How Gold Became Green: The Financial Impact of Unsustainable Behavior in the Luxury Fashion Industry

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Abstract. This study researches the effect of unsustainable behavior on financial performance in the luxury fashion industry. Despite previous research focusing attention on the effect of sustainable behavior in non-luxury sectors, quantitative research on the financial consequences of unsustainability within the luxury fashion industry has not explored. The findings suggested that there is a positive initial relationship between the mentioned variables, with insignificant negative subsequent results partially due to the study's limitations, which included a small sample size, ultimately making it difficult to generalize results on the population. In addition, the luxury fashion market showed positive stock market movements particularly during scandals receiving high media coverage and taking place during the COVID pandemic year 2020. Other moderators such as brand positioning, designer involvement, statement timing, and type of scandal were not able to successfully explain the variations in the market responses.

Keywords: Luxury, fashion, marketing, finance, sustainability, CSR

Table of Contents

1 Introduction

For a long time, luxury fashion and sustainability were considered contradictory terms (Campos Franco, Hussain, & McColl, 2020). Over the last decade, however, new generations of clients have driven a significant shift from *"a focus on self-indulgence to community concerns, from conspicuous consumption to conscientious consumption, and from immediate gratification to concern for future generations"*(Truong, 2010). Unfavorable press and the rapid flow of information through social media have exposed unsustainable practices, leading customers to hold brands accountable (Moraes, Chatzidakis, & Carrigan, 2017). As a result, it has become more relevant than ever for luxury fashion brands to adapt to sustainable practices.

With consumers becoming increasingly aware of the impacts of the current consumption levels, sustainable production and consumption have become areas of focus in marketing and business strategy (Papadas, Avlonitis, & Carrigan, 2017). Up until recently, research has focused on sustainable Fast-Moving-Consumer Goods (FMCGs), which includes items like organic and fair-trade foods (Davies & Gutsche, 2016; Nuttavuthisit & Thøgersen, 2017), beauty (Cervellon & Carey, 2011; K.-H. Kim & Kim, 2022; Hennigs, Karampournioti, & Wiedmann, 2016), and cleaning products (Ouimette, 2011). However, extending sustainable practices to all products and services, beyond just FMCGs, is crucial for effectively addressing global environmental, social, and economic challenges, as other industries also significantly impact the planet and society. Recent studies have started to explore the implementation of sustainable production and consumption in other domains such as durable goods (T. Osburg & Heibach, 2018; McLeay, Yoganathan, Osburg, & Pandit, 2018), technological innovations (Hyysalo, Johnson, & Juntunen, 2017; Jansson, 2011), and the travel and tourism industry (Hardeman, Font, & Nawijn, 2017; Randle, Kemperman, & Dolnicar, 2019). Surprisingly, the luxury fashion industry remains underexplored (Athwal, Istanbulluoglu, & Ghauri, 2019).

Despite the increasing demand for sustainable fashion (Athwal, Wells, Carrigan, & Henninger, 2019), there remains a lack of research examining the quantitative impact of sustainable behavior in the fashion industry, particularly within the luxury sector. Entirely absent are quantitative studies on *unsustainable* behavior.

Measuring marketing activities with financial metrics is increasingly important because it offers a more objective and precise evaluation of marketing effectiveness than traditional metrics do. Therefore, this study aims to bridge the gap between marketing and finance in the luxury fashion industry, by examining the financial impact of unsustainable practices, both in terms of environmental and ethical issues. Specifically, this work will address the following question:

"How does unsustainable firm behavior influence financial performance in the luxury fashion industry?"

1.1 Relevance

A Sector Worth Investigating Luxury fashion presents interesting insights for several reasons. First, the perception of luxury creates distinct consumer bases, business models, and market expectations for luxury fashion houses compared to high street (non-luxury) fashion brands. The understanding of sustainable firm behavior in FMCGs cannot be easily generalized to luxury products, as luxury items have different characteristics compared to FMCGs, such as the value and frequency of purchase, visibility to others, essentiality for daily life, and complexity (Athwal, Istanbulluoglu, & Ghauri, 2019; Davies, Lee, & Ahonkhai, 2012). These differences may lead to unique reactions to (un)sustainable practices, making luxury fashion a research area on its own.

Second, the luxury market has experienced rapid growth in the last decade (D'Arpizio, Levato, Prete, de Montgolfier, & de Smet, 2019), with a growth of over 10 per cent per year since 2009 (Bain and Co., 2012). Given the industry's high profit margins and resilience to economic downturns, it has become an attractive sector for investors (Deloitte, 2019). This makes it interesting to investigate the financial impact of sustainability issues from an investor's perspective, as addressing these concerns can be important for maintaining investors' confidence.

Third, the democratization of luxury fashion, characterized by more frequent collections and mass production, presents significant challenges in aligning with sustainable principles (Dubois, Laurent, & Czellar, 1998). For example, practices such as the destruction of unsold stock to maintain exclusivity raise serious concerns among stakeholders and provoke public outrage (Agarwal, 2024). Other pressing issues include animal cruelty, poor working conditions in factories, unsustainable practices within the global jewelry industry, and a lack of transparency in supply chains (Kent, 2024).

Additionally, luxury fashion can influence the broader fashion industry by setting trends not only in creativity but also in sustainable practices, serving as a model for other sectors to follow (V.-S. Osburg, Davies, Yoganathan, & McLeay, 2021). Luxury goods and services are known to act as initiators for innovations that become mainstream over time. For example, luxury automotive brand Tesla has significantly advanced both the electric car and solar energy markets with its high-end, innovative products. Similarly, business models in fashion and electronics often originate in the luxury sector before being adopted more broadly (Hu, Tan, & Tang, 2019; Bundgaard & Huulgaard, 2019).

Academic & Managerial Relevance The study of the impact of unsustainable behavior in the luxury fashion industry holds relevance for both academic work and practical decision-making in the luxury fashion industry.

From an academic perspective, understanding the relationship between unsustainable behavior and financial performance adds to a growing body of research on the marketing and finance interace (Edeling, Srinivasan, & Hanssens, 2021). By examining how unsustainable practices influence investors' perceptions and market valuation, researchers can understand how unsustainable behavior translates into tangible outcomes for companies.

From a managerial standpoint, insights from this research can inform strategic decision making and crisis management practices within luxury fashion brands. By understanding the effects of unsustainable behavior on stock market performance, brands can address sustainability concerns based on quantitative evidence, and mitigate potential negative effects.

The research question will be tested using event study and regression methodologies to analyze abnormal stock returns in a unique sample of 27 instances of luxury fashion misconduct. Additionally, the research will explore how moderators such as brand positioning, designer involvement, crisis management strategies, and different types of scandals influence this effect.

2 Theoretical Background & Literature Review

This section will first establish a theoretical foundation on the definitions of luxury and sustainable firm behavior, and how these concepts interact in contemporary contexts. Next, a theoretical framework will be presented to address the research question. Finally, a state-of-the-art literature review that this work builds upon will be provided.

2.1 Theoretical Background

Luxury & Sustainability

What's sustainability got to do with it? Sustainability in business, or Corporate Social Responsibility (CSR), can be defined as "A company's commitment to operate in a sustainable manner, considering the ethical, environmental, and economic impacts of its activities" (Bansal & DesJardine, 2014). As (Moir, 2001) states, "Business only contributes fully to society if it is efficient, profitable, and socially responsible." Therefore, the ultimate goal for companies is to not only comply with laws and regulations, but to also make positive contributions to society and the environment.

CSR includes environmental sustainability, such as reducing waste, conserving resources, and minimizing environmental impact, as well as ethical sustainability, such as fair treatment of employees, honest marketing, legal compliance, and animal welfare (Du, Bhattacharya, & Sen, 2010).

Luxury The meaning of luxury remains vague and lacks a consistent definition (Liang, Ghosh, & Oe, 2017), largely because of its subjective and contextual nature (Kapferer & Bastien, 2016; Roper, Caruana, Medway, & Murphy, 2013; Roux, Tafani, & Vigneron, 2017). Therefore, rather than defining luxury itself, this section will focus on understanding the factors that drive consumers' attitudes towards it.
Consumers' attitudes towards luxury are shaped by several characteristics that differentiate them from non-luxury items, as summarised by Figure 1.

Tangible value, which includes product quality and the brand value of luxury goods, is a major driver in consumer preferences (Hennigs, Wiedmann, Klarmann, & Behrens, 2015; Tynan, McKechnie, & Chhuon, 2010). This brand value is often associated with higher price

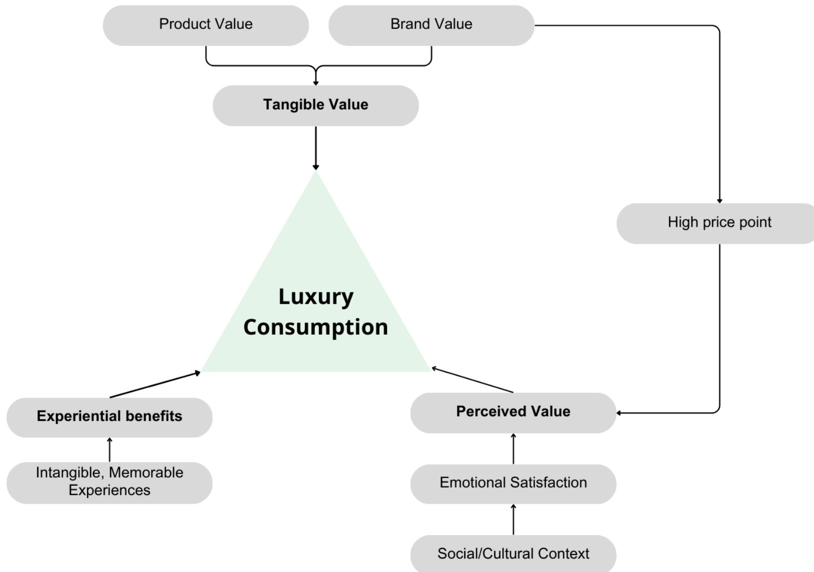


Fig. 1: Drivers of luxury consumption.

points and greater perceived social status and prestige, which in turn enhance the perceived value that the brand accumulates. Perceived value—derived from the pleasure and social status associated with luxury items—also plays a significant role in influencing consumer preferences (Choo, Moon, Kim, & Yoon, 2012; Kapferer & Bastien, 2016). Moreover, there is a growing shift towards experiential benefits in the luxury market. Unique and memorable experiences are becoming increasingly important, highlighting the importance of not just owning luxury items, but also enjoying the unique experiences they provide (Atwal & Williams, 2009; Caru & Cova, 2008).

