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Can Warren Buffett's Investment Decisions Independent of ESG? Evidence from Berkshire Hathaway

Ziwei Chang[1,a,*]

[1]Business School, University of Sydney, Sydney, NSW 2008, Australia
a. zcha7409@uni.sydney.edu.au
**corresponding author*

Abstract: The past decade has witnessed a growing recognition of ESG (Environmental, Social, and Governance) investing, yet the application of ESG principles within Berkshire Hathaway, under the leadership of renowned investor Warren Buffett, has not been prominently evident. This study seeks to ascertain whether the historical investment decisions made by Buffett's Berkshire Hathaway, seemingly disassociated from active ESG involvement, may have nonetheless been subject to the influence of ESG factors. Employing methodologies encompassing correlation and regression analyses, this research unveils a discernible positive relationship between Berkshire Hathaway's investment quantities and the ESG scores of the invested firms. Moreover, companies demonstrating a positive trajectory in ESG considerations tend to be more aptly enlisted in the subsequent year's investment roster, while those witnessing a decline in ESG scores are prone to exclusion. In a comparative exploration of financial variables and ESG metrics, this study chose profit margin, ultimately revealing that ESG scores exert a notably more pronounced impact on Berkshire Hathaway's investment deliberations, specifically pertaining to share quantities, in contrast to the effect exerted by profit margin.

Keywords: ESG investing, Berkshire Hathaway, Warren Buffett, Correlation, Regression Analysis

1. Introduction

ESG investing involves considering not only financial returns but also a company's impact on the environment, society, and its governance practices. It evaluates factors like a company's environmental responsibility, social behavior, and governance structure to make investment decisions [1, 2]. It has gained global recognition in recent decades because ESG investing strives to unite financial aspirations with positive societal and environmental impacts. Advocates of this approach believe that companies proficient in managing ESG aspects exhibit greater sustainability and resilience over extended periods [3]. By taking ESG factors into account, investors can pinpoint businesses that are not only financially stable but also make beneficial contributions to society while mitigating potential risks associated with inadequate environmental or social practices [4]. Companies with strong ESG performance can attract a broader pool of investors, including those who prioritize sustainability. This access to capital can support growth initiatives and foster positive change [3, 5].

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Warren Buffett, a renowned investor known as the "Oracle of Omaha," is the driving force behind Berkshire Hathaway, a multinational conglomerate headquartered in the United States [6]. Guided by Buffett's expertise, Berkshire Hathaway has expanded into a diverse holding company, spanning sectors such as insurance, energy, manufacturing, and technology [7]. Recognized for his value-based investment approach and emphasis on enduring perspectives, Buffett has transformed Berkshire Hathaway into a symbol of enduring success and prudent financial management [8].

Berkshire Hathaway has been associated with a traditional value investing approach, which emphasizes financially strong companies with competitive advantages [8]. While Warren Buffett has shared opinions on various investment matters, integrating ESG considerations into investment decisions hasn't been a major focus of Berkshire Hathaway's strategy [8, 9]. However, the investment landscape has been evolving, and ESG awareness has grown across various sectors, including more traditional investment firms [10, 11]. Even though there might not be a clear-cut link between Berkshire Hathaway's practices and formal ESG investing, it's possible that the company, like many others, has been influenced by the increasing societal emphasis on ESG factors.

This study aims to explore whether there exists a connection between Warren Buffett's historical investment decisions, evidenced by Berkshire Hathaway's annual top 15 invested companies in shareholder letters, and their corresponding ESG scores. Despite the perception of Warren Buffett's limited emphasis on ESG criteria, this research seeks to ascertain whether his investment choices exhibit independence or correlation with ESG performance. By analyzing data spanning ten years, this study intends to enhance understanding of the potential impact of ESG considerations on Berkshire Hathaway's investment strategies.

