is a sudden increase in domestic inflation accompanied by a decrease in international competitiveness, while simultaneously incentivizing its people to remain productive.

SWF serves as a signaling effect for information related to social and environmental aspects in the capital market, which determines and gives influence, particularly to investors (Kreander, *et al.*, 2015; Al Ayoubi & Enjolras, 2021). According to Vasudeva (2013), from a policy standpoint, investment through SWFs plays a decisive role in shaping the strategic choices of companies affected by government priorities as normative pressure and then imitating it. SWF primarily benefits portfolio companies, host countries, and their fellow shareholders (Yin, 2018), while also providing long-term financial stability, particularly for decision-makers encountering financial market volatility and regulatory risks that affect investors' market timing (Antonakis, *et al.* 2016).

However, this does not mean that SWFs has been without difficulties or, at the very least, criticism. Hypothetically, if SWF invests in a foreign company that turns out to violate the ethical guidelines, there is no international law that says that the SWF is also responsible (Demeyere, 2011). It is due to this legal uncertainty that Richardson (2012) sees SWF as an administrative law that formally and procedurally can be judicially reviewed but, substantively, investment decisions cannot be easily prosecuted. In some cases, internal sanctions, which are not visible externally, are prioritized for violations of social and environmental standards that occur (Jensen & Seele, 2013).

SWFs have also been criticized for being indecisive when it comes to implementing ethical guidelines. Seele, *et al.* (2015) popularized the term "ethical free riding," which means that SWFs are classified as passive shareholders in order to avoid regulatory and political backlash from investment host countries (Yin, 2018). This avoidance could be a reflection of how SWF position themselves and view the host country. SWFs have been referred to as 'institutional chameleons' (Richardson, 2012) because they face ambiguity (Hachigan, 2015) and friction (Liang & Renneboog, 2020) between having to fulfill financial obligations and non-financial regulations as well as policies that form the framework for their existence in their home country. As SWFs are characterized as institutional investors, they have, of necessity, to adapt their investment policies to the complexities of global financial markets. This, for instance, is shown by the alleged passive share ownership in tobacco companies (Blitz & Swinkels, 2021) and corruption which necessitates either the Ethics Council's compliance with the rules or the development in the guidelines of tools to investigate these suspicions (Næss, 2019).

The context of the SWF debate is inextricably linked to the guidelines, specifically the ethical investment guidelines. According to the previous bibliometric analysis, Norway is the most frequently mentioned country in keywords. This is due to the fact that Norway's SWF serves as a model and pioneer for the formulation and implementation of SWFs, as Norway was a pioneer in the use of these guidelines (Reiche, 2010). Norway's SWF has played a critical role in the development of sustainable investments that meet ESG criteria, particularly in the sovereignty context. Tranøy (2009) delves into how Norway managed to accumulate the surplus from one of the world's largest oil and gas exporters into a petroleum fund in 1990, which was then transformed into The Government Pension Fund – Global (GPF-G) in 1996.– The strategy implemented was to invest its assets entirely overseas, with stock shares holding 60% of funding assets or fixed income and the remaining 40% fixed in bonds or equities, with the investment decision-makers being the Bank, the Ethics Council, and the Ministry of Finance as the final decision-maker.

Despite criticism of the sources of funding stemming from the exploitation of fossil-based energy resources and Norway's fragmented and contradictory environmental policies (Wirth, 2018), Norway's is currently the largest SWF in the world. Since the global financial crisis of 2007–8, more than 30 new SWFs have been established (Liang & Renneboog, 2020), and according to the most recent SWF Institute data there are currently more than 100 SWFs with a total asset under management (AUM) of US\$ 9.6 trillion. Norway's SWF holds the first position, with a market value of US\$ 1.4 trillion, although according to GPF-G's most recent report (2022), it has reached 12,340 billion NOK, or US\$ 1,871.98 billion, as of the end of 2021. Interestingly, only Norway's is the only SWF from a developed country with high democratic standards included among the top ten largest SWFs, while others tend to be low (Braunstein, 2018).

