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Investors' Moral and Financial Concerns—Ethical and Financial Divestment in the Fossil Fuel Industry

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Abstract: It is discussed intensively whether divestment decease sales in the fossil fuel industry or whether investors divest from the fossil fuel industry because of stranded assets. Furthermore, it is unclear what the consequences of these activities are for the fossil fuel industry. Therefore, the study explores the direction of causality between cash flow factors, such as production factors and sources of financing and sales of the fossil fuel industry using lagged regression models and applying the Granger causality test. Our sample consists of fossil fuel companies from the Carbon Underground 200 list. Because R-squared values for both lagged financial factors and lagged sales were similar, we suggest a "bi-directional causality" between the financial flow factors and sales. We conclude that divestment (because of ethical concerns) can cause lower sales and that lower sales can cause divestment because of fear of the risk of stranded assets. Because a third factor usually causes bi-directional causations, we conclude that the need for the fossil fuel industry to reduce greenhouse gas emissions is the third factor that influences both the ethical and financial motivation of divestment. Consequently, the study contributes to theoretical approaches to divestment.

Keywords: divestment; climate change; fossil fuels; production function; socially responsible investment

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1. Introduction

Investing in the fossil fuel sector is discussed controversially as its business activities make it a significant contributor to the climate crisis. In addition, some fossil fuel companies have also been engaging in efforts to curb climate actions and policies [1,2]. Consequently, many studies found reduced returns and the risk of stranded assets for investors [3,4]. To address these issues, fossil fuel divestment aims to divest capital from the fossil fuel sector to impair the sector's capacity of exploration, production, and capitalization of fossil fuel resources and pressure the industry to transition their business activities into a climate-friendly direction. Besides, the divestment movement tries to influence governments to introduce climate mitigation legislation, such as banning future drilling and levying carbon taxes [5]. Since the movement gained momentum in 2013 [1], fossil fuel divestment announcements have attracted increasing media attention and significantly impacted fossil-fuel-related shares' prices [6].

Investors that adopt a fossil fuel divestment strategy are mainly driven by two considerations: Ethical concerns and financial concerns [7]. Ethically oriented investors adopt this strategy to divest financial capital from the fossil fuel sector because they do not want to support an industry with major negative impacts on climate change [7]. For instance, Fossil Free, an organization that is "a global movement to end the age of fossil fuels and build a world of community-led renewable energy for all", recognizes fossil fuel divestment as both "norm entrepreneur" and "moral entrepreneur" [8]. This organization states that combating climate change should become a social norm because fossil fuel consumption contributes to two-thirds of the global CO_2 emissions [3].

Based on financial considerations, returns-driven investors are worried about the financial risks derived from stranded assets caused by a low-carbon economy transition.

According to Heede and Oreskes [9], only 20 percent of the current fossil fuel reserves can be burned to stay below a 2 degrees Celsius temperature increase. This might create stranded assets, defined as unanticipated or premature write-downs, and devaluation of assets, such as fossil fuel reserves [10]. Consequently, the objective of this paper is to understand the connection between financial factors and sales in the fossil fuel industry. Firstly, capital switching because of ethical reasons is conducted before sales decrease. According to general production functions, divesting capital should decrease sales of fossil fuels. Secondly, capital switching because of financial reasons appears because of declining sales. In this study, we lagged both investments and sales to model the two divestment motives. Consequently, our research questions explore (1) whether changes in financial factors have an impact on sales (ethical motive) and (2) whether changes in sales have an impact on financial factors (financial motive).

We adopt two production functions with different cash flow factors to answer these questions. The sample consists of 90 fossil fuel companies selected from the Carbon Underground 200 traded in the North American capital market. Granger causality tests are used to analyze causality by lagging the cash flow factors (various production factors and financing sources) and sales, respectively. A significant correlation between the lagged financial factors and sales supports the concept of capital switching because of ethical reasons. A significant correlation between the lagged sales and financial factors supports capital switching because of financial motivation.

