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The Impact of ESG Scores on Stock Returns: An Analysis of Seasoned Equity Offerings' European firms during Covid-19 Pandemic

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Abstract

Seasoned equity offerings (SEOs) play a crucial role in securing sustainable capital structures for firms. However, these events are associated with costs and often results in the negative stock price reactions, as documented in literature and empirical research. Moreover, the finance sector has been increasingly focused on sustainability measured by Environmental, Social, and Governance (ESG) scoring. Previous studies have explored the influence of ESG factors on firm stock performance, but the impact of ESG factors on such corporate events within the context of difficult time remains unclear.

Therefore, this study aims to shed light on the relationship between ESG scores and stock returns by using the sample data from 253 European firms that underwent SEOs during Covid-19 pandemic. The event study reveals significantly negative announcement period stock returns across most industries, which is consistent with prior studies on SEOs. However, little evidence is found to support the association between ESG scores and SEO returns, while firm characteristics and offering information are dominant factors. As a result, this master thesis provides suggestions to financial professionals on how to mitigate the negative market reaction and enhance their firm's stock performance.

Keyword: Seasoned equity offerings (SEOs), capital structure, ESG scores, event study, Covid - 19 pandemic.

JEL classification: G14, G32, Q56

Contents

1. Introduction

This thesis aims to address a significant challenge associated with seasoned equity offerings (SEOs) that follow initial public offerings. This obstacle stems from the negative market reaction to stock prices during announcement period, a phenomenon well-documented in the existing literature on corporate finance. The adverse impact of SEOs can primarily be attributed to asymmetric information, wherein managers possessing superior information of overvalued share prices decide to issue equity. Consequently, this issuance sends a negative signal to external investors, leading to a drop in stock prices during the announcement period. Empirical research provides solid evidence supporting this behavior (Masulis & Korwar, 1985; Dierkens, 1991; Eckbo & Masulis, 1995; Corwin, 2003). Additionally, long-term underperformance of SEO firms is visible in every industry and implies managers exploit the time of overvaluation (Spiess et al., 1995).

Despite the complication of that, the decision of public offerings is one of the most significant milestones in the life of a company to generate funds for new projects (Wadhwa et al., 2016). SEOs are frequent strategies for firms to establish a sustainable capital structure through equity rather than debt. However, firms experienced a loss on SEO announce returns, an average 2.02% within 3-day window from 1996 to 2012 (Akhigbe et al., 2015). The performance was even worsened by economic downturns, the average loss increased to 8.6% in the same window period during Covid-19 pandemic (Zezius et al., 2022). The decrease of stock prices clearly hurt firms in terms of not only the proceeds of issuance but also the cost of capital and the market value.

In the context of unexpected and negative shocks to the economy, there are a greater demand for fundraising that cannot be delayed. If firms must issue equity, can firm managers time the market to minimize the negative effect of the announcement and improve stock performance, as suggested by market timing theory (Baker & Wurgler, 2002)? While there may be a possibility, timing the market is not straightforward, especially during economic disruptions when the market faces heightened volatility and uncertainty. Inevitably, besides considering financial factors, firms need to find feasible solutions for this situation which is likely to happen in the future.

Interestingly, recent research suggests an answer for that puzzle by sustainable factors, Environmental, Social and Governance pillar score (ESG). Through ESG performance, firms can improve not only financial performance but also stock performance, thereby mitigating the negative reaction from the market. For example, companies aligned with ESG objectives create long-term value for shareholders by enhanced financial performance in both accounting terms the stock return, management quality and reduced business and credit risk (Zumente et al. 2021). High ESG performance provides downside protection for firms during Covid-19 pandemic (Beloskar et al., 2022) and ESG-indexed assets offer better hedging risk qualities (Piserà et al., 2022). Reber et al. (2021) showed evidence of the positive relationship between ESG factors and stock returns in the event of IPOs during Covid-19 pandemic.

However, there are inconsistent results about the impact of sustainability or ESG criteria on returns. High-sustainability funds do not consistently outperform low-sustainability funds, despite the perception that sustainability positively predicts future performance (Hartzmark et al., 2019). The incorporation of social responsibility into the assessment of stock prices shows little evidence, except when firms was known as "bad" and a weak correlation between ESG ratings and firms' operating performance (Cornell et al.,2020). ESG strategy may be more effective when firms have financial slack (Duque-Grisales et al., 2021). During Covid-19 crisis, ESG performance has no significant association stock returns after controlling for intangibles investments (Demers et al. 2020). In addition to that, there is lack of evidence that Corporate Social Responsibility (CSR) can protect firms from the detrimental impact of the pandemic time (Bae et al., 2021). Therefore, the impact of sustainable or ESG factors on firm stock performance in SEO events appears unpredictable and requires further investigation.

Moreover, to the best of my knowledge, there are limited papers uncovering whether ESG performance effects on the event of SEOs in association with a special economic condition, especially the most recent one is Covid-19 pandemic. Most studies focus on the impact of CSR on SEOs rather than ESG on SEOs and ESG on stock prices generally. ESG is a larger term than CSR since it demonstrates that both enterprises and investors pay attention to environmental, social, and governance aspects, whereas CSR focuses on social obligations (Gillan et al., 2021). Therefore, my motivation is to shed the light on how ESG performance influences the lens of equity market in the event of SEOs during Covid-19 time and therefore answer whether it can mitigate the negative reaction. Using this event is also advantage to assess the relationship between ESG performance on the market reaction as SEOs are unexpected events, these events will improve the reverse causality relationship problem (Feng et al., 2018). Most existing studies have analyzed data from the US, so I aim to contribute to this topic by using data from the European market.

This paper uses 253 listed firms underwent SEOs in Europe during Covid-19 pandemic, 03/2020 – 05/2022. The methodology includes conducting an event study to estimate average abnormal returns using different asset pricing models (market model, CAPM, Fama & French 3-factor model and 3-factor model with the momentum factor from Carhart) to measure event effects with an estimation window [-260, -11] and an event window of 3 days [-1,1]. Following that, cross-sectional OLS regression analysis is employed to examine the relationship between announcement returns and overall ESG score, as well as individual component scores, while controlling for firm characteristics, offering information, and stock market information. Instrumental variable regressions are used for robustness checks. The findings show average negative abnormal returns of -0.59% on the announcement date and a negative announcement effect of -1.82% in 3 days, and reveal that ESG factors cannot support firm stock returns in SEOs' announcement period.

