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EXECUTIVE SUMMARY OF THE THESIS

Financial performance of ESG funds: a descriptive study on how their strategies impact invested companies' results.

TESI MAGISTRALE IN MANAGEMENT ENGINEERING – INGEGNERIA GESTIONALE

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1. Introduction

Environmental, Social, and Governance (ESG) investing has become a critical factor in investment decisions, leading to a significant shift in how investments are conducted and refers to evaluating a company's performance based on environmental, social, and governance factors. Investors are increasingly seeking to align their investments with their values and promote positive social and environmental outcomes, leading to the rise of ESG investing. The Covid-19 pandemic has accelerated the shift towards ESG investing, highlighting the importance of sustainability and resilience, with companies that prioritize ESG factors better positioned to weather the crisis. ESG investing has reshaped the way investments are conducted, with investors now incorporating even more ESG factors into their investment decisions. It has become an important consideration for institutional investors, including pension funds, endowments, and foundations, as well as retail investors. Companies are expected to comply with regulations related to environmental and social impact, and ESG criteria provide a framework for assessing it.

Private equity and venture capital funds have gained significant attention in recent years, with growing interest in understanding how ESG factors play a role in their investment decisions. Both types of funds have the potential to make a significant impact on the companies they invest in, and there is growing interest in understanding how ESG factors play a role in their investment decisions.

Investing in companies that meet ESG criteria is also expected to provide certain financial returns. Several studies have shown that companies that prioritize ESG factors tend to outperform those that do not. Companies that prioritize ESG criteria are also better equipped to manage risks, including reputational risks, and are better positioned to capitalize on opportunities related to sustainability.

2. Starting Points

This work expands on a through literature study on the main topics connected to ESG Investing, aiming at summarizing what has been previously defined in past studies. In particular, the main definitions analyzed by the authors are centered at Socially Responsible Investing, that underlines the importance of combining financial returns with social, ethical and environmental issues; UN Principles for Responsible Investing, principles launched to promote best practices and transparency in socially responsible investing, with a focus on environmental, social, and governance (ESG) factors; and Impact Investing, seeking to generate positive impacts, both financial and social. Another relevant focus of the analysis has been to investigate how Private Equity and Venture Capital funds embrace ESG connected themes, and how much their strategies have shifted towards ESG Investing into the recent years. Furthermore, the authors centered this work at understanding how funds can effectively generate financial and social returns.

The main goal of this thesis is then to understand if "Private Equity and Venture Capital firms that adhere to ESG policies outperform non – ESG funds in terms of financial performance? How do they impact the companies they invest in?" Main starting points have emerged from the literature review and have been set as the foundation for this work and will be further explored in this work through relevant descriptive and statistical analysis. They are the following:

- ESG investing is "*no longer niche, as it is entering in the mainstream, with more investors recognizing the long-term benefits of investing in sustainable and responsible companies*"
- Institutional investors and companies prioritizing environmental, social and governance factors tend to have better long – term performance, lower risk profiles, and are more attractive to socially responsible investors.

3. Research Questions

As previously stated, the purpose of this thesis is to examine the importance of ESG themes in investing, specifically in the context of private equity and venture capital funds. The literature review brought the authors to formulate four main research questions, centred at understanding and evaluating the performance of ESG funds compared to non-ESG funds, as well as the impact of ESG factors on the companies they invest in. Moreover, the main goal has been to provide insights into the potential benefits of ESG investing and the role it can play in promoting sustainable, socially responsible investments.

- RQ1. *Are ESG funds more profitable than non-ESG funds? Do they explicit a higher financial return?*
- RQ2. *Is it possible to state that there is a correlation between the funds_PEESGstatus and other significative variables about the fund itself?*
- RQ3. *Do ESG funds explicit a higher or lower IRR with respect to non – ESG funds?*
- RQ4. *Do ESG funds bring more value to companies than non–ESG funds?*

3.1. RQ1

The literature review section of the thesis brought the authors to the attention of ESG Investing and, having access to a Prequin database, it has emerged the possibility to directly analyze and provide insights on funds' profitability, in particular considering Private Equity and Venture Capital firms that adhere to environmental, social and governance practices. The main objective of this work is indeed to understand whether or not ESG funds are more profitable than non – ESG funds. Different scholars and relevant studies have tried to answer to this question, and the novelty that this work is bringing to the existing literature is a strong answer, result of a relevant study, having access to data from a global network of Private

Equity and Venture Capital funds. The result is made possible by the analysis of different variables that would be further presented and discussed in this work.

