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The impact of the ESG strategy of Sovereign Wealth Funds on the Environmental Sustainability of their portfolio companies, a mixed method approach.

Author: Nick Swinnen
Supervisor: Carlos Desmet
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Abstract

Given the limited research on the Environmental, Social and Governance (ESG) practices of Sovereign Wealth Funds (SWFs), this exploratory research leverages a relatively new mixed method approach focussing on four SWFs. It entails conducting interviews with Fund Managers to result in an understanding of currently used ESG practices and future developments, while collecting environmental sustainability scores for their portfolio firms through weighted Sustainalytics' ITR scores and ENCORE industry score mapping. The outcomes from the interviews and environmental sustainability assessments were linked through a cross-tabulated analysis, resulting in an understanding of the impact of the SWFs' practices on the portfolio firms. This resulted in insights for the literature and in managerial advice for SWFs, having found positive outcomes from: engagement in governance and ESG target setting with portfolio firms, well-designed ESG trainings for fund personnel, and alignment of financial and ESG sustainability in the SWFs.

UNIVERSITÉ CATHOLIQUE DE LOUVAIN
Louvain School of Management
Place des Doyens, 1 bte L2.01.01, 1348 Louvain-la-Neuve
Boulevard Emile Devreux 6, 6000 Charleroi, Belgique
Chaussée de Binche 151, 7000 Mons, Belgique
www.uclouvain.be/lsm

Foreword

This master thesis, concerning “The impact of the ESG strategy Sovereign Wealth Funds (SWF) on the Environmental Sustainability of their portfolio companies, a mixed method approach.” has been written as part of the graduation requirements for my master’s degree in the CEMS Double Degree “Master [120]: ingénieur de gestion, à finalité spécialisée” at the Louvain School of Management.

Within the context of Business Engineering and International Management the growing importance of sustainability related topics has sparked my interest to craft a deeper understanding of its dynamics. This especially within the financial sector, which has been shown to have a profound impact. The thesis was completed in parallel while I was engaging in a traineeship at the European Investment Bank, as part of the Climate-related and Environmental Risks Unit, again underlying my profound passion for this continuously evolving topic. This is also the reason why I decided to submit in the August – September session.

The setup consisted of interviews and a quantitative analysis of the results. This gave me the privilege to engage with fund managers of the most prestigious funds, creating a skill set of clear communication and understanding of insights provided by them. Additionally, I created a better understanding of the SWF and ESG assessment landscape, from a different point of view.

This work is also intended to be a contribution to the literature surrounding the ESG appetite and mechanisms at Sovereign Wealth Funds, which seemed to be in a relatively exploratory stage with limited insights on the current practices and results.

On a final note, I want to especially thank my academic supervisor Professor Desmet for his support throughout this research, helping with the setup and structuring of the thesis.

Nick Swinnen, Louvain-La-Neuve, July 30, 2024

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1. Introduction

With a total estimated assets under management of more than 12 Tn USD as of 2024, the importance of Sovereign Wealth Funds in the contemporary financial landscape cannot be neglected (GlobalSWF, 2024). Yet, the need for more research on the implications of ESG and Sustainability within the strategy of SWFs is apparent (Wurster & Schlosser, 2021), given ESG's rising importance due to its strategic, managerial, and even financial implications (Gerard, 2018; Hastalona & Sadalia, 2021), for instance, stating that it would be beneficial to research the ESG score of concrete investment decisions of SWFs, to enhance the proper understanding behind it. Building upon this, the relevance of linking the ESG approach of SWFs to the one of their target firms can be drawn from the already shown differences in the literature with for example Urban (2017), finding that SWFs' ownership has a positive impact on some financial metrics such as the price to book value of the companies. The findings that financial metrics are influenced leads to the possibility that this influence also exists within the ESG approach. This is strengthened by Bortolotti et al. (2015), who found that the level of SWF involvement influences the financial performance of the firms, which should now be evaluated for Sustainability performance. The importance of the level of involvement is also a criterion that will have to be considered in this research, especially when looking at the categorization of the selected funds.

Given the significance of the intersection of ESG and SWF practices, and the previously highlighted gaps in the literature, this research will focus on two major research questions, being:

1. "Which mechanisms are being used by Sovereign Wealth Funds to stimulate the ESG approach of their portfolio companies?"
2. "What is the impact of the ESG approach of different SWFs on the Environmental Sustainability approach of the companies in the portfolio?"

Through these questions, this research will have a contribution to the literature by creating an understanding around the SWFs' ESG appetite and the ESG mechanisms being currently used at four SWFs and the impacts of these practices on the environmental focus of their portfolio. By using a semi-structured interview setting with Portfolio Managers and ESG Directors at the funds there is space left for their new initiatives through open questions, and there can be verified which initiatives found in the literature are being put into practice across the firms, to afterwards verify their impact on the portfolio companies.

Building upon this, the methodology being used in this exploratory stage of ESG research for SWFs entails a newly used mixed method approach, linking the qualitative findings on Manager's views to the quantitative results from the Environmental Sustainability of the portfolio companies, represented through Sustainalytics' ITR scores and an ENCORE climate impact industry mapping which were also weighted based on the investment amounts. Consequently, the linking is done through a cross-tabulated analysis.

In terms of conclusions, some interesting highlights should be addressed. When it comes to the current practices being used, a striking finding was that none of the firms used positive screening methods, which together with prior literature led to the conclusion that ESG practices are primarily leveraged as risk mitigation and stabilization factors and not as inherent contributions. Additionally, the research found that some of the most beneficial practices being used at the funds contributing to more ESG oriented portfolio companies were: 1. engagement through good governance support and joint setting of ESG targets and milestones, 2. a holistic set of ESG related trainings offered to a multiple types of staff members going further than ESG or investment teams, and 3. an alignment and consideration of financial and ESG related sustainability considerations.

Going further with the future focus points of the firms and developments in the field, biodiversity is expected to play a central role, which in this research was being addressed as a main regulatory driver influencing the funds' ESG practices. Additionally, the link between ESG and financial data is also a broadly analysed topic amongst the SWFs, expected to get even further attention towards the future, which is an interesting shift given the ESG-financial sustainability alignment has also been addressed as one of the beneficial practices in making portfolios more environmentally sustainable. When finally conducting a more granular analysis of portfolio impacts, no clear link was found between the funds' CO_2 assessments and the firms' GHG emission impacts.