This paper will contribute to both existing literature and practical aspects in several ways. Firstly, the finding contributes to the literature of SEOs and identify dominant factors influencing SEOs in the context of economic downturns. Secondly, it will offer empirical evidence regarding the role of ESG ratings in firms' financing decisions, specifically in the case of SEOs. Thirdly,

understanding how the market reacts to firm events is crucial for managers to develop effective strategies for equity offerings and improve stock performance as the market performance of a public firm determines the cost of equity, which in turn affects its valuation. Fourthly, this study can contribute to the portfolio management of investors or asset managers in the way of firm selection and ESG scoring. Fifthly, in combination with previous results, the study suggests policy makers the importance of policy agreements in ESG scoring to enhance the quality and effective use of information. Sixthly, by focusing on the COVID-19 period, this study provides insights into European market and its ESG performance in the challenging time, which can offer lessons for policy makers and managers to build firm resilience during future economic crises. Finally, to myself, this research will enhance my knowledge of corporate finance, sustainable finance, as well as provide valuable experience in conducting and writing scientific research.

The structure of this paper is as follows: Section 2 reviews the related literature, relevant research on SEOs and ESG factors. Section 3 presents the hypothesis development and methodology. Section 4 describes the data collection process. Section 5 focuses on data analysis, including event study analysis and the empirical results of cross-sectional regression. Section 6 summarizes the findings and presents implications, limitations, and conclusions. The remaining sections, 7 and 8, contain the appendix and references, respectively.

2. Literature review

This section covers related topics of literature with regards to SEOs and ESG investment, which bases on capital structure theory and market reaction of firms' equity issues, recent research findings about the impacts of Covid-19 on the financial market and the impacts of ESG on the market performance of firms.

2.1. Capital structure theory and market reaction to firms' equity issues

Starting with the signaling theory (Leland & Pyle, 1977), which contended that markets have characteristics defined by informational gaps between buyers and sellers, generally explains how the capital market reacts to equity issues. Following this theory, the pecking order theory was formed to contribute to the literature of captain structure. The theory stated firms prefer internal finance, if external finance is required, firms issue the safest security first, stating with debt, hybrid securities and then equity as last resort (Myer, 1984). Clearly, internal funds help firms to avoid issue costs and debts have lower costs than equity. Previous work highlights the impact of asymmetric information which gives prediction in line with the pecking order. As given the firm's investment opportunity, the manager will issue and invest when the manager 's inside information is unfavorable - i.e. the price of shares is over-valued, so if the manager acts in this way, their decision will signal bad news to both old and new investors and thus also incurs a cost of selling shares less than its real worth. This consequence also goes beyond when the practice of offering equities not only sends an unfavorable message about the true value of the company but also results in undertaking less valuable investment opportunities (Myers & Majluf, 1984).

In order to have in-depth review of financing decision and its relevance to this topic, it is essential to mention limitations of pecking order theory. Fama and French (2004) contributed empirical evidence of contradiction between prediction of the theory and the real world, which is based on the observation of financing decisions of firms during 1973-2002. In the light of theory, firms rarely issue stocks and therefore net new issues of equity are smaller than net new debts. In fact, every year, on average, 67% of firms issue equity from 1973 to 1982, then increasing to 74% from 1983 to 1992 and 86% from 1993 to 2002. The pecking order breaks down, at least in part because there are approaches to issue stocks with low transaction costs and mild asymmetric information difficulties. Issues to employees, rights issues, and direct purchase plans are three alternatives to SEOs for issuing equity that requires both low transaction costs and little asymmetric information difficulties. Mergers financed with stock may also fall into this category. Issues with workers are likely essential in explaining both the scale and frequency of issues throughout the data period, and mergers are important in explaining the magnitude of equity concerns, at least during the last ten years of the study period. This paper also highlights the characteristics of net issuer equities. These firms are less profitable, expand business quickly and potentially confront with current and expected finance deficits.

Masulis and Korwar (1985) provided a cross-sectional review of stock announcement returns reveals a positive association with changes in corporate leverage and market runup and a negative association with preceding stock returns. Besides, the outcomes are mixed when the variable of leverage is removed from the regression, the coefficient estimation of the number of shares offered has a significantly negative sign in the industrial sample. It is also significant in the public utility sample, but the sign is positive, which contradicts the theoretical assumption. Lucas and McDonald (1990) indicate, on average, equity issues are preceded by an increase of abnormal returns. The relevance of information asymmetry between the managers of the firm and outside investors is significant in the event of equity issues (Dierkens, 1991). Seasoned public offerings have negative impacts on returns, and the average market reaction is more negative with the larger value of stocks and less negative with the less risky stocks (Eckbo & Masulis, 1995). Moreover, Corwin (2003) investigated seasoned equity offers during the 1980s and 1990s in the US and indicates there is an evidential underpricing. Therefore, this entails substantial costs to the shareholders of issuing firms.

Another theory of capital structure, market timing theory – the practice of issuing shares when the market value is high and repurchasing when it is low. By tracking down the history of market-to-book ratios on capital structure, Baker and Wurgler (2002) answered how equity market timing affects capital structure. The result is that market timing has large and persistent effects capital structure, so there is no optimal capital structure in this theory and capital structure is largely the cumulative outcome of past attempts to time the equity market. This work contributes an important knowledge to corporate financial policy and real financing decision-making.

In addition to that, Jung et al. (1996) offered the agency model which emphasizes on the costs of managerial discretion. The firm’s managers have discretion and sometimes choose

projects at the expense of shareholders. Thus, managers with the aim of firm growth, equity issues are valuable for shareholders when having good investment opportunities. Besides, firms issue equity due to limited debt capacity and poor investment opportunities. The latter firms suffer a more negative stock price reaction than former firms. Holderness et al. (2018) also provided their work about the impact of agency problem on equity issuances by analyzing mandatory shareholder approval of equity issuances varies across and within countries. The findings showed average announcement returns are positive when there is approval of issuances from shareholders, but returns are negative and 4% lower when managers issue stock without shareholder approval.

To summarize, it is evident that investors respond negatively when news of seasoned equity offers is released. The reason for negative reaction can generally be captured by asymmetric information which are rationalized through signaling effect, adverse selection and agency problem. In attempt to disentangle which one will offer more explanatory power, Kim and Purnanandam (2006) demonstrated empirical support from data S&P1500 for signaling effect and agency problem and found little evidence for adverse selection.