The current research provides valuable information for individuals and financial institutions seeking practical insights and understanding of how Environmental, Social, and Governance (ESG) considerations can impact stock selection and investment decisions. It offers useful guidance on the real-world implementation of ESG factors in the process of choosing stocks for investment purposes.

The present study undertakes a comprehensive examination of the independence of Environmental, Social, and Governance (ESG) factors within the context of Berkshire Hathaway's investment decisions. This exploration unfolds through a series of analytical stages. Initially, the study delves into the correlation existing between the number of company shares invested by Berkshire Hathaway and the corresponding ESG scores of these companies over the respective years. Subsequently, the investigation delves into the potential relationship between the inclusion of new companies and the exclusion of existing ones from Berkshire Hathaway's portfolio and the resultant shifts in their ESG scores over the examined timeframe in stage two. Furthermore, the study extends its analytical framework by introducing an additional independent variable: profit margin, in stage three. This extension aims to discern whether the shares acquired by Berkshire Hathaway are influenced by a dual interplay of financial performance and ESG considerations. In essence, the research explores the multifaceted dimensions of ESG factors in Berkshire Hathaway's investment strategy, encompassing both quantitative correlations and multifactor regression analysis.

2. Method

2.1. Data Collection

The research period spans from 2012 to 2021, encompassing ten years of historical investment activities by Berkshire Hathaway. Annual lists of the top 15 invested companies were recorded from the Berkshire Hathaway Inc. Shareholder Letters webpage. These lists reflect the companies that Berkshire Hathaway considered its key investments, with the composition changing annually across diverse industries, including Financials, Information Technology, Energy, Health Care,

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Industrials, Communication Services, and Consumer Staples. This yielded a total of 39 distinct companies over the ten-year period. Concurrently, ESG disclosure scores for these 39 companies were gathered from Bloomberg, allowing for a comprehensive examination of the correlation between Berkshire Hathaway's investment choices and the corresponding ESG scores.

Meanwhile, the study involved compiling profit margin metrics for the 39 selected companies across the timeframe spanning 2012 to 2021. This essential dataset was systematically compiled to support the third-stage regression analysis, which sought to explore potential correlations between these companies' profit margins and their corresponding Environmental, Social, and Governance (ESG) scores. The incorporation of profit margin data into the analytical framework enhanced the investigation by introducing a financial dimension, thereby providing a comprehensive grasp of the intricate factors influencing Berkshire Hathaway's investment strategies. The study aimed to unveil potential associations between profit margin, ESG considerations, and investment decisions, ultimately enhancing the comprehension of the underlying interconnections.

2.2. Data Screening

For the purpose of the initial correlation analysis, only relevant years of ESG scores were considered. This ensured that the ESG data corresponded directly with the annual lists of Berkshire Hathaway's invested companies. Irrelevant years of ESG score data were excluded from the initial analysis. However, these excluded years provided supplementary guidance for exploring the potential influence of ESG considerations on Warren Buffett's company selections in stage two.

2.3. Data Analysis

Excel was employed as the primary tool for data analysis. This method facilitated the calculation of the correlation coefficient between Berkshire Hathaway's annual invested company lists and the corresponding ESG scores. By specifying the appropriate data ranges, the correlation coefficient and associated p-values were computed. The p-values were examined to determine the statistical significance of the correlations observed. This data analysis approach allowed for an objective assessment of the potential correlation between Berkshire Hathaway's investment decisions and the ESG scores of its invested companies.

2.4. Variables

There are two dependent variables in stage one. Firstly, shares invested by Berkshire Hathaway and the percentage of the company owned by Berkshire Hathaway. However, there is only one independent variable, the ESG disclosure score for the 39 companies in corresponding years. However, a new independent variable, profit margin, was introduced in stage three to extend the analysis with a finicial perspective.