Additionally, the funds' portfolio analyses in terms of industry and ESG impact showed unexpected outcomes, having limited levels of sectoral diversification amongst the firms and having a slight normal distribution in terms of ESG scores, with only a limited amount of extreme ESG-scored companies.

On a side note, it has to be stated that the main outcome and goal of this research is creating an understanding of the practices that are being used by these funds and their effect

on the environmental sustainability of the funds' portfolios, hence the goal is not generalizing these findings, given the limited scope and sample size of this research.

Finally, the paper will be structured as follows. The Literature Review section will describe this paper's relation to the current literature, being followed by the Methodology section, which elaborates on the followed research structure. Then, the Data section will address some important coverage constraints, as well as the descriptive interview outcomes and portfolio compositions. Building upon this, in the Results section, links will be constructed between the different observations and conclusions will be retrieved, being translated in practice through the Managerial Suggestions section. Finally, the Conclusion section will give an overview of the key findings and contributions of this research, being followed by the Future Research section, which will shed a light on some areas which deserve additional attention within the existing research surrounding the ESG strategies of SWFs.

2. Literature Review

Looking at the literature concerning Sovereign Wealth Funds (henceforth SWF) and their ESG strategy, it became clear a lot of attention has been paid to the drivers of ESG preference by private investors and on how scores and other indicators enable fund allocation according to those preferences, underlining the growing significance of ESG topics (Hastalona & Sadalia, 2021). However, despite the relevance of SWFs, the translation of their ESG preferences to the use of indicators and the impact on the firms in their portfolios have been less studied (Dai et al., 2022; Wurster & Schlosser, 2021). In what follows, a light will be shed on the existing literature surrounding the three major points of this research, including the SWFs, the ESG practices in finance and the Environmental Sustainability at companies.

2.1. Sovereign Wealth Funds

In general, SWFs can be seen as government owned investment funds, however, as stated by Bahoo et al. (2020) there is no universally used definition within the literature. Hence, for the goals of this research we will use the definition from Kunzel et al. (2008), who defined SWFs as: "Government-owned investment funds, set up for a variety of macroeconomic purposes." Especially the implication that SWFs can have different purposes is important in our research, given this will be a factor to be considered when analysing the relation between the SWF ESG practices and the Environmental Sustainability results of the portfolio companies.

Additionally, the literature shows the importance of understanding the differences amongst funds, which requires proper categorizations. This looks specifically at the important distinction of geographical and industrial focus (Bahoo et al., 2020), as well as objectives, economic or political, of the fund (Alhashel, 2015), which will require having a clear understanding of the diversity in the analysed funds. Besides, when looking at the strategy of the fund, based on the Santiago Principles, five categories of SWFs were distinguished, being: saving funds, reserve investment corporation, pension reserve funds, development funds and stabilization funds (Kunzel et al., 2008), which is addressed and analysed by Al-Hassan et al. (2013). On a final, but crucial note, the question whether SWFs are seen as active or passive investors has also sparked a debate in the literature (Fernandes, 2014; Liu et al., 2021). In this regard, Bortolotti et al. (2015) stated there are both active and passive SWFs, and additionally finding that the type of SWF has an effect on the returns of the targeted company, a finding that is especially relevant when assessing if this is also the case in terms of environmental performance. This is therefore most certainly a valuable classification that will afterwards also require assessing the different ways of involvement the active firms engage in. One final distinction that will be made concerns Strategic Investment Funds, having a double bottom line, including sustainable development (Bortolotti et al., 2023). It is important to highlight this work will not consider these types of funds, and only focus on SWFs, in order to not confuse their different reasons of existence, which might otherwise affect the analysis.

2.2. ESG in Finance

The significance of the ESG topics has been growing strongly over the past years in both the literature as well as in the practical and managerial implications it has (Hastalona & Sadalia, 2021). Nevertheless, as addressed by Garcia et al. (2017), there is still no clear definition, resulting in multiple terms being interchangeably used, looking at for instance sustainability and corporate responsibility. Additionally, Garcia et al. (2017) constructed a categorization across the definitions, being useful for the purpose of our research. Within the light of our research, focus was laid on the category which is linked to the use of ESG scores in finance, as this is most representative in the assessment of SWF practice, resulting in the definition, where ESG investing refers to: “The incorporation of Environmental, Social or Governance concerns into the decisions of investors” (Rau & Yu, 2023).

When discussing the current ESG approach within finance, a strong suggestion was that ESG scores tend to have a positive effect on the financial performance of a company (Friede et al., 2015; Gerard, 2018; Nguyen et al., 2022). This might already be an interesting basis to think that it is beneficial for the SWF to ensure proper ESG performance. Considering SWFs, it has been found that the overall objective is to maximize the financial return and minimize the risk, which implies the importance of the stability and long-term view (Liang & Renneboog, 2020; Mohseni-Cheraghlou, 2017). Liang and Renneboog (2020) did find that SWFs do take the ESG performance into consideration in the decision process, a finding that lies at the basis when looking at our research question. Going further, Dai et al. (2022) found evidence that firms' stronger CSR scores attract more SWFs' investments. Even when this highlights the funds' interests in CSR and ESG related investing, the question remains at which stages of the investment and how ESG metrics are considered and implemented. Additionally, Bortolotti et al. (2023) laid the further link between ESG policies and SWF's alignment of the capital deployment with the Sustainable Development Goals (SDG's). Nevertheless, it is important to counter this with the finding that the current research does not show that engagement of SWFs helps in improving the ESG performance of target firms (Liang & Renneboog, 2020; Alhashel, 2015). The combination of these findings lays an important basis to be assessed, especially when adding the consideration that was discussed seen in the categorization section, showing it is clear that SWFs have different approaches, resulting in different outcomes. Hence, this underlines this should be taken into consideration in this research, looking at amongst others the fund selection, differentiation, and analysis.

2.3. Corporate Environmental Sustainability

An additional relevant part to this research is the current view and practice surrounding Environmental Sustainability and ESG approach within corporates. First and foremost, it is of course paramount to select a proper definition for Environmental Sustainability, which in the scope of our research, will be the definition that has been previously related to corporate governance in the literature, given our context of SWFs' influences as a shareholder and investor. Hence, the definition will be used from Aguilera et al. (2021) and Walls et al. (2011): "The set of corporate behaviours and strategies that mitigate a firm's impact on the natural environment, which include implementing products, processes, and policies that reduce

energy consumption and waste, us[ing] ecologically sustainable resources, and employ[ing] environmental management systems."

