THE TRACTION OF MORAL VIRTUES COMPARED TO RISK-RETURN FUNDAMENTALS IN FOSSIL FUEL-RELATED INVESTMENTS

Chekani Nkwaira *, Huibrecht Margaretha van der Poll **

* *Corresponding author,* Graduate School of Business Leadership, University of South Africa, Pretoria, South Africa
** Graduate School of Business Leadership, University of South Africa, Pretoria, South Africa
Contact details: Graduate School of Business Leadership, University of South Africa, P. O. Box 392, Pretoria 0002, South Africa

OPEN ACCESS

How to cite this paper: Nkwaira, C., & van der Poll, H. M. (2024). The traction of moral virtues compared to risk-return fundamentals in fossil fuel-related investments [Special issue]. *Journal of Governance & Regulation, 13*(2), 374–381. https://doi.org/10.22495/jgrv13i2siart13

ISSN Print: 2220-9352
ISSN Online: 2306-6784

Received: 25.10.2023
Accepted: 06.06.2024

JEL Classification: G11, G18, G21, G31
DOI: 10.22495/jgrv13i2siart13

Abstract

The fundamental view that investors require compensation aligned to the risk attributes they discern in their investments runs at odds with efforts to curb climate risks. Moral considerations should play an important role in climate-related investments (Hulme, 2014). However, in the case of fossil fuel investments, the moral virtues in decisions are blurred. This article aims to determine the extent of moral virtues in investment decisions involving fossil fuels amidst risk-return principles. Document analysis is used from a population of 60 banks identified as increasing or reducing fossil fuel financing from the Cable News Network website. In addition to a random sampling of banks, market prices, and ten-year government bonds data are obtained from Macrotrends and Yahoo.com websites to compute the cost of equity over a seven-year period using the capital asset pricing model (CAPM). The t-test proves that the required returns for increasing fossil fuel financing remain higher than those for decreasing, while regression reflects that the moral virtue gap remains an existential threat to climate mitigation. These results demonstrate that the curbing of climate risks remains elusive unless investors place moral considerations above monetary returns. In conclusion, the need for adequate monetary compensation for investing in fossil fuels far outweighs the moral obligation.

Keywords: Banking Groups, Climate Risks, Green Financing, Investment Returns, Moral Virtue

Authors' individual contribution: Conceptualization — C.N.; Methodology — C.N.; Software — C.N.; Validation — H.M.v.d.P.; Formal Analysis — C.N.; Investigation — C.N.; Resources — C.N. and H.M.v.d.P.; Data Curation — C.N.; Writing — Original Draft — C.N.; Writing — Review & Editing - H.M.v.d.P.; Visualization — C.N.; Supervision — H.M.v.d.P.; Project Administration — C.N.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

Acknowledgements: The Authors thank the University of South Africa for making the funds available to cover the publication fees.

1. INTRODUCTION

It would be an uphill task for climate response efforts to achieve something significant without first addressing investors' moral virtues amidst the traditional risk-return philosophy. Hence, continuous positive traction of moral virtues should be observed in all stakeholders' activities, particularly in all investors' demeanours. This governing principle is aligned with the sustainability of the environment through climate mitigation. Hulme (2014) challenged the stance on climate change debate by portraying a dominant view of mere talk without correspondence to equally dominant moral virtues in terms of responses. For investments involving potential environmental concerns, it should be universally recognised that moneymaking can no longer be central to such endeavours. As Linnanen (2016) asserted, the reason for investments should not be solely to generate profits but to make the world a better place to live. Indeed, this inclination to do good can surpass that of making higher returns (Linnanen, 2016). Hence, non-financial factors such as moral virtue should be considered critical and pertinent in any investment that can potentially contribute to climate hazards. The topical nature of moral obligations stems from the fact that substantial returns seem to flow into the coffers of those individuals, sectors, and even governments with an unquenchable appetite for investing in fossil fuels. According to the Centre for Environmental Rights (2023), an estimated 6,500 institutional investors have an estimated USD 3.07 trillion in shares and bonds held by companies dealing in fossil fuels.