We found that the lagged variables in the two production functions for the Granger causality test are significant. Our results suggest a bi-directional causality between the financial factors and sales, supporting the two concepts of capital switching because of ethical and financial reasons.

Furthermore, the bi-directional interaction between these two concepts and the linkage between moral and financial concerns can also be explained. Ethically motivated capital switching precedes stranded assets, and stranded assets precede capital switching because of financial reasons. In line with [11], the bi-directional causations can be explained through a third factor that might influence ethical and financial reasons to divest or through the interaction between ethical and financial divestment motives.

This study contributes to the knowledge about the causes and effects of fossil fuel divestment. We show that divestment can be motivated ethically and financially and that both types of divestments interact and might be influenced by a third variable, such as climate change.

The structure of the remainder of this paper is as follows: The literature review section discusses moral and financial concerns related to fossil fuel divestment, followed by the introduction of the theory and methods. Next, the regressions and the Granger causality tests are presented. The discussion section provides a detailed explanation of the bi-directional interaction between the variables. Finally, the conclusion section summarizes the findings, contributions, limitations, and an outlook for future research.

2. Background

The following sections provide an overview of the literature on the ethical and financial aspects of fossil fuel investment and a general summary of fossil fuel divestment.

2.1. Ethical Aspects of Investing in the Fossil Fuel Industry

The financial sector can influence business activities of the fossil fuel industry by providing or not providing finance. Some projects with significant adverse environmental impacts, such as pipelines and power plants and new resource extraction projects, are highly dependent on financial capital, making investors and lenders important players [12]. Divestment can significantly affect business activities and consequently the share prices of companies in the fossil fuel industry that are highly dependent on financing [13,14]. Divestment announcements such as campaigns, pledges, and endorsements that aim to mitigate climate change and reduce greenhouse gases (GHGs) can impair financial returns

and the share prices of divested companies in the short-term [6]. Moreover, divested capital can be reinvested to support green energy [4], contributing to the low-carbon economy, making it an option for socially responsible investors. Nicholas Stern, for instance, recommends the combination of divestment and reinvestment as a better strategy for tackling climate change [15]. Studies estimate that the global renewable energy industry needs $1 trillion annually [16] to meet the goal of the Paris Agreement.

Because of the impact of finance on sustainable development and the impact of sustainable development on finance [17], financing should be conducted responsibly [18,19]. Because of potential risks of adverse consequences caused by a transition to a low-carbon economy as well as because of reputational risks, the financial industry is integrating environmental, social, and governance (ESG) factors into lending and investment processes [20–22]. The ESG integration brought about new business lines, such as climate finance [23] and Socially Responsible Investment (SRI) [24].

Stakeholder pressure on the financial industry amplifies these ethical concerns since reputation and trust are essential for the financial sector [25]. Once the trust is weakened, the financial institutions may become dysfunctional rapidly [26]. Hoepner and Wilson [27] also discussed Social, Environmental, Ethical, and Trust (SEET) issues in the banking industry and how these issues may affect risk management, reputation, and performance. Climate change has become an issue of concern for stakeholders in the financial system.

Consequently, there is increasing ethical pressure on the industry to align with climate goals and decrease the carbon exposure of their financial portfolio. However, there is a research gap with regard to the impact of ethically motivated investment on the outcomes of the fossil fuel industry. It is still not clear whether divestment is able to decrease the production and the sales of fossil fuels. We will address this gap in our first research question, whether changes in financial factors influence sales (see below).

2.2. Financial Aspects of Investing in the Fossil Fuel Industry

From a financial point of view, shifting capital away from the fossil fuel industry might be a strategy to avoid financial losses resulting from stranded assets [28,29] and declining sales of fossil fuels. Furthermore, a previous study [3] found that divesting from fossil fuels and investing in clean energy increased the risk-adjusted financial returns of US investors. Other long-term-oriented studies that did not focus on the relatively new risks of climate-related stranded assets suggest that divesting from fossil fuel shares does reduce financial returns. They suggest that fossil fuel stocks neither outperform stocks from other industries on a risk-adjusted basis nor contribute to diversification [30].