Sustainable Luxury Fashion As luxury fashion brands expand their reach from a "privileged few" to the "happy many" (Dubois et al., 1998), the growing consumer base has become increasingly aware of environmental and ethical issues (Presse, 2008; Lochard & Murat, 2011). This shift is particularly relevant given that social media scandals can severely damage the reputation of luxury brands (D'Arco, Cortese, & Lucchetti, 2019; Hansen, Kupfer, & Hennig-Thurau, 2018; Moraes et al., 2017).

In response, luxury fashion brands have made sustainability central to their core values, intensifying their focus on implementing more ethical and environmental initiatives to meet stakeholder demands and maintain their reputations (Acabou & Dekhili, 2013; Guercini & Ranfagni, 2013; Athwal, Istanbulluoglu, & Ghauri, 2019; D'Anolfo, Barbarossa, & Beckmann, 2017).

Several luxury fashion brands are actively working to mitigate their environmental and societal impacts. For example, brands like Stella McCartney and Vivienne Westwood have made strong commitments to CSR standards (de Angelis, Adıgüzel, Amatulli, Guido, & Stoppani, 2017), with McCartney offering exclusively vegan collections. Other luxury brands have introduced specific initiatives or product lines focused on sustainability. Gucci and Armani, for example, have implemented a fur-free policy, while LVMH has established a sustainability fund. In 2021, Hermès partnered with MycoWorks to create a leather alternative made from mycelium, introducing the first mushroom-made bag, the Victoria. Additionally, some brands are recognized with the Butterfly Mark for their commitment to sustainable luxury.

The Marketing-Finance Interface

The marketing-finance interface is an interdisciplinary area of research that explores the effects between marketing activities and financial performance (Edeling et al., 2021). It examines how marketing activities impact financial metrics such as revenue, profitability, and stock market performance. In doing so, it incorporates the perspectives of investors. By acknowledging investors as relevant stakeholders, this research area aknowledges the significance of marketing in influencing business decisions and overall financial outcomes (Moorman, 2004). In turn, understanding this interface is crucial for making informed business decisions that align marketing efforts with financial goals.

Evaluating Marketing Activities with Financial Measures The interface between marketing and finance is important for understanding the broader impact of marketing activities on firm performance. Traditionally, the performance evaluation of marketing activities has been measured through metrics such as brand sentiment, customer satisfaction, and market share. However, these measures often lack objectivity and precision since customer mindset metrics are difficult to measure accurately (Srivastava, Shervani, & Fahey, 1998). They are often subjective and can vary significantly depending on the methodology used. For example, (Srivastava et al., 1998) report that the average correlation between financial measures and customer mindset metrics is only 0.27. This calls for the need for more reliable measures that can provide a clearer picture of marketing effectiveness. In turn, financial measures can offer more quantitative insights in assessing the impact of marketing investments and overall firm performance (Grewal, Iyer, Kamakura, Mehrotra, & Sharma, 2009; Joshi & Hanssens, 2009).

2.2 Literature Review

An overview of the current literature on (un)sustainable behavior in the luxury industry is presented in Figure 2. This figure illustrates the effect of (un)sustainable behavior, alongside the general impact of marketing activities, on traditional metrics (such as brand image) and financial metrics (such as stock performance). Additionally, it links traditional metrics to drivers of luxury consumption (Figure 1).

A summary of the discussed literature on (un)sustainable behavior in the (luxury) fashion industry is presented in Tables 1 and 2.

Traditional Metrics Considerable research has provided insights into how sustainable initiatives in fashion influence traditional metrics (e.g., consumer behavior or brand perception). (Shen, Wang, Lo, & Shum, 2012) found that fashion consumers are increasingly prioritizing CSR considerations, such as fair labor practices and environmental sustainability, when making purchase decisions. The research indicates that brands engaging in sustainable practices tend to build stronger reputations and achieve higher levels of customer loyalty. This positive brand image can lead to improved financial performance as consumers are more likely to support brands that align with their ethical values.

Research also focused on the effect of other marketing activities like social media marketing (SMM). (A. J. Kim & Ko, 2012) found that SMM activities, including entertainment, interaction, trendiness, customization, and word of mouth, positively influence value equity, relationship equity, and brand equity of luxury fashion brands.

(Amatulli, De Angelis, Korschun, & Romani, 2018) challenge the notion that luxury and CSR are incompatible by investigating consumer reactions to different CSR initiatives in luxury companies. Through three experiments involving 461 respondents, they find that

CSR initiatives significantly increase consumers' willingness to buy, particularly among those with higher status and a conspicuous consumption orientation.

In turn, while highly covered in other industries, the relationship between *unsustainable* behavior and traditional metrics in the (luxury) fashion industry has not been extensively studied. (Amatulli, De Angelis, Pino, & Guido, 2020) researched consumers' reactions to luxury versus mass-market fashion products produced unsustainably. The study finds that third-party information revealing the unsustainable nature of luxury products elicits higher consumer guilt compared to mass-market products. This guilt drives negative word-of-mouth (NWOM) about the company, which can significantly damage the brand's reputation.

(Nakdali & Ahmed, 2021) focused specifically on fast fashion giant H&M to explore the impact of unethical behavior on customer brand image. The research highlighted that unsustainable practices, such as poor working conditions and environmental negligence, severely damage a brand's image and lower consumer trust. It found that negative perceptions stemming from unsustainable firm behavior lead to decreased customer loyalty.

Financial Metrics Despite the discussed research on the benefits of sustainable fashion, there remains a notable lack of quantitative analysis on the consequences of breaking these policies (unsustainable behavior). This is particularly evident in the luxury fashion sector, where quantitative marketing studies are entirely lacking.

Research on the financial performance of non-luxury fashion companies, particularly in relation to CSR practices, is upcoming, but sparse. (Medcalfe & Miralles Miro, 2022) explored the effect of sustainable practice on financial measures in the fast fashion industry, indicating a significant positive correlation between sustainable practices and financial performance. Their findings suggest that fashion companies that prioritize sustainability not only contribute positively to social and environmental outcomes but also enhance their financial performance.

Similarly, (E. R. G. Pedersen, Gwozdz, & Hvass, 2018) found a positive relationship between CSR and self-reported financial performance in their survey of non-luxury fashion industry managers, though this relationship was not significant when organizational values were considered. Additionally, (Paik & Krumwiede, 2017) documented that fashion companies signing the North American Alliance for Bangladesh Worker Safety agreement saw higher abnormal returns in the days following the agreement, despite a negative relationship between prior financial performance and the decision to sign. (Fan & Lo, 2012) examined the effect of voluntary Occupational Health and Safety Management System certification on the financial performance of fashion- and textile-related companies. They found that while certification implementation increased return on assets and sales during the implementation period, return on assets was negative in subsequent periods.

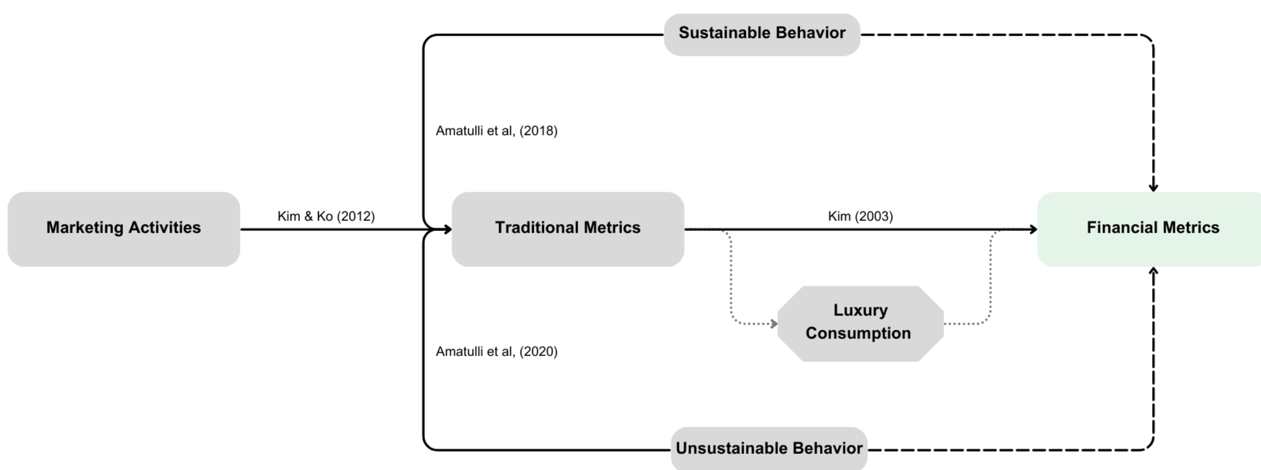


Fig. 2: State-of-art marketing literature luxury industry.

(H.-b. Kim, Gon Kim, & An, 2003) found that consumer-based brand equity, encompassing brand loyalty, perceived quality, and brand image, significantly enhances financial performance in the luxury hotel sector. This suggests a similar potential impact in the luxury fashion industry. Consequently, it can be stated that sustainable firm behavior can improve the financial performance in luxury fashion through the positive effect of well-researched traditional metrics (Amatulli et al., 2018). In this work, the inverse relationship is formally proposed:

H1: *Unsustainable practices in luxury fashion companies negatively affect the abnormal stock return of the company.*

Industry	Dependent Variable	Independent Variable	Key Findings	Author(s)
Non-luxury	Consumer Behavior (Traditional)	Sustainable Behavior	Consumers prioritize CSR considerations, such as fair labor practices and environmental sustainability, in their purchase decisions.	(Shen et al., 2012)
Luxury	Customer Relationships (Traditional)	Social Media Marketing (SMM)	SMM activities positively influence value equity, relationship equity, and brand equity in luxury fashion.	(A. J. Kim & Ko, 2012)
Luxury	Consumer Willingness to Buy (Traditional)	Sustainable Behavior	Luxury companies' CSR initiatives increase consumers' willingness to buy; this effect is accentuated for consumers with higher status and conspicuous consumption orientation.	(Amatulli et al., 2018)
Luxury	Consumer Guilt (Traditional)	Unsustainable Behavior	Third-party information revealing the unsustainable nature of luxury products causes higher consumer guilt compared to mass-market products, leading to negative word-of-mouth and damaging brand reputation.	(Amatulli et al., 2020)
Non-luxury	Brand Image (Traditional)	Unsustainable Behavior	Unsustainable practices severely damage brand image, erode consumer trust, decrease customer loyalty, and potentially lead to adverse financial outcomes.	(Nakdali & Ahmed, 2021)

Table 1: Summary of literature on (un)sustainable behavior and traditional metrics in the fashion industry.