3.2. RQ2

The main variable analysed in the Prequin database has been *"funds_PEESGstatus"*, a categorical variable that is defining whether or not a fund is following environmental, social or governance practices. What had not been much explored by available literature is the attempt of defining which are the main characteristics of ESG funds. The authors have provided it, through a study on the correlation of this variable with other relevant ones such as the asset class, region, funds size and strategies adopted. In this way it has been possible to depict an interesting and defined "image" of what ESG funds are and which are the characteristics that distinguish them.

3.3 RQ3

The third question has been a central theme in this work, centred at understanding if ESG funds explicit a higher financial performance than non-ESG funds. The available literature is currently lacking on analysis focused on the Internal Rate of Return (IRR) and the authors have mainly based their result on the assessment of this variable, providing relevant insights on the profitability and financial return of investments. Together with this also measures such as Total value to Paid in Capital has been evaluated and studied to determine the success of the investment.

3.4 RQ4

To conclude, the fourth research question has brought interesting insights, filling a research gap for what concerns the connection between Private Equity and Venture Capital funds, and the companies receiving the investments. Indeed, the authors provided the existing literature with relevant information on how these companies are impacted by ESG funds and which are the main differences on both income statement and balance sheet measures with companies receiving funds from non-ESG funds.

4. Methodology

4.1. Data collection

The Prequin database has been selected for creating a comprehensive database that contains all the relevant deal information, company registries, fund registries, fund features and funds' financial performances. The database has undergone a cleaning process to ensure the consistency of data by removing inconsistencies within it. Then has been adopted a funds perspective by grouping the observations of deals per fund, to enable a more comprehensive, reliable and insightful analysis. This database collected data about 3,185 funds. After conducting all the analysis per funds, it has been merged with financials data of companies invested in by each fund. To do so companies registries have been inserted in Orbis and the accounting data of 62,112 companies, from 2021 to 2011, have been extracted. All companies' data have been joined to the Prequin deals database. Considering investments' deals, to provide a more accurate analysis, accounting data belonging to a period previous the year's deal have been removed. It has instead been decided to consider in the analysis the accounting data from the year's deal until the last available year in the time frame studied, that is 2021. The reason behind this choice is that in this way the improvements and the whole effect after 2 or more deals is directly visible on balance sheet and income statement measures. In this way there is no discontinuity in the positive or negative effect brought by deals [1]. In order to understand funds impact on companies, has been computed the percentage average of each accounting measure year-over-year, then has been reported to each funds the mean of that percentage change considering only companies invested in by each fund. After cleaning this database from data inconsistency and empty values, it was possible to assess the impact of only 853 companies invested.

4.2. Analysis methodology

The analysis is composed by 2 main parts: one focused on analyzing the dependence between descriptive and performance features of funds and their ESG status, while the second is dedicated on analyzing the impact that ESG vs non-ESG funds had on companies invested in. This subdivision is dictated by the great difference between the 2-database built. Considering this difference, two different methodologies of analysis have been selected. The first analysis has been conducted by looking at the descriptive statistics of each fund features considering 2 subsets: one with only ESG-funds and one only with non-ESG funds. Then, for each feature, several statistical tests have been conducted in order to assess if there was a statistical prove of non-independence between the feature under analysis and the funds' ESG status. The Chi-Square statistic test has been used to investigate the categorical feature, while for the numerical features, since they revealed to be non-normally distributed after analyzing QQ-plots and carrying out the Shapiro-Wilk test, has been run the Mann-Whitney U test. Afterward, several Machine Learning classifications algorithms have been run, setting as target variable the funds ESG status, as independent variable funds features. Random Forest Classifier has been selected as the best algorithm to maximize both the accuracy and the computational request to calculate feature importance and SHAP values. It validated the dependence between the funds ESG status and the funds features with an accuracy of 77%. The feature importance and SHAP values built using the Random Forest Classifier, agree on defining which are the most important features explaining the ESG status. Then, considering the limited shape of the database with impacts on companies, the next step has been to analyze descriptive statistics of each impact feature and statistical tests. These tests had the goal to validate statistically which fund impacts on companies invested in are non-independent with fund ESG status. For each feature reveals to be non- normally distributed. So, has been applied the Box-Cox transformation. After this transformation, the Shapiro-Wilk test confirmed that the transformed data are normally distributed. It has been then possible to apply the t-test, which statistically confirmed that the means of the subsamples are not equal, as intuited with descriptive statistics.