On the contrary, Mark Carney, former Governor of the Bank of England, warned in speeches and publications that climate change risks could threaten the financial sector's stability (Carney, 2015) because of its exposure to climate risks through fossil fuel loans and investments. Consequently, stress tests proved this warning [31].

The transition to a low-carbon economy will indirectly pressure the financial sector. High carbon-emitting industries will be required to reduce their GHG emissions, adding additional expenses to their businesses. Some industries, such as the fossil fuel industry, might even need to change their business model away from fossil fuel-based energy. creating financial risks for investors and lenders [32]. Even worse are scenarios of systematic risks because of stranded assets resulting from a transition to a low-carbon economy [10]. However, though stranded assets are assumed in many studies, it is still unclear whether the risks of stranded assets lead to investor reactions and consequently to divestment. We will address this gap in our second research question, as we explore whether changes in sales impact financial factors (see below).

2.3. Direction of Causality

This study uses a similar approach as [11] to explore the direction of causality between the concepts of capital switching and stranded assets as well as the linkage between the moral and financial motivations of divestment. They found a bi-directional correlation

between corporate social performance (CSP) and corporate financial performance (CFP), corresponding to the slack resource theory and the good management theory. Waddock and Graves [11] support this bi-directional correlation by finding that CSP is positively associated with CFP in the previous and future periods. Furthermore, they found that the factor "institutional framework" has unidirectional causality to CSR and CFP. Scholtens [33] applied lagged OLS and Granger causality tests to analyze this bi-directional interaction and discovered that the direction of causality from financial performance to social performance is predominant.

3. Objectives and Research Questions

Based on the literature review and background, the objective of this study is to understand the connection between financial factors and sales in the fossil fuel industry. Our research questions are (1) whether changes in financial factors have an impact on sales (ethical motive) and (2) whether changes in sales have an impact on financial factors (financial motive). Consequently, this study contributes to research and theory in socially responsible investment and divestment.

4. Materials and Methods

This study adopts the concept of "required" and "available" capital flow factors, representing production factors and financing sources [34]. The idea of "required" and "available" financial indicators is related to the net stable funding ratio, which is a regulatory indicator introduced in Basel III and is calculated for liquidity risks management [35]. By applying the Granger causality test, this study addresses the question of the cause and effect of financial factors and sales in the fossil fuel industry [36].

4.1. Sample and Data

The sample is taken from Carbon Underground 200 (CU200). The list contains the top 100 coal companies and 100 oil and gas companies based on the conversion from fossil fuel reserves to carbon emissions. The sample consists of publicly traded companies on the North American market (see Table A1). We used this sample because of data availability that is not given for non-publicly traded firms. Moreover, the sample consists of companies with the highest carbon emissions and is, therefore, representative of high-emitting firms on the North American market. Consequently, it represents the companies with the highest risks of stranded assets. Hence, investor reactions to the companies are more likely. Secondly, ethically motivated investors often address firms with potentially high GHG emissions to prevent them from using their resources.

There has been rapid growth in the number of institutions committed to fossil fuel divestment since 2012 (Fossil Free, 2018). Therefore, the study period ranges from 2012 to 2018. Because the Carbon Underground 200 list only provides the 2017 ranking of the fossil fuel companies, we used 2017 as the base year.

4.2. Modeling

The study uses two production functions based on the Cobb–Douglas production function. Such a function models the interaction between production input factors, such as employees, property/plant/equipment (PPE), intangibles, inventories, cash and equivalents, long-term debt, preferred stock, common stock, capital surplus, and retained earnings, and production output factors, such as sales [37].