Industry	Dependent Variable	Independent Variable	Key Findings	Author(s)
Non-luxury	Financial Performance (Financial)	Sustainable Behavior	Positive correlation between sustainable practices and financial performance in the fast fashion industry.	(Medcalfe & Miralles Miro, 2022))
Non-luxury	Financial Performance (Financial)	Sustainable Behavior	Positive relationship between CSR and self-reported financial performance, though not significant when organizational values were considered.	(E. R. Pedersen, Gwozdz, & Hvass, 2018)
Non-luxury	Abnormal Returns (Financial)	Sustainable Behavior	Firms signing the North American Alliance for Bangladesh Worker Safety agreement saw higher abnormal returns post-agreement, despite negative prior financial performance.	(Paik & Krumwiede, 2017)
Non-luxury	Return on Assets (Financial)	Sustainable Behavior	Certification increased return on assets and sales during the implementation period, but return on assets was negative in subsequent periods.	(Fan & Lo, 2012)
Luxury	Financial Performance (Financial)	Brand Equity	Consumer-based brand equity significantly enhances financial performance, suggesting potential impact in luxury fashion.	(H.-b. Kim et al., 2003)

Table 2: Summary of literature on (un)sustainable behavior and financial metrics in the fashion industry.

Conceptual Framework In line with the conceptual framework in Figure 3, the following additional hypotheses are proposed to gain more insights in how unsustainable firm practice relates to the financial performance of luxury fashion brands.

Brand Heritage While on moral grounds one could reason that sustainable firm behavior is relevant for both luxury and non-luxury fashion, it is only shown in non-luxury fashion brands that unsustainable firm behavior can result in negative financial outcomes. As previously discussed, the unique characteristics of luxury make it difficult to translate these non-luxury results to the luxury sector (Athwal, Istanbulluoglu, & Ghauri, 2019; Davies et al., 2012). This raises the question of whether luxury consumers might be more forgiving of unsustainable practices, and whether the luxury positioning of a fashion brand influences this impact. Lower-positioned luxury brands might be viewed more similarly to fast fashion brands than higher-positioned luxury brands, potentially resulting in different effects. Furthermore, since brand image plays a crucial role in determining a brand's position within the luxury sector(Carvalho, Mendes, & Pereira, 2022), and unsustainable behavior has been shown to negatively affect brand image (Amatulli et al., 2020), higher-positioned luxury brands may be better equipped to mitigate these negative impacts. The following hypothesis is therefore stated:

H2: *Higher luxury brand placement mitigates the negative effect outlined in H1.*

Designer effect Research indicates that negative events associated with a company and its representatives can lead to a more significant decline in stock performance compared to issues unrelated to representatives. For instance, (Graham, Harvey, & Rajgopal, 2005) demonstrated that scandals involving corporate executives can severely impact investor trust and firm value, much more than operational issues. Similarly, (Arthaud-Day, Certo, Dalton, & Dalton, 2006) found that misconduct by key representatives causes greater damage to corporate reputation and financial performance compared to other types of corporate issues. Applying these findings to the luxury fashion industry, it is reasonable to hypothesize that scandals involving creative directors (designers), who are central figures in luxury brands, could have a more detrimental effect on abnormal stock returns compared to non-representative related issues. The following hypothesis is therefore stated:

H3: *Scandals involving creative directors of luxury brands intensify the negative effect outlined in H1.*

Crisis Management The timing and nature of a firm's response to a crisis can significantly influence its impact on stock performance. (Coombs, 2007) found that quick and appropriate responses to crises can mitigate negative effects on corporate reputation and financial performance. Furthermore, (Lee, 2005) found that immediate responses to crises are generally more effective in preserving stock value compared to delayed responses. Therefore, in the context of luxury fashion firms the following hypothesis is proposed:

H4: *An immediate (delayed) firm statement weakens (strengthens) the negative effect outlined in H1.*

Scandal type effect The specific nature of a scandal can differ within the broader context of unsustainable firm behavior. It's important to research how different types of scandals impact a company's financial performance. For example, popular sustainability fashion icons such as Stella McCartney and Vivienne Westwood take strong stands on particular issues, such as the use of fur in fashion and worker exploitation, but not on others, like water usage, recycled materials, and dye production. This raises the question of whether addressing only ethical (or environmental) issues is sufficient in the luxury industry and if luxury consumers are exclusively sensitive to ethical (or environmental) concerns.

In this work, the effects of ethical issues will be tested against environmental issues to understand which type of scandal has a more significant influence on financial performance. By identifying whether ethical or environmental issues have more significant financial repercussions, this study aims to contribute to a deeper academic understanding of corporate social responsibility (CSR) and its impact on firm valuation within the context of luxury fashion. Additionally, this insight will be valuable to luxury fashion companies in strategically allocating their focus of sustainable marketing efforts.

As this body of literature is still in its early stages, no specific hypothesis is made in this work. Instead, empirical results will need to demonstrate which type of scandal has a more significant effect in the luxury fashion industry.

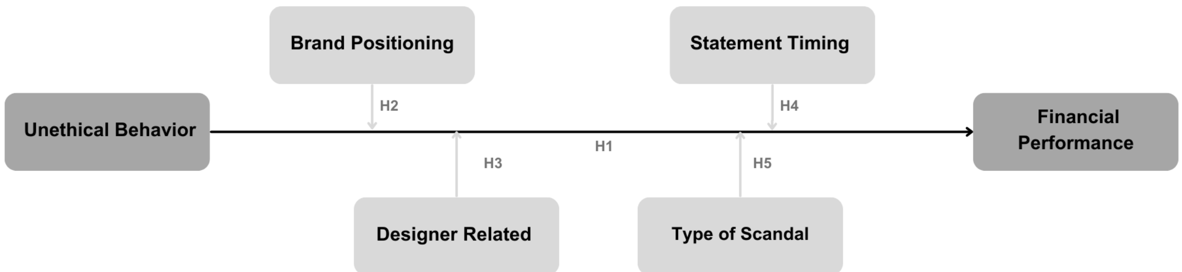


Fig. 3: Conceptual Framework

3 Empirical Analysis

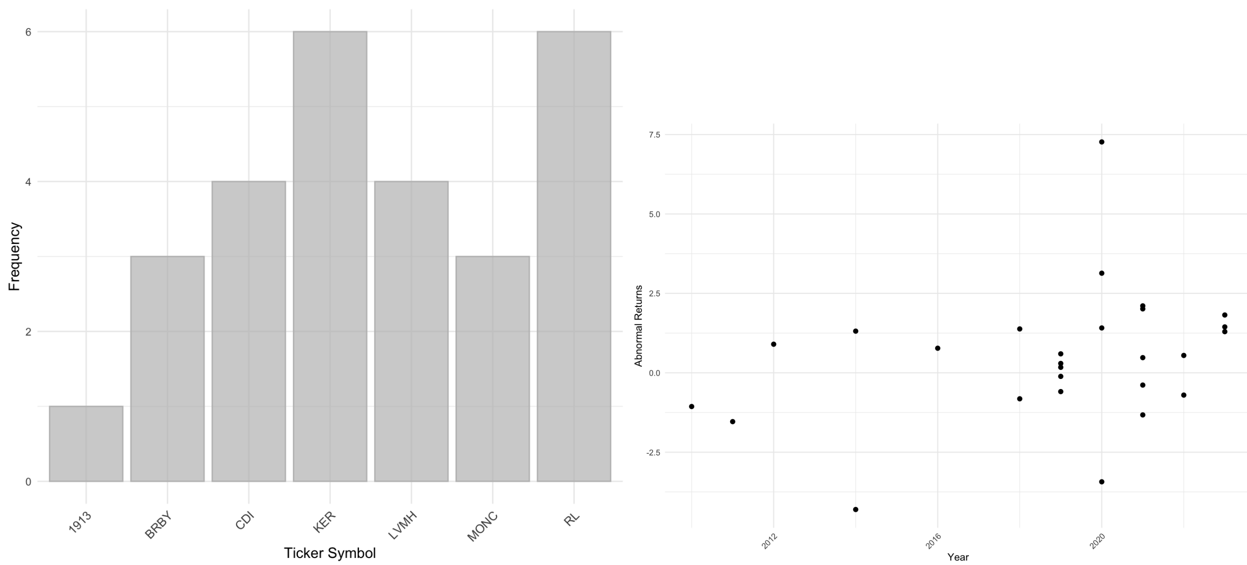
3.1 Data

Event Study The dataset consists of daily stock data (Eikon) from the 15 largest publicly traded luxury fashion brands and covers 27 distinct scandals over the period from 2010 to 2024. When a fashion brand is part of a larger conglomerate[1], the stock information of the conglomerate was used. This resulted in the analysis of 8 distinct fashion companies, with an average of approximately 3.5 scandals per company within the specified time period.

Figure 4a shows the distribution of scandals across different companies in the dataset. As can be seen, companies such as Kering (KER) and Ralph Lauren (RL) experienced the highest number of scandals (6), while companies like Prada (1913) and Moncler (MONC) experienced fewer scandals. Full details regarding the (selection of) scandals are provided in

[1] Large luxury conglomerates, such as Kering or LVMH, own numerous high-end fashion houses and other luxury brands across various sectors, including fashion, jewelry, cosmetics, and wines. These conglomerates provide financial support and strategic direction to enhance global presence and profitability. Famous examples include LVMH's Louis Vuitton and Moët & Chandon, and Kering's Gucci and Saint Laurent.