However, the traditional view by investors that high-risk projects should be good as long as the commensurate returns are also good seems to be central in the continued resistance by investors to divest from fossil fuel investments. This underlying approach to investments has been significantly dominated by the demand for higher returns, which is proportionate to the risk that can be envisioned in the investment. Although risk in investments is widely accepted as the variation of returns from the expected, in investments linked to climate risks, climate-related consequential activity such as droughts can lead to such variations. Therefore, nullifying the possibility of the occurrence of a climate-related trigger would mitigate such variations in return. To achieve this agenda, investors would need to find ways to waive higher returns associated with investments in riskier sectors, such as fossil fuels. There is a dearth of information, and hence a gap in research, that furnishes the degree to which moral virtues compete with monetary returns in influencing investments in fossil fuels. Furthermore, the governing bodies of such institutional investors need to reconfigure their policies to align with this mindset. Consequently, this article aims to determine the extent of moral virtues in investment decisions involving fossil fuels amidst risk-return principles. The results will give valuable insights into determining whether moral virtues can be relied upon as a factor that influences investments in fossil fuels.

To achieve the aim of the study, a quantitative methodology was carried out comprising a random selection of banks from a list of identified fossil fuel financiers. The list was obtained from the publication by Clifford (2021) on the Cable News Network website. Computations of the cost of equity were performed by deploying the asset capital pricing model using market prices and ten-year government bond yields from Macrotrends and the Yahoo.com website. Based on the t-test, the required returns from those increasing fossil fuel financiers far exceed those from banks decreasing the financing of fossil fuels. However, the regression analysis performed demonstrates an unexpected and insignificant influence of moral virtues in fossil fuel investment decisions. The contribution of this study is in its revelation of the lack of a moral impetus in investors who are focussing on fossil fuel financing, a condition that calls for more efforts to be instituted to induce moral awareness as a determining factor to curb climate risks.

The remainder of this article is structured as follows. In Section 2, the related literature is reviewed. Section 3 provides the methodology used in the study and Section 4 shows the results. In Section 5, the results are discussed and Section 6 concludes the article.

2. LITERATURE REVIEW

There are numerous ways to try and comprehend the dynamics that emanate from fossil fuel investments. Specifically, investments that are actuated by risk-adjusted returns may or may not incorporate moral considerations. Therefore, it is pertinent to review related literature on the importance of moral obligations, the relationship between moral virtues, good products, and investments, risk-return fundamentals, and the role of cost of equity as a measure of required returns.

2.1. Moral persistence

The economic advantages emanating from investments that have a bearing on the environment should be understood in the context of the commensurate negative consequences affecting the present and future generations. When investors realise that costs related to carbon emissions are escalating and seek to increase the required returns (Li et al., 2014), where is the moral obligation of abandoning such projects located? However, moral considerations also require that the perpetrator (carbon emitter) should deal with the threat caused by his actions (Shue, 1999, as cited by Hormio, 2023). Although banks are slowly devising climate-protective policies (Bernardelli et al., 2022), adverse interventions such as sudden policy changes could harm the same banks through economic defaults and the tumbling of share prices (Campiglio et al., 2023).

As Hedberg (2018) suggested, he was inclined to appeal to a committed moral duty to lower greenhouse gas (GHG) emissions. Effectively, everyone should be held responsible for something they can control (Fuerst & Luetge, 2023) and investing in fossil fuels is a choice and, therefore, controllable. Morality requires acknowledging that alternative pathways, such as green financing, can decelerate cashflows toward fossil fuels and therefore mitigate environmental damage (Sachs et al., 2019). The moral duty cannot be the sole responsibility of the financiers of GHG projects, such as banks, but should be equally assigned to investors associated with those banks. Institutional investors can show an inclination towards good moral virtues by divesting their holdings by selling them in preference for low-carbon emission projects (Benedetti et al., 2021). It would seem that investors' continued demand for increased returns from those financiers is a confident gesture that encourages financiers to continue financing GHG projects. The moral duty, a duty of justice, entails that no harm should be inflicted on others in the name of seeking profits (Broome, 2016).

Describing investors as savvy and stewards of long-term capital, Sachs et al. (2019) pointed out that they need to transcend their focus beyond current market prices and, by implication, current market returns and put green financing front and centre. Put differently, Sachs et al. (2019) urged investors to be morally driven and to avoid channelling funds towards climate-damaging projects. On the contrary, Christophers (2019) highlighted that the performance of investment drives investors such as fund managers and there is an inherent focus on returns, whether legally supported or not. Furthermore, it could be a case of an investment barrier at play, which sees a deficiency in the ability of investors to properly evaluate companies making tangible efforts to decarbonise (In et al., 2017). We conjecture that investments that are solely based on the premises of higher risk and higher returns are immediately frowned upon by environmentalists and those who are sensitive to climate risks.