The "required" and "available" cash flow is adopted to assess the long-term liquidity of a company. The "available" cash flow is the financing resources, such as long-term debts and equities that are needed in addition to the required capital. The "required" capital flow factors represent input production factors in the form of various assets. These factors are necessary to support productivity and, consequently, sales. These are employees, property/plant/equipment (PPE), intangibles, inventories, cash, and equivalents. The "available" capital flow factors represent the financing sources in the form of multiple

equities and debt used to input production factors. These financial factors are long-term debt, preferred stock, common stock, capital surplus, and retained earnings (see Table 1).

Table 1. Indicators used in the study.

Function	Variables	Unit	Time
Production factors-required Capital Flow Factors	Employees	person	(Beginning of fiscal year + Ending of fiscal year)/2
	Property/plant/equipment (PPE)	$ in thousands	
	Intangibles	$ in thousands	
	Inventories	$ in thousands	
	Cash & equivalents	$ in thousands	
Financial sources–available capital flow factors	Long-term debt	$ in thousands	
	Preferred stock	$ in thousands	
	Common stock	$ in thousands	
	Capital surplus	$ in thousands	
	Retained earnings	$ in thousands	
	Sales	$ in thousands	End of fiscal year

We used the indicators representing the required and available capital flow factors described above and in Table 1 to construct our production functions that are transformed logarithmically (see Equations (1) and (2)).

$$\begin{aligned} \mathrm{LnY} \;=\; & \mathrm{Lna0} + \mathrm{a1}{*}\mathrm{Ln(Employees)} + \mathrm{a2}{*}\mathrm{Ln(PPE)} + \mathrm{a3}{*}\mathrm{Ln(Intangible)} \\ & + \mathrm{a4}{*}\mathrm{Ln(Inventories)} + \mathrm{a5}{*}\mathrm{Ln(Cash\ \&\ Equivalents)} \end{aligned} \tag{1}$$

$$\begin{aligned} \mathrm{LnY} \;=\; & \mathrm{Lna0} + \mathrm{a1}{*}\mathrm{Ln(Employees)} + \mathrm{a2}{*}\mathrm{Ln(Long-term\ Debt)} + \mathrm{a3} \\ & {*}\mathrm{Ln(Contributed\ Capital)} + \mathrm{a4}{*}\mathrm{Ln(Retained\ Earnings)} \end{aligned} \tag{2}$$

4.3. Granger Causality Test

The Granger causality test [36] is applied to analyze the direction of causality between the capital flow factors (various production factors and financing sources) and the market demand (sales). The test uses lagged regressions to analyze causality. The current period is tn and the lagged period is tn-i (i: The time lagged). To explore the causal effect between the two variables y and x, the test calculates whether the lagged value xt-i (or yt-i) influences the current value yt (or xt) and vice versa (see Equations (3) and (4)). This study uses a one-year lag to analyze causality.

$$y_t = \alpha + \sum_{i=1}^{p} \beta_i y_{t-i} + \sum_{i=1}^{q} \gamma_i x_{t-i} + \varepsilon_t \tag{3}$$

$$x_t = \alpha + \sum_{i}^{p} \beta_i x_{t-i} + \sum_{i}^{q} \gamma_i y_{t-i} + \varepsilon_t \tag{4}$$

5. Results

First, we present the results for the lagged capital flow factors. The results for the lagged outputs follow these.

5.1. Lagged Capital Flow Factors

In this section, the capital flow factors are lagged to study the impact on the industrial output of the fossil fuel industry in the following year. For both models, Levene's Test

of Equality of Error Variances results show that the variance of the dependent variable "Sales" of fossil fuel companies is not significantly different between groups ($p_{required}$ = 0.71, $p_{favailable}$ = 0.90).