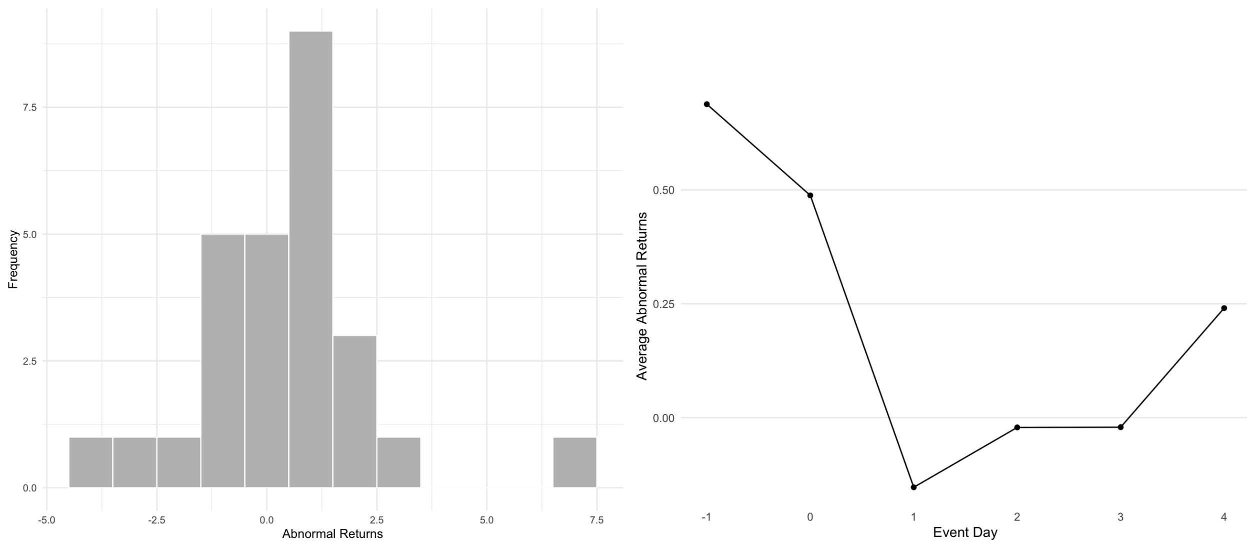
Appendix B. The scatter plot in Figure 4b illustrates the abnormal returns on the event day 0 for each year, indicating notable effects during the COVID pandemic year 2020.



(a) **(b)**

Fig. 4: (a) Frequency of scandals by company. (b) Abnormal returns on the event day (t=0) categorized by the year.

The abnormal returns observed during the scandals, analyzed over an event window of [0, +4] days relative to the scandal event, range from a minimum of -5.15 percent at $t = +1$ to a maximum of 7.2 percent at $t = 0$, with an average abnormal return of 0.07 percent. The distribution of the abnormal returns on the event date is presented in Figure 5a.



(a) (b)

Fig. 5: (a) Distribution of abnormal returns on the event day (t=0) for 27 scandals. (b) Mean of abnormal returns for 27 scandals.

On average, the immediate impact of a scandal shows a sharp decline in abnormal stock returns, as can be seen in Figure 5b by the drop from roughly 0.5 percent to -0.2 percent from event day 0 to event day +1. After the initial negative reaction, the abnormal stock returns gradually recover to zero over the following few days.

Regression Variables Several variables are included in the regression analysis to account for factors influencing the impact of scandals on stock performance. Four moderators are constructed:

1. **Brand** is included to account for the luxury brands' positioning considering price point, craftsmanship, heritage, and design. It is hand constructed using the fashion model positioning pyramid [2] and present-day domain knowledge. It is defined by three levels:

[2] The fashion pyramid is a well-established model used to segment fashion brands based on price, quality, and exclusivity. This pyramid can be divided into several levels, each representing a different tier in the fashion market. (Fashinza, 2023)

   (a) Accessible luxury brands, such as Ralph Lauren, Moncler, and Max Mara, who offer premium quality at relatively lower price points, making them more accessible for a broader consumer base.
   (b) Aspirational luxury brands, including Prada and Gucci, are positioned higher, relating more to consumers who view these products as status symbols.
   (c) Supreme luxury brands, like Hermès, Loro Piana, and Dior, represent the pinnacle of luxury with exceptional quality, craftsmanship, and exclusivity, relating to the highest rank of consumers who view these products as investments and creative expression.
2. **Designer** is binary coded that indicates whether the scandal was specifically related to the actions of the (artistic) director of the fashion company.
3. **Statement Timing** indicates the timing of the firm's response to the scandal, indicating if the firm publicly made a statement about the scandal. This variable does not only consider the existence of a statement but also focused on the exact timing of the firm's communication, categorising it as occurring on the day of the scandal, the day after, or being entirely absent.

Scandal is included given that investors might be more sensitive to different types of misconduct (e.g. environmental). Using media articles, each scandal was classified into either an ethical (e.g. worker exploitation, animal cruelty) or environmental issue (e.g. burning of stock, deforestation).

To control for year effects which were significant for luxury fashion, a dummy variable for the COVID-19 year (2020) will be used. Initial exploration using ANOVA tested if the year had a significant effect on abnormal returns. ANOVA compared the mean of the abnormal returns across different years to determine any statistically significant differences.

For all days in the event window, the ANOVA results showed p-values greater than 0.05 (Appendix A), indicating no significant difference in the mean of the abnormal returns for all event days across years. Therefore, the null hypothesis—the mean of the abnormal returns is the same for all years—could not be rejected. This finding is consistent with Figure 4b, which shows no clear trend in AR by year for event day 0.

The decision to still keep the year of 2020 included in further analyses aligns with the domain knowledge of the observed boom in luxury stock during the COVID-19 pandemic[3] Additionally, a variable for rise in media attention was used, taken as the slope between the difference in media coverage three days post event compared to one day before event. In this case, the COVID pandemic and the rise in media attention are being controlled for to better isolate the effect of the other variables on abnormal returns.

Table 3 provides an overview of all variables, including description and data source.

Table 3: Regression Variables

Variable	**Description**	**Source**	**Mean**	**Min**	**Max**
AR	Abnormal returns	Eikon	0.065	-5.146	7.267
Designer	Indicator for designer involvement	Domain knowledge	0.185	0	1
Statement0	Indicator for first type of statement	Media articles	0.148	0	1
Statement1	Indicator for second type of statement	Media articles	0.185	0	1
Brand	Brand positioning	Domain knowledge	1.778	1	3
Environment	Indicator for environment scandal	Media articles	0.574	0	1
Covid	Indicator for COVID year	Domain knowledge	0.148	0	1
Media	Media control index	Google Trends	-1.870	-33.5	16.5

The correlation plot in Figure 6 presents the correlations between the cumulative average abnormal returns (CAAR) and the independent variables. While analyzing AR would have required choosing a specific time ($t = 0, 1, 2, 3, 4$), the decision to focus on CAAR provides a more comprehensive understanding of the correlations.

First, a positive correlation (0.34) between Covid and Environment suggests that environmental scandals were more frequent during the COVID-19 period. Next, a negative correlation of Environment with Statement0 and Statement1 (-0.43 and -0.30 respectively) indicates that fewer statements are made when the scandal is environmental. Additionally, a positive correlation (0.43) between Statement1 and Media indicates that there is a tendency for more statements to be made one day after scandals that receive high media coverage compared to scandals with lower media coverage. A positive correlation (0.38) between Brand

[3] During the COVID-19 pandemic, the luxury sector experienced a significant increase in stock performance, driven by shifts in consumer behavior and increased demand for high-end goods (Smith, 2021).

and Designer indicates the obvious: higher placed luxury brands often have more renowned designers than lower-end brands. And so are more prone to scandals involving their designers.

Finally, a positive correlation (0.30) between CAAR and Designer shows that scandals involving designers are associated with favorable stock movements over the whole event window.

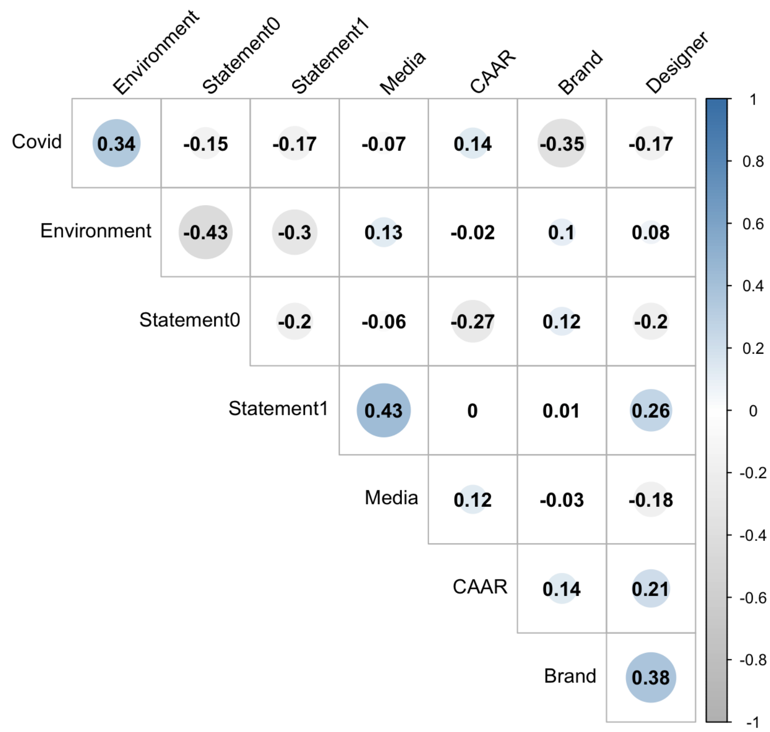


Fig. 6: Correlation between full event window CAAR and ndependent variables

3.2 Methodology

Event Study Event studies are a common statistical method used to estimate the impact of (unanticipated) events on the stock price performance of companies (Brown & Warner, 1985), such as scandals surrounding luxury fashion houses. The idea behind event studies is based on the efficient market hypothesis (Fama, 1970), suggesting that the effects of significant events are absorbed in the stock price and can therefore be observed through changes in a company's stock price. Consequently, changes in the stock price following an event, relative to the pre-event price, can be interpreted as the market's assessment of the economic significance of that particular event. In the following sections, the econometric structure of event studies will be discussed.

Event Window The first step in conducting an event study involves defining the event of interest, T_0, and determining the event window during which the stock prices of the affected firms will be analyzed. In practice, it is common to extend the period of interest to include several days $[T_0 - d, T_0 + d]$, ensuring that the window encompasses both the announcement day and at least the following day (MacKinlay, 1997). This approach accounts for the price effects of announcements made after the stock market has closed on the announcement date.

In this study, the primary event window of interest is defined as $[0, +1]$ to capture the market's initial reaction to the announcement. Additionally, an extended timeframe of $[+1, +4]$ is considered to account for any further adjustments or delayed responses in the market.

Abnormal Returns Event studies are used to measure the impact of a firm-specific event on the value of that firm by examining abnormal returns (AR). AR represents the difference between predicted and actual returns of a stock following the event. Central to this, of course, is the model which predicts what the return of a stock would have been on the event day. Various models are available for this purpose (MacKinlay, 1997). This research will employ the market model (Brown & Warner, 1980), which adjusts the event date return to mitigate the influence of overall market conditions, thereby enhancing the accuracy of assessing the impact of scandals on a fashion company. The market model can be defined as

$$R_t = \alpha + \beta \cdot RM_t + e_{t,i}. \tag{1}$$

Where $R_{t,i}$ and RM_t represent the return on day t for the stock of company i and the overall market (taken as MSCI index), respectively, $e_{t,i}$ the company-specific abnormal return on day t, while parameters α and β specify the linear structure of the market model across a specified estimation window.