Norway wields financial and political power via the SWF, an investment vehicle with ethical guidelines/regulations. SWF Norway is regarded as a forerunner or pioneer of standards for morally based investment formulation. The Ethics Council (Graver-utvalget), which was established in 2002, established three institutional mechanisms in 2004: (1) long-term ownership based on international standards; (2) a selection process or negative screening of entities that violate human rights and/or environmental principles, and (3) divestment or withdrawal of investment from the infringing entity. These three became the model for developing the SWF guidelines. Businesses that manufacture weapons, violate human rights, engage in corruption, and, most importantly, harm the environment will not be considered investment targets. As negative screening provides significant financial benefits as well as long-term performance for Norway's SWF (Vargas, et al., 2014), it can also be held accountable if any human rights issues arise (Kreander & McPhail, 2019).

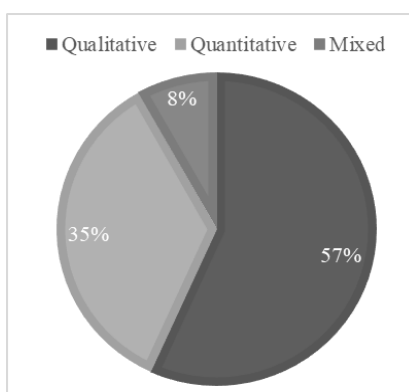
Aside from the majority of articles that explore SWF, particularly Norway's SWF, from a conceptual to an implementation level, some articles also show how SWFs are utilized to spur transformation in the real sector's substantial impacts. For instance, among the 100 SWFs registered by the SWF Institute are SWFs from small Pacific countries that are directly affected and threatened by climate change. Taupo (2019) investigates this, focusing on how SWFs in Tuvalu and Kiribati lessen their reliance on foreign assistance in carrying out post-disaster risk management. Numerous different lines of research support sectoral impact investments, such as, mangrove restoration and conservation, electric

vehicles (Farrel & Löw Beer, 2019), financial system integration to strengthen investment in the world's forest governance sector (Begemann, *et al.*, 2021), and the carbon market (Niblock & Harrison, 2013). Van Zanten, *et al.* (2021) is also regarded as important since it presents a framework that can aid investors in assessing participation using sovereign funds.

4.2.2 Method Used in the Articles

We identified that the majority (21 articles) of the 37 publications we thoroughly examined used qualitative approaches as their study method. The topic of SWF, specifically the assessment of SWFs development and dynamics, including an in-depth case study from Norway as a pioneer of ethical norms, is the reason for this. Furthermore, among the quantitative methods (13 articles), the autoregressive-based causality analysis, particularly Granger Causality, is the most commonly utilized. Meanwhile, the remaining three (3 articles) research employ both qualitative and quantitative methods.

Figure 8 Method Used in Sovereign ESG Research



Discussions of SWF with a descriptive approach or qualitative method from a general or global perspective were undertaken by Demeyere (2011), Wright (2013), Richardson (2015), Hachigian (2015), Braunstein (2018), Yin (2018), Farrel & Löw Beer (2019), Blitz & Swinkels (2021), Begemann, *et al.* (2021), and van Zanten, *et al.* (2021). Seele *et al.* (2015), on the other hand, employ qualitative methods with the addition of creating a hypothetical matrix. Karametaxas (2017) and Pavlidis (2019) connect them to the significance of the ethical rules now being adopted by SWF based on the Santiago Principles and UNCTAD Principles.

The discussion on SWF specifically or in relation to Norway's SWF was carried out by Tranøy (2009), Reiche (2010), Richardson (2012), Wirth (2018), Kreander & McPhail (2019), and Næss (2019). Meanwhile, Quatrini (2021) employs a qualitative method known as Comparative Analysis to examine decision making in five developed countries regarding sustainable investment by comparing three ratings: RobecoSAM's Country Sustainability Rankings, IFC Performance Standards, and ETH's Impact ASSURANCE Sovereign Ratings.

The research performed by Quatrini (2021) is rather uncommon, because research using the ESG rating or index, conducted as such by the three aforementioned rating agencies, is more frequently carried out using quantitative methods. In this case, Drut (2010) uses the Vigeo Sustainability Country Rating (SCR) as a composite index and analyzes it using the efficient frontiers technique. Different ratings are also utilized, such as the Global Sustainable Competitiveness Index, which Vargas, et al., (2014) examined using Spearman's rank-order correlation and "best-in-class" analysis. The data was also sourced from MSCI, specifically the MSCI World Index (Melas et al., 2017) and the MSCI ESG Leaders Indices (Umar, et al., 2020), which were examined using Directional Connectedness based on Granger Causality results.