In the first model, which is built with production factors in the form of assets, the result of the lagged regression shows that the variables "Employees" and "Property & Plant & Equipment (PPE)" are significant. The R-squared (R^2) and the adjusted R-squared are 0.903 and 0.900, respectively. In the second model, composed of financing sources in the form of equities and debts, the result of the lagged regression suggests that the significant variables are "Employees", "Long-term Debt", and "Contributed Capital". The dummy variable (coal = 1, oil and gas = 0) is also significant with a negative coefficient, suggesting that coal companies have lower sales than other fossil fuel companies. The R-squared (R^2) and adjusted R-squared values for the financing sources in the form of equities and debts are 0.884 and 0.881, respectively. Table 2 presents the details.

Table 2. Regressions for the lagged capital flow factors (Model 1: Required factors, Model 2: Available factors), with lagged sales as the dependent variable.

Variables Model 1	Model 1 Factors	Variables Model 2	Model 2 Factors
Intercept	−1.003 **	Intercept	1.778 **
Employees	0.199 ***	Employees	0.540 ***
PPE	0.885 ***	Long Term Debt	0.502 ***
Intangibles	0.008	Contributed Capital	0.126 *
Inventories	0.016	Retained Earnings	0.006
Cash & Equivalents	0.035		
Coal = 1; Oil & Gas = 0	0.094	Coal = 1; Oil & Gas = 0	−0.704 ***
[Year = 2013.0]	0.014	[Year = 2013.0]	0.203
[Year = 2014.0]	−0.406 **	[Year = 2014.0]	−0.262
[Year = 2015.0]	−0.576 ***	[Year = 2015.0]	−0.470 ***
[Year = 2016.0]	−0.207	[Year = 2016.0]	−0.079
[Year = 2017.0]	0 [a]	[Year = 2017.0]	0 [a]
R Squared	0.903	R Squared	0.884
Adjusted R Squared	0.900	Adjusted R Squared	0.881

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; [a]: Parameter set to 0 because it is redundant.

5.2. Lagged Industrial Output

In this section, the industrial output of the fossil fuel industry is lagged to study the impact on the next-year capital flow factors. Again, the results show that the variance of sales is not significantly different between groups ($p_{required}$ = 0.71, $p_{available}$ = 0.97). The results of the regressions show that, in the first model, the significant variables are "Employees" and "Property & Plant & Equipment (PPE)", with R-squared (R^2) and adjusted R-squared values of 0.941 and 0.940, respectively. In the second model, all independent variables are significant. The dummy variable (coal = 1, oil & gas = 0) is also significant with a negative coefficient. The R-squared (R^2) and adjusted R-squared values are 0.903 and 0.900, respectively (see Table 3).

The R-squared and adjusted R-squared values for both the lagged financial indicators and the lagged sales are similar. The adjusted R-squared values for the lagged industrial outputs are 0.94 and 0.91. The adjusted R-squared values for the lagged financial indicators are 0.90 and 0.88. Though the latter is a little lower, we can accept bi-directional causation. Usually, bi-directional causations between two variables exist if either a third variable impacts both variables or if both variables interact.

Table 3. Results of the regressions for the lagged industrial outputs (Model 1: Required factors; Model 2: Available factors).

Variables Model 1	Model 1 Factors	Variables Model 2	Model 2 Factors
Intercept	−0.082	Intercept	1.888 ***
Employees	0.302 ***	Employees	0.590 ***
PPE	0.776 ***	Long Term Debt	0.504 ***
Intangibles	0.003	Contributed Capital	0.079 *
Inventories	0.024 **	Retained Earnings	0.007*
Cash & Equivalents	0.019		
Coal = 1; Oil & Gas = 0	−0.003	Coal = 1; Oil & Gas = 0	−0.629 ***
[Year = 2014]	0.027	[Year = 2014]	0.098
[Year = 2015]	0.177	[Year = 2015]	0.208
[Year = 2016]	−0.158	[Year = 2016]	−0.099
[Year = 2017]	−0.280 **	[Year = 2017]	−0.297 **
R Squared	0.941	R Squared	0.912
Adjusted R Squared	0.940	Adjusted R Squared	0.910

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

The key results are summarized in Figure 1. They suggest that there is a causal effect of the financial factors on sales as well as a causal effect of sales on financial factors. This means ethically driven divestment decreases future sales and decreasing sales influence financially driven divestment. Since the R-squared values are relatively similar for the lagged financial factors and lagged sales as well as for the available and required financial factors, we cannot assume one specific cause–effect direction dominates.