The debates, discussions, and reports on climate change have been ongoing for decades, and it is time for tangible efforts to be realised. Therefore, it would seem that the moral aspect of these investments can be considered worthy of exploration.

2.2. Moral virtue, good product, and good investment

When a bank lends money or finances fossil fuel projects, the loan to fossil fuel companies is the product. One would be provoked to ask whether the loan is a good product. In their analysis, Gangi et al. (2016) established that where investors exhibit a high degree of caring, the issue of returns is subordinated to social responsibility, which in this case equates to what the product can do post cash inflows. It is argued in this research that an investment in fossil fuels that has been shown to cause severe human and ecological distress through carbon emissions, leading to rising sea level temperatures, diseases, deaths, unemployment, and many other social ills, is undoubtedly a bad investment. Due to such bad investments, the question posed by Gangi et al. (2016) regarding the readiness to receive inadequate returns in the spirit of recognising benefits aligned with investor values becomes relevant. It can be argued that such bad investments are executed mainly on profitability grounds or the required return rates. Therefore, investors should consider the potential returns of an investment before conducting due diligence on the long-term consequences of the investment on the environment, society and economies. Investors should indeed awaken to the realities away from fossil fuel financing strategies, as Garel and Petit-Romec (2021) reflect that companies with *bona fide* environmental strategies can generate better returns than those focused on environmentally unfriendly strategic imperatives. A paradigm shift from fossil fuel financing would constitute moral virtues, which according to Le Duc (2023) cannot be separated from environmental ethics. Therefore, moral virtues might lead to the production of environmentally friendly products.

Garel and Petit-Romec (2021) established that companies with responsible strategies on environmental issues experience better stock returns. A good investment strategy should have a way out through a flight to climate safety, which involves shifting funds from climate risks surrounding the invested funds (Ferriani et al., 2023). A good investment such as green financing also comes with risk, and the fundamental principle of high risk and high return still holds (Ozili, 2022). The lack of rationality and the absence of moral virtue can be gleaned from the findings of the interviews by Christophers (2019) with investors, from which he confirmed the lack of investor objectiveness and the fact that the risk embedded in fossil fuel financing is considered subjectively.

2.3. The risk-return fundamental

The major concern of investors and even economists for many years has evolved around the levels of returns that should be borne by assets considered risky (Karp & van Vuuren, 2017). Referencing the capital asset pricing model (CAPM), Barroso and Maio (2023) alert to the existence of a positive relationship between risk and return. Furthermore, Barroso and Maio (2023) signify a positive relationship between risk premium and conditional volatility on factors such as profitability and other risk factors related to investments. The positive relationship involves wealth maximisation, which, according to Gangi et al. (2016), is not sufficient to explain why other investors would opt for socially responsible investments. Caldecott et al. (2016) posited that numerous financial institutions possess economic growth amongst other factors and show little regard towards environmental issues. It would also seem likely that one of the major reasons that can influence financiers such as investment banks to shift from the returns associated with fossil fuels is by means of anticipated mandatory obligations to support green initiatives (Cojoianu et al., 2023). Furthermore, there is an escalation in proposals by shareholders, effectively putting checks and balances on financing activities that are anti-green (Diaz-Rainey et al., 2023).

Initiatives such as global carbon taxes can reduce fossil fuel investments (Kahn, 2016), but their influence on the triggering of moral obligations is debatable in our view. An investment that overlooks the suitability of a product for ecological suitability cannot be regarded as a good investment. Investors can divest and buy into green financial indices to mitigate carbon exposure (Shen et al., 2019) rather than protect invested interests by demanding higher returns. However, some fund managers act consciously by strategically vying for equity portfolios with low carbon concentrations (Caldecott et al., 2016). It would seem that carbon price risk aligns with the chances of the propagation of climate agreements, and investors are considering differentiating approaches to national policies regarding carbon (Sachs et al., 2019).

2.4. The significance of the cost of equity

The cost of capital (equity and debt) is crucial in determining the direction of the flow of investment funds (Zhou et al., 2021). Meanwhile, Sumaryati and Tristiarini (2018) defined the cost of equity as the cost experienced by a company to compensate for the demand by investors in the form of an expected rate of return. Hence, the returns that equity investors require can be measured through a company's cost of equity. Using the beta coefficient and CAPM, Trinks et al. (2022) confirmed a positive relationship between carbon intensity and cost of equity. Similarly, using a cross-sectional dataset, Bui et al. (2020) established that enhanced emissions are associated with more premiums on the cost of equity.