To account for early information leaks that could affect stock prices, a gap between the event window and the estimation window is recommended (MacKinlay, 1997). In this study, a 10-day gap will be employed. The estimation window typically covers at least 120 trading days prior to this gap (Castro-Iragorri, 2019). Consequently, for each announcement, a 130 trading day period prior to the event window will be used as the estimation window.

By assumptions inherent in the structure of the market model (OLS), the firm-specific abnormal return $e_{t,i}$ is unrelated to the overall market and therefore has an expected value of zero. Hence, for company i, the expected return on day t, given the market return on day t, can be defined as:

$$E[R_{t,i}|RM_{t,i}] = \alpha + \beta \cdot RM_{t,i}. \tag{1}$$

With these two formulas, the abnormal return for company i at time t ($AR_{t,i}$) can be defined as:

$$AR_{t,i} = R_{t,i} - E[R_{t,i} \mid RM_t] \tag{2}$$

In essence, AR captures the portion of a stock's return that cannot be attributed to general market movements. With a dataset consisting of I events covering T days from the event date onwards, the following AR matrix representation can be constructed:

$$\begin{bmatrix} AR_{1,1} & \cdots & AR_{1,I} \\ \vdots & \ddots & \vdots \\ AR_{T,1} & \cdots & AR_{T,I} \end{bmatrix} \tag{3}$$

Average Abormal Returns In this research, which aims to identify patterns of influence from fashion scandals in general rather than focusing solely on Dior's response to the anti-Semitic comments made by Mr. Galliano, the analysis takes a broader perspective. Therefore, AR will be assessed relative to the abnormal returns across the entire collection of similar events. Average abnormal returns (AAR) will be used for this, which takes the row-wise mean in the AR matrix, resulting in an average representation of abnormal return for every time t post event date. Mathematically, AAR for a given time t is calculated as follows:

$$\text{AAR}(t) = \frac{1}{N} \sum_{i=1}^{N} \text{AR}_{t,i}. \tag{4}$$

With N being the number of events in the sample, and $\text{AR}_i(t)$ being the abnormal return for event i at time t.

Cumulative Average Abnormal Returns In continuation of the analysis, cumulative average abnormal returns (CAAR) will also be considered to further understand the aggregated impact of fashion scandals over time. CAAR is obtained by summing the AAR over a specified period, thus providing a cumulative measure of the abnormal returns. This metric helps in capturing the longer-term effect of an event on stock performance. Mathematically, for a given time period stretching t_0 to t_1, CAAR is calculated as follows:

$$\mathrm{CAAR}_{[t_0,t_1]} = \sum_{t=t_0}^{t_1} \mathrm{AAR}(t). \tag{5}$$

Cumulative abnormal returns (CAR) are closely related to CAAR. While CAAR is the average of the cumulative abnormal returns across multiple events, CAR represents the cumulative abnormal return for a single company or event. Essentially, CAAR can be viewed as the aggregation of CARs for multiple entities, providing an overall measure of the market's reaction to a specific type of event across a sector or group. CAR is calculated as follows:

$$\mathrm{CAR}(i) = \sum_{t=0}^{T} \mathrm{AR}_{t,i}, \tag{6}$$

where $\mathrm{AR}(t)$ denotes the abnormal return for event i at time t.

Statistical Significance To verify whether the observed abnormal returns are statistically different from zero, thereby indicating a true impact rather than random fluctuations, the following hypotheses will be tested to determine this significance:

$$H_0 : \mathrm{(C)AAR} = 0,$$
$$H_a : \mathrm{(C)AAR} \neq 0.$$

For AAR, the test statistic for each time t is calculated as follows:

$$t_{\mathrm{AAR}}(t) = \frac{\mathrm{AAR}(t)}{\sigma_{\mathrm{AAR}(t)}}, \tag{7}$$

where $\sigma_{\mathrm{AAR}(t)}$ is the standard error of the AAR at time t.

For CAAR, the test statistic for each time period $[t_0, t_1]$ is calculated as:

$$t_{\mathrm{CAAR}_{[t_0,t_1]}} = \frac{\mathrm{CAAR}_{[}t_0, t_1]}{\sigma_{\mathrm{CAAR}_{[t_0,t_1]}}}, \tag{8}$$

where $\sigma_{\text{CAAR}_{[t_0,t_1]}}$ is the standard error of the CAAR at time window $[t_0, t_1]$. Because the true standard error of (C)AAR is unknown, it is estimated using bootstrapping, following the methodology outlined by (Efron, 1992). A detailed description of this method is provided in the Appendix D.

Regression Analysis To determine the influence of the moderators, multivariate Ordinary Least Squares (OLS) regression will be used. The dependent variables for this analysis are AR(t) and $\text{CAR}_{[t_0,t_1]}$, representing significant times t and time periods $[t_0, t_1]$. These variables will be regressed on the independent variables defined in Section 3.1. A detailed description of this method is provided in Appendix C.

Modeling To determine the best explanatory model, two different models will be compared based on their adjusted R-squared and Akaike Information Criterion (AIC) values to identify the optimal one.

The Baseline model includes all hypothesized moderators and control variables. In the second model, interaction terms are incorporated into the variables from the full model. These interaction terms help to capture the combined effects of two variables acting together, providing deeper insights into their relationships. For instance, the impact of a designer-related scandal might vary depending on whether the brand is perceived as premium or high-end. To optimize this model, step-wise AIC selection is employed. This method starts with the full model, which includes all variables and interaction terms, and iteratively removes the least significant predictors to minimize the AIC. The AIC balances model complexity with goodness-of-fit, selecting the Optimal model that best explains the data while avoiding overfitting.

While the baseline model offers valuable insights, the Optimal model serves to confirm and strengthen the patterns implied by the baseline model.

Bootstrapping Due to the small size of the dataset, traditional OLS assumptions regarding the distribution of error terms may not hold. Therefore, bootstrapping will be used to estimate the accuracy of the regression coefficients. This approach allows for more robust estimates of the standard errors and confidence intervals of the regression coefficients without relying on the assumptions of normality and homoscedasticity of error terms. A detailed description of this method can be found in the Appendix D.

Timing of Statements In the context of modeling the AR on event days and the days following an event, the timing of public statements by the firm needs to be carefully considered. Including these timing variables in regression models varies based on the day being analyzed.

For the regression model where the dependent variable is AR day 0 (AR(0)), only Statement0 is included. This is because, on the event day, information about possible statements made after day 0 is not yet available for investors. Therefore, Statement1 (indicating statements made one day after the scandal) will be omitted from this model. For regression models analyzing AR on day 1, both Statement0 and Statement1 will be included. Given that the data contains no observations for statements made beyond one day after the event, the subsequent regression models will be structured similarly to the model for AR(1).

3.3 Results

Event Study The results of the event study for 27 scandals are presented in Tables 4 and 5. These tables include the (C)AAR values along with their bootstrap standard errors (SE), t-statistics, and p-values.

Table 4: (C)AAR Results, B= 5000

Event Date	AAR	SE	t-stat	p-value	CAAR	SE	t-stat	p-value
0	**0.469%**	**0.252**	**1.859**	**0.074***	0.469%	0.252	1.859	0.074
+1	-0.142%	0.257	-0.555	0.583	0.327%	0.356	0.919	0.360
+2	-0.040%	0.252	-0.160	0.874	0.287%	0.403	0.712	0.479
+3	-0.025%	0.255	-0.100	0.921	0.262%	0.464	0.565	0.576
+4	0.324%	0.252	1.287	0.210	0.585%	0.3613	1.620	0.110

The analysis of AAR(0) reveals a positive and statistically significant reaction at the ten percent level (0.469%, p = 0.074), suggesting that the initial market response to the announcement of a scandal is positive.

However, the AAR's on the days immediately following the event (AAR(1), AAR(2), and AAR(3)) are negative before turning positive on the fourth day after the scandal (AAR(4)). While this provides an interesting pattern, it is statistically insignificant.

Table 5: CAAR Results, B=5000

Event Window	CAAR	SE	t-stat	p-value
[0, 1]	0.3268%	0.3658	0.8935	0.3798
[0, 2]	0.2866%	0.4465	0.6418	0.5266
[0, 3]	0.2611%	0.5016	0.5205	0.6071
[0, 4]	0.5850%	0.5643	1.0367	0.3094
[1, 2]	-0.1827%	0.3632	-0.5030	0.6192
[1, 3]	-0.2081%	0.4354	-0.4781	0.6366
[1, 4]	0.1158%	0.5121	0.2261	0.8229
[2, 3]	-0.0657%	0.3534	-0.1859	0.8540
[2, 4]	0.2582%	0.4370	0.5909	0.5597
[3, 4]	0.2985%	0.3598	0.8295	0.4144

Furthermore, no statistically significant cumulative impact was found in the event window. The lack of statistical significance in the negative AAR values in the subsequent days and the CAAR values suggests that while there is an initial positive reaction to a scandal, the cumulative negative impact is not substantial over the extended short term.

The evidence does not support the notion that unsustainable behavior in luxury fashion firms negatively affects financial performance in a statistically significant manner. In fact, there is a statistically significant positive initial stock reaction. Therefore, Hypothesis 1 is rejected.

Regression Analysis Significant (C)AAR values are used as dependent variables in regression analyses. The regression models include various independent variables, comprising all variables defined in Section 3.1 as well as their interaction terms, to evaluate their influence on stock performance. Additionally, bootstrapping techniques were used to ensure more stable and reliable regression estimates. This approach helps ensure that the results are robust and not implied by sample-specific characteristics, which is especially important given the small sample size ($n = 27$).

The event study revealed that the AAR on the event date, AAR(0), was statistically significant, while none of the CAAR values were significant within the event window analyzed. Despite no CAAR values being statistically significant, its negative pattern the days following the event date sparks interest to further understand the factors driving this negativity.

Therefore, to further explore the underlying influences of the positive AAR(0) and the subsequent negative AAR values, a series of regression analyses were conducted using AR(0) and $CAR_{[1,3]}$, as dependent variables. It is important to note, that because of significant initial reaction AAR(0), the AR(0) will remain the main focus for addressing the hypotheses.

Assumptions The Variance Inflation Factor (VIF) was calculated to test for collinearity. For baseline models, all VIF values were under 5, as detailed in Appendix E.1. However, the Optimal AR(0) model demonstrated a VIF value of 8.919 for the interaction term. To address this, all predictors were centered by subtracting their means. Centering can help clarify regression coefficients and reduce multicollinearity at the micro level without affecting the overall model fit (Aiken & West, 1991; Iacobucci, Schneider, Popovich, & Bakamitsos, 2016; Disatnik & Sivan, 2016).