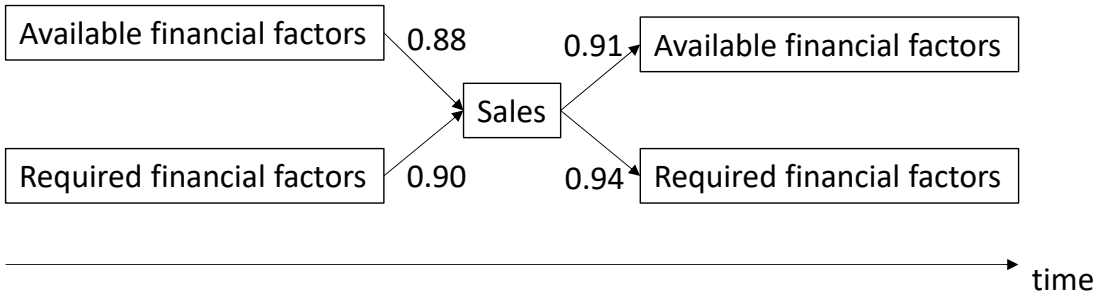

Figure 1. Summary of the results. Numbers represent adjusted R^2.

6. Discussion

Our results suggest that the capital flow factors in the two models, including "Employees", "Property & Plant & Equipment (PPE)", "Long-term Debt", and "Contributed Capital", have significant effects on the next-year "Sales" of the fossil fuel companies. The decrease in these factors negatively impacts the next-year sales in the fossil fuel industry. This finding shows the effect of capital switching because of ethical reasons. Ethically motivated divestment will decrease sales in the fossil fuel industry and consequently reduce the emissions of fossil fuels.

Moreover, the factors "Employees" ($coefficient_{model1} = 0.302$, $coefficient_{model2} = 0.590$) "Property & Plant & Equipment (PPE)" ($coefficient_{model1} = 0.776$, $coefficient_{model2} = 0.504$), "Inventories" ($coefficient_{model1} = 0.024$, $coefficient_{model2} = 0.007$), "Long-term Debt" ($coefficient_{model2} = 0.504$), "Contributed Capital" ($coefficient_{model2} = 0.079$), and "Retained Earnings" ($coefficient_{model2} = 0.007$) have significant effects on the lagged (previous-year) "Sales" of the fossil fuel companies. The decrease in previous-year sales of the fossil fuel industry negatively influences the following-year cash flow factors. This finding supports

the concept of stranded assets [10,28], as the decrease in industrial sales or market demand in the previous year negatively affects the next-year values and holdings of various production factors and financing sources, which are in the form of assets, equities, and debts. In this case, investors divest because of possible stranded assets [38,39].

Furthermore, the Granger causality tests suggest a bi-directional causality between financial factors and sales. A change in financial inputs changes sales and vice versa. The bi-directional causality between the cash flow factors and the industrial output that has already been identified by Waddock and Graves [11] for CSR is presented in Figure 2. Capital switching precedes the stranded assets. Ethically motivated divestment might lead to withdrawals of financial capital from the fossil fuel industry, leading to a decrease in financial capital needed to maintain sales and industrial output, including the exploitation of fossil fuel resources [40].

Consequently, the industrial output and market demand for fossil fuel products will drop, leading to a further decrease in the holding value of various cash flow factors for production. The reason is the fear of stranded assets because future regulations and restrictions might cause a drop in the production and consumption of fossil fuels. Furthermore, the availability and holding values of the various capital flow factors in the form of assets, equities, and debt might decrease, leading to the further impairment of industrial productivity [41].