The analysis conducted in this study involves two distinct dependent variables within the first stage. These variables encompass the shares invested by Berkshire Hathaway in companies as well as the percentage of company ownership attributed to Berkshire Hathaway. In this initial stage, the sole independent variable considered is the ESG disclosure score of the listed 39 companies across their respective years. Subsequently, the study progresses to stage three, where an additional independent variable is introduced.This new independent variable is the profit margin, which provides a financial perspective and reflects the profitability of the companies. The dependent variable in this stage is the shares invested by Berkshire Hathaway in the designated 39 companies in different years. This extension aims to explore the joint effects of both ESG disclosure scores and profit margins on Berkshire Hathaway's investment decisions. By incorporating financial indicators

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alongside ESG considerations, stage three delves into the intricate interplay between ethical and financial aspects that shape Berkshire Hathaway's investment strategies.

2.5. Predictions

As the global economy becomes increasingly interconnected, the pervasive influence of ESG factors may be more profound than initially apparent, even for stalwarts like Berkshire Hathaway. While this influence might not have been explicitly recognized, it is plausible that Berkshire Hathaway has inadvertently become subject to the ESG currents that traverse the modern economic landscape. Therefore, it is a logical conjecture that an underlying correlation could emerge between the ESG scores of invested companies and the shares allocated by Berkshire Hathaway. Furthermore, as ESG considerations are intrinsically linked with favorable company performance, an expectation arises that companies exhibiting commendable ESG scores would be favored for inclusion in the investment portfolio. Conversely, companies with inadequate ESG scores might face exclusion. This aligns with the conventional understanding that companies operating under ethical and sustainable practices tend to demonstrate resilient and robust performance. While traditional financial metrics, such as profit margin, remain a crucial facet of investment analysis, it is conceivable that their influence on the allocation of shares might be more direct and pronounced compared to the somewhat nuanced impact of ESG considerations. Thus, this study anticipates that while both ESG and financial perspectives will play roles in shaping Berkshire Hathaway's investment decisions, the traditional financial viewpoint may wield a stronger influence on share allocation, whereas ESG considerations will contribute in a meaningful yet perhaps more nuanced manner.

3. Results

3.1. Stage One

The correlation between ESG disclosure score and shares purchased by Berkshire Hathaway is significantly positively correlated ($r=0.349$, $p=0.000012$) for the total 10-year period while the correlation between ESG disclosure score and the percentage of company owned by Berkshire Hathaway is not significantly correlated. The correlation analysis reveals intriguing insights into the interplay between Berkshire Hathaway's investment parameters and Environmental, Social, and Governance (ESG) scores. Table 1 below presents the correlation coefficients.

Table 1: Correlation Investigation: ESG score vs. Berkshire Hathaway's Invested Shares and ESG score vs. Percentage of Company Ownership

Year	Correlation between ESG and Share	Correlation between ESG and percentage of company owned
2021	0.353	0.169
2020	0.107	-0.122
2019	0496	0.398
2018	0.538*	-0.331
2017	0.414	0.093
2016	0.187	-0.324
2015	0.337	-0.404
2014	0.279	-0.218
2013	0.159	-0.222
2012	0.140	-0.287

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Table 1: (continued).

10-year Toatal	0.349**	-0.100

Note: Without * p > 0.05, with * p < 0.05, with ** p<0.001.

While the correlation coefficients may not always reach statistical significance, a positive trend emerges in correlation with shares. It indicates that Berkshire Hathaway would increase its investment if there is a tendency for ESG scores to also rise. On the contrary, a negative pattern is observed for the correlation with the percentage of company ownership, with no statistical significance.

3.2. Stage Two

From 2012 to 2021, there are in total 39 companies invested by Berkshire Hathaway. While remaining a company list of 15 each year, it means Warren Buffet and his compnay need to decide which companies to continue investing and which to exclude from the list. Throughout 10 years there is 30 new companies added to the list and 30 companies have been excluded. By investigating the ESG trends of these companies where the addition or exclusion happened, two categories are formed: the addition of a new company when its ESG score is increasing and the exclusion of an existing company when its ESG score is decresing. The following Table 2 depicts the pattern observed between the addition and exclusion of companies to Berkshire Hathaway's investments and changes in ESG scores.

