# Do ESG companies in Saudi Arabia outperform market risk factors? Empirical Evidence from the Tadawul Exchange

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## Abstract

Environmental, Social and Governance (ESG) is an approach aimed at increasing sustainability and promoting ethical and responsible practices. Although it is yet to be mandatory in Saudi Arabia and is still in its early stages, this has resulted in ignorance of ESG, as the benefit remains unclear. A 2021 Murad Ali did a study on ESG reporting in Saudi Arabia and found that there is a significant gap in ESG reporting in Saudi Arabia, indicating that ESG in Saudi Arabia may not be mature enough to be considered. Additionally, a 2020 research paper by Hussein Mohammad Salameh that used the 5-factor model, 3-factor model and CAPM concluded that due to the nature of the Tadawul exchange being different to the rest of the world due to Islamic Sharia and laws, it is challenging to find accurate results. This research paper aims to run a linear regression using the Carhart Four Factor Model to five portfolios that consist of the top 50 ESG firms in the Saudi Arabia Stock Exchange (Tadawul) to uncover if firms more aligned with ESG are outperforming market risk factors. Empirically, the results show that the top 20 ESG firms in Saudi Arabia outperform market risk factors on a consistent basis; more specifically, the p-value rejects the null hypothesis, which indicates ESG outperforming regular stocks on a risk-adjusted basis, with the rest accepting the null hypothesis. The results suggest that while ESG is still a new topic in the business world, firms that are implementing it may benefit in the Tadawul Exchange. It is worth noting that the majority of the firms in the highest-rated portfolio were banks and telecom firms, which could invalidate the result. Further research is necessary to conclude the impact of ESG on returns.

## Table of Contents

## Introduction

Can ESG be a viable investment metric? This is a question that recently has gained global relevance. With new government regulations and customer expectations that force businesses to align with ESG objectives, businesses in Saudi Arabia have seen increased pressure to improve their ESG awareness and implementation. With ESG in its early stages in Saudi Arabia, it is not yet mandatory across businesses and lacks awareness among stakeholders. This has resulted in poor ESG integration across many companies.

The increased pressure in Saudi Arabia to improve ESG in businesses was partially started by the Stock Exchange Tadawul, beginning in 2018 after they partnered with Sustainable Stock Exchanges to boost ESG integration in the listed companies. Furthermore, they continued with this path in 2020 after announcing Saudi Companies being included in the MSCI index (SSE Initiative, 2018). These actions by the Saudi Stock Exchange are interesting because ESG awareness is usually promoted by governments and then integrated into Stock Exchanges, whereas here it seems the opposite occurred.

ESG is the approach used to evaluate the social and environmental sustainability of companies. Its three pillars–Environment, Social, and Governance–aim to promote responsible and ethical practices among businesses. However, can be challenging to track ESG because there is not one main index used unanimously, as some indexes prefer specific criteria over others, which can cause confusion in tracking ESG in a business.

Social norms in different countries are another factor that influence ESG. Certain indexes may favor ESG metrics that are not common in certain countries, which can lower an ESG score for a business in something they cannot entirely control. For example, Deforestation in Environmental would be preferred by Brazilian ESG indexes due to the deforestation problems ongoing in Brazil, while ESG indexes in countries that do not have an ongoing deforestation issue would not weigh the issue as heavily. An ESG index that employs the same metrics for every country will likely provide inaccurate results, which is why it'll be important to use a variety of indexes to measure ESG rather than relying on one.

One of the main selling points for integrating ESG into a business is that a more sustainable future that can technically benefit companies in the long term, but is this always the case? This paper analyses various Saudi Arabian companies and measures their performance based on their ESG rating to determine if their rating can be a viable investment metric in the Saudi Stock Exchange (Tadawul). This will be done using historical return data and a standard portfolio evaluation model.

## Literature Review

In 2021, Murad Ali conducted a notable study on ESG practices in Saudi Arabia, a relatively underexplored subject in this region. The study revealed a significant gap in ESG reporting

among Saudi companies, with a limited number of them publishing Social Reports. This lack of comprehensive ESG data presents challenges for investors who are focused on ESG stocks, as it hinders their ability to effectively track and assess the performance of these stocks. The findings from this study suggest that the ESG market in Saudi Arabia may not yet be mature enough for effective implementation and investment, underscoring a need for enhanced ESG disclosure and reporting practices within the Saudi corporate sector.