Contrary to Bui et al. (2020), Li et al. (2014) were unable to establish a positive impact on the cost of equity due to high carbon emissions. However, Christophers (2019) also illuminated a different perspective in that divestment could affect the cost of capital by influencing the drive toward low stock multiples and ultimately raising the cost of equity. According to Stern (2014), social values can be detected from the actions of markets. Moreover, contrary to Campiglio et al. (2023) theory that assets prone to climate-related risks should carry a premium, it cannot always be the case where moral virtues are in the mix. Investors need to recognise the argument by McKibben (2012) that they can have a sound fossil-fuel balance sheet but a precarious planet.

The literature review shows a gap in portraying how entrenched moral considerations are amidst the traditional risk-return principle. Therefore, this study aims to determine if there is a progression in the determination of the required returns in fossil fuel investments from the underlying principles of risk return to morally determined rates of returns.

3. METHODOLOGY

A quantitative research approach is undertaken based on secondary data. The methodology commences with a random sample selection of 16 banks deemed to be decreasing and those increasing fossil fuel financing from a population of 60 global banks as provided by the Cable Network Business Channel (CNBC) website. The banks are initially randomly placed in Microsoft Excel spreadsheets using the individual estimated financing amounts provided. The sample was drawn by randomly opening the spreadsheets, matching the name of the bank with the estimated fossil fuel amount, and grouping them according to the descriptor increasing or decreasing the financing aspect as provided by the CNBC website. The CAPM is used to determine the cost of capital for both banking groups. The computation of beta coefficients for both banking groups (increasing and decreasing fossil fuel financing) using regression analysis. Furthermore, according to Tofallis (2008), the relationship can be depicted as follows.

$$R_i = \alpha + \beta R_m \quad (1)$$

whereby R_i represents the rate of return on investment, R_m depicts the market's rate of return, α represents the intercept (the percentage return greater or less than an average share) and β denotes the slope (riskiness of individual share returns in relation to the market).

We assume that, whether a reference is made to a fund manager or investors in general, there is room to suggest that their moral persuasion may play a role in determining returns that bear no relationship to beta. We also assume that the risk associated with climatic damages emanating from fossil fuels needs to be observed, and therefore, the investments do not require further compensations beyond that provided for beta. Hence, α could be used to interpret the moral virtue aspect of investments.

The variables considered are the seven years (2015–2021) historical market returns (from historical prices) of the indices on which the banking shares are listed, as well as the historical price returns of the banking shares. Market indices and share prices were obtained from the Yahoo.com and Macrotrends websites. The dependent variable is represented by the historical share returns of the sampled banks and the independent variable is represented by the market index returns on which the individual banks are listed. The slope of each curve denotes the beta coefficient. The means of the betas for each group are then calculated. Table 1 shows a descriptive analysis of beta and market returns for the two banking groups.

Table 1. Descriptive statistics

Variable	*Banks increasing fossil-fuel financing*	*Banks decreasing fossil-fuel financing*
Mean beta	1.5525	1.2975
Std. deviation beta	0.29	0.27
Mean market return	6.50%	6.21%
Std. deviation market return	2.79	3.96
Population of banks ≥ 1.40	75%	50%
Std. error	0.1707	0.1531
Estimated proportion of banks whose beta is ≥ 1.40	42% ≥ and ≤ 100%	20% ≥ and ≤ 80%

Table 1 reflects a significant perspective. First, it can be visualised that the mean beta for banks increasing the financing of fossil fuels is marginally greater than for banks that show a decrease in financing. Although both groups of banks have betas higher than the average beta of 1.0, the group increasing fossil fuel 1.5525 moves up and down more than the other group 1.2975, reflecting that it is riskier. The corresponding standard deviation of 0.29 against 0.27 asserts the group's riskier element of increasing fossil fuel financing. Although the group that increases fossil fuel financing is riskier, it exhibits a higher market return of 6.50%. However, the variability of 2.79 in the market return is surpassed by the group decreasing fossil fuel financing 3.96. Clearly, the estimated proportion population of banks whose beta is greater than 1.40 and increasing fossil fuel financing is higher and lies between 42% and 100%, whilst for those decreasing fossil fuel financing, it is lower between 20% and 80%.