Table 2: Addition and Exclusion of Companies Relevant to the Trending of ESG score

	Dropping out of list with decresing ESG	Adding to list with increasing ESG
Number of companies	11	22
Percentage of addition / exclusion	37%	73%

These findings indicate a noteworthy linkage between Berkshire Hathaway's consideration of ESG factors and its investment decisions. The substantial majority of new additions exhibit an upward ESG trend, suggesting a deliberate preference for companies demonstrating positive ESG performance. Similarly, the correlation between decreasing ESG trends and companies being removed underscores a potential strategic alignment between ESG considerations and investment choices.

3.3. Stage Three

The regression analysis introduces a new layer by incorporating the profit margin constraint alongside ESG scores. The results indicate statistically significant and positive relationships for both ESG score disclosure and profit margin coefficients. Table 3 below presents the regression statistics and coefficients:

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Table 3: Regression Results of Two Independent Variables

	Coefficients	Standard Error	T Stat	P-value
Intercept	-248913013	76477623.23	-3.2547169	0.0014087
Profit Margin	6076479.42	1601951.495	3.79317316	0.00021668
ESG score disclosure	5809172.74	1401633.763	4.14457249	5.7262E-05
Multiple R	0.447			
R Square	0.200			
Adjusted R Square	0.189			
Standard Error	195657810			
Observations	150			

Regression analysis results indicate a multiple R of 0.447, demonstrating a moderate correlation. The R square of 0.200 suggests that 20% of the variability is explained by the model.

$$\widehat{\text{Share}} = 6076479.42 * \text{Profit Margin} + 5809172.74 * \text{ESG score disclosure} \quad (1)$$

The profit margin coefficient highlights a significant positive relationship ($p < 0.001$) between higher profit margins and more favorable investment outcomes. Intriguingly, the ESG score disclosure coefficient also demonstrates statistical significance ($p < 0.001$), reinforcing the notion that Berkshire Hathaway's investments tend to align with companies exhibiting higher ESG scores.

The covariance between profit margin and ESG score disclosure (16.68) further accentuates the interdependence between profitability and ESG performance, strengthening the argument for a complementary relationship within Berkshire Hathaway's investment strategy.

The regression analysis indicates that both the ESG disclosure score and profit margin are statistically significant independent factors. However, in terms of their respective t-statistics and p-values, the ESG score disclosure ($t = 4.14$, $p < 0.001$) appears to be relatively stronger than the profit margin ($t = 3.79$, $p = 0.0002$). This suggests that, within the context of the model, changes in the ESG score disclosure have a slightly more pronounced impact on the dependent variable (shares invested by Berkshire Hathaway) compared to changes in the profit margin.

4. Discussion

This study aimed to comprehensively explore the intricate interplay among Environmental, Social, and Governance (ESG) factors, profit margins, and investment decisions within Berkshire Hathaway's operations. The findings aligned with existing literature and projections in the initial stages, confirming the substantial role of ESG factors in shaping investments. Surprisingly, the third stage revealed a significant shift, where ESG disclosure scores overshadowed profit margins in predicting investment patterns.

While consistent with prior research, these outcomes presented a novel dimension. ESG disclosure scores emerged as a prominent predictor, prompting contemplation on the multifaceted causality underpinning investment dynamics. This divergence could stem from the limitation of relying solely on profit margins, without accounting for crucial financial indicators like ROE, PE ratio, D/E ratio, and market capitalization.

In summary, the comprehensive analysis uncovers a nuanced and intricate connection between Berkshire Hathaway's investment parameters, ESG scores, and profit margins. While some correlations may not achieve statistical significance, a coherent pattern emerges, suggesting a

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deliberate consideration of ESG factors alongside other investment criteria, potentially influencing informed investment decisions.