Hussein Mohammad Salameh (2020) applied the 5-factor model on the Tadawul exchange and compared it to the CAPM and the 3-factor model. The author found that the 5-factor model does not necessarily have an advantage over the 3-factor model and CAPM. Additionally, they conclude that, due to the nature of the Tadawul exchange being different to the rest of the world due to Islamic Sharia, finding accurate results can be challenging due to complicating the return determinants.

The study conducted by Simin Chen in 2023 focused on investigating the impact of ESG on financial performance, specifically examining whether this relationship is moderated by digital transformation. The study utilized data from A-share listed companies in China, spanning from 2015 to 2021, to test this mechanism. The dataset comprised 15,710 unbalanced panel datapoints from 2,256 listed companies, excluding certain types of companies and those with missing data or high debt-to-asset ratios. ESG data were sourced from the Huazhong ESG rating system and financial data from the China Stock Market and Accounting Research (CSMAR) database and the National Bureau of Statistics.

The study adopted return on assets (ROA) as the dependent variable to reflect resource allocation efficiency, and ESG performance was measured using the Huazhong ESG rating system, which assigns grades based on quarterly ESG ratings. These grades range from 1 to 9, with higher scores indicating better ESG performance. For measuring digital transformation, the study conducted text analysis and word frequency statistics on the annual reports of listed companies, focusing on elements like AI technology, Big Data, cloud computing, blockchain technology, and digital technology application. This analysis utilized Python and the "jieba" word segmentation tool. The regression analysis revealed that ESG performance significantly and positively affects corporate financial performance, as indicated by ROA. This positive effect persists even when accounting for lag periods, suggesting a consistent influence of ESG on financial improvement. The study found that the enhancement effect of ESG on financial performance varied, being significant for non-state-owned companies and those in the eastern region of China, and more pronounced for polluting firms compared to non-polluting ones.

The 2023 study by William T. Smith analyzed the impact of ESG practices on stock returns in the US market from 2002 to 2020. The study replicated earlier research indicating that while socially responsible funds previously underperformed, this trend has diminished in recent years. The findings revealed that regardless of the ESG database used, neutral stock portfolios consistently showed higher systematic risk (beta) than ESG portfolios, although this gap has narrowed over time, likely due to increased demand for ESG portfolios. Contradicting earlier literature, the study found that risk-adjusted returns varied significantly based on the ESG rating

provider and did not consistently support the underperformance or superiority of ESG portfolios over time. This inconsistency led to the conclusion that the "ESG label" alone is not a definitive factor in determining portfolio performance.

Eraslan (2013) used the three-factor model in the Istanbul Stock Exchange based on monthly data spanning seven years,and the paper concluded that the book-to-market ratio has a significant effect in the Istanbul Stock Exchange, more specifically the firms with a high book-to-market ratio. This is significant and will be one of the factors used in this study, and with Istanbul having similar Islamic Sharia laws as the Tadawul Exchange.

Shaker & Khairy (2014) used five different models on the Egyptian Stock Market to compare the data they have gathered, and the models included CAPM, Fame & French three-factor model, the Carhart four-factor model, Fame & French five-factor model, and the liquidity-based four-factor model. The study used six portfolios based on book-to-market ratio and size. The study concluded that the Fama & French three-factor model was the best option. Similar to Eraslan (2013), with the Egyptian Stock Market having similar Sharia Laws to Tadawul, the results found here can be interesting to compare to the result of this paper.

## Theoretical Passage

### *Efficient Market Hypothesis*

The Efficient Market Hypothesis (EMH), posited by Fama and French in 1970, forms the foundational premise of this paper, which aims to discern whether ESG investing yields superior returns compared to non-ESG stocks, and more critically, if it is possible for an investor to consistently outperform the market through sustainable investing. EMH asserts that asset prices fully reflect all available information, suggesting that beating the market consistently on a risk-adjusted basis is unfeasible. Fama and French categorized market efficiency into three forms: weak-form, examining historical price information; semi-strong form, considering public information beyond historical prices; and strong-form, focusing on private information.