Numerous researches also use the Granger Causality technique. Using the Granger Causality & Connectedness Network, Lundgren, et al. (2018) explore the direction and interconnectivity of the spillover of profits from renewable energy stocks. Ari and Koc (2018) use Granger Causality to elaborate on sustainable debt and examine the causal relationship between public investment and sovereign debt in the world's four major economies. Guo et al. (2020) utilized it to analyze credit default swaps (CDS) in ten Asian nations. Other causality analysis techniques, such as non-parametric quantile-in-causality, were also employed, as Antonanakis, et al. (2016) did.

Aside from the approaches mentioned above, research on sovereign ESG in the context of sustainable investment includes Niblock and Harrison's (2013) ordinary least squares (OLS), Taupo's (2019) Monte Carlo simulation for forecasting, and Al Ayoubi & Enjolras's (2021) event analysis methodology. There is also a relatively advanced method used by Liang and Renneboog (2020) that is difference-in-difference (DiD).

Three studies that use mixed methods are Jensen & Seele (2013), Vasudeva (2013), and Kreander, et al. (2015). Jensen & Seele (2013) used Semantic Content Analysis and Descriptive Statistics to investigate the existence of ethical investing rules targeted at overcoming social and environmental concerns from 13 SWFs and Pension Funds from ten countries. Vasudeva (2013) used the generalized estimating equation (GEE) method to examine the results of two rounds of stakeholder interviews, while Kreander, et al. (2015) used 300 charities from Norway and the United Kingdom as samples to compare the ideological and institutional frameworks in two SWFs using non-parametric testing and binary logistic regressions.

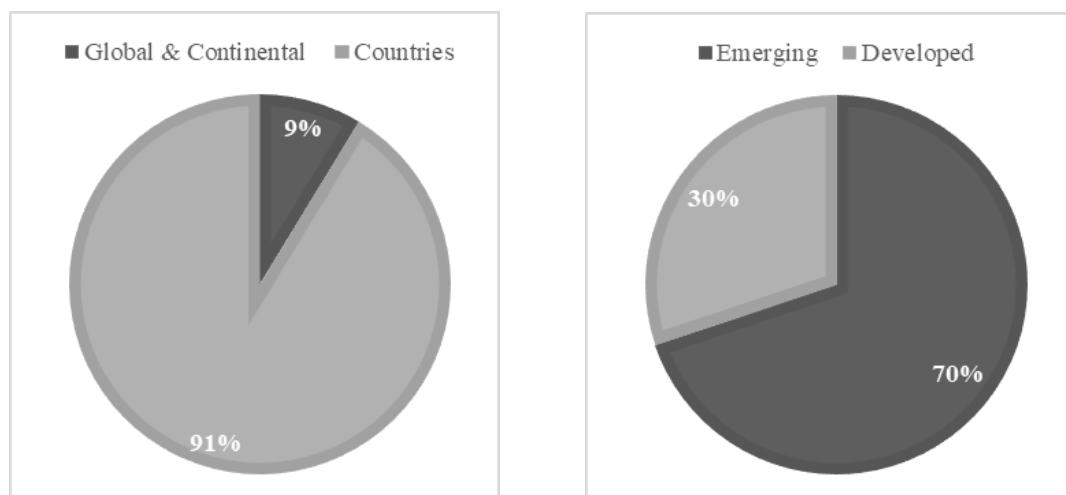
4.2.3 Countries Coverage in the Articles

The articles we analyzed were typically undertaken at loci or through case studies on a national scale rather than in a general or worldwide setting. Figure 9 illustrates that more than 90% of studies have a country coverage while just 9% include the large picture background. We notice that the publications we compiled cover 116 country case studies, with several countries referenced multiple times. We can observe from this data that emerging countries are discussed significantly more than developed countries, with emerging countries being the locus 81 times while developed ones only 35 times.