2.2. The impact of Covid-19 pandemic on performance of the stock market and SEO announcement

During this difficult period, restrictive government policies can give rise to uncertainty and the influences of negative investor sentiments also have an adverse impact on the financial market. Baig et al. (2021) showed evidence of the significant increase in illiquidity and volatility due to Covid-19 pandemic. The global financial market risks have increased substantially in response to the pandemic. Inevitably, investors suffer remarkable loses in a very short period of time (Zhang et al. 2020). Government restrictions accelerate the volatility of the stock market which may augments risky assets sell-off and the cost of equity. Higher volatility remains in the future as long as possible government interventions are expected in the future (Zaremba et al. 2020). In comparison with earlier pandemics, "the effects of Covid-19 on stock market are without historical precedent. There were more than 1,100 daily stock market moves (up or down) greater than 2.5% from 1900 to 2019" (Baker et al., 2020).

Regarding SEO announcements during Covid-19 pandemic, Zezius et al. (2022) found cumulative average abnormal returns on average is -8.6% for period [-1,1] in the US's stock market. There were different degrees of impact on different industries and size of firms. Larger firms had better SEO performance. Bio-tech and healthcare companies showed a more negative SEO announcement while other companies, with ongoing growth opportunities and thus higher valuation, exhibit more positive price reactions to announcement. Another evidence in ASX 200-listed companies from 1998 to 2020 indicates that abnormal returns of firms issuing SEOs are confronted with intensity of volatility during economic disruptions, from dot-com bubble in early 2000, global financial crisis in 2008 and covid-19 pandemic (Prasad et al. 2021). They also identified that firms in higher performing sectors have higher volatility in these difficult times. In short-term period, it is suggested that firms should balance their needs for quick capital through SEOs and the degree of volatility of investor abnormal returns. Given that in long-term period, the

success of firms would be best guaranteed for investor's returns so one of appropriate implications is that detailing of reasons for SEO choice can improve transparency and decrease investor's sensitivity.

2.3. The impact of ESG on the market performance of firms

ESG strategy is a new genuine paradigm resonating self-interest and individual profit with the interest of community in terms of the environment, inclusion and sustainability (Savio et al. 2023). The environmental factor reflects how firms take actions to protect and minimize adverse impacts of their operation to the environment. The social factor shows how firms behave towards employees and the communities that they serve. The governance factor assesses how firms' management organizes and controls their organizational authority (Bofinger et al., 2022). In fund managers and investors' analysis process, these factors are evaluated and referred to identify material risks and growth opportunities.

Bermejo et al. (2021) showed that environment and governance metrics highlight the significantly positive effect on the growth of portfolio returns and the converse effect on the volatility of portfolio returns, while the social score does the opposite way, evidence from European ESG ratings provided by Bloomberg. They acknowledged for the limitation of the precision in ESG rating measure and reflect a challenge when including ESG information in making investment decision. Besides, Engelhardt et al. (2021) investigated the link between ESG ratings and stock performance during the COVID-19 crisis and discovered a favorable and statistically significant association between market capitalization, ROE, historical volatility, and momentum. Furthermore, they concluded that strong ESG-rated European firms are associated with reduced stock volatility and greater abnormal returns. In addition to the effect of pandemic period on ESG, Al Amosh et al. (2022) analyzed its effect on the performance of ESG with a massive worldwide panel dataset with 12,325 company-year observations across the years 2016-2021. The result showed COVID-19 had an encouraging and significant effect on ESG performance. However, it has a negative effect on governance performance.

On the other hand, another empirical result from Duque-Grisales et al. (2021) indicated that ESG scores effect negatively on firm financial performance (ROA) in Latin American context. They explain that it could be the case that the implementation of ESG strategy is not performed in a correct way, or there is not sufficient institutional support to make it efficient. Another reason added is that firms highly invest in ESG may need to use cash flow or resource so their performance is decreased. Under financial slack, the relationship reverses as it is explained that strong financial resource can boost firm concern at investing in ESG and therefore improve their firm performance. Based on these views, if sophisticated investors value these constrained firms by using discounted cash flow model, ESG performance may have negative impacts on their valuation of stock prices and as well stock returns. Besides, firms with higher ESG scores of firms performing better than other firms with a condition that they maintain higher cash holdings and liquid assets necessary to absorb the pandemic externalities (Cardillo et al., 2022). Another research showed the association of ESG rating and stock performance is not significant. By employing a two-step technique to

examine the association of the stock performance of firms in Eurostoxx50 with their ESG scores from 2010 to 2018, the result showed there is little evidence to agree that companies with strong Environmental, Social, and Governance ratings have better excess returns and reduced volatility (La Torre et al.,2020).

In order to gain better understanding about the impact of ESG, it is important to also take into account specific events of firms such as ESG news, Initial public offerings (IPOs) and Seasoned equity offerings (SEOs).

Firstly, stock prices only react to the news on ESG issues that are reasonably and likely to affect firms' financial or operating performance according to SASB standards, including significantly positive (negative) price reaction to positive (negative) news, and the market reaction comes from unexpected news (Serafeim et al., 2022). From this point of view, investors could not incorporate all information of ESG of firms in their assessment, so even if higher ESG rated companies, but not relevant to financial factors, their market performance will not be affected.

Secondly, IPOs usually worths paying attention, but there is substantial information asymmetry between issuers and outside investors because, as private equity companies, they are not subject to the same disclosure requirements as public companies. As a result, ESG disclosure mitigates disparity and therefore lower underpricing in countries with higher ESG Government Ratings (Baker et al., 2021). Another evidence from a sample of 1,856 initial public offerings by U.S. companies for the 2007–2018 period robustly documented that investors are willing to bid high 11% higher on average for firms disclosing ESG performance information prior to the event and concluded that investors' reaction to ESG-rated firms is not influenced by any bias so they invest because of firm potential prospect rather than sentiment (Economidou et al., 2022).

Last but not least, SEOs are critical financing decision when the need for external fund is determined after considering possible solutions based on pecking order theory. These fund-raising activities are expensive due to underwriting fees charged by investment banks. When asymmetric information or poor information environment increases, it is likely that underwriters charge higher fees. Thus, so it is important for decision-makers to search solutions to maximize the expected net proceeds. Research result suggested that SEO issuers with CSR strategies are effective in decreasing the likelihood of the issue being withdrawn from the registration and in mitigating negative abnormal returns surrounding the issue (Li et al. 2022). However, in market perspective, there is an interesting finding from Dutordoir et al. (2018), by using U.S. companies between 2004 and 2013. They stated that seasoned equity issuers with high CSR scores tend to have higher post-SEO increases in cash holdings, and lower investments in real assets, than issuers with low CSR scores. High-CSR issuers have worse post-SEO operating and stock price performance than low-CSR issuers. This paper suggested that high CSR scores misinform shareholders and leads them have higher valuation for seasoned equity issues. In this argument, CSR should not be referred and then in reaction to unexpected events, investors should not be affected by high CSR. In an effort to search robust evidence for the impact of sustainable factors, especially research using ESG

rating metrics and its impact on the market reaction to SEOs, I find few research fully covering that.