The two-paired sample test is used to compare the population means. The corresponding seven-year historical risk-free rates are obtained from the World Government Bonds website. Ten-year government bonds were used as risk-free rate proxies. The CAPM was used to estimate the cost of equity of the two banking groups. Although it is not a perfect model, it is widely used, particularly due to the simplicity of the beta coefficient (Fernandez, 2015).

The limitations of the CAPM are considered in that it indicates that a share's return only depends on its sensitivity to the market as represented by beta, whilst actual returns may not reflect that assertion. However, the fundamental advantage of CAPM is the objectivity of the estimated costs of equity derived from the model (Rossi, 2016). According to Fernandez (2015), the use of the CAPM should recognise the following assumptions.

All investors:

- possess the same expectations regarding returns, market volatility, and correlations for each stock;
- are not limited to lending and borrowing amounts at the risk-free rate of interest;
- can embark on shorting of any assets as well as retaining any portion of an asset;
- intend to invest over the same time span;
- are only concerned about the expected return and the volatility of their investments.

According to Karp and van Vuuren (2017), the CAPM is stated as follows.

$$E(r_i) = R_f + \beta_i\left[E(R_m) - R_f\right] \quad (2)$$

where, $E(r_i)$ = the expected return on the asset; R_f = the risk-free rate of interest; β_i = the beta value of the asset; $E(R_m)$ = the expected return on the market.

Therefore, in a nutshell, the CAPM specifies the relationship between risk and the required rate of return on assets held in diversified portfolios.

With these limitations and assumptions in mind, the CAPM was used as a proxy to determine the banking groups' equity cost in this study. The risk-free rate was estimated using the rate on ten-year treasury bonds as the proxy. This is more in line with the establishment of a long-term cost of equity. The beta coefficients were estimated using the slope coefficient in a regression model, with the banks' share returns on the y-axis and monthly market returns on the x-axis. It is assumed that the research period is not too far back to make the beta irrelevant and does not reflect the banks under study as of today. Therefore, market risk premiums were estimated using the historical average return on bank shares in conjunction with historical risk-free rates.

4. RESULTS

In Table 2, a display of regression coefficients of all the banks studied is shown. The interpretations are subsequently provided thereafter.

Table 2. Regression analysis results

Banks increasing fossil fuel financing			*Banks decreasing fossil fuel financing*	
Bank	***Regression coefficient***		***Regression coefficient***	
No.	***Intercept***	***Slope***	***Intercept***	***Slope***
1	-0.007	1.83	-0.003	1.36
2	-0.005	1.04	-0.004	1.34
3	-0.003	1.43	-0.009	1.50
4	-0.007	1.83	0.000	1.39
5	-0.003	1.77	-0.010	1.24
6	-0.014	1.76	-0.004	1.26
7	-0.006	1.52	-0.009	0.65
8	-0.001	1.24	-0.004	1.64
Mean	-0.006	1.59	-0.007	1.30

Table 2 shows that the estimated mean of beta is higher for banks that are increasing fossil fuel financing. However, both groups seem to be moving up and down on average by considerably higher percentages than the 1.0 average beta. The intercepts of -0.006 and -0.007 which are denoted by α in Eq. (1) mean that those increasing fossil fuel financing earned 0.6% per month less than an average stock due to factors unrelated to price increases, while those decreasing fossil fuel financing earned 0.7% per month less than an average stock. Assuming that the dominant factor not related to the price increase is the moral principle regarding products associated with climate risks, it is difficult to see the impact of moral influences since the intercepts are nearly the same, a scenario of great concern. It would be logical to expect the earnings attributed to the moral virtue of those who decrease fossil fuel financing to be less impacted since risks associated with fossil fuels are decreasing.

The two-paired sample t-test was used to compare the means of the cost of equity as reflected in Table 3.