Going further, overall, the growing importance of the interwovenness of sustainability, with environmental sustainability as a subset, within business has been clear (Borland et al., 2014; Huang, 2019), and given the focus of this research on what the impact will be on the portfolio companies, especially the effectiveness of practices and current evolutions are valuable to further address. In this regard, the systematic literature review from Dzhengiz and Niesten (2019) found that environmental competences have a positive impact on the firm's environmental performance, while also being influenced by the context, looking at for instance the stakeholders' pressure. This is a valuable finding in terms of the potential influence coming from SWFs, being the shareholders of the firm and having the potential to influence them through shareholder activism, applying pressure to the portfolio firms. Additionally, Çop et al. (2020) highlighted the importance of internal changes, looking at the positive effect of green transformational leadership. Similarly, Dzhengiz and Niesten (2019), and Laasch and Conaway (2015) clarify this within the field of overall responsible management in its contribution towards competence building. An interesting result will be to verify the potential influences SWFs and their Investment Managers can have on the companies' leadership and sub consequently its responsible management practices, if any.

3. Methodology

3.1. Mixed Method Approach

For this research there was made use of a mixed method approach, looking at the ESG practices of the SWF, and analysing the relation with the Environmental Sustainability performance of the companies in the portfolio of different SWFs. Firstly, there is the ex-ante measure, being the qualitative interviews, which allows to define a first appetite and integration of ESG mechanisms in the different SWFs. Then, there is the ex-post measure, which allows to measure how SWFs transform their ESG appetite and mechanisms into investment decisions and Environmental Sustainability performance of portfolio companies. It should also be highlighted that the followed mixed method approach, leveraging interviews, has also been used to some extent in the analysis of the ESG approach of Private Equity funds by Zaccone and Pedrini (2020). This approach has shown to contribute in getting the needed

understandings of developments within the Private Equity business, and could hence have a potential added value when translated in the context of SWFs.

This approach was adopted, given the prior literature review has shown the literature concerning the ESG approach of SWFs is still in a developmental stage, and only a limited view is available on the actual ESG integration mechanisms being followed within the funds. As stated by Liamputtong (2019), qualitative interviews are especially valuable to gain this exact understanding, which is still needed. This was especially the case in identifying which practices are mainly used at SWFs to stimulate the ESG approach of their portfolio companies, given the lack of insights on this in the literature. On the other hand, the Environmental Sustainability scores, as part of ESG scores, of the target companies are usually better addressed in the literature, providing the potential to better quantify these, and analyse and aggregate them on a portfolio level. On a final note, the linking of the qualitative and quantitative data will be done through a cross-tabulated analysis (Momeni et al., 2017). In conclusion, the overall mixed approach can still be considered as a very novel one, hence being a valuable addition to the literature in terms of newly tested approach.

3.2. Interviews

The organisation of the interviews was based on the best practices highlighted by Remenyi (2022). There was especially focussed on Fund Managers and ESG experts at the funds to get relevant insights for the questions. These people were contacted through the fund's general contact point or directly through LinkedIn. Important to notice is that two managers were not available to have a conversation and hence decided to answer the questions in a written format. Given the elaborate version of their answers this was deemed as still valuable. The questions were carefully constructed based on the existing literature and previously conducted interviews on Responsible Investing and Sustainability within finance. This resulted in a semi-structured interview, with clear questions having a dual use in guiding the conversation. They firstly addressed which ESG practices and mechanisms seen in the literature were implemented by the funds (15 questions) and secondly leaving space for in depth discussion on additional methods the fund is using, to create new insights (3 questions and open discussion). The 18 questions (See Appendix A) related to 6 main ESG topics, being: ESG screening methods, ESG internal training, data usage, management, target company involvements and future projections. For the ESG screening methods part, besides the

negative screening methods, there was also looked for positive screening methods, as this has been identified by Andersen and Dreyer (2023) at the Danish Pension Funds as a potential ESG rating methodology. Going further, attention is given to the internal ESG-related trainings available for fund managers, looking at whether they are mandatory and being seen as helpful in the investment decision itself. Then light was shed on the ESG data usage, looking at which type of data is being used (E.g., externally, or internally sourced), this, given it has been highlighted in the literature how ESG data sources strongly vary in terms of validity and reliability (In et al., 2019). As a fourth topic, the ESG-management-related questions look at whether managers' projects' ESG impacts are being tracked, if there are financial bonuses for managers based on ESG-related targets and if the fund has already actively exercised its voting rights on ESG-related topics. This final question was introduced, as it has been highlighted by (Clements et al., 2020) that active ownership on ESG topics was strongly used across the 20 biggest SWFs. Besides, this also underlines once again the importance of the SWF categorization based on investment involvement (active/ passive). On the counter side, there was also taken a look at how the fund assesses the target company through ESG results, milestones and GHG emission results. On a final note, the fund manager's view on future ESG developments in general and at the fund were addressed to get a pulse on the current dynamics and important topics at each fund.

3.3. ESG rating

When it then comes to the assessment of the ESG level of the target firms in the SWFs' portfolio, and more specifically their Environmental Sustainability approach, more complexity is involved. Dorfleitner et al. (2015) pointed out the divergence of the use of measurements in ESG scoring approaches, after analysing three ESG rating systems being: the ASSET4 database, the KLD ratings provided by MSCI ESG STATS and the ESG data set of Bloomberg Sustainability. This finding was confirmed on a larger scale by Clément et al. (2023), who addresses the difficulties in a proper understanding of the differences across the scores, highlighting the importance of a methodological alignment of the used metric with the research purposes. Additionally, when deciding upon the used metric for this research, consideration was given to the usage within the industry itself besides the literature, to enhance representativeness and value of the outcomes.