Interestingly enough, a review ESG and CSR research in corporate finance from Gillan et al. (2021) highlighted that ESG is broader concept than CSR because ESG shows both firms and investors incorporate environmental, social and governance pillars while CSR emphasizes social responsibilities. In which, governance in ESG rating is clearly categorized as a separate factor, but in CSR, it is reflects in environmental and social considerations. Also in this paper, by aggregating and comparing research results, they concluded that although firms with ESG/CSR profile and activities are proved to be strongly related to the firm's market in numerous studies, "results from these studies in corporate finance are more mixed than the overall conclusions of the Friede et al. (2015)", so there are debating hypotheses and results that are not resolved completely, which gives rise to continued questions and a need for more research.

3. Theoretical framework

3.1. Hypothesis development

Lins et al. (2017) addressed the question that to what extent social capital effects firm performance. The dimension of social capital is mainly decomposed into civic engagement and trust and cooperative norms. Based on previous work at firm level in economics, they selected CSR ratings as a good proxy for social capital and performance measures including stock returns, operating returns on assets and capital raising. From MSCI ESG Stats database in the US over August 2008 to March 2009 - financial crisis period and the earlier period July 2007 through July 2008, their research provided evidence that firms building social capital through CSR activities paid off during that negative shock and highlights firms with high CSR ratings perform better than those with low CSR ratings, especially during the crisis.

With respect to SEO announcements of US firms in the SDC Global New database from 1992 to 2012, the sample consists of 1076 firm–year offerings, Feng et al. (2018) focused on these events because SEOs are cleaner exogenous factors which mitigates the problems of reverse causality between CSR and firm performance existing previous studies. Their result is that CSR activities play a role on reducing negative returns, especially firms highly active in improving environment, women rights and minorities have better performance in returns and less underpricing.

As seen on the literature review, the market reacts negatively on SEO announcements, leading to negative stock returns (Myer, 1984; Eckbo & Masulis, 1995; Corwin, 2003). During the negative shock like Covid-19, abnormal returns of firms issuing SEOs are more negative (Zezius et al., 2022) and more volatile and the degree of volatility depends on the performance of different industry (Prasad et al., 2021). Thus, combining all elements mentioned above, in the event of SEOs during Covid-19, ESG performance may assist firms with a role of alleviating the negative reaction

from the market so firms with higher performance of ESG ratings is expected to have better announcement period returnss.

H1: The announcement returns of SEO issuers during Covid-19 pandemic is less negative by the impact of overall score and each ESG component.

3.2. Methodology

Event study is applied to estimate the effect of SEO announcements on the market reaction through abnormal stock returns in the context of global crisis due to Covid-19 pandemic. Following that, running cross-sectional regression of cumulative abnormal returns in estimation window on ESG score variables and control other regressors to analyze the impact of ESG on SEO returns.

3.2.1. Normal returns of SEO firms

According to Mackinlay (1997), the counterfactual takes market exposures into consideration, the normal returns $R_{i,\tau}$ is explained as follows:

- Market model:

$$R_{i,\tau} = \gamma_i R_{m,\tau} + \varepsilon_{i,\tau} \quad (1)$$

$$E(R_{i,\tau}) = \hat{\gamma}_i R_{m,\tau} \quad (2)$$

- CAPM:

$$R_{i,\tau} = R_{f,\tau} + \beta_i(R_{m,\tau} - R_{f,\tau}) + \varepsilon_{i,\tau} \quad (3)$$

$$E(R_{i,\tau}) = R_{f,\tau} + \widehat{\beta_i}(R_{m,\tau} - R_{f,\tau}) \quad (4)$$

Following the methodology originally developed by Fama et al. (1970), 3-factor model by Fama and French (1992) (FF3 model) and FF3 and momentum factor model by Carhart (1997) (Mom model) are applied in recent research on the stock market reaction on firm events (Zenzius et al., 2022) as they provide a good description for risk premium reflecting in expected stock returns:

- FF3 model:

$$R_{i,\tau} = R_{f,\tau} + \beta_{1i}(R_{m,\tau} - R_{f,\tau}) + \beta_{2i}SMB + \beta_{3i}HML + \varepsilon_{i,\tau} \quad (5)$$

$$E(R_{i,\tau}) = R_{f,\tau} + \widehat{\beta_{1i}}(R_{m,\tau} - R_{f,\tau}) + \widehat{\beta_{2i}}SMB + \widehat{\beta_{3i}}HML \quad (6)$$

- Mom model:

$$R_{i,\tau} = R_{f,\tau} + \beta_{1i}(R_{m,\tau} - R_{f,\tau}) + \beta_{2i}SMB + \beta_{3i}HML + \beta_{4i}MOM\ \varepsilon_{i,\tau} \quad (7)$$

$$E(R_{i,\tau}) = R_{f,\tau} + \widehat{\beta_{1i}}(R_{m,\tau} - R_{f,\tau}) + \widehat{\beta_{2i}}SMB + \widehat{\beta_{3i}}HML + \widehat{\beta_{4i}}MOM \quad (8)$$

In this paper, I will use 4 models above to estimate normal returns, therefore arrive at anormal returns and cumulative returns.