5. Findings

The results that come from the tests carried out, can be grouped as follow.

5.1. Funds features and ESG status relationship

All the statistical tests proved the non-independence between the funds ESG status and each funds feature, as investigated with the descriptive statistics while selecting the most relevant features. These features represent funds' asset class, size, core industries, region focus, strategy, and performances; they allowed to depict ESG and non-ESG funds main traits. ESG funds are mostly Private Equity funds, rather than Venture Capital ones and that is because the former have more power and control on the company invested. Another characteristic is connected to the Fund Size: ESG funds in most of the cases exhibit a larger size, because of their long-term investment focus, the necessity to have a strong reputation and more negotiating power, allowing them to strive for and accomplish greater ESG development. Moreover, it has been found that ESG funds operate mainly in the Energy & Utility or Consumer Discretionary sectors; while non-ESG funds in the Information Technology. ESG funds are more concentrated in Europe while non-ESG in Asia. The strategy adopted by ESG-funds are mainly Balanced and Buyout while non-ESG funds have a growth strategy. Considering funds performances, non-ESG funds reveal to be better in all the metrics analyzed: Net Internal Rate of Return, Total Value to Paid-in Capital, Distributions to Paid-In Capital, Residual Value to Paid-in Capital, and Called (i.e. percentage of GP's promised funds really called and invested). Another key metrics analyzed are the Fund Number Overall and Series. The first indicates how many funds were created by the same GP prior to the present fund, independent of the funds' strategy and it can be used to gauge a

GP's experience. Whereas the second displays how many of the GP's funds followed the identical strategy previous to the fund under scrutiny. It indicates the fund manager's experience with a certain approach. Interesting findings come out by the analysis of these two variables, in fact both reveal that ESG-funds have a higher average of the non-ESG ones. These findings bring out some criticisms from both Kaplan & Schoar and Phalippou & Gottschalg studies [2] [3]. The authors reported that is possible to assess a manager's competence level based on the number of funds they have managed and, as a result, the performance of those funds. Instead, has been discovered that while the non-ESG funds have greater performance in all the indicators than non-ESG, they have a lower mean of both Funds Number Overall and Series. These results show that ESG funds, despite a lower performance, usually have a more experienced management. However, it is important to point out that the analysis on funds performances metrics have been carried out on a lower database due to information's lack. This analysis restriction is too wide to consider it as a confutation of the studies analyzed, it ranges from an 80% to 85% database reduction, based on performance metrics took into consideration. In light of this extensive reduction, the performance measures were not used as independent variable for the classifications. Then, the classification algorithms were able to validate how much funds features can explain funds ESG status. The feature importance and the SHAP values reveal to have the same top 3 variables: the primary region focus in Asia, the primary region focus in Europe and the fund size. In fact, the funds with primary region focus in Asia are mainly non-ESG, while the one with the primary region focus in Europe are mainly ESG, and the fund size reveals a good non-discretionary feature to distinguish ESG status.