To ensure consistency and comparability, all other models were centered. The potential drawback of losing the original scale interpretation is not as relevant for this research, which focuses more on the comparative rather than absolute nature of the moderators. The initial models without centering are presented in Appendix E.1.

Table 6 presents the centered regression outputs of all the constructed models for AR(0), and $CAR_{[1,3]}$. It includes the parameter estimates along with their bootstrap p-values. The full results table for each model, including both the original and bootstrap t-values and p-values, can be found in Appendix E.2.

Table 6: Summarised Regression Model Results for AR(0) and CAR

Dependent Variable	**AR(0)**				$\mathbf{CAR}_{[1,3]}$					
Model	**Baseline**		**Step-wise AIC**		**Baseline**		**Interaction**		**Step-wise AIC**	
	β	**p-value**	β	**p-value**	β	**p-value**	β	**p-value**	β	**p-value**
Intercept	0.056	0.959	0.402	0.556	-0.208	0.704	0.501	0.404	0.518	0.348
Covid	1.393	0.811	1.531	0.491	-0.026	0.984	1.388	0.395	1.331	0.304
Brand	0.235	0.856	0.116	0.774	0.336	0.656	0.033	0.962	-0.187	0.726
Designer	-0.873	0.579			1.841	0.245	2.308	0.161	**2.498**	**0.024****
Statement0	-2.181	0.129	-2.281	0.346	-0.198	0.913	0.159	0.919		
Statement1					-1.891	0.276	0.849	0.707	0.758	0.713
Environment	0.358	0.683			-1.743	0.304	-1.542	0.331	-1.666	0.243
Media	0.017	0.852			**0.099**	**0.052***	**0.155**	**0.023****	**0.155**	**0.043****
Brand:Statement0			2.043	0.581						
Covid:Media							**0.667**	**0.036****	**0.650**	**0.025****
Statement1:Media							-0.249	0.184	-0.270	0.299
Statement0:Media							0.077	0.557		
Adjusted R-squared	0.006		0.133		-0.068		0.154		0.270	
AIC	125.072		119.962		138.728		133.781		128.471	
Chi-squared	0.199, p = 0.999		0.122, p = 0.998		6.806, p = 0.449		1.350, p = 0.969		7.031, p = 0.426	
Durbin-Watson	2.624, p = 0.951		2.447, p = 0.868		2.016, p = 0.458		4.984, p = 0.892		5.725, p = 0.767	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Hypothesis 2 The coefficient for Brand is 0.235 in the Baseline AR(0) model and 0.116 in the Optimal AR(0) model. This indicates that moving from a lower luxury brand to a higher luxury brand is associated with an increase of 0.235 (0.116) units in AR(0). However, this effect is not statistically significant. While the results suggest a positive relationship between higher luxury brand positioning and the initial stock reaction, there is insufficient evidence to support the notion that higher-end luxury brands experience a positive impact on stock returns from scandals compared to more premium luxury brands. Therefore, Hypothesis 2 is rejected.

Hypothesis 3 The coefficient for Designer in the Baseline AR(0) model is -0.873, indicating that designer-specific scandals are associated with a decrease of 0.873 units in AR(0).

However, this result is not statistically significant. Conversely, the $CAR_{[1,3]}$ models suggest a positive relationship between designer involvement and stock performance over an extended period. Specifically, the Optimal $CAR_{[1,3]}$ model shows a significant positive relationship ($\beta = 2.498$), at the 5 percent level. Given these mixed and statistically insignificant results for AR(0), Hypothesis 3, which stated that designer-specific scandals intensify the negative impact on stock returns compared to non-representative related issues, is rejected. However, evidence for the opposite is presented in the significant positive estimate in the optimal $CAR_{[1,3]}$ model

Hypothesis 4 Statement0 demonstrates a negative effect in the Baseline and Optimal AR(0) model (-2.181 and -2.81 respectively), but this result is not statistically significant.

In the $CAR_{[1,3]}$ regression, the coefficient for Statement0 is also negative in the Baseline model (-0.198), while Statement1 is more negative (-1.891). This initially suggests that a delayed response may have a more detrimental effect on stock market performance compared to an immediate response. However, when considering interactions with media coverage in the Interaction model, the interpretation changes.

For immediate responses (Statement0), the main effect is slightly positive (0.159), and the interaction with media coverage further enhances this effect (0.077), leading to a combined positive impact of 0.236. For delayed responses (Statement1), the main effect is positive (0.849), but the interaction with media coverage is negative (-0.249), resulting in a combined positive and more pronounced effect of 0.600 compared to the immediate response.

Lastly, in the Optimal $CAR_{[1,3]}$ model focusing solely on delayed responses, the main effect remains positive (0.758), while the interaction with media coverage is negative (-0.270), indicating that media coverage slightly reduces the positive impact of delayed responses.

However, the lack of statistical significance for these effects leads to the rejection of Hypothesis 4. Therefore, there is insufficient evidence to state that delayed responses are more damaging to stock market performance compared to immediate responses.

Hypothesis 5 The Environment variable has a coefficient of 0.358 in the Baseline AR(0) model, though this effect is not statistically significant. In the $CAR_{[1,3]}$ models, the coefficients are -1.743 in the Baseline model and -1.666 in the Optimal model, indicating that environmental scandals are associated with a decrease in $CAR_{[1,3]}$ compared to ethical scandals, but these effects are also not statistically significant. Therefore, there is not enough evidence to support the statement that environmental scandals have a more damaging impact than social scandals. Hypothesis 5 is rejected.

Overall, the models' performance metrics support these findings. The adjusted R-squared of the AR regressions improves from 0.006 in the baseline model to 0.133 in the Optimal model, and from -0.068 to 0.270 in the $CAR_{[1,3]}$ models, indicating better explanatory power in the optimized models.

Moreover, the AIC is lowest in the Optimal models for AR(0) and $CAR_{[1,3]}$ (119.962 and 128.471 respectively), suggesting that these models provide the best fit compared to the baseline models.

Further Insights The regression analysis provides additional insights beyond the individual hypotheses. First, the interaction term of COVID and Media is positive and significant at the 5 percent level in the optimal $CAR_{[1,3]}$ model (0.650). This suggests that during the COVID-19 pandemic, the relationship between high media coverage of scandals and abnormal returns is more positive compared to periods without the pandemic.

Second, the positive coefficient of the interaction term Brand and Statement0 (2.043) in the optimal AR(0) model indicates a positive relationship between higher luxury brand positioning and the initial stock market reaction when an immediate statement is made, although this effect is not statistically significant.

Lastly, the regression analysis reveals an insignificant negative coefficient (-0.249) for the interaction between delayed statements (Statement1) and media coverage, and an insignificant positive coefficient (0.077) for the interaction between immediate statements (Statement0) and media coverage in the interaction $CAR_{[1,3]}$ model. This suggests a trend where delayed responses to widely covered scandals may result in adverse effects on cumulative abnormal returns, whereas immediate statements during high media coverage might be associated with a more favorable impact.

3.4 Discussion

Interpretations The results of this study offer several insights into the stock market reactions to scandals in the luxury fashion industry.

Positive Initial Reaction The results showed a statistically significant positive abnormal average stock return of 0.469 percent on the event date, suggesting that the market initially reacts positively to the announcement of a scandal. This finding is interesting as it contradicts the conventional expectation of negative market reactions to negative news (Huang & Chen, 2006). One possible explanation is that the immediate market response might reflect an initial underestimation of the severity of the scandal, leading to a delayed correction in the stock price as more information becomes available.

Insignificant Subsequent Reactions The average abnormal return on the days following the event are mostly negative but not statistically significant, and the cumulative average abnormal returns over various event windows also show no significant cumulative impact. This indicates that while there may be an initial positive reaction, it does not translate into a lasting negative impact on stock performance. This could imply that the luxury fashion market is resilient to the negative effects of scandals, possibly due to strong brand loyalty and reputation.

Regression Analysis Findings This research did not find evidence to support significant impact of brand positioning, statement timing, and environmental issues on stock performance.

However, designer involvement in a scandal significantly positively impacts abnormal stock returns, with 2.498 percent. This suggests that designer-specific scandals might actually benefit the brand in the long run, possibly because the increased attention on the designer draws more interest and engagement with the brand overall.

High media attention also shows a significant positive effect on cumulative abnormal returns, increasing by 0.155 percent. While counterintuitive, increased visibility from media coverage, particularly regarding scandals, can enhance brand awareness. Scandals often attract consumer attention, potentially leading to higher sales and greater investor interest, thereby improving stock performance. This aligns with the popular saying, "there's no such thing as bad publicity", indicating that negative media coverage can enhance both brand awareness and stock market performance in the luxury fashion industry (Berger, Sorensen, & Rasmussen, 2010).

During the COVID-19 pandemic, the positive impact of media coverage on cumulative abnormal returns was even more pronounced, with a significant positive effect of 0.650 percent. This could be because the pandemic created an environment where consumers and investors were particularly attuned to news and updates, amplifying the effects of media coverage. Research has shown that during times of high uncertainty, such as the COVID-19 pandemic, the demand for information significantly increases, which can influence market dynamics and investor behavior, leading to amplified market reactions to media coverage (Jiang, Zhu, Zhang, Yan, & Shen, 2021).

Managerial Implications The insights from this work, including the interpretation of insignificant findings, can assist decision-making processes in two ways.

Luxury Fashion Managers First, the results provide valuable insights for crisis management strategies. While the statistical significance is limited, the results imply that both immediate and delayed responses to scandals tend to have positive impacts on stock performance compared to not making a statement, particularly for scandals highly covered by media. However, delayed responses, for scandals receiving high media coverage, show a more pronounced positive effect compared to immediate responses. This suggests that luxury fashion managers should not rush to respond immediately but should instead focus on making well-thought-out responses.

The positive coefficient for environmental scandals indicates that investors might be more concerned about environmental issues compared to ethical ones. Managers should prioritise clear and transparent communication regarding their environmental sustainability efforts as it can help maintain investor confidence.

Luxury Fashion Investors Second, the results provide insights for luxury fashion investments.

The findings support the notion that the luxury fashion market demonstrates notable resilience to scandals, even those highly covered by the media during the COVID pandemic.

This resilience is shown by the significant and positive abnormal returns on the event day, indicating an immediate, favorable reaction from the market. While subsequent stock reactions are negative, they are statistically insignificant, suggesting that the initial impact does not lead to a lasting downturn. This implies that while scandals may create initial volatility, they do not significantly affect the extended short-term performance of luxury fashion stocks.