3.2.2. Abnormal returns

To estimate the effect of the event of SEOs, abnormal returns $AR_{i,\tau}$ are observed as a difference between actual returns and predicted returns normal returns from models mentioned above.

$$AR_{i,\tau} = R_{i,\tau} - E(R_{i,\tau}) \quad (9)$$

3.2.3. SEO announcement returns and ESG ratings

Research model

Based on the model used by Feng et al., 2018, the model describes the stock market reactions to SEO announcements and ESG rating factors under controlling a set of variables correlated with stock returns as follows:

$$SEO\_CAR_{it} = \beta_0 + \beta_1 ESG\_score_{it-1} + \beta_2 Size_{it-1} + \beta_3 Leverage_{it-1} + \beta_4 Marketcap_{it-1} + \beta_5 Number\_of\_shares_{it} + \beta_6 Secondary\_offer_{it} + \beta_7 Market\_return\_pior_{it} + \beta_8 Firm\_returns\_pior_{it} + \beta_9 Industry + \beta_{10} Year + \varepsilon_{it} \quad (10)$$

$$SEO\_CAR_{it} = \beta_0 + \beta_1 E\_score_{it-1} + \beta_2 Size_{it-1} + \beta_3 Leverage_{it-1} + \beta_4 Marketcap_{it-1} + \beta_5 Number\_of\_shares_{it} + \beta_6 Secondary\_offer_{it} + \beta_7 Market\_return\_pior_{it} + \beta_8 Firm\_returns\_pior_{it} + \beta_9 Industry + \beta_{10} Year + \varepsilon_{it} \quad (10a)$$

$$SEO\_CAR_{it} = \beta_0 + \beta_1 S\_score_{it-1} + \beta_2 Size_{it-1} + \beta_3 Leverage_{it-1} + \beta_4 Marketcap_{it-1} + \beta_5 Number\_of\_shares_{it} + \beta_6 Secondary\_offer_{it} + \beta_7 Market\_return\_pior_{it} + \beta_8 Firm\_returns\_pior_{it} + \beta_9 Industry + \beta_{10} Year + \varepsilon_{it} \quad (10b)$$

$$SEO\_CAR_{it} = \beta_0 + \beta_1 G\_score_{it-1} + \beta_2 Size_{it-1} + \beta_3 Leverage_{it-1} + \beta_4 Marketcap_{it-1} + \beta_5 Number\_of\_shares_{it} + \beta_6 Secondary\_offer_{it} + \beta_7 Market\_return\_pior_{it} + \beta_8 Firm\_returns\_pior_{it} + \beta_9 Industry + \beta_{10} Year + \varepsilon_{it} \quad (10c)$$

Dependent variable: SEO_CAR

The cumulative effect of SEOs up to a period inside the event window will be reflected in the cumulative abnormal returns, CARs:

$$SEO\_CAR_{i,\tau} = \sum_{\tau}^{L} AR_{i,\tau} = \sum_{\tau=0}^{L} (R_{i,\tau} - E(R_{i,\tau})) \quad (11)$$

Zenzius et al. (2022) highlights the announcement effect is persistent to variations in the length event window. This study therefore will base on estimation window [−260, −11] to observe

10 different intervals [20;20], [10;10], [-5;5], [-4;1], [-3;3], [1;4], [-1;1], [0;1], [0;5] and [0;10] to analyze abnormal returns and cumulative abnormal returns as well.

Main explanatory variables: combined overall ESG score and Environmental, Social and Governance Score

To answer research question, ESG scores are used as main variables to estimate the the impact of ESG on market reaction to SEOs. The same as recent research (Duque-Grisales et al. 2021), variables of ESG scores are retrieved from Refinitiv. According to Refinitiv, ESG metrics are collected from 630 data points, ratios and analytics and classified into 10 categories based on three pillar scores to assess firm ESG performance based on firms' disclosure report. This paper also analyses the impacts of ESG scores in total and three pillars separately.

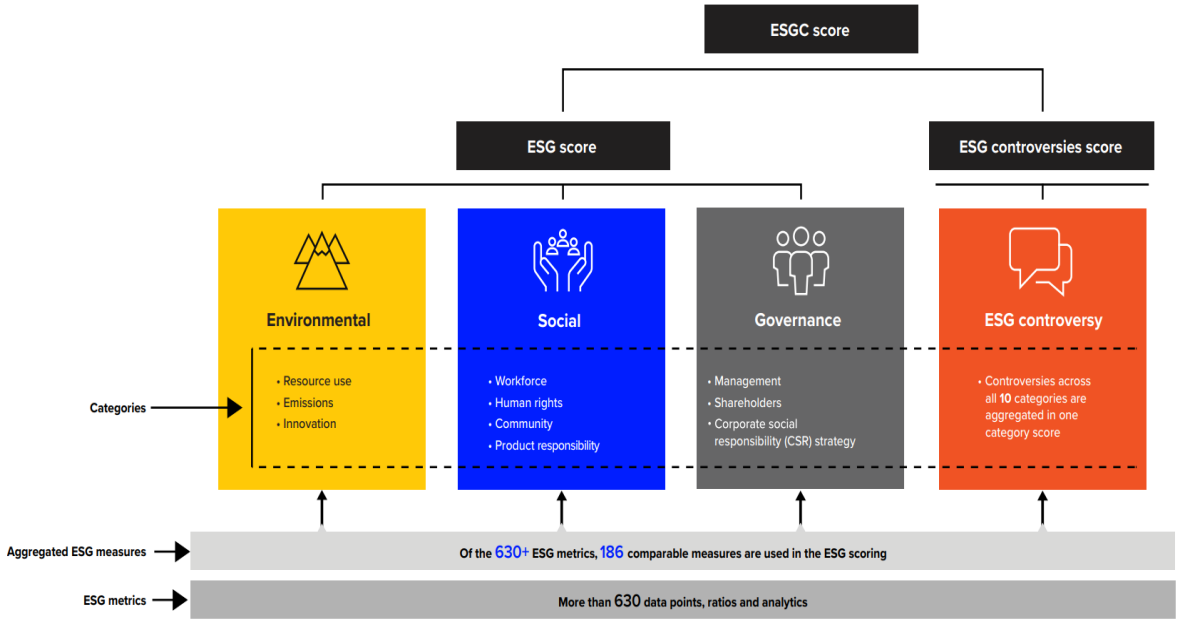


Figure 1. ESG composition (Source: Refinitiv methodology, May 2022)

According to Refinitiv's methodology updated version on May 2022, the ESG pillar score is a relative sum of the category weights, which vary per industry for the environmental and social categories. For governance, the weights remain the same across all industries. The pillar weights are normalized to percentages ranging between 0 and 100. Definition details in Appendix 1.

Control Variables

According to Masulis and Korwar (1985); Lucas and McDonald (1990), Fama and French (1992); Eckbo & Masulis (2007), Feng et al. (2018) and Engelhardt et al. (2021), the price of stock issues is significantly correlated with characteristics as follows:

- Issuer: Size (total assets), Leverage, ROE and Market capitalization, which captures the scaled version of a firm's stock price for cross-section of returns.