This firstly resulted in the following metrics: Sustainalytics' and MSCI Implied Temperature Rising Score (henceforth ITR) and the SBTi temperature alignment validation, which all follow the concept of alignment with global temperature goals, which is in line with the methodology of this research (Low Carbon Transition Ratings, 2024; ESG Fund Ratings, 2024, Target Dashboard, 2024). Not to confound the different methodologies behind the approaches and given some limited coverage of the MSCI and SBTi scores, this research will use the Sustainalytics' score, having the highest coverage across portfolios (Appendix F, Table 1), and a clear proven worth in the literature (Anton and Huij, 2022). Their ITR score will be used as the main Environmental Sustainability metric, being defined as: "The temperature to which degree the world would warm if all companies expected emissions differed from their net-zero budgeted emissions to the same degree as this company.", with the net-zero budget being defined as: "The company's allotment of a potential future global net-zero carbon budget until the year 2050." Concerning the non-covered companies, given previously discussed divergence across ESG metrics it was not possible to use these metrics in parallel to fill up the gaps, hence these were assessed through an industry proxy. This proxy was reached through an industry mapping with the ENCORE Tool (ENCORE, 2024), which assesses sustainability impacts of different industries. The assessed factors by ENCORE, ranging from GHG Emissions to pollution criteria, show good alignment with the methodology of the discussed Environmental Sustainability metric, hence being a useable alternative for the purpose of this research. In this regard, the following steps were followed. All companies that were not by the Sustainalytics ITR score were mapped in industries within ENCORE. Then the ENCORE scores across industries were standardized and mapped to the standardized ITR scores from the entire Sustainalytics database. This way, it became possible to attain a certain ITR score for each ENCORE industry, resulting in scores for the portfolio companies. Nevertheless, one important factor that is not considered in this mapping is the company specific adjustment being used in the Sustainalytics ITR methodology, represented through their management score. To take this into consideration, a flag was added to the sustainability-oriented firms, resulting in an adjustment of their attained ITR scores. The final score which was used as a proxy representing the ESG level of the funds' portfolios, was an average of the Sustainalytics ITR scores and the ITR scores gained through the ENCORE mapping. Henceforth there will be referred to this average of the portfolios as the ITR score. In order to ensure proper alignment between the Sustainalytics ITR score methodology and

the ENCORE mapping methodology also a cross analysis will be performed, performing the ENCORE mapping also for the portfolio companies covered by Sustainalytics, in order to assess the alignment between the two scores.

Besides the ITR score itself, there will also be calculated a weighted ITR score based on the portfolio investments across the firms. This to better represent the actual investments of the funds across the portfolio.

One final additional analysis that was done through the granularity of the ENCORE industry mapping is assessing the GHG emission impact. Given ENCORE addresses this as one of the industry indicators, it can be used to assess the number of companies being part of a highly emitting sector per funds' portfolio. This will then be linked to the question whether the funds perform CO_2 assessments on their portfolio firms. Given the high amount of portfolio companies which were analysed through the ENCORE mapping this will be able to give representative results.

3.4. SWF selection

When looking at the categorization, as stated in the review by Bahoo et al. (2020) of the current literature on SWFs, there is a fundamental need within the research for more comparison amongst the funds, being strengthened by Gangi et al. (2019) stating that there is currently insufficient evidence of the influence of these differences amongst SWFs on their performance and the performance of their target firms. This has been considered in the fund selection of our research, given the low amount of funds analysed, there was only differentiated on a small number of metrics, keeping similarities for others to prevent the categorizations from impacting the results. Following the points addressed in the literature, the main factors that were considered were location, geographical focus, and fund type/ approach (Aguilera et al., 2016; Alhashel, 2015; Bertoni & Lugo, 2014). Before elaborating on the classification, it must be stated that at first, 14 funds were contacted in total, however given limited responses there was only proceeded with the four funds that answered and were willing to participate in the research. This is especially important given the findings from Wurster and Schlosser (2021), who stated that the ESG disclosure of SWFs also shows their actual intensions on being ESG oriented. Therefore, the aspect of only considering the funds that were open to support the research entails a restriction of this research which can create biases. This is also confirmed through the LM Transparency Index of Boubakri et al. (2016),

with a very high score for three out of the four funds (ÖBAG not being scored). In what follows an insight will be given in how the analysed funds were classified and a general overview of this can be found in Appendix B.

First of all, the differentiation amongst SWFs would be based on their active or passive approach, given the findings of Bortolotti et al. (2015) stating that this has already an impact on financial performance. This could hence be of value when looking at the ESG related impact. Nevertheless, given a big part of the interview questions also focussed on involvement of the funds with the portfolio companies relating to the research' goal of observing the impact of ESG practices of the funds, only active SWFs were analysed in this research. Going further, the concrete fund type categorization is based on the taxonomy used by Al-Hassan et al. (2013) and refined by Gangi et al. (2019). Out of the four categories (reserve, multi-objective, savings, and development), the four funds analysed in our research could be classified as multi-objective funds, being funds that pursue multiple objectives (Al-Hassan et al., 2013), given their broad focus stipulated in their mission statements. However, some minor differences in focus points should be addressed. ISIF could be considered as a reserve fund (specifically a pension fund), defined by Al-Hassan et al. (2013) as "designed to address future outflows based on commitments in the state budget to pay pensions", given it is the successor of the National Pensions Reserve Fund, still having inherited some of its objectives. Also, ÖBAG is a very particular fund, given there was found they only invest in 11 companies not changing or having other companies being added to the portfolio through the years. This atypical nature for a SWF is a crucial differentiation to be considered in the analysis of the results. It could additionally also be seen more as a development fund, "allocate financial resources to socio-economic projects, investing especially in infrastructure" (Al-Hassan et al., 2013). Linked to this objective also the source of funding is an important differentiation (Kunzel et al., 2011), hence in line with Boubakri et al. (2016) we took the distinction between commodity and non-commodity funds into account, with the four funds that were analysed all being non-commodity ones, meaning the main sources of financing come from foreign-exchange reserves and other sources (Aguilera et al., 2016). This is an interesting consideration, as Kunzel et al. (2011) stated that commodity SWFs might be more tempted to invest in asset classes that hedge commodity prices, hence being influenced by an additional external factor.

Another classification which was important is the geographical spread and investment. There are three European and one non-European fund and additionally two funds have mainly globally oriented investments (Bpifrance and Future Fund) while the other two are more domestically oriented, ensuring a good balance.