Understanding that scandals might not always harm stock performance, especially during strong market conditions, demonstrates the resilience of luxury fashion brands in contrast to non-luxury fashion brands. This makes luxury fashion brands a more stable investment compared to non-luxury fashion brands, even in turbulent times. Additionally, designer involvement can attract significant attention, potentially transforming a negative situation into an opportunity for increased brand visibility. This makes brands with prominent designers a more reliable investment.

Moreover, although statistically insignificant, higher positioned luxury brands may benefit from a stronger reputation, which helps mitigate negative stock movement caused by scandals. Similarly, this makes higher positioned brands a more reliable investment.

Limitations and Future Research This study has two limitations that should be addressed. First, while bootstrap techniques were employed to provide the most robust results possible, the small sample size of 27 observations may still affect the generalizability of the results of this study. Moreover, bootstrap methods assume that the sample itself is representative of the population, which is difficult to be certain of. Future research should aim to use larger datasets to enhance the robustness and reliability of the results.

Secondly, the data used in this study was manually collected and curated. While this approach ensures detailed and specific data, it can introduce biases and errors. Automated and more standardized data collection methods should be considered in future research to reduce potential biases and improve data accuracy.

Future research could make a deeper analysis of the statements made in response to scandals. While the current study primarily focused on the timing of these statements (immediate vs. delayed), finding that both timings can positively affect stock performance—with delayed responses showing slightly better financial outcomes during highly publicized scandals—there is much to be gained from a more detailed examination. Future research should focus on the content and tone of these statements to gain further insights into their impact on financial metrics. Analyzing different types of statements (e.g., apologetic, defensive, corrective) and their specific content through natural language processing (NLP) could provide better insight in how crisis management influences financial performance.

In addition, future research could benefit from measuring financial performance through a different metric such as revenue growth or profit margins. This could reveal additional insights into the relationship between scandals and financial performance.

Future research could also investigate the quantitative impact of *sustainable practices* in the luxury fashion industry, as this also represents a notable gap in the literature. This research could compare the effects of sustainability to those observed in this study regarding unsustainable practices. The same relevance applies: research conducted in non-luxury sectors lacks generalizability to the luxury industry, making this an interesting area for research.

Lastly, a longer-term event study should be conducted to assess the broader impact of scandals on financial performance in the luxury fashion industry. Extending the event window will help determine whether short-term market reactions are representative of long-term consequences. This would provide valuable insights into the resilience of luxury brands and the long-term effects of their strategies.

4 Conclusion

This study investigates the financial implications of unsustainable behavior in the luxury fashion industry using event study and regression methodologies. Measuring marketing activities with financial metrics is increasingly important as it offers a more objective and precise evaluation of marketing effectiveness in comparison to traditional metrics.

This research represents a significant gap in existing literature, as prior research in non-luxury sectors is not generalizable to the luxury fashion industry due to the nature of the sector. The findings of this research confirm this as it shows that scandals do not significantly negatively affect financial performance in the short term for luxury fashion brands, which contradicts the results found in non-luxury fashion.

The initial market response to scandals is positive, followed by negative reactions. However, these are statistically insignificant, indicating no sustained downturn. Over the event window of $[0, +4]$, the market generally recovers to pre-event levels. Additionally, the market demonstrates no significant negative financial implications even during adverse market conditions such as the Covid-19 pandemic, highlighting the resilience of the luxury market in comparison to non-luxury sectors.

The results suggest that the luxury fashion market's resilience is possibly due to strong brand loyalty and reputation, which mitigate the negative effects of scandals. Furthermore, scandals involving high-profile designers and high media coverage may even have a positive short-term financial impact by increasing visibility and engagement with the brand. High media coverage of scandals can enhance brand awareness, potentially leading to higher sales and greater investor interest.

The limitations of this study, including the small sample size and manual data collection, suggest that future research should aim to use larger datasets and automated data collection methods to enhance the robustness and reliability of the results. Future research could benefit from examining different financial metrics, obtain deeper insights in the moderating effect of crisis management strategies, and applying the same methodology to the effect of sustainable initiatives in luxury fashion.

Although this research did not find evidence supporting short-term negative financial consequences of unsustainable behavior of luxury fashion brands, the growing consumer awareness and demand for sustainable practices indicate that long-term effects should be explored further. Given that the planet cannot sustain current levels of consumption forever (McDonagh & Prothero, 2014), future studies should research and compare how unsustainable and sustainable initiatives influence the financial performance of luxury fashion brands over time, providing a clear understanding of the role sustainability is set out to play in the luxury fashion industry

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A ANOVA

Table 7: ANOVA Results for Abnormal Returns (AR) and CAAR [0,+4]

Event Day	F-value	p-value
+0	0.306	0.806
+1	0.104	0.969
+2	0.306	0.749
+3	1.808	0.140
+4	0.843	0.598
[0,+4]	0.730	0.688

B Scandal Selection

The fashion industry, particularly the luxury segment, has been involved in several high-profile scandals that illustrate the negative consequences of unethical behavior. For this study, 40 distinct unsustainable scandals within the luxury fashion industry were initially identified. These scandals were carefully selected to ensure they represented a broad spectrum of unethical practices with significant implications for firm performance.

To refine the sample and eliminate the impact of confounding events, several checks were implemented. Events that coincided with other major firm announcements or involved multiple types of misconduct on the same day should be excluded. This determination was made by scanning the scandal dates for related news using Google. No instances were removed. The initial sample was further reduced for the following reasons.

First, one scandal was excluded due to overlapping estimation and event windows. In this case, if a firm engaged in two different acts of misconduct close together in time, the first event was within the estimation window of the second event. Following standard event study practices (Engelen & Kabir, 2006), the second event was dropped.

Second, twelve events were excluded because the firms were not listed on a public stock market during the estimation window. This process resulted in a final sample of 27 distinct scandals.

For the 27 scandals, the percentage change in stock price was extracted directly from Eikon. This data represents the daily percentage change in stock price between the opening and closing prices for each trading day. Additionally, the corresponding MSCI index values for the same trading days were extracted from Eikon.

C OLS

Model Specification : The linear regression model can be specified as follows:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n + \epsilon$$

where y represents the dependent variable, β_0 is the intercept term, $\beta_1, \beta_2, \ldots, \beta_n$ are the coefficients of the independent variables $x_1, x_2, \ldots, x_n$, and ϵ denotes the error term.

Estimation of Coefficients : The OLS method estimates the coefficients $\beta_0, \beta_1, \ldots, \beta_n$ by minimizing the sum of the squared residuals (the differences between the observed and predicted values of y). This can be formulated as:

$$\min_{\beta} \sum_{i=1}^{n} (y_i - \hat{y}_i)^2 = \min_{\beta} \sum_{i=1}^{n} \left(y_i - (\beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_n x_{in})\right)^2$$

Solution : The minimization problem is solved by:

$$\hat{\beta} = (X^T X)^{-1} X^T y$$

where X is the matrix of independent variables, y is the vector of the dependent variable, and $\hat{\beta}$ is the vector of estimated coefficients.

Assumptions The OLS method relies on several key assumptions summarised in Table 8

Table 8: Assumptions of Regression Analysis

Assumption	Description	Methods of Verification
Linearity	The relationship between the dependent and independent variables is linear.	Scatter plots and residual plots.
Independence	Observations are independent of one another.	Durbin-Watson test.
No Perfect Collinearity	Independent variables exhibit no perfect multicollinearity.	Variance Inflation Factor (VIF) and correlation matrices.
Homoscedasticity	The variance of the error terms is constant across all levels of the independent variables.	Breusch-Pagan and White's tests.
Normality	Error terms follow a normal distribution.	Q-Q plots, Shapiro-Wilk test, and Kolmogorov-Smirnov test.
Exogeneity	Independent variables are uncorrelated with the error terms.	Hausman test.

D Bootstrapping Methodology

Bootstrapping is a resampling technique that allows the estimation of the sampling distribution of an estimator by resampling with replacement from the original sample data. This method is particularly useful when the theoretical distribution of the estimator is complex or unknown (Efron, 1992).

For this study, bootstrapping is employed to obtain robust standard errors for the estimated parameters of the AAR values and regression estimates. Normal regression assumes that the residuals are normally distributed and that the variance of the residuals is constant across all levels of the independent variables (homoskedasticity). Bootstrapping does not rely on the assumptions of normal distribution and homoskedasticity and can provide more reliable estimates if these assumptions are violated. This is often the case when dealing with real-world data, which can exhibit skewness, kurtosis, or heteroskedasticity. Additionally, traditional regression methods often require large sample sizes to ensure the accuracy of estimates and the validity of statistical tests. When the sample size is small, these assumptions are more likely to be violated, leading to unreliable estimates.

The procedure for bootstrapping to estimate the sampling distribution of an estimator involves the following steps:

Resampling Generate B bootstrap samples, each denoted by $\mathbf{X}_b^*$ (where $b = 1, 2, \ldots, B$), by randomly sampling with replacement from the original dataset $\mathbf{X}$. Consequently, the primary assumption for bootstrapping is that the original sample is a true reflection of the entire population. Each bootstrap sample $\mathbf{X}_b^*$ has the same size n as the original sample.

$$\mathbf{X}_b^* = \{X_1^*, X_2^*, \ldots, X_n^*\} \quad \text{for} \quad b = 1, 2, \ldots, B. \tag{9}$$

Estimation For each bootstrap sample $\mathbf{X}_b^*$, estimate the parameter estimates $\hat{\beta}_b$.

Distribution Construct the empirical distribution of the bootstrap estimates $\{\hat{\beta}_1, \hat{\beta}_2, \ldots, \hat{\beta}_B\}$. This empirical distribution approximates the sampling distribution of the estimator.

Inference Calculate the bootstrap standard errors, confidence intervals, and other relevant statistics from the empirical distribution. The bootstrap standard error for the parameter β is given by:

$$\sigma_{\text{boot}}(\hat{\beta}) = \sqrt{\frac{1}{B-1} \sum_{b=1}^{B} (\hat{\beta}_b - \bar{\beta})^2}. \tag{10}$$

Where $\bar{\beta}$ is the mean of the bootstrap estimates:

$$\bar{\beta} = \frac{1}{B} \sum_{b=1}^{B} \hat{\beta}_b. \tag{11}$$

Test Statistics The AAR test statistic for each time period t defined in Equation 7 can then be calculated using the bootstrapped standard error:

$$t_{\text{AAR}}(t) = \frac{\text{AAR}(t)}{\hat{\sigma}_{\text{AAR}(t)}}, \tag{12}$$

where $\hat{\sigma}_{\text{AAR}(t)}$ is the bootstrap standard error of the AAR at time t.