- Stock market: Reputation of stock exchange listing, Euronext – largest stock exchange in Europe, Cumulative market and firm stock return before announcements (runup factors), which provides investors assessment about issuers.

- Offering: percentage of number of shares offered before SEO and percentage of secondary offers.

In this research, I keep fixed effects for year and industry and winsorize all variables at the 25th and 75th percentiles for all the models. Every standard error is clustered at the firm level. Detailed definition of variables is presented and expected relationship based on previous research in Table 1.

Table 1. Definition of variables

Variable name		Definition	Expected sign
$SEO\_CAR_{i,\tau}$	:	Cumulative abnormal stock return for the time interval around the SEO announcement for firm i.	+
ESG_score_{it}	:	ESG Combined Score is an overall company score based on the reported information in the environmental, social and corporate governance pillars (Eikon Refinitiv)	+
E_score	:	Environmental pillars (Eikon Refinitiv)	+
S_score	:	Social pillars (Eikon Refinitiv)	+
G_score	:	Governance pillars (Eikon Refinitiv)	+
$Size_{it-1}$	:	Natural logarithm of the book value of total assets for firm i in the year prior to the SEO announcement	-
$Leverage_{it-1}$	:	Ratio of the book value of long-term debt to the book value of total capital for firm i in the year prior to the SEO announcement.	+
$Market\text{-}cap_{it-1}$	:	Natural logarithm of market capitalization for firm i in the year prior to the SEO announcement.	-
ROE_{it-1}	:	Returns on equity of firm i in the year prior to the SEO announcement	+
$Number\_of\_shares_{it-1}$	:	Number of shares offered divided by total shares outstanding for firm i in the year prior to the SEO announcement.	-
$Secondary\_offer_{it}$	:	Percentage of secondary shares being sold by existing shareholders to total shares offered for firm i in the SEO announcement year	-
$Market\_return\_priors_{it}$	:	Market returns over 60 trading days prior to the SEO announcement date for firm i.	+
$Firm\_return\_priors_{it}$	:	Firm stock returns over 60 trading days prior to the SEO announcement date for firm i.	-
Euronext	:	Indicator variable that takes the value of 1 for Euronext -listed firms and 0 otherwise for firm i in the SEO announcement year.	+

Variable name		Definition	Expected sign
Industry	:	TRBC business sector based on Refinitive Eikon.	
Year	:	Year of SEO event.	

4. Data collection

Firstly, retrieving from Refinitiv Eikon database, SEO data was selected as follows:

1) Issue type: Follow-On/Seasoned equity offering;
2) Transaction status: Live;
3) Security type: Common stock or Ordinary shares or Ordinary or common shares;
4) Announcement date: 11/03/2020-16/05/2022.
5) Issuer Domicile Region: Europe;
6) Target market: Europe
7) New issue of head quarter: Europe
8) New issues offer price: Equal or greater than 1 USD;
9) TRBC industry: Energy, Basic Materials, Industrials, Consumer Cyclicals, Consumer Non-Cyclicals, Healthcare, Real Estate, Education.

In which, issue date specified from the first date WHO declared global pandemic on 11/03/2020 to the date that European government ended mask mandates on 16/05/2022. New issue offer price is at least 1 USD to avoid extreme outline. Industry section excludes financial sector, utility and institutions, associations and organizations and government activity because those sectors have much different characteristics from others (Feng et al. 2018). After retrieving data with these restrictions, the initial sample has 1,191 observations, details in Table 2.

Table 2. Number of SEO deals among European countries and business sectors during Covid-19 pandemic (11/03/2020 - 16/05/2022)

Ord	Nation	Tech	Health care	Indust-rials	Consumer Cyclicals	Real Estate	Basic Materials	Consumer Non-Cyclicals	Energy	Edu	Total
1	Sweden	73	69	28	31	17	8	4	3	1	234
2	United Kingdom	42	15	25	53	18	12	5	8	0	178
3	Germany	35	30	37	29	8	5	4	13	2	163
4	France	16	29	24	22	5	6	4	6	0	112
5	Norway	25	10	17	5	1	7	11	9	1	86
6	Poland	24	16	7	6	2	0	3	1	0	59
7	Belgium	4	17	4	4	14	1	3	0	0	47
8	Italy	19	1	8	12	3	0	1	1	0	45
9	Finland	9	10	9	9	3	2	1	0	0	43
10	Switzerland	3	11	12	4	6	4	2	1	0	43
11	Denmark	15	12	7	5	0	2	0	0	0	41

Ord	Nation	Tech	Health care	Indust-rials	Consumer Cyclicals	Real Estate	Basic Materials	Consumer Non-Cyclicals	Energy	Edu	Total
12	Netherlands	4	3	6	6	0	3	5	1	0	28
13	Spain	8	3	6	1	6	2	0	1	0	27
14	Russia	1	0	4	4	0	7	4	2	0	22
15	Ireland	2	0	1	4	0	1	2	0	0	10
16	Turkey	1	1	0	1	1	0	5	0	0	9
17	Greece	0	0	3	2	0	2	0	1	0	8
18	Luxembourg	1	0	2	2	1	1	0	0	0	7
19	Austria	1	0	3	0	1	1	0	0	0	6
20	Estonia	0	0	3	0	2	0	0	0	0	5
21	Cyprus	3	0	0	0	0	1	0	0	0	4
22	Malta	2	0	0	1	0	0	0	0	0	3
23	Portugal	0	0	0	1	0	1	1	0	0	3
24	Bulgaria	1	0	0	0	1	0	0	0	0	2
25	Guernsey	0	0	0	0	2	0	0	0	0	2
26	Gibraltar	0	0	0	1	0	0	0	0	0	1
27	Iceland	0	0	0	0	0	0	1	0	0	1
28	Jersey	0	0	0	1	0	0	0	0	0	1
29	Lithuania	1	0	0	0	0	0	0	0	0	1
	Total	**290**	**227**	**206**	**204**	**91**	**66**	**56**	**47**	**4**	**1,191**

The table indicates overview of how the equity markets, especially seasoned equity offerings, respond to the economic shock from Covid-19 pandemic in terms of regions and sectors. The largest contributor in follow-on issuance is Sweden, 234 SEO events ~ 20% total deals in Europe, followed by the UK with 178 issuances ~ 15% and Norway 163 issuances ~ 13.7%. Further, SEO firms involves in various business sectors, in which technology and healthcare are the most active ones, accounting for 24% and 19% respectively. Capital demands from these sectors quickly reflects essential market demands during this tough time. On the other hand, the largest contraction in fundraising through equity offerings is energy and education.