### *Fama-French Three-factor and Carhart four-factor models*

The Fama-French Three-Factor and Carhart Four-Factor Models are pivotal to this discussion. The Fama-French Model, introduced in 1992, aims to explain stock return fluctuations. It was a natural choice for regression analysis in this thesis, given its relevance in examining the performance differential between ESG and non-ESG companies. This model includes the market-to-book factor, reflecting a firm’s earning potential relative to its book value, and size, linked to profitability. Fama and French's findings indicate that, controlling for book-to-market equity, smaller firms often have lower earnings on assets compared to larger firms, known as the size effect. This model also incorporates the market factor, acknowledging that size and book-to-market factors alone can not fully explain the variance between average stock returns and risk-free returns. The Carhart Four-Factor Model further enhances this analysis by including

momentum as an additional factor, based on the observation that stock prices tend to continue their existing trends.

*Jensen's Alpha*

Jensen's Alpha, introduced by Fama and French, is a metric for gauging a strategy's ability to surpass market performance. It signifies a strategy's "edge" or "excess return" and is used to determine the abnormal return of a security or portfolio over its theoretically expected return. In this study, Jensen's Alpha measures the marginal return of investing in ESG companies against a standard market portfolio, like the Hang Seng Top 50. Alpha, the intercept in regression equations, can be positive, negative, or zero, reflecting the performance of an investment relative to a benchmark index.

*Capital Asset Pricing Model*

Finally, the Capital Asset Pricing Model (CAPM) is an essential component of this analysis. CAPM is a model that models the relationship between the expected return of an asset and its risk, quantified by its beta, which measures the asset's volatility relative to the market. CAPM posits that the expected return on an investment is a function of the risk-free rate of return, the investment's beta, and the market's expected return. This model provides a theoretical framework to assess whether the risk-adjusted returns of ESG investments differ significantly from those predicted by the market. In the context of this paper, CAPM serves as a benchmark to evaluate the performance of ESG stocks against market expectations, offering insights into the viability and effectiveness of ESG investing as a strategy to achieve superior market returns.

**Hypothesis**

While ESG metrics offer valuable guidance for businesses to enhance their sustainability and practices, they also entail significant costs. Most ESG-focused changes lead to increased expenses for companies. For instance, adopting clean energy solutions necessitates substantial capital investment, yet profits may not immediately reflect this investment. This financial burden of adopting ESG practices is a likely reason for the slower adoption of ESG practices in Saudi Arabia compared to other regions, where there is less government and consumer pressure to implement such changes.

The growth of ESG in Saudi Arabia is further hindered by the absence of mandatory reporting requirements for companies. The lack of publicly available ESG data makes it challenging to ascertain whether a business is adhering to ESG principles. This situation arises from a lack of regulatory enforcement and minimal consumer demand for ESG compliance, offering little incentive for companies to disclose their ESG efforts.

Additionally, businesses focusing on ESG initiatives might need to redirect resources from their core functions. Significant investment in ESG infrastructure, including the hiring of specialists,

can divert financial and human resources, potentially impacting profitability. This shift in focus and resource allocation may be viewed unfavorably by investors, especially if it leads to reduced financial performance.

The absence of standardized ESG metric reporting in Saudi Arabia complicates the ability for investors to compare and evaluate businesses, potentially deterring them from investing in ESG-focused companies. Furthermore, since ESG initiatives are typically long-term endeavors, they may not align with the short-term performance expectations of some investors.

Businesses embracing ESG practices might face the need to increase their prices to cover the costs of sustainable operations. While a segment of consumers may appreciate and support these sustainable efforts, a significant portion might react negatively to higher prices, potentially forming an adverse opinion of ESG initiatives. However, for those consumers who value sustainability, this could enhance brand loyalty and return business, highlighting that despite the challenges, effectively implemented ESG practices can contribute positively to a company's profitability and public image.

*H0: ESG stocks cannot outperform regular stocks on a risk-adjusted basis.*

*H1: ESG stocks can outperform regular stocks on a risk-adjusted basis*

## Methodology

This paper utilizes the Carhart four-factor model for analysis, which is a modified version of the Fama & French three-factor model. The initial three-factor model uses Market Risk Factor, Small Minus Big (SMB), and High Minus Low (HML). Respectively, these assess the excess return of the market; the historical outperformance of small stocks over big stocks; and the difference between value and growth stocks, with the assumption that value stocks outperform growth stocks. In Carhart's model, a fourth factor is added Momentum (WML). Momentum accounts for the historical run of a stock and argues that historically well-performing stocks will continue to perform well. Using the Carhart four-factor model will provide a regression to be able to analyze the results and answer the question this paper aims to find.