4. Data

First and foremost, some clarifications will have to be made concerning the data that was used and some constraints in terms of coverage. Additionally, an overview of the Sovereign Wealth Funds' portfolio compositions will highlight a limited sectoral diversification and initial differentiations in the level of Environmental Sustainability of the portfolios. On a final note, a synopsis of the outcomes of the interviews will show a diverging approach being used in terms of ESG practices established across firms.

Before addressing the data, an important consideration has to be made, as it was perceived during the data analysis process that some portfolios also consisted of an elevated number of minor investments in Small and Medium Enterprises or startups. Not to bias the data towards these minor investments, which usually appeared to be more environmentally sustainable, there was decided to put a minimum invested amount of 50 million EUR for these funds, ensuring still a large number of invested firms for the funds while not biasing towards small investments. Similarly, some portfolios also consisted of other funds in which the SWF invested. These were not considered, given the nature and goal of this research, consisting of the assessment of the ESG impact on portfolio companies and not on the funds being part of the portfolio, given this indirect approach would not be within the scope and goals of this research.

4.1. Sustainalytics and ENCORE Coverage

When cross-checking the coverage of different ESG scores for the portfolio companies of the targeted funds, it was noted a low coverage existed for some funds for the SBTi and MSCI scores. This was an additional reason Sustainalytics ITR score has been used, having the highest coverage amongst the discussed approaches in the methodology section (Appendix F, Table 1). Nevertheless, given the still weak overall coverage of 6% across all the portfolios, the non-covered companies were assessed through the ENCORE mapping.

Considering the previously stated divergence of ESG assessment methodologies (Dorfleitner et al., 2015), and to ensure alignment across the Sustainalytics and ENCORE methodologies, a cross analysis was performed for the companies covered by Sustainalytics (Appendix F, Table 2). It can be seen that overall Sustainalytics has a higher average outcome of 3.06°C compared to the ENCORE average of 2.64°C. However, the deviation does not appear in a consistent manner across the funds, showing for instance a higher ENCORE score for the Bpifrance. Moreover, given the minor differentiations in scorings, it seems like the used ENCORE industry mapping is an appropriate alternative, which can be properly used for the portfolio companies not being covered by Sustainalytics.

4.2. Portfolio Composition

When looking at the portfolio compositions across the funds (Appendix D), it becomes initially apparent that overall, most investments are made in technology related sectors, looking at Health Care Technology, Systems Software, Data Processing & Outsourced Services and Financial Exchanges & Data, four sectors which represent 63% of the total investment company industries across the funds. This is an important first finding, given these are considered as low to medium environmentally damaging sectors within the ENCORE mapping, with an ITR score ranging from 1.31-2.52°C. Additionally, it can also be seen that the funds invest mostly in a specific group of three to four industries, then diversifying through spread investments across industries, being especially visible in Bpifrance's and the Future Fund's strategies, which have respectively 59% and 67% invested in their top 3 industries.

When looking at the portfolio compositions in terms of ITR scores (Appendix E), the funds seem to have relatively normal distributions with only a low level of extreme investments. The average ITR score across funds is 2.2°C, which is mainly biased by the Future Fund and Bpifrance which have lower ITR averages and a higher number of firms in their portfolio. The respective averages are ISIF 2.35°C, ÖBAG 2.40°C, Bpifrance 2.24°C and Future Fund with 2.17°C (Table 1). This shows the spread across funds is relatively small, given the spread in ENCORE industries was between 0.95°C and 3.73°C for the lowest and highest emitting sector. Given Bpifrance and Future Fund clearly have the lowest ITR averages, they will be considered as more sustainable in the analysis and linking with the interview results. Additionally, the standard deviations of the portfolios were respectively ISIF 0.67°C, ÖBAG 0.88°C, Bpifrance 0.60 °C and Future Fund 0.95°C. This is important to address, given it

represents well ÖBAG's special nature of only investing in a very small number of firms in both environmentally positive and negative firms.

Table 1

Portfolio aggregated ITR score outcomes

Categories	ISIF	OBAG	Bpifrance	Future Fund
ITR Score Portfolio Companies (°C)	2.35	2.40	2.24	2.17
Weighted Average ITR Score (°C)	2.36	2.68	2.28	2.16

When addressing the weighted average ITR score, being respectively ISIF 2.36°C, ÖBAG 2.68°C, Bpifrance 2.28°C and Future Fund with 2.16°C (Table 1) an interesting observation is that these are very much in line with the ITR averages. The only significant shift is the aggravation of the score of ÖBAG, which witnesses a 12% increase, mainly due to its outspoken investment in Verbund AG, which is an electricity provider, and hence scores a very weak score of 2.81 °C in the ENCORE industry mapping. In conclusion, Bpifrance and Future Fund can still be seen as having the more sustainable portfolios given their low weighted average ITR scores.

On a final note, a strong distinction can be witnessed when looking at the amount of portfolio companies being part of an industry with a strong GHG impact, of which a detailed overview can be found in Appendix C, Table 2. Relatively per portfolio, in terms of ENCORE coverage, we got ISIF 35%, ÖBAG 38%, Bpifrance 14% and Future Fund only 7%, clearly showing how Bpifrance and Future Fund have less exposure to sectors with elevated GHG emissions. Worth noticing is that following the ENCORE scoring, 48 out of the 54 industries were considered as having an impact on the GHG emissions, ranging from medium to very high.

4.3. Interviews

Given the semi-structured format of the survey, linked to the dual goal, two different types of results were gathered in terms of understanding the funds used ESG mechanisms and ESG focus points. We will firstly address the category specific findings on which practices addressed in the literature are used by the funds. Afterwards, light will be shed on which alternative and new practices were brought forward by the funds.

4.3.1. ESG Screening Methods

When it comes to the ESG screening methods, it was apparent that most funds do have negative screening criteria mainly based on sector exclusions. The only exception was the Future Fund, which has merely a couple of sector exclusions (E.g., Military, tobacco…), but when looking at ESG standards they prefer to engage with firms instead of excluding any. On the contrary, ISIF addressed the strongest screening methodology using a red flag system based on ESG criteria including pollution and climate change management, clearly relating to the adaptation risks. Nevertheless, no fund used positive screening methods, limiting the extent to which they favour ESG performance when investing.