5. Empirical results

5.1. Abnormal returns (ARs)

From the initial sample above, obtaining stock return data from Refinitive Eikon Datastream and arriving at the sample size of 676 firms which is reduced by blanks and errors. In addition, the European market data which includes the market returns, risk free rate, 3-factor model (Fama and French) (FF3 model) and momentum factor (Carhart) from the Data library of Tuck School of Business at Dartmouth College. For the following event study, I observe the effect of SEO event with a broad event window, in which includes 20 trading days prior the announcement date, the announcement date and also consider 20 trading days after in order to provide a comprehensive assessment of potential early or late reactions of stock prices.

Four models include market model (MM), CAPM, Fama-French 3 factor model (FF3) and FF3 and FF3 and Mom model (Mom) mentioned in the section of methodology applied to calculate average abnormal returns (AARs) of 676 firms from each day in the interval time [-20;20]. Table 3 shows, firms witness highly significant AARs from 4 models, market model on the announcement date, date 0, and date 1: -0.51% & -1.24%; CAPM: -0.63% & -1.33%; FF3 model: -0.57% & -1.33%; Mom model: -0.59% % -1.31% respectively. There is not much different in abnormal returns between FF3 and Mom models. The market reaction in all 4 models is strongly negative at a 1% level for t-test, CDA test, Patell test, Boehmer test, Corrado rank test and Wilcox test.

The reaction of the market to SEO events is present in the cross section of the sample and is not disproportionally influenced by a small number of events, as shown by the consistent result in test statistics and in different models. AARs on dates far away from the announcement day are either less significant or insignificant.

Table 3. Abnormal returns of SEO firms (%)

t	MM	CAPM	3FF	Mom	t	MM	CAPM	3FF	Mom
-20	0.15	0.06	0.01	0.03	0	*-0.51****	*-0.63****	*-0.57****	*-0.59****
-19	0.08	0.02	0.03	0.03	1	*-1.24****	*-1.33****	*-1.33****	*-1.31****
-18	0.18	0.16	0.14	0.14	2	-0.09	-0.12	-0.08	-0.11
-17	0.15	0.08	0.09	0.12	3	0.17	0.06	0.11	0.14
-16	0.22	0.08	0.15	0.13	4	0.05	-0.03	0.03	0.05
-15	0.25*	0.21	0.19	0.18	5	0.04	-0.05	-0.01	-0.03
-14	0.28*	0.19	0.21	0.24	6	-0.15	-0.23	-0.22	-0.23
-13	-0.07	-0.14	-0.17	-0.16	7	-0.15	-0.23	-0.19	-0.11
-12	0.15	0.12	0.10	0.10	8	-0.02	-0.05	-0.06	-0.04
-11	0.01	-0.01	0.00	0.02	9	-0.23	-0.28*	-0.25	-0.24
-10	-0.14	-0.12	-0.16	-0.19	10	0.11	0.06	0.03	0.02
-9	0.09	0.01	-0.02	0.00	11	-0.24	-0.29*	-0.30**	-0.31**
-8	0.31**	0.24	0.20	0.18	12	0.24	0.21	0.18	0.18
-7	0.00	-0.05	-0.03	0.01	13	-0.08	-0.11	-0.13	-0.15
-6	0.21	0.08	0.084	0.11	14	0.00	-0.07	-0.09	-0.10
-5	0.20	0.14	0.157	0.15	15	0.15	0.05	0.03	0.00
-4	0.25	0.20	0.190	0.19	16	0.17	0.15	0.12	0.07
-3	0.24	0.21	0.212	0.19	17	-0.20	-0.29*	-0.24	-0.28*
-2	0.23	0.14	0.165	0.17	18	0.00	-0.07	-0.06	-0.08
-1	0.17	0.10	0.095	0.10	19	0.04	-0.08	-0.07	-0.07
					20	-0.22	-0.27*	-0.27*	-0.31**

Note: ∗∗∗, ∗∗, and ∗ indicate significance at the 1%, 5%, and 10% level respectively, at t-test assuming cross-sectional independence according to Serra (2002, p. 4).

5.2. Cumulative average abnormal returns (CAARs)

Some research chooses different event windows, so I group different intervals to analyze and capture SEO announce effect. Table 4 shows CAARs of SEO are estimated in 10 event windows, [20;20], [10;10], [-5;5], [-4;1], [-3;3], [-1;4], [-1;1], [0;1], [0;5], [0;10], with a wide range test in the event study. The detail of each statistic test based on four models is mentioned in Appendix 2.

The result in Table 4 shows the market model has the highest CAARs while CAPM demonstrates the lowest among other models. The negative reaction of market maintains across the length of event window with all significant tests at the significance level 1% in interval [-4;1], [-3;3], [-1;4], [-1;1], [0;1], [0;5], [0;10]. So, it is important to highlight that there are abnormal returns due to investor behaviors to SEO events. The result is robust when applying different models of stock returns. Thus, my event study findings are in line with other research on seasoned stock issues.