Table 3. T-test: Paired two samples for means

Computed statistics for banks			***Upper bound/Lower bound (95% confidence level)***	
Banks	***Increase in fossil fuels***	***Decrease in fossil fuels***	0.08357	0.05142
Variables	0.0218	0.0241	0.14390	0.108114
Mean	0.113743	0.079771		
Variance	0.001895	0.001673		
Observations	7	7		
Pearson correlation	0.887576			
Hypothesised mean difference	0			
Df	6			
T stat.	4.453931			
P (T ≤ t) one-tail	0.002155			
T critical one-tail	1.94318			
P (T ≤ t) two-tail	0.004311			
T critical two-tail	2.446912			

In Table 3, it is significantly revealed that the mean difference between the two groups is not zero. The null hypothesis tested by the sample t-test is that the two-population means are equal. The alternative hypothesis is that the means are not equal. The t-test is 4.453931 and reaches significance at 0.05 level, i.e., at $p < 0.05$ given that we applied the two-tailed test. Hence, the null hypothesis of a zero mean difference is rejected. The cost of equity is statistically higher for banks increasing fossil fuel financing than for those decreasing the financing. At 95% confidence levels, the estimated cost of equity lies between 0.08357 (8.4%) and 0.14390 (14.4%) for those increasing financing, while it is between 0.05142 (5.1%) and 0.108114 (10.8%) for those showing a decrease in fossil fuel financing.

5. DISCUSSIONS

The results reveal a visible correspondence in the risk dimensions related to fossil fuel financing activities. Banks increasing fossil fuel financing are riskier than those decreasing financing, as exhibited by the beta coefficient. However, it is also evident that higher returns compensate for the higher risk. This positive relationship amongst the bank stocks increasing financing of fossil fuels since the inception of the Paris Agreement is in tandem with Barroso and Maio's (2023) conclusions on risk-return parameters. It, therefore, implies that in this realm of investments, wealth maximisation is attained (Gangi et al., 2016) by those investors who prefer to hold those banking stocks despite the dreaded impact of fossil fuels on the economies, environment, and societies. Therefore, it would suggest that investors in banks that increase fossil fuel financing are primarily interested in profitability issues rather than protecting the environment (Caldecott et al., 2016). The moral aspect is hard to determine under these circumstances. The predominance of risk-return fundamentals is clearly at play. The situation concerning banks decreasing fossil fuel financing is rather different to interpret. Firstly, the lower risk in terms of fossil fuels seems to be accompanied by lower returns.

Even though the risk-return underlying principle is equally applicable, the question is whether the lower returns are also acceptable due to investors' appreciation of the reduced financing of fossil fuels. This being the case, it would imply that these investors are morally upright. It could also be attributed to the willingness to receive inadequate returns compared to those applicable to banks that are increasing fossil fuel financing due to good moral virtues (Gangi et al., 2016). The intercept in both regression scenarios provides yet another dimension to the discussion. Both groups earn almost equal percentages less than average stocks due to other factors that are not related to price. In tandem with Tofallis's (2008) assertion that the intercept represents other factors not aligned to return volatility as in beta, the moral duty was assumed to dominate the other factor category, and it would have been logical to assume that banks that are decreasing fossil fuels would have earned at least a higher return than those increasing fossil fuel financing. Since this logic is not confirmed, it can be asserted that moral virtue is not dominant in these investments and remains subordinate to risk-return fundamentals.

6. CONCLUSION

This study aimed to determine whether there was a progression in the determination of required returns in fossil fuel investments from risk-return underlying principles to morally determined rates of returns. The seven-year data reflects that investors have, over the measured period, been demanding more required rates of return from banks that are increasing fossil fuel financing than those decreasing the financing. Therefore, it follows that there is a reward for decreasing fossil fuel financing and a penalty for increasing it by investors. However, requesting more returns is illogical when it comes to fossil fuel financiers. If they can generate more profits from the hazard they are creating, then they can still afford to pay higher required returns. It is because of these dynamics that investments should be made on moral grounds. This possibility, however, requires a complete paradigm shift from not only the economic profit mentality but also from a governance perspective. It seems though that, despite the existence of corporate governing bodies, investments into fossil fuel projects continue unabated. The underlying risk-return principle continues to lure investors into the fossil fuel financing arena. However, moral virtues seem not to be a telling factor in such investments, the risk-return underlying principle is manifested. Consequently, governance policies on investments should consist of a significant element that is related to moral obligation. Governing bodies should understand the long-term ill-fated nature of the risk-return fundamental when it comes to fossil fuel financiers. That understanding should be indicated in subsequent financing policies. Once policies are enacted and financiers change strategy toward sustainable green projects, a commensurate paradigm shift based on moral grounds can be seen through investment flows to less-paying but environmentally sustainable projects. Therefore, the moral obligation lies equally on the leadership, the governing bodies, and the investors. To shift the seemingly non-existent levels of moral considerations by investors to something of significance in the fossil fuel financing arena requires extensive efforts considering the prevailing status quo. The study's limitations stem from using the CAPM and the implication that a share's return only depends on its sensitivity to the market as represented by beta when the actual returns may not reflect that assertion. In addition, the intercepts from the regression analysis that are used to explain the perspective on moral virtues consist of all-encompassing factors. Therefore, future studies can be carried out to measure moral virtues by the movement of values, such as in divestments of projects away from fossil fuel investments to green projects.