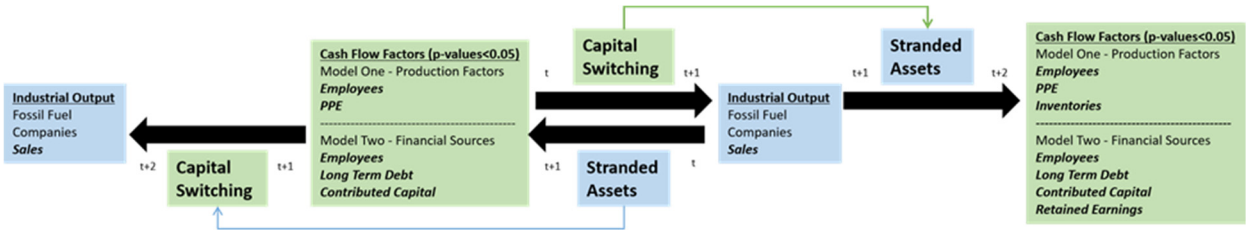

Figure 2. The interrelationship between capital switching and stranded assets.

Finally, based on the bi-directional causality between the capital switching and stranded assets, the bi-directional linkage between the investors' moral concerns and financial concerns in the divestment processes can also be explained (see Figure 3). Because of ethical considerations, socially responsible investors hope to limit the fossil fuel industry's business development and capital expansion by switching the capital flow [6,14,41]. Because of financial concerns, returns-driven investors hope to avoid risks related to stranded assets resulting from the low-carbon economy transition [29,37,42]. On the one hand, moral concerns might precede financial concerns because socially responsible investors avoid the potential financial risks related to stranded assets. On the other hand, financial concerns might precede moral concerns because return-driven investors also fulfill moral responsibility by divesting financial capital from the fossil fuel industry, limiting the industry's opportunity for fossil fuel exploration, production, and capitalization.

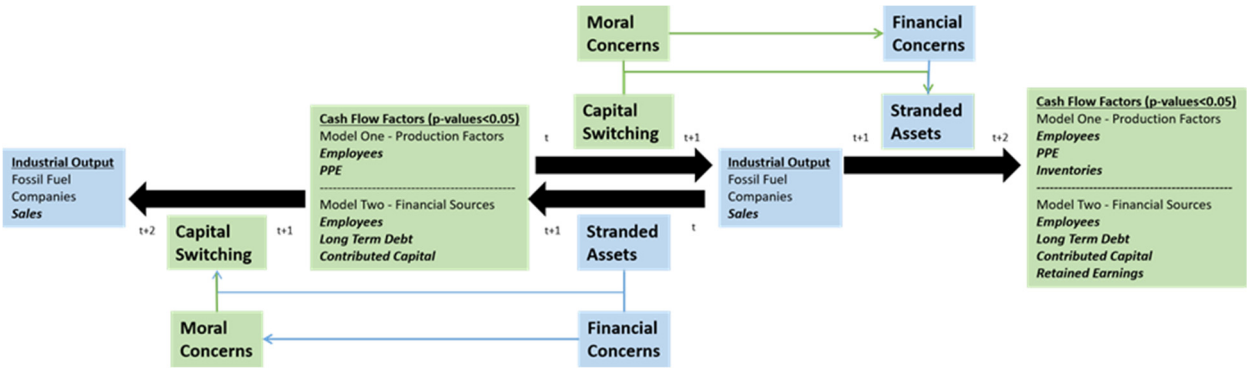

Figure 3. The interrelationship between ethical and financial concerns.

6.1. Connection to Previous Research and Theory

The findings address a gap in the literature on the effect of divestment. Based on production functions [42,43], and in contrast to [44], the study shows that the decrease in various cash flow factors negatively influences the future fossil fuel sector's industrial output (see also [45]). Hence, the study linked the divestment literature and production theory in the fossil fuel sector [46]. Complementing [6,41,47], this study empirically demonstrated that a change in investments influences the productivity and sales in the fossil fuel sector and that investors react to the change in sales because of the fear of stranded assets. Consequently, the results close a gap in the knowledge about investors' motivation to divest [47].