## Data

Given the recent introduction of ESG rankings in Saudi Arabia and that the rankings have recently been established, I compiled the companies used in this paper from ESG Invest (Sustainability Excellence, 2023), taking the highest 50 ESG-ranked companies in the Tadawul Exchange. ESG Invest creates its ranking based on "ESG data points across 9 Sustainability Dimensions and 43 ESG issues with more than 180 data points for companies in the Arab world". A lack of ESG rankings in Saudi Arabia severely limited which one I could pick, and ESG

Invest seemed like the best option in this regard. The companies were separated into five quintiles, from the ten best to the ten worst ESG rankings, with Portfolio 1 being the ten best.

Yahoo Finance was used to capture the 50 chosen companies' monthly share prices from January 1, 2018 - August 1, 2023. The monthly return was calculated by ((New Month Price - Old Month Price) / Old Month Price). The Carhart four-factor model data was taken from Kenneth R. French - Data Library, using the developed market factors, as to a lack of data available in Saudi Arabia and the Middle East. The market factors included Small Minus Big (SMB), High Minus Low (HML), Risk-free rate (RF), Market Risk-free rate (Mkt-RF), and Momentum (HML).

## Empirical Results

### Table 1 - Portfolio Regression Analysis

| | | Alpha | Mkt-RF | SMB | HML | Momentum | Observations | Adjusted R-squared |
|---|---|---|---|---|---|---|---|---|
| **Portfolio 1** | beta | 0.007474 | -0.00173 | 0.004312 | -0.00195 | -0.001051 | 68 | -0.013758502 |
| | p-value | 0.010709 | 0.240756 | 0.281785 | 0.327869 | 0.6707391 | 68 | |
| **Portfolio 2** | beta | 0.015368 | -0.00164 | 0.003117 | -0.00303 | -0.001551 | 68 | -0.013615801 |
| | p-value | 0.038315 | 0.305198 | 0.474029 | 0.164504 | 0.5649872 | 68 | |
| **Portfolio 3** | beta | 0.011217 | -0.00207 | 0.00478 | -0.00256 | -0.001056 | 68 | -0.016075077 |
| | p-value | 0.185261 | 0.26229 | 0.341642 | 0.307719 | 0.7339602 | 68 | |
| **Portfolio 4** | beta | 0.009759 | -0.00069 | 0.009168 | -0.00408 | -0.001278 | 68 | 0.020942641 |
| | p-value | 0.301641 | 0.736588 | 0.105496 | 0.147741 | 0.7131027 | 68 | |
| **Portfollio 5** | beta | 0.009726 | -0.00048 | 0.009622 | -0.00421 | -8.52E-05 | 68 | 0.006860017 |
| | p-value | 0.387628 | 0.844465 | 0.153528 | 0.209833 | 0.9835899 | 68 | |
| **Portfolio 6** | beta | 0.010709 | -0.00132 | 0.0062 | -0.00316 | -0.001004 | 68 | 0.000805078 |
| | p-value | 0.181978 | 0.448716 | 0.194452 | 0.183964 | 0.7328983 | 68 | |

*Note:* Carhart Four Factor Model data from Dartmouth Kenneth R. French - Data Library (January 1st 2018 - August 1st 2023). Monthly share prices from Yahoo Finance (January 1st 2018 - August 1st 2023)

In the regression analysis for the portfolios, key statistical metrics such as alpha, p-value, and adjusted R-squared are included. These metrics play a crucial role in hypothesis testing, particularly in determining whether to reject the null hypothesis. The null hypothesis, in this context, posits that ESG stocks do not outperform regular stocks.

The criteria for rejecting the null hypothesis primarily hinge on the p-value, a measure of the probability that the observed results would occur under the null hypothesis. Typically, a p-value threshold (often set at 0.05) is used; if the p-value is less than this threshold, it suggests that the observed results are statistically significant, and the null hypothesis can be rejected. In this analysis, Portfolios 1 & 2 have p-values below the threshold, leading to the rejection of the null hypothesis. This supports the idea that ESG stocks outperform regular stocks in these portfolios.

Conversely, Portfolios 3-5 and Portfolio 6 have p-values above the threshold, indicating that the results are not statistically significant enough to reject the null hypothesis. Therefore, for these portfolios, there is not sufficient evidence to conclude that ESG stocks outperform regular stocks. In fact, for Portfolio 6, which comprises all 50 ranked companies, the inability to reject the null hypothesis suggests that investing in a broad portfolio of ESG stocks might not yield better returns than regular stocks and could sometimes be less advantageous.