REFERENCES

Barroso, P., & Maio, P. F. (2023). *The risk-return tradeoff among equity factors*. Advance online publication. https://doi.org/10.2139/ssrn.2909085

Benedetti, D., Biffis, E., Chatzimichalakis, F., Fedele, L. L., & Simm, I. (2021). Climate change investment risk: Optimal portfolio construction ahead of the transition to a lower-carbon economy. *Annals of Operations Research*, *299*, 847–871. https://doi.org/10.1007/s10479-019-03458-x

Bernardelli, M., Korzeb, Z., & Niedziółka, P. (2022). Does fossil fuel financing affect banks' ESG ratings? *Energies*, *15*(4), Article 1495. https://doi.org/10.3390/en15041495

Broome, J. (2016). Do not ask for morality. In A. Walsh, S. Hormio & D. Purves (Eds.), *The ethical underpinnings of climate economics* (pp. 9–21). Routledge.

Bui, B., Moses, O., & Houqe, M. N. (2020). Carbon disclosure, emission intensity and cost of equity capital: Multi-country evidence. *Accounting & Finance*, *60*(1), 47–71. https://doi.org/10.1111/acfi.12492

Caldecott, B., Harnett, E., Cojoianu, T., Kok, I., & Pfeiffer, A. (2016). Stranded assets: A climate risk challenge. In Ana R. Rios (Ed.), *Inter-American Development Bank*. https://publications.iadb.org/en/publication/12597/stranded-assets-climate-risk-challenge

Campiglio, E., Daumas, L., Monnin, P., & von Jagow, A. (2023). Climate-related risks in financial assets. *Journal of Economic Surveys*, *37*(3), 950–992. https://doi.org/10.1111/joes.12525

Centre for Environmental Rights. (2023, April 20). *New data reveals extent of South African investors' fossil fuel holdings*. https://cer.org.za/news/new-data-reveals-extent-of-south-african-investors-fossil-fuel-holdings

Christophers, B. (2019). Environmental beta or how institutional investors think about climate change and fossil fuel risk. *Annals of the American Association of Geographers, 109*(3), 754–774. https://doi.org/10.1080/24694452.2018.1489213

Clifford, K. (2021, April 22). *These are the world's largest banks that are increasing and decreasing their fossil fuel financing*. CNBC. https://www.cnbc.com/2021/04/22/which-banks-are-increasing-decreasing-fossil-fuel-financing-.html

Cojoianu, T. F., Hoepner, A. G. F., Schneider, F. I., Urban, M., Vu, A., & Wójcik, D. (2023). The city never sleeps: But when will investment banks wake up to the climate crisis? *Regional Studies, 57*(2), 268–286. https://doi.org/10.1080/00343404.2021.1995601

Diaz-Rainey, I., Griffin, P. A., Lont, D. H., Mateo-Márquez, A. J., & Zamora-Ramírez, C. (2023). Shareholder activism on climate change: Evolution, determinants, and consequences. *Journal of Business Ethics*. Advance online publication. https://doi.org/10.1007/s10551-023-05486-x

Fernandez, P. (2015). CAPM: An absurd model. *Business Valuation Review*, *34*(1), 4–23. https://www.researchgate.net/publication/277574983_CAPM_An_Absurd_Model

Ferriani, F., Gazzani, A. G., & Natoli, F. (2023). Flight to climatic safety: Local natural disasters and global portfolio flows. Advance online publication. https://doi.org/10.2139/ssrn.4497865

Fuerst, M. J., & Luetge, C. (2023). The conception of organizational integrity: A derivation from the individual level using a virtue-based approach. *Business Ethics, the Environment & Responsibility*, *32*(1, special issue), 25–33. https://doi.org/10.1111/beer.12401

Gangi, F., Camminatiello, I., & Varrone, N. (2016). Analysis of private socially responsible investment: The impact of personal concern with corporate social responsibility. *Review of Economics & Finance*, *6*(4), 47–62.