4.3.2. ESG internal training

All funds provided internal training on ESG topics to some extent, however some interesting differentiations can be made, especially looking at whether the training is created internally or externally. Bpifrance seemed to have the most holistic approach, having internally developed CSR trainings, and developing a digital platform that focusses on both pre-investment (screening methodology) and post-investment (defining ESG KPI's) stage. Also, the Future Fund seemed to have a very elaborative training offering, available to all staff on a variety of ESG topics. Additionally, it also ensured the continuous education of the Investment Stewardship and ESG team, which sits within the Investment Team. On the other side, ÖBAG relied on external trainings and a budget for its staff to get ESG certificates and ISIF had a very limited description of trainings provided to the investment and deal teams.

4.3.3. Data usage

Most of the funds have a dual approach of direct data collection from the companies and externally sourced ESG data, as the basis of their ESG analysis. For instance, Bpifrance engages in annual data collections from the companies for basic ESG data and the externally sourced data is merely for, e.g., carbon price estimations. Only the Future Fund seems to have a slightly different approach, given they source the ESG data only externally from specialist ESG data vendors, to use this data and analyse it through their own internal methodologies. The use of internal methodologies to make the ESG assessment, rather than basing themselves on external ESG raters, is also a common trend across the funds. Next, all funds except ÖBAG

confirmed to take the impact of ESG criteria on financial sustainability into account, where ÖBAG confirms this is the next step they are currently working on. The three funds already considering it all highlighted their long-term sustainability view which directly implies entanglement of both ESG and financial sustainability.

4.3.4. Management

For the first question, ÖBAG was the only fund which confirmed they have increased the value of a firm through ESG initiatives, addressing the case of Verbund AG, a renewable energy hydropower firm. The interviewee did not address which concrete practices were put in place and mainly stated its increased value was due to the growing importance of renewables and the company's contribution towards society. Adding to this, the person also addressed they tracked the ESG performance and stock market performance, simultaneously showing good results for this company. The other funds highlighted that they were not able yet to confirm this link but were in the process of exploring its potential towards the future. When it comes to the tracking of the ESG impact of a manager's ESG impact through projects, only ÖBAG and Future Fund confirmed to entail this analysis. Whilst ÖBAG merely used a limited set of qualitative metrics, Future Fund's practices consisted of a more advanced approach which, for listed equity managers, entailed regular meetings to assess the ESG and stewardship programs put in place by the manager, and routine ESG reviews of incumbent managers in other asset classes, while being in the process to further develop a standard set of ESG metrics for external managers to report on. On the third question concerning management bonuses related to ESG criteria, no fund confirmed to have this established so far. Only ÖBAG had an indirect approach towards this by having some managers being part of the board of the companies they invest in and then establishing mandatory ESG bonuses to be implemented in portfolio company's remuneration policies. On a final note, all funds confirmed to have used their voting rights actively on ESG related topics, even when Bpifrance made the nuance that they always have minority interests.

4.3.5. Portfolio company involvements

On both the questions whether the ESG results and CO_2 emissions of the portfolio companies are being tracked, Bpifrance was the only fund with a negative answer. Nevertheless, they were in the process of implementing a holistic ESG dashboard which would include the carbon

footprint. The other funds all confirmed the tracking, where Future Fund had the practise of monitoring all the firms to a certain extent and increase the monitoring further if specific concerns might arise. For the ESG-related management bonuses, interestingly, ÖBAG was the only firm for which it was mandatory to include this in the renumeration policy of the portfolio firm. Concerning the ESG milestones there is an interesting division, looking at ÖBAG which indeed has these milestones for its portfolio companies, while Future Fund sets appropriate targets together with the investment manager and company, Bpifrance only requires the company to set internal KPI's and ISIF only has its own targets at portfolio level. On a final note, all funds had some form of minimum governance standards, but in rather different ways. The most interesting new practices came from Bpifrance which sets a minimum amount of people a firm should dedicate to ESG topics. Additionally, Future Fund also underlined once again how much it values engagement, also in addressing the minimum governance standards, which is done in a collaborative way.

4.3.6. Alternative new practices

The major common development being focussed on by ÖBAG, Future Fund and ISIF is the biodiversity impact analysis they want to implement. An additional development highlighted by ÖBAG is that they are trying to assess the true value of dividends, internalising the ESG benefits or costs related to investments. Moreover, Future Fund also addressed the potential of incorporating the ESG criteria in the manager selection itself, an interesting initiative which was not yet addressed by this research, and which can potentially be looked at towards the future.

5. Results

Before analysing the results, it is important to stress these cannot be generalised towards all SWFs, given the very limited amount of funds that were considered. Additionally, the focus on a specific set of active funds having mainly a multi-objective commitment is also important. In what follows a light will be shed on the meaning of the results found in the interviews, understanding the implications of the used ESG mechanisms by the funds, and then linking them to the ITR results of the portfolio companies.

5.1. Portfolio composition

Even when not being initially part of the research question, as a sidenote, an interesting observation in light of the literature's prior findings is the limited sectoral diversification found within the analysed SWFs' portfolios. This counters to some extent the findings of Balding (2008) and Aizenman and Glick (2010), which highlighted the very diversified approach of SWFs in general. Hence, our findings show that even when there is a certain level of diversification, the funds analysed by us tend more towards the general trends such as technology and innovation. This not only needs to be considered within the analysis of the further results, given a strong trend towards some industries might influence environmental sustainability outcomes of the portfolio, but this also lays a basis for further research, verifying if this lack of diversification is a trend at other SWFs as well.

5.2. Used ESG mechanisms by the funds

It was seen that no funds use positive screening methods, which is an interesting finding, given Dai et al. (2022) stated that SWFs are more likely to invest in firms with higher CSR scores. Together with the findings in our research that most SWFs do track ESG initiatives and practices at the portfolio companies, and with the general long term sustainability view of SWFs addressed by Liang and Renneboog (2020), this leads to think that the funds indeed mainly consider the ESG practices as a risk mitigation and stabilization factor rather than an inherent intent to contribute to ESG sustainable development. This is a finding that should be further analysed through additional research for more funds.

Looking at the low usage of ESG-related management bonuses at portfolio company level, it has to be addressed how the view on these seems so be misaligned with the literature findings. Especially given Bonham and Riggs-Cragun (2024) found that these executive ESG compensations can motivate ESG shifts within a firm, under the premise of enough shareholders valuing ESG. Given the dynamic of these SWFs having high amounts of shares in their companies, the lack of using these bonuses should be further addressed through better analysis in future research.