Based on the latest report from the SWF Institute, developing countries are indeed the majority of countries in Asia, the continent with the most SWF locations in the ten

largest SWFs worldwide. The same category includes China, the UAE, Saudi Arabia, and Kuwait, countries which have SWFs with a relatively large AUM but are still classified as developing countries. However, in terms of quality, the context of the discussion in developed countries is much deeper. The context of the discussion in this case is how although the existing SWF, both in number and nominally, are dominated by developing countries, the SWF often elaborated on are from developed countries, especially Norway.

Figure 9 Research Loci of Sovereign ESG Research



4.3 Discussion

It is critical to remember that the discourse we are making is predicated on the assumption that emerging countries require more inward investment than rich countries. This circumstance, in some cases, renders emerging countries eager to relax restrictions concerning the environmental impact of investment, often known as the Pollution Haven Hypothesis. Such terms for inward investment are unquestionably incompatible with sustainable development principles, particularly in the context of ESG-compliant sustainable investment. According to Gratcheva, *et al.*, (2021) and Gratcheva, Emery, & Wang (2021), in the setting of a state with sovereignty restrictions, the ESG aspects must be translated to be utilized in that capacity.

According to some research we examined, SWF dominates in the context of sovereignty. Demeyere (2011) noted that sovereign debt and SWF are two complementing opposites, implying that a considerable supply of cash from multiple nations with surpluses will be directed to countries in need with appropriate terms and conditions sooner or later. Sustainable investments are becoming increasingly important, both for entities with surpluses and for those in need (Wright, 2013).

Norway, as a developed country with the world's largest SWF market value, making it the object of research and we discovered much more frequent in-depth discussion of Norway's SWF in the articles we found. Despite the fact that many emerging

countries have nominally substantial cumulative market values, they are rarely elaborated in similar studies. According to Umar et al. (2020), the ESG investment market, particularly through the stock market, is dominated by developed countries, such as the United States, Canada, Europe, and the UK and countries with high average growth in the Asian region, i.e. Japan, China and India, are net receivers. One of the main aspects that has to be considered in future studies is the opportunity to explore SWF in developing countries, including how to use SWF or vehicle funds owned by such countries themselves as an extension of SWF in rich countries (Taupo, 2019).

We specifically note that there are themes that are both intriguing and important in order to stimulate the execution of such research. Transformative sovereign wealth funds (TSWFs) were discussed by Farrell and Löw Beer (2019) for a case study of mangrove conservation and electric vehicles, and Begemann *et al.*, (2021) for increasing demand for sustainable investment in the forest governance sector and forest governance integration with financial systems, including regulatory taxonomies and investment criteria. Investor-led engagement with governments on sustainability issues is currently a new phenomenon (van Zanten, *et al.*, 2021), because carrying out sustainable development projects without the assistance of the adoption of sustainable finance models will result in unsustainable economic outcomes (Ari & Koc, 2018). Hence, both reflect how sovereign ESG and SWF research directions might penetrate the real economy, which has a direct impact on sectors that mitigate and/or adapt to climate change.

SWFs are expected, as institutional investors, to have criteria that cover ethical obligations in social and environmental concerns. Unfortunately, because the underlying principles, the Santiago Principles, cannot directly ensure SWFs' compliance, countries and relevant institutions should consider finding other solutions to incorporate other regulations, such as the UNCTAD Principles (Pavlidis, 2019), into domestic regulations and international agreements (Yin, 2018). In addition to incorporating them into binding and compatible domestic regulations and international agreements, it is also critical to position them, like the guidelines, not only as a tool for developing public relations (Jensen & Seele, 2013) but also as having a long-term impact on all parties who look forward to their benefits.

Our findings indicate that compatibility between composite indicators or ratings employed by rating agencies is still scarce. According to Drempetic *et al.* (2020), there are at least 16 ESG sustainability rating firms, each of which has varied recording criteria and a questionable amount of openness. This element, or the convergence of indicators, metrics, and criteria used by SWFs and investment instruments with other ESG aspects, is also required for fair and sustainable standards, not just for institutions or investors, but also for host countries. It is also necessary to employ a variety of approaches, including scenario-based research, in order to robustly predict market complexity as well as policies inside and between countries.