In the same manner, the test statistic of CAAR can be defined as

$$t_{\text{CAAR}[t_0,t_1]} = \frac{\text{CAAR}[t_0, t_1]}{\hat{\sigma}_{\text{CAAR}[t_0,t_1]}}, \tag{13}$$

where $\hat{\sigma}_{\text{CAAR}(t)}$ is the bootstrap standard error of the CAAR at time period $[t_0, t_1]$.

E Results Tables

E.1 Original Regression Models

Table 9: Regression Results for AR(0)

	Original					Bootstrap		
Variable	**Estimate**	**SE**	**t-value**	**p-value**	**VIF**	**SE**	**T-value**	**P-value**
Intercept	0.056	1.46473	0.038	0.097		1.092	0.051	0.959
Covid	1.393	1.262	1.104	0.283	1.208	2.306	0.604	0.567
Brand	0.235	0.579	0.406	0.689	1.244	0.549	0.428	0.750
Designer	-0.873	1.299	-0.672	0.509	1.530	1.080	-0.809	0.469
Statement0	-2.181	1.295	-1.684	0.108	1.273	1.152	-1.893	0.188
Environment	0.358	1.264	0.283	0.780	1.212	0.696	0.514	0.717
Media	0.017	0.036	0.460	0.650	1.071	0.039	0.428	0.750

Adjusted $\mathbf{R}^2$ = 0.006

AIC = 125.072

Chi-squared = 0.199, df = 6, p-value = 0.999

Durbin-Watson = 2.624, p-value = 0.951

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 10: Step-wise AIC Regression Results for AR(0)

	Original					Bootstrap		
Variable	**Estimate**	**SE**	**t-value**	**p-value**	**VIF**	**SE**	**T-value**	**P-value**
Intercept	0.845	1.045	0.808	0.428		0.766	1.103	0.271
Covid	1.531	1.100	1.392	0.178	1.051	2.216	0.691	0.520
Brand	-0.187	0.526	-0.355	0.726	1.177	0.453	-0.412	0.685
Statement0	-5.912	3.148	-1.878	0.074	8.617	3.530	-1.675	0.099
Brand:Statement0	2.043	1.495	1.366	0.186	8.919	1.676	1.219	0.237

Adjusted $\mathbf{R}^2$ = 0.133

AIC = 119.962

Chi-squared = 0.122, df = 4, p-value = 0.998

Durbin-Watson = 2.447, p-value = 0.868

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 11: Baseline Regression Results for CAR

	Original					Bootstrap		
Variable	**Estimate**	**SE**	**t-value**	**p-value**	**VIF**	**SE**	**T-value**	**P-value**
Intercept	-0.319	1.528	-0.209	0.837		1.854	-0.177	0.870
Covid	-0.026	1.658	-0.016	0.988	1.287	2.070	-0.013	0.987
Brand	0.336	0.740	0.453	0.655	1.254	0.778	0.432	0.678
Designer	1.841	1.706	1.080	0.294	1.628	1.547	1.190	0.245
Statement0	-0.198	1.694	-0.117	0.908	1.343	1.810	-0.109	0.914
Statement1	-1.891	1.750	-1.080	0.294	1.715	1.770	-1.067	0.309
Environment	-1.743	1.706	-1.022	0.320	1.363	1.684	-1.035	0.310
Media	**0.099**	0.054	1.836	**0.082***	1.485	0.051	1.946	**0.052***

Adjusted R-squared: -0.068

AIC: 138.728

Chi-squared: 6.806, df = 7, p-value = 0.449

Durbin-Watson: 2.447, p-value = 0.868

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 12: Step-wise AIC Regression Results for CAR

	Original					Bootstrap		
Variable	**Estimate**	**SE**	**t-value**	**p-value**	**VIF**	**SE**	**T-value**	**P-value**
Intercept	0.169	0.679	0.248	0.807		0.858	0.197	0.844
Covid	2.546	1.660	1.534	0.142	1.887	1.575	1.617	0.137
Designer	2.498	1.277	1.955	0.065	1.335	1.036	2.411	0.045
Statement1	0.253	1.808	0.140	0.890	2.675	4.621	0.055	0.961
Environment	-1.666	1.327	-1.255	0.225	1.205	1.398	-1.191	0.256
Media	0.109	0.048	2.278	0.035	1.702	0.043	2.502	0.022
Covid:Media	0.650	0.269	2.419	0.026	1.775	0.089	2.654	0.012
Statement1:Media	-0.270	0.164	-1.650	0.115	2.843	0.328	-0.823	0.420

Adjusted R^2 = 0.270

AIC = 128.471

Chi-squared = 7.031, df = 7, p-value = 0.426

Durbin-Watson = 1.396, p-value = 0.048

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

E.2 Centered Regression Models

Table 13: Baseline Regression Results for AR(0)

	Original					Bootstrap		
Variable	**Estimate**	**SE**	**t-value**	**p-value**	**VIF**	**SE**	**T-value**	**P-value**
Intercept	0.056	1.465	0.038	0.970		1.099	0.051	0.959
Covid	1.393	1.262	1.104	0.283	1.208	2.343	0.595	0.811
Brand	0.235	0.579	0.406	0.689	1.244	0.549	0.428	0.856
Designer	-0.873	1.299	-0.672	0.509	1.530	1.105	-0.790	0.579
Statement0	-2.181	1.295	-1.684	0.108	1.273	1.180	-1.848	0.129
Environment	0.358	1.264	0.283	0.780	1.212	0.691	0.518	0.683
Media	0.017	0.036	0.460	0.650	1.071	0.039	0.427	0.852

Adjusted R^2 = 0.006

AIC = 125.072

Chi-squared = 0.199, df = 6, p-value = 0.999

Durbin-Watson = 2.447, p-value = 0.868

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 14: Step-wise AIC Regression Results for AR(0)

	Original					Bootstrap		
Variable	**Estimate**	**SE**	**t-value**	**p-value**	**VIF**	**SE**	**T-value**	**P-value**
Intercept	0.402	0.384	1.047	0.307		0.682	0.590	0.556
Covid	1.531	1.100	1.392	0.178	1.051	2.256	0.703	0.491
Brand	0.116	0.494	0.235	0.817	1.037	0.960	0.121	0.774
Statement0	-2.281	1.132	-2.014	**0.056***	1.115	4.402	-0.518	0.346
Brand: Statement0	2.043	1.495	1.366	0.186	1.074	2.921	0.699	0.581

Adjusted R-squared: 0.1331

AIC: 119.962

Chi-squared: 0.122, df = 4, p-value = 0.998

Durbin-Watson: 2.447, p-value = 0.868

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 15: Baseline Regression Results for CAR

	Original					Bootstrap		
Variable	**Estimate**	**SE**	**t-value**	**p-value**	**VIF**	**SE**	**T-value**	**P-value**
Intercept	-0.208	0.519	-0.401	0.693		0.546	-0.381	0.704
Covid	-0.026	1.658	-0.016	0.988	1.287	2.070	-0.012	0.984
Designer	1.841	1.706	1.080	0.294	1.628	1.507	1.222	0.245
Brand	0.336	0.740	0.453	0.655	1.254	0.770	0.435	0.656
Statement0	-0.198	1.694	-0.117	0.908	1.343	1.809	-0.109	0.913
Statement1	-1.891	1.750	-1.080	0.294	1.715	1.653	-1.144	0.276
Environment	-1.743	1.706	-1.022	0.320	1.363	1.633	-1.067	0.304
Media	**0.099**	0.054	1.836	**0.082***	1.485	0.051	1.946	**0.052***

Adjusted R-squared: -0.068

AIC: 138.728

Chi-squared: 6.806, df = 7, p-value = 0.449

Durbin-Watson: 2.447, p-value = 0.868

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 16: Interaction Regression Results for CAR

	Original					**Bootstrap**		
Variable	**Estimate**	**SE**	**t-value**	**p-value**	**VIF**	**SE**	**t-value**	**p-value**
Intercept	0.501	0.584	0.858	0.404		1.207	0.415	0.679
Covid	1.388	1.590	0.873	0.395	1.495	1.716	0.810	0.584
Brand	0.033	0.694	0.048	0.962	1.393	0.908	0.037	0.933
Designer	2.308	1.571	1.469	0.161	1.745	1.766	1.307	0.264
Statement0	0.159	1.546	0.103	0.919	1.413	2.614	0.061	0.952
Statement1	0.849	2.216	0.383	0.707	3.472	5.666	0.150	0.882
Environment	-1.542	1.538	-1.002	0.331	1.399	1.773	-0.869	0.402
Media	**0.155**	0.062	2.510	**0.023***	2.463	0.129	1.201	0.231
Covid:Media	**0.667**	0.291	2.291	**0.036***	2.067	0.465	1.433	0.161
Statement1:Media	-0.249	0.179	-1.388	0.184	2.874	0.399	-0.624	0.549
Statement0:Media	0.077	0.129	0.599	0.557	1.246	0.380	0.202	0.802

Adjusted R-squared: 0.2733

AIC: 127.726

Chi-squared: 1.350, df = 6, p-value = 0.969

Durbin-Watson: 1.497, p-value = 0.098

Hausman Test: Chi-squared = 4.984, df = 10, p-value = 0.892

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 17: Step-wise AIC Regression Results for CAR

	Original					Bootstrap		
Variable	**Estimate**	**SE**	**t-value**	**p-value**	**VIF**	**SE**	**T-value**	**P-value**
Intercept	0.518	0.541	0.959	0.350		0.957	0.542	0.348
Covid	1.331	1.400	0.951	0.354	1.341	1.301	1.023	0.304
Designer	**2.498**	1.277	1.955	0.065*	1.335	1.063	2.350	**0.024****
Statement1	0.758	2.016	0.376	0.711	3.325	4.590	0.165	0.713
Environment	-1.666	1.327	-1.255	0.225	1.205	1.412	-1.180	0.243
Media	**0.155**	0.057	2.709	**0.014****	2.447	0.075	2.067	**0.043****
Covid:Media	**0.650**	0.269	2.419	**0.026****	2.039	0.093	2.405	**0.025****
Statement1:Media	-0.270	0.164	-1.650	0.115	2.769	0.311	-0.868	0.299

Adjusted R-squared: 0.2698

AIC: 128.471

Chi-squared: 7.031, df = 7, p-value = 0.426

Durbin-Watson: 2.447, p-value = 0.868

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$