Following this, questions also arise from the divergent approach of firms in setting ESG milestone for the portfolio firms, given the different levels of engagement. Balp and Strampelli (2022) already highlighted the unclarity on the effective implementation of engagement strategies in the context if institutional investors, also stating that it would be beneficial for

highly diversified ones to actively engage, in which we found is not being done strongly by most of the SWFs analysed given Future Fund was the only fund to jointly set the targets. Nevertheless, for Balp and Strampelli (2022) engagement was also strongly related to exercising the voting rights. The strong use of this is confirmed in our research given all the funds have used their votes on ESG related topics and it also confirms the earlier finding by Clements et al. (2020) on the broad usage of active ownership on ESG topics across SWFs.

When it comes to the rising interest in biodiversity impact for rising new practices, it has to be noted this can be related to the regulatory context, given biodiversity is part of the ESRS E4 requirement to assess the materiality and impact on biodiversity, as part of the Corporate Sustainability Reporting Directive (Directive - 2022/2464 - EN - CSRD Directive - EUR-LEX, 2022). Hence, the question: "How the funds are driven by regulations?" arises, given this was not yet discussed as a key driver of SWF investment decisions (Bahoo et al., 2020).

5.3. Relationship with portfolio companies' Environmental Sustainability

In analysing the link between the funds' initiatives and the ITR outcomes, as discussed in the data section, Bpifrance and the Future Fund will overall be seen as having a more sustainable portfolio given their low average and weighted average ITR score outcome. The outcomes of the interviews can be seen in a cross-tabulated analysis (Appendix C, Table 1) and these will now be linked to how sustainable the portfolio companies are. Overall, Bpifrance and Future Fund appeared to be differentiated from the other firms in their higher level of engagement approaches through governance standards and voting rights, their alignment of ESG and financial goals, and holistic view trainings provided.

Firstly, the strength of the level of engagement of both firms shall be addressed. Even when overall all funds use voting rights, there were other levels of engagement where clear differences arose, looking at the setting of the ESG targets and minimum governance standards to even the exclusion criteria. Especially Future Fund, having the lowest (weighted) ITR score, had the very different approach of not having exclusions based on ESG criteria, but rather assessing them and engaging in improvements. A similar approach was seen in the governance standards and the setting of the ESG milestones, given the Future Fund jointly sets targets with the portfolio firms and investment managers to work towards the requirements and adapt them based on the specific situations of the firms. Similarly, Bpifrance had the approach of focussing on internal KPI's for the firms themselves. This engagement was also

shown through Future Fund's ESG impact tracking approach, which was generally more advanced through stewardship programs put in place by the manager engaging with the portfolio firms. These results align with previous findings in the literature on the importance of ESG engagement and the impact on shareholder value (Gerard, 2018; Gond et al., 2018), where our research puts it in the context of having impact on ESG outcomes for SWFs' investments, which hasn't been confirmed by previous literature (Liang & Renneboog, 2020; Alhashel, 2015).

Secondly, an important distinction for Bpifrance and Future Fund is their stressing of the implications of ESG strategies on financial outcomes, given they both related ESG criteria to financial sustainability, where Bpifrance even concretized it to transition risk implications for their investments. This link seems to show these funds understand how ESG topics align with their goals of creating a financially sustainable portfolio. It therefore implies a rational link with the funds' higher portfolio (weighted) average ITR scores and underlines the findings of Liang and Renneboog (2020) on SWFs long term sustainability goals, where our research concretizes the bridge between ESG and financial sustainability.

Thirdly, even when all funds provided some form of training, the differences need to be addressed, given Bpifrance's and Future Fund's elaborate approach. They both have the combination of internal and external trainings, where especially the internally developed ones set them apart from ÖBAG and ISIF. Additionally, the targeting of the trainings to a broader scope, including all staff, is also a strong point of Bpifrance and Future Fund, being more holistic than for instance ISIF's sole focus on the investment and deal teams. This also can be related to the finding of Gond et al. (2018), who highlighted the importance of ESG learnings and knowledge creation for investors and even extending it to the potential of knowledge diffusion towards the invested companies. This relates back to the potential of engagement discussed earlier in our research, and hence, it could bring us to a potential finding of the value of engaging portfolio firms to a certain extent in these trainings.

Going further, looking at the additional more granular analysis through the GHG emission impact, it was clear that the portfolios of Bpifrance and Future Fund had the lowest GHG emission impact. Nonetheless, Bpifrance, having the second-lowest exposure to high emitting sectors with 14% of the assessed portfolio, was the only fund not having CO_2 assessments (Appendix C, Table 2). This could potentially raise questions about the added value of the assessments, while highlighting the value of the earlier discussed ESG milestones

and the engagement where Bpifrance had a stronger way of working. However, given the limited size of this research, further analysis would be required to confirm such findings.

As an additional remark, it must be addressed that nothing can be said about initiatives that were not or barely used by any of the funds, given their relatively new nature. For instance, given no funds provide bonuses for Investment Managers based on ESG criteria, no conclusions can be made in terms of effectiveness. These practices should be further analysed in the literature through alternative research methodologies.

On a final note, a central clarification is that even when Bpifrance and Future Fund had the highest (weighted) average ITR scores, they were not the ones with the most initiatives overall. It was especially ÖBAG, having the lowest (weighted) average ITR score, which had a high number of commitments confirming to have implemented 11 of the 15 assessed practices. Nevertheless, this underlines again the point of this research and cross-tabulated analysis, which was not to generalise or decide which fund performs best, but rather to find which types of initiatives seemed to have the best impacts.

6. Managerial Suggestions

Given the very specific format of the research targeted at four funds, this also enables us to give very targeted advice and share Managerial suggestions in terms of best practices for these funds and to some extent the industry as a whole. In this regard, suggestions on both levels were given, looking at future focus points and best practices for enhanced portfolio ESG outcomes.