In addition, the study shows that the bi-directional causality between corporate social performance (CSP) and corporate financial performance (CFP) [11] is valid in the case of the fossil fuel industry as well. However, the question remains open as to whether bi-directional feedback [48] or the impact of a third variable [11], such as the general impact of climate change and climate change policies, causes the bi-directional causation. In our study, we found evidence for the first reason. However, future research might address this question more in detail.

6.2. Limitations of the Study and Further Research

A limitation of this study is a potential endogeneity issue [49]. Since the endogeneity cannot be eliminated, the causal relationship between factors cannot be fully established. The Granger Causality test cannot prove whether one factor "causes" another factor [50]. In addition, the interpretation of the bi-directional interrelation between finance and productivity is not unique. It can be explained through the interaction between the variables or by introducing a third variable that influences the other variables [11,47]. Hence, further research can address the endogeneity issue through a quasi-experimental design and test the influence of a third variable, such as climate change policies, on the independent variables.

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Appendix A

Table A1. List of companies in the sample.

Headquarter Location	Company Name	Headquarter Location	Company Name
United States	Allete	United States	Rhino Resource Partners
United States	Alliance Resource Partners	United States	Rice Energy
United States	American Energy	United States	SM Energy
United States	Anadarko Petroleum	United States	Southwestern Energy
United States	Antero Resources	United States	Westmoreland Coal

Table A1. *Cont.*

Headquarter Location	Company Name	Headquarter Location	Company Name
United States	Apache Corporation	United States	Whiting Petroleum
United States	Arch Coal	United States	WPX Energy
United States	Black Hills	United Kingdom	Anglo American
United States	Cabot Oil & Gas	United Kingdom	BP
United States	California Resources	United Kingdom	Rio Tinto
United States	Chesapeake Energy	The Grand Duchy of Luxembourg	ArcelorMittal
United States	Chevron	Spain	Repsol
United States	Cimarex Energy	South Africa	Sasol
United States	Cloud Peak Energy	Russia	Gazprom
United States	Concho Resources	Russia	Mechel
United States	ConocoPhillips	Nigeria	Oando
United States	CONSOL Energy	Netherlands	Royal Dutch Shell
United States	Continental Resources	Italy	ENI
United States	Denbury Resources	India	Vedanta
United States	Devon Energy	Germany	BASF
United States	Energen	France	ENGIE
United States	EOG Resources	France	Total
United States	EP Energy	Colombia	Ecopetrol
United States	EQT	China	CNOOC
United States	ExxonMobil	China	PetroChina
United States	FirstEnergy	China	Yanzhou Coal Mining
United States	Foresight Energy	Canada	ARC Resources
United States	Gulfport Energy	Canada	Birchcliff Energy
United States	Hallador Energy	Canada	Canadian Natural Resources
United States	Hess	Canada	Cenovus Energy
United States	Linn Energy	Canada	Crescent Point Energy
United States	Marathon Oil	Canada	Encana
United States	Murphy Oil	Canada	Husky Energy
United States	NACCO Industries	Canada	Imperial Oil
United States	National Fuel Gas	Canada	Lundin
United States	Newfield Exploration	Canada	MEG Energy
United States	Noble Energy	Canada	Painted Pony Petroleum
United States	Oasis Petroleum	Canada	Peyto E&D
United States	Occidental	Canada	Seven Generations Energy
United States	PDC Energy	Canada	Suncor Energy
United States	Peabody Energy	Canada	Teck Resources
United States	Pioneer Natural Resources	Canada	Tourmaline Oil
United States	QEP Resources	Brazil	Vale
United States	Ramaco Resources	Australia	BHP Billiton
United States	Range Resources	Australia	Santos

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