5. Conclusion

In summation, this study embarked on an in-depth exploration of the intricate interplay between Environmental, Social, and Governance (ESG) considerations and investment choices within the realm of Berkshire Hathaway. The culmination of findings derived from distinct analytical stages has contributed significantly to both theoretical comprehension and practical implications.

The outcomes of the initial stage of analysis unveil a discernible positive correlation between ESG scores and the volume of shares acquired by Berkshire Hathaway. A general tendency emerges, indicating that higher ESG scores correspond to increased share acquisitions. This observation is further refined through an exploration involving the inclusion and exclusion of companies based on their own ESG scores' trends. Notably, companies exhibiting an upward trajectory in ESG scores are likelier to join Berkshire Hathaway's investment roster, while those experiencing declining ESG scores are susceptible to exclusion.

The subsequent phase introduces a pivotal juncture, revealing the significance of both financial parameters -- profit margin and ESG disclosure score, in predicting share acquisitions by Berkshire Hathaway. Notably, ESG emerges as slightly more influential than profit margin.

This research serves as a crucial conduit, bridging an existing practical gap by highlighting the pragmatic utility of ESG scores in crafting investment portfolios. The empirical scrutiny of Berkshire Hathaway as a tangible case study yields actionable insights, offering tangible guidance to stakeholders navigating real-world investment scenarios. The implications extend extensively, catering to both individual investors and financial institutions, facilitating a harmonious alignment of investment strategies with ESG imperatives.

However, it is important to acknowledge the study's limitations. The restricted array of financial metrics in the third analytical phase beckons for future research to encompass a broader spectrum of financial variables. Such exploration holds promise in enhancing our comprehensive understanding of the intricate interplay between ESG dynamics and financial considerations within the investment paradigm.

References

[1] *Faure, J. ESG Investing: An overview of current and past trends, performance and challenges. (2021).*
[2] *Cornell, B. ESG investing: Conceptual issues. The Journal of Wealth Management, 23(3), 61-69 (2020).*
[3] *Cho, E. Time-varying preferences for ESG investments: evidence from an emerging market. Journal of Derivatives and Quantitative Studies: 선물연구, (ahead-of-print) (2023).*
[4] *Dai, Y. Can ESG investing beat the market and improve portfolio diversification? Evidence from China. The Chinese Economy, 54(4), 272-285 (2021).*
[5] *Andersson, E., Hoque, M., Rahman, M. L., Uddin, G. S., & Jayasekera, R. ESG investment: what do we learn from its interaction with stock, currency and commodity markets?. International Journal of Finance & Economics, 27(3), 3623-3639 (2022).*
[6] *Rosenbaum, E. For Buffett, Berkshire, beating Blackrock ESG may be as hard as beating S&P 500, CNBC. August 9, 2021. Retrieved on August 4, 2023. Retrieved from: https://www.cnbc.com/2021/08/09/for-buffett-beating-blackrock-esg-may-be-as-hard-as-beating-sp-500-.html*
[7] *Buffett, W. Berkshire Hathaway Inc. Shareholder Letters. Retrieved on July 14, 2023. Retrieved from https://www.berkshirehathaway.com/letters/letters.html*
[8] *Edwards, J. Risks and rewards of Berkshire Hathaway. August 16, 2022. Retrieved on August 2, 2023. Retrieved from https://www.investopedia.com/articles/markets/100115/biggest-risks-investing-berkshire-hathaway-stock.asp*
[9] *Cornell, B. ESG preferences, risk and return. European Financial Management, 27(1), 12-19 (2021).*
[10] *Leins, S. 'Responsible investment': ESG and the post-crisis ethical order. Economy and Society, 49(1), 71-91 (2020).*

[11] Kaiser, L. ESG integration: value, growth and momentum. Journal of Asset Management, 21(1), 32-51 (2020).