6.1. Future developments

The two main developments addressed by the funds concerned the biodiversity assessment and the internalization of ESG impacts. As addressed, the biodiversity assessment can be seen as a regulatory drive followed by the funds. Nevertheless, the importance cannot be underestimated, as Future Fund also took the leap referring to the rising importance of Physical Risks, which can indeed also impact the portfolio companies, hence it needs to be taken into consideration in a proper risk assessment. Also, the internalization of ESG impacts, taking these into account for valuation methodologies or financial forecasting, is an interesting point that was addressed by the funds. Important is that ÖBAG addressed this should be in a dual way, looking at both the positive and negative impacts, in order to make better

assessments of the investments. Especially the positive ones might be a steppingstone towards including positive screening criteria. On a final note, an important suggestion from Future Fund is the growing importance of Artificial Intelligence in the ESG assessments. There are indeed companies arising leveraging AI's capabilities to assess companies ESG approaches more efficiently or even create suggestions for development.

6.2. Best practices

The best practices having shown the best effects at the analysed funds mainly relate to engagement, training, and alignment. In terms of engagement, it was seen that by jointly setting ESG milestones through the investment managers and firm managers, rather than forcing them upon a firm, better results were achieved. On the fund level itself, the importance of the type of training provided by the SWF to its own staff should also be highlighted. Besides external trainings, the value of internally developed trainings seemed to have a positive effect, especially when being offered to all fund personnel. On a final note, related to the future expected developments, a SWF's clear understanding and potential in linking its ESG results to financial outcomes was also considered as an important factor positively affecting the portfolios' ESG outcomes.

7. Conclusions

In conclusion, in line with the exploratory early stage of this academic field, this research entailed a relatively new mixed method approach, linking insights from interviews with Investment Managers and ESG Directors of four renowned Sovereign Wealth Funds to the ESG results of their portfolio companies through a cross-tabulated analysis.

Though the semi-structured interviews, an understanding was formed surrounding the current and future ESG practices being leveraged at these funds, addressing existing ones subtracted from the literature and finding new ones provided by the funds. This showed how biodiversity has been of growing interest to the firms, underlining a regulatory-driven approach. Additionally, internalization of ESG benefits and costs and incorporation of ESG criteria in the management selection process have also been found as newly developed practices by the funds. On the counter side it also highlighted the lacking use of some practices across the funds, given none used positive screening methods, which led to the conclusion of

these funds leveraging ESG practices as risk mitigation strategies, and neither did they use bonuses for Investment Managers based on ESG criteria.

Looking at the ESG data from the portfolio companies, which was retrieved through Sustainalytics' ITR scores and an industry mapping from ENCORE climate impact scores, and weighted through the invested amounts, conclusions were drawn from the SWFs' portfolio compositions. The ESG scores were distributed in a normal way, with only a minor number of extreme ESG score companies in the portfolios. Looking at the industries in which the portfolio companies are active, an unexpectedly low amount of diversification was found for the analysed funds, showing a stronger shift towards innovative technology companies, which should be further analysed for a bigger set of SWFs.

When then linking the outcomes from the interviews to the ESG data of their portfolios, three major initiatives were brought forward as most valuable in enhancing the ESG practices of the portfolio companies, looking at: engagement, training, and alignment. Firstly, a joint way of working between the fund, Investment Manager and the portfolio firms in terms of setting ESG milestones and targets seemed to have a more beneficial effect compared to forced metrics being established. Building upon this, even when all funds provided ESG trainings to their employees, it appeared that the funds with internally made trainings, complemented with external ones, had the best ESG outcomes for their portfolio firms. As a third initiative, alignment in terms of financial and ESG sustainability considerations appeared to have a positive impact as well. When finally performing a more granular analysis concerning the CO_2 assessments, no link was witnessed between the use of CO_2 assessments and the GHG emission impact of the portfolio companies.

In this regard, this research has contributed to both the academic literature as well as the managerial implications, not only performing an experimental methodology in a research field which is heavily being explored, but also by drawing conclusions in terms of proven practices SWF can follow in enhancing their portfolios' environmental sustainability and ESG practices.

8. Future Research

Given the exploratory nature of this research, entailing a mixed method approach, combined with only a limited number of observations looking at four funds, this research results in some key findings which should be further analysed in future research. Especially, a scaling of the

results and testing them for other SWF types will be valuable. This for instance entails looking at differentiations in the SWF types from the Santiago Principles, larger size SWFs and passive SWFs. One of the most important needed further improvements related to the transparency factor discussed within the research. Given now only funds that were willing to partake in the research were analysed, only relatively transparent funds were at scope, and given the findings of Wurster and Schlosser (2021) stating how ESG disclosures closely relate to ESG intensions, an apparent need for analysing less transparent funds is also needed. Given the size of this research this was not possible yet, nevertheless, future research done by more established research could potentially include such funds within the scope, broadening the findings.

Going further, a very important addition to the analysis could be to consider a time series, in order to get a better view of the evolutions of the environmental sustainability of the companies. Given a lack of data accessibility to historical portfolio compositions of the funds, this analysis could not have been performed in light of this research, even when being valuable to better assess the actual impact of the SWFs' ESG practices.

Additional areas and questions that arise from this research which can be further analysed, also relate to the extent of which the SWFs are driven by the regulations, as this was addressed in the case of their interest in biodiversity. It might be of great value to analyse to which extent international ESG regulations play a role as one of the investment drivers of SWFs, especially given their specific nature of being government owned. Going further, the potential of ESG related management bonuses at SWFs can be addressed in future research. This especially given no fund had this established, which made it not possible to better analyse this within the scope of this research. Besides confirming whether these bonuses are being used at other funds, there is also the potential of establishing case studies which assess the managers' investments' ESG performance in relation to having an ESG related bonus.

Moreover, the link between the CO2 assessments of the SWFs and the GHG emission impacts of the portfolio firms should also be further analysed, given no clear results were drawn from this research due to the lack of observations. Regarding the diverging approaches of ESG assessment methodologies addressed in the methodology section, it should be highlighted that it can be of great value to recreate this research with the use of an alternative ESG assessment metrics, looking at for instance SBTi or MSCI. This could ensure the robustness of the findings through different assessment methodologies.

On a final note, the assessed lack of sectoral diversification within the analysed funds also raised questions which shall be further addressed in future research through two main implications. Firstly, this requires this research to be recreated with funds which have more diversified portfolios, to ensure the results were not mainly linked to the sectoral focus of the analysed funds. Additionally, it will be interesting to analyse the trends in terms of industry investments and diversification approaches at multiple SWFs, to understand if a similar approach is followed across the industry.

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