5. Conclusion

SWF should not only avoid enterprises that harm the environment or violate human rights, but should also promote long-term development (Richardson, 2012;

Karametaxas, 2017). We propose four future research directions based on the 37 publications we obtained from 2009 to 2021 related to sovereign aspects of ESG based sustainable investment. *First*, research in the context of SWFs needs to – and should – be replicated where developing countries are further elaborated, both developing countries with SWFs with a high market value and developing countries with a high potential for inward investment with optimal returns in all three ESG aspects. *Second*, the ethical principles that underpin the SWF must have a solid legal foundation in order to prioritize sanctions for offenders and have the same or comparable standards among entities. *Third*, a standard index or common denominator should be adopted to enable the assessment and evaluation of ESG-based sustainable investments, including those made through SWFs and other investment vehicles. *Fourth*, the significance of performing SWF and sustainable investment with ESG research in areas closely relevant to climate change adaptation and mitigation activities needs further investigation.

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Appendix 1 Journals on Sovereign Aspect of Sustainable Investment and ESG

No.	Title	Author(s)	Year	Journal/ Book	Publishers	Citation
1	Flexible Adjustment in the Age of Financialisation: The Case of Norway	Tranøy, B. S.	2009	Geopolitics	Taylor & Francis	4
2	Sovereign wealth funds as a new instrument of climate protection policy? A case study of Norway as a pioneer of ethical guidelines for investment policy	Reiche, D.	2010	Energy	Elsevier	17
3	Sovereign Bonds and Socially Responsible Investment	Drut, B.	2010	Journal of Business Ethics	Springer	36
4	Sovereign wealth funds and (un)ethical investment: using 'due diligence' to avoid contributing to human rights violations committed by companies in the investment portfolio	Demeyere, B.	2011	Human Rights, Corporate Complicity and Disinvestment	Cambridge University Press	3
5	The European Redemption Pact: Implementation and macroeconomic effects	Doluc, H., Hübner, M., Rumpf, D., & Weigert, B.	2012	Intereconomics	Springer	10
6	Sovereign Wealth Funds and Socially Responsible Investing: An Emerging Public Fiduciary	Richardson, B. J.	2012	Global Journal of Comparative Law	Martinus Nijhoff Publishers	5
7	Weaving together the normative and regulative roles of government: How the Norwegian sovereign wealth fund's responsible conduct is shaping firms' cross-border investments	Vasudeva, G.	2013	Organization Science	Institute for Operations Research and the Management Sciences	29
8	Carbon markets in times of VUCA: a weak-form efficiency investigation of the phase II EU ETS	Niblock, S. J., & Harrison, J. L.	2013	Journal of Sustainable Finance & Investment	Taylor & Francis	12
9	Fiduciary Law and Responsible Investing	Richardson, B. J.	2013	Fiduciary Law and Responsible Investing	Routledge	6
10	An analysis of sovereign wealth and pension funds' ethical investment guidelines and their	Jensen, O. A., & Seele, P.	2013	Journal of Sustainable Finance &	Taylor & Francis	7

	commitment thereto			Investment		
11	Global Finance and the Environment	Wright, C.	2013	The Handbook of Global Climate and Environment Policy	Wiley	2
12	Sovereigns, socially responsible investing, and the enforcement of international law through portfolio investment and shareholder activism: The three models	Ghahramani, S.	2014	University of Pennsylvania Journal of International Law	University of Pennsylvania Law School	5
13	Searching For The Most Profitable And Sustainable Investment Strategy: Evidence From Sovereign Bond Funds	Vargas, M., Vicente, R., & Muñoz, F.	2014	Journal of Business Economics and Management	Taylor & Francis	3
14	Ethical free riding? The double entendre of "dirty hands" in finance, exemplified by ethical investment guidelines	Seele, P., Jensen, O. A., & Dalva, C. D.	2015	Studies in Communication Sciences	Elsevier	4
15	International Environmental Law and Sovereign Wealth Funds	Richardson, B. J.	2015	International Environmental Law and the Global South	Cambridge University Press	1
16	Ambiguity, discretion, and ethics in Norway's sovereign wealth fund	Hachigian, H.	2015	Business and Politics	Walter de Gruyter	0
17	Charity ethical investments in Norway and the UK	Kreander, N., McPhail, K., & Beattie, V.	2015	Accounting, Auditing & Accountability Journal	Emerald	3
18	Predictability of sustainable investments and the role of uncertainty: evidence from a non-parametric causality-in-quantiles test	Antonakakis, N., Babalos, V., & Kyei, C.	2016	Applied Economics	Routledge	14
19	Sovereign Wealth Funds as Socially Responsible Investors	Karametaxas, X.	2017	International Economic Law	Springer	1
20	Factor Investing and ESG Integration	Melas, D., Nagy, Z., & Kulkarni, P.	2017	Factor Investing	Elsevier	5
21	Sustainability performance of countries Based on the example of Oekom research AG's country	Bönning, M.	2017	Managing the Business Case for	Taylor & Francis	0