5.2. Funds ESG status implications on companies

The t-tests run on each accounting voices impacted come out with p-values lower that 5%. For each companies accounting voices impacted, the t-tests confirmed a statistical difference between the mean of YoY percentage changes of ESG-funds subset and the mean of non-ESG subset. The research shows that firms invested by ESG funds have a significantly higher growth rate in Intangible Fixed Assets compared to non-ESG funds. This may be due to ESG funds' focus on sustainability and social responsibility, leading to expenditures in areas such as research and development, patents, and brand creation. Additionally, ESG-focused firms are perceived as more trustworthy and socially responsible, contributing to increased brand recognition and customer loyalty. The study suggests that investing in firms through ESG funds may result in higher financial returns due to faster growth in Intangible Fixed Assets, benefiting both investors and society. ESG fund investments resulted in a 126.08% YoY rise in intangible fixed assets for enterprises, while non-ESG funds showed an increase of 99.98%. ESG funds' ability to promote sustainability and social responsibility, results in higher long-term performance and resilience, bringing to higher reputation and customer loyalty. Non-ESG funds may prefer tangible assets, which are simpler to value and sell, as a more secure investment option for short-term profitability. However, this short-term emphasis may come at the price of long-term sustainability and social responsibility. Companies invested by non-ESG funds had higher growth in cash and cash equivalents (193.86% YoY) compared to ESG funds (161.28% YoY). Those companies are more inclined to focus on long-term value development and financial stability, while non-ESG funds may invest in firms focusing on conventional industries like oil and gas or manufacturing, which can generate more rapid cash flows. Organizations that prioritize ESG policies tend to outperform their rivals in risk management, and innovation, indicating that emphasizing social and governance concerns can provide both short and long-term benefits. However, ESG funds' investments have a more predictable trajectory, due to a lower standard deviation in cash and cash equivalents growth. The difference in cash and cash equivalents growth between ESG and non-ESG funds may also be due to the amount of regulation and control that ESG funds are subject to; ESG funds may be subject to stricter regulations and require larger reserves for potential risks and liabilities, while non-ESG funds may invest in riskier assets. Further research is needed to explore variations in these findings across market segments, locations, and investment methods. Firms invested by ESG funds experience a 17.52% higher average rise in Total Assets compared to those invested by non-ESG funds, suggesting that ESG investment may contribute to greater asset growth and long-term value creation. Companies that prioritize sustainability are better equipped to navigate changing market situations, regulatory environments, and stakeholder expectations, resulting in higher returns and increased market value over time. ESG investment has a favorable impact on equity growth, with companies invested by ESG-funds growing at a pace 11.60% faster than firms invested by non-ESG companies. Such investments attract socially responsible investors, leading to higher valuations and stock prices, resulting in more significant market capitalization and higher shareholder equity. Companies invested in ESG funds have a smaller average rise in revenue from sales and services than those invested in non-ESG funds. Companies emphasizing ESG concerns may prioritize long-term revenue growth by investing in sustainable practices that benefit the world and society, creating a stronger reputation among stakeholders and improving long-term success. Firms invested in non-ESG funds had a higher average gain in EBIT than those invested in ESG funds. Despite the lower profitability of companies invested by ESG-funds, in the long run they could have a much higher profitability leading to a greater average, since the ESG-funds has proved to have a more experienced management.

6. Conclusions

Overall, this work allows the reader to gather deeper insights about ESG Investing, in particular on important definitions accessed through a thorough literature review. The main topics that have emerged are centered on **what are the main characteristics of ESG funds**, where they are located, and which are the strategies that they mostly adopt in the selection process. Moreover, other relevant insights are related to **their profitability, compared to non-ESG funds**. Despite many scholars have stated that ESG funds are more profitable than non-ESG ones, the study conducted brought to the opposite conclusion. Through the **analysis of the effects on invested companies** instead, it has been possible to state that ESG funds bring a positive contribution mainly on balance sheet items. ESG Investing has a strong effects on companies, but they are visible in the long run rather than in the short term and are more focused on balance sheet measures. To conclude ESG Investing would have even a stronger role in the future, being a good alternative in promoting in particular social responsibility and the right organization's governance. For everything that regards the Environmental perspective instead, too little has been done so far and the results are not as strong as could be expected. It is crucial that regulators will make consistent changes in the near future and take action to provide the financial ecosystem with a new framework.

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