The measure of uncertainty, indicated by the high p-values in Portfolios 3-5, also casts doubt on the reliability of the alpha values. Alpha represents the excess return of a portfolio over its expected performance, based on its risk profile. However, when the p-value is high, it implies a greater degree of uncertainty about whether the observed alpha is due to genuine outperformance or merely random chance. In such cases, high p-values reduce the credibility of the alpha values, suggesting that the apparent outperformance might not be reliably attributed to the portfolio's characteristics but could be a result of random fluctuations or other unaccounted-for factors.

**Limitations & Extensions**

The exploration of whether ESG companies in Saudi Arabia outperform market risk factors, as evidenced by the empirical study from the Tadawul, reveals significant limitations that impacted the study's outcomes. A pivotal constraint was the use of monthly prices rather than daily, which led to a smaller sample size. This limitation is crucial as it potentially undermines the reliability of the data, given that a larger data set could provide more robust and statistically significant results. Smaller sample sizes often result in less reliable data due to increased susceptibility to outliers and reduced power in detecting true effects.

Another significant limitation was the restricted scope of companies included in the study, constrained by the lack of comprehensive ESG data in the Saudi Arabian context. Expanding the range of companies analyzed could have potentially offered a more representative picture of the ESG landscape in Saudi Arabia. However, the lack of available ESG data limited this possibility, potentially biasing the results.

The low Adjusted R Squared values observed across all portfolios suggest that the market risk factors might not be a suitable fit for this particular analysis. This finding indicates that these factors may not accurately track or predict future market expectations within the context of ESG investing in Saudi Arabia. This aspect raises questions about the appropriateness of the market risk models used and suggests a need for models that better capture the nuances of ESG investing in the region.

A notable observation was the significant difference between Portfolios 1 & 2 compared to 3-5. This discrepancy could indicate a unique characteristic inherent in the first two portfolios. Intriguingly, Portfolio 2 exhibited twice the alpha of Portfolio 1, implying the portfolio has performed better than would be expected given its risk level. This difference could stem from factors not captured in the model or discrepancies in the accuracy of the ESG ranking. The composition of Portfolio 2, predominantly banks and telecommunications companies, may have contributed to its superior performance, reflecting the sectors' growth in line with recent increases in economic spending and activity in Saudi Arabia. This sector-specific performance could indicate that certain industries may be better positioned to leverage ESG principles for enhanced market performance.

Conversely, Portfolio 5, which had the highest p-value, included three cement companies. The presence of these companies might have negatively influenced the portfolio's performance, considering the typically lower sustainability metrics associated with the cement industry. This finding suggests that industry-specific factors play a critical role in determining the efficacy of ESG investing and its impact on market performance.

Overall, these insights highlight the need for a more refined approach to analyzing ESG performance in Saudi Arabia, one that accounts for the specificities of the Saudi market and the limitations posed by available data. Future research could benefit from incorporating a larger sample size, more frequent data points, and a broader range of companies to provide a more comprehensive understanding of the relationship between ESG practices and market performance in the region.

## Conclusion

In conclusion, this paper investigated whether ESG companies in Saudi Arabia outperform non-ESG companies, revealing mixed results. While Portfolios 1 & 2, predominantly consisting of banks and telecom companies, exhibited a significant outperformance of regular stocks, this was not observed across all portfolios. Limitations such as the use of monthly data and a lack of comprehensive ESG data affected the reliability of the findings. The study underscores the

importance of industry-specific factors in ESG performance and highlights the need for more detailed ESG reporting and analysis tailored to the Saudi market. Future research should focus on expanding data sources and incorporating a broader range of companies to assess the impact of ESG practices more accurately on market performance in Saudi Arabia.

To deepen the understanding of ESG's influence on market performance in Saudi Arabia, future research should adopt a multifaceted approach. Expanding the data collection to include daily pricing and a diverse array of companies, including smaller enterprises, would offer a richer dataset for analysis. Longitudinal studies could reveal evolving ESG trends over time, providing insights into long-term impacts. Sector-specific analyses are crucial, considering the varied ESG effectiveness across industries. Comparative studies with similar economies or regulatory environments would contextualize Saudi Arabia's ESG performance globally. Additionally, assessing the influence of regulatory changes on ESG integration and examining consumer and investor behaviors towards ESG could offer valuable insights into market dynamics and preferences.

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