	rating			Sustainability: The Integration of Social, Environmental and Economic Performance		
22	Connectedness network and dependence structure mechanism in green investments	Lundgren, A. I., Milicevic, A., Uddin, G. S., & Kang, S. H.	2018	Energy Economics	Elsevier	35
23	Sustainable Financing for Sustainable Development: Understanding the Interrelations between Public Investment and Sovereign Debt	Ari, I., & Koc, M.	2018	Sustainability	MDPI	11
24	The Norwegian government pension fund global, corporate social responsibility and climate change	Wirth, E.	2018	Revista de Economia Mundial	Universidad de Huelva	1
25	Regime Type and Sovereign Wealth Management: Implications of Cyber-Democracy on Sovereign Wealth Fund Investment Behavior	Braunstein, J.	2018	Handbook of Cyber- Development, Cyber- Democracy, and Cyber-Defense	Springer	0
26	Sovereign wealth funds, shareholder activism and socially responsible investing: impact on corporate governance and sustainability	Yin, W.	2018	International Journal of Green Economics	Inderscience	0
27	Producing the ecological economy: A study in developing fiduciary principles supporting the application of flow-fund consistent investment criteria for sovereign wealth funds	Farrell, K. N., & Löw Beer, D.	2019	Ecological Economics	Elsevier	3
28	State investments and human rights? The case of the Norwegian Government Pension Fund Global	Kreander, N., & McPhail, K.	2019	Accounting, Auditing & Accountability Journal	Emerald	3
29	Investment Ethics and the Global Economy of Sports: The Norwegian Oil Fund, Formula 1 and the 2014 Russian Grand Prix	Næss, H. E.	2019	Journal of Business Ethics	Springer	1
30	Promoting responsible sovereign lending and borrowing: the role of	Pavlidis, G.	2019	Journal of Financial	Emerald	0

	sovereign wealth funds			Regulation and Compliance		
31	Sustainable financing for climate and disaster resilience in Atoll Islands: Evidence from Tuvalu and Kiribati	Taupo, T.	2019	Pacific Economic Review	Blackwell Publishing	5
32	The static and dynamic connectedness of environmental, social, and governance investments: International evidence	Umar, Z., Kenourgios, D., & Papathanasio u, S.	2020	Economic Modelling	Elsevier	16
33	The global sustainability footprint of sovereign wealth funds	Liang, H., & Renneboog, L.	2020	Oxford Review of Economic Policy	Oxford University Press	5
34	Sovereign Credit Spread Spillovers in Asia	Guo, B., Han, Q., Liang, J., Ryu, D., & Yu, J.	2020	Sustainability	MDPI	0
35	Challenges and opportunities to scale up sustainable finance after the COVID-19 crisis: Lessons and promising innovations from science and practice	Quatrini, S.	2021	Ecosystem Services	Elsevier	6
36	Who owns tobacco stocks?	Blitz, D., & Swinkels, L.	2021	Journal of Asset Management	Palgrave Macmillan	1
37	Quo Vadis global forest governance? A transdisciplinary Delphi study	Begemann, A., <i>et al.</i>	2021	Environmental Science & Policy	Elsevier	0
38	Sustainability integration for sovereign debt investors: engaging with countries on the SDGs	van Zanten, J. A., Sharma, B., & Christensen, M.	2021	Journal of Sustainable Finance & Investment	Taylor & Francis	0
39	The Norway Model in Perspective	Chambers, D., Dimson, E., & Ilmanen, A.	2021	The Journal of Portfolio Management	Portfolio Management Research	0
40	How Norway's sovereign wealth fund negative screening affects firms' value and behaviour	Al Ayoubi, K., & Enjolras, G.	2021	Business Ethics, the Environment & Responsibility	Blackwell Publishing	0