Garel, A., & Petit-Romec, A. (2021). Investor rewards to environmental responsibility: Evidence from the COVID-19 crisis. *Journal of Corporate Finance*, *68*, Article 101948. https://doi.org/10.1016/j.jcorpfin.2021.101948

Hedberg, T. (2018). Climate change, moral integrity, and obligations to reduce individual greenhouse gas emissions. *Ethics, Policy & Environment*, *21*(1), 64–80. https://doi.org/10.1080/21550085.2018.1448039

Hormio, S. (2023). Collective responsibility for climate change. *Wiley Interdisciplinary Reviews: Climate Change*, *14*(4), Article e830. https://doi.org/10.1002/wcc.830

Hulme, M. (2014). Climate change and virtue: An apologetic. *Humanities*, *3*(3), 299–312. https://doi.org/10.3390/h3030299

In, S. Y., Park, K. Y., & Monk, A. (2017, August 21). *Is "being green" rewarded in the market? An empirical investigation of decarbonization risk and stock returns* (Stanford Global Projects Center Working Paper). https://www.sustainablefinance.ch/upload/cms/user/SSRN-id3020304.pdf

Kahn, M. E. (2016). The climate change adaptation literature. *Review of Environmental Economics and Policy*, *10*(1), 166–178. https://doi.org/10.1093/reep/rev023

Karp, A., & van Vuuren, G. (2017). The capital asset pricing model and Fama-French three factor model in an emerging market environment. *International Business & Economics Research Journal (IBER)*, *16*(4), 231–256. https://doi.org/10.19030/iber.v16i4.10040

Le Duc, A. (2023). Responsibility as a primary environmental virtue in Islam. *Asian Journal of Philosophy and Religion*, *2*(1), 187–206. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4511474

Li, Y., Eddie, I., & Liu, J. (2014). Carbon emissions and the cost of capital: Australian evidence. *Review of Accounting and Finance*, *13*(4), 400–420. https://doi.org/10.1108/RAF-08-2012-0074

Linnanen, L. (2016). An insider's experiences with environmental entrepreneurship. *Greener Management International, 38*(38), 71–80. http://surl.li/szvva

McKibben, B. (2012, July 19). *Global warming's terrifying new math.* RollingStone https://www.rollingstone.com/politics/politics-news/global-warmings-terrifying-new-math-188550/

Ozili, P. K. (2022). Green finance research around the world: A review of literature. *International Journal of Green Economics*, *16*(1), 56–75. https://doi.org/10.1504/IJGE.2022.125554

Rossi, M. (2016). The capital asset pricing model: A critical literature review. *Global Business and Economics Review*, *18*(5), 604–617. https://doi.org/10.1504/GBER.2016.078682

Sachs, J. D., Woo, W. T., Yoshino, N., Taghizadeh-Hesary, F. (2019, January) *Why is green finance important?* (ADBI Working Paper No. 917). Asian Development Bank Institute. https://www.adb.org/publications/why-green-finance-important

Shen, S., LaPlante, A., & Rubtsov, A. (2019). Strategic asset allocation with climate change. Advance online publication. https://doi.org/10.2139/ssrn.3249211

Stern, N. (2014). Ethics, equity and the economics of climate change paper 1: Science and philosophy. *Economics & Philosophy*, *30*(3), 397–444. https://doi.org/10.1017/S0266267114000297

Sumaryati, A., & Tristiarini, N. (2018). The influence of cost of equity on financial distress and firm value. In *Proceedings of the 1st Economics and Business International Conference 2017 (EBIC 2017)* (pp. 194–197). Atlantis Press. https://doi.org/10.2991/ebic-17.2018.31

Tofallis, C. (2008). Investment volatility: A critique of standard beta estimation and a simple way forward. *European Journal of Operational Research*, *187*(3), 1358–1367. https://doi.org/10.1016/j.ejor.2006.09.018

Trinks, A., Ibikunle, G., Mulder, M., & Scholtens, B. (2022). Carbon intensity and the cost of equity capital. *The Energy Journal, 43*(2), 181–214. https://doi.org/10.5547/01956574.43.2.atri

Zhou, X., Wilson, C., & Caldecott, B. (2021). *The energy transition and changing financing costs*. Oxford Sustainable Finance Programme. https://www.smithschool.ox.ac.uk/sites/default/files/2022-02/The-energy-transition-and-changing-financing-costs.pdf