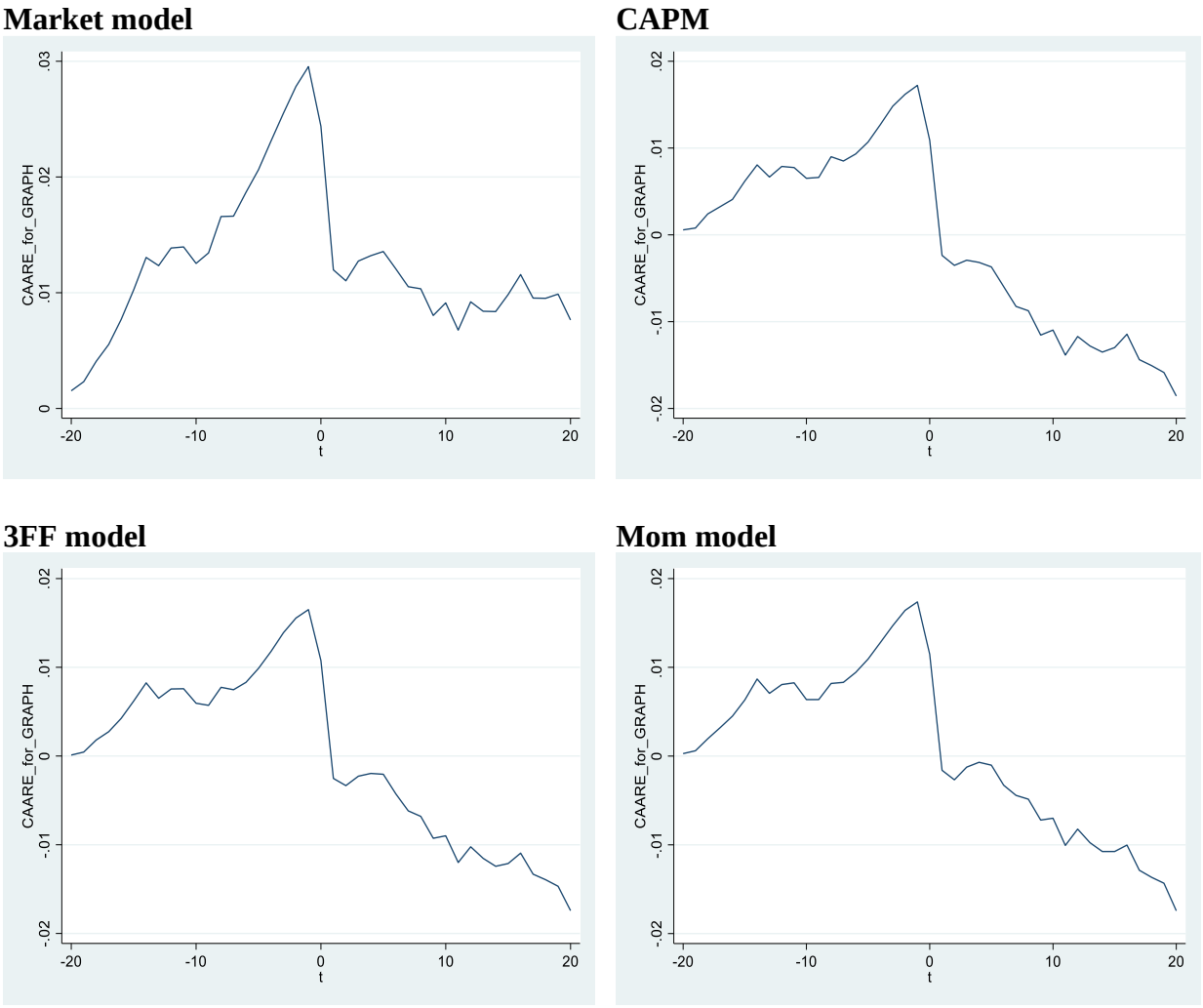
Table 4. CAARs in 4 models for different time windows (%).

t	MM	CAPM	FF3	Mom
[-20;20]	0.77	-1.86	-1.74	-1.74
[-10;10]	-0.48	-1.87**	-1.66**	-1.53**
[-5;5]	-0.51	-1.30**	-1.04**	-1.05**
[-4;1]	-0.86	-1.31***	-1.24***	-1.25**
[-3;3]	-1.04	-1.56***	-1.41***	-1.40**
[-1;4]	-1.46**	-1.94**	-1.75***	-1.71***
[-1;1]	-1.58**	-1.86***	-1.81***	-1.80***
[0;1]	-1.76***	-1.96***	-1.90***	-1.90***
[0;5]	-1.60***	-2.09***	-1.86***	-1.84***
[0;10]	-2.04***	-2.82***	-2.55***	-2.44***

*Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level respectively, at t-test assuming cross-sectional independence according to Serra (2002, p. 4).*

Figure 2 shows the cumulative abnormal returns are positive and keep growing in 20 trading days prior SEO events and reach a peak in date -1, followed by a remarkable fall in date 0. This means the plan of SEOs is well organized for timing the market before the announcement. After 20 trading dates from date 0, firm stock returns recover weakly, but still fluctuate and experience a downward trend from date 16 to date 20.

Figure 2. Graph of CAARs in 4 models (accumulated day by day, from date -20 to date 20).



5.3. Cross-sectional data for SEO announcement returns

After assessing CAARs in different intervals, the above-mentioned result shows CAARs in the long period which is far away from the announcement date does not perform significantly in statistic tests covered in event study. These CAARs does not satisfy assumptions of normality and no cross-sectional correlation. There is also not much different in results when applied 4 models. Therefore, in this analysis section, I will present CARs estimated in Mom model and the event window [-1;1] as it is significant in all statistic tests, strongly captures abnormal returns due to the event effect and also is used in many relevant research.

A set of control variables mentioned in methodology section is retrieved and based on the sample of 676 SEO firms by using time series request in Refinitive Eikon Datastream. The sample now has 253 observations after cleaning non-information and errors, details about data analysis shown in Table 5, Table 6, Table 7, Table 8 and Table 9.

Table 5 exhibits SEO companies in Europe have negative mean of CARs, -1.82% and median of CARs, - 2.51%, suffering much less than as US market did during Covid-19, -8.92% (Zenzius et al., 2022). Average ESG score 51%, Social pillar score 45% and Governance score 57%, which are all lower performance compared to average ESG scores in Europe in 2020 and 2022 (Sizilárd, 2022). Market returns and firms returns are both positive before announcement dates, which is consistent with prediction of previous research about SEO events.

Table 5. Statistical description of variables.

Variable	Obs	Mean	Std. Dev	Min	Max	25th Percentile	Median	75th Percentile
Dependent variable								
SEO_CAR	253	-1.82	8.29	-34.33	37.06	-6.40	-2.51	1.32
Main regressor								
ESG _score	253	50.5	19.2	3.93	87.74	37.63	51.79	64.96
Environment _score	253	44.75	25.8	0	99.07	25.82	43.21	63.92
Social _score	253	52.02	23.36	1.49	94.30	33.99	52.71	71.14
Governance _score	253	57.20	21.68	6.17	96.75	40.91	59.28	74.73
Control variables								
Firm characteristics								
Marketcap	253	14.44	1.80	8.98	20.57	13.05	14.56	15.65
Leverage	253	38.00	24.42	0	144.95	20.40	37.82	52.90
Size	253	14.28	1.92	8.69	20.67	12.92	14.24	15.61
ROE (%)	253	3.78	61.82	-276.52	612	3.00	11	18.13
Offering information								
Number_of_shares	253	2.32	7.98	0	174.62	0	2.32	9.80
Secondary_offer	253	2.93	4.22	0	28.57	0	0.34	4.97
Stock market information								
Firm_return_prior	253	9.95	23.75	-79.8	132.79	1.77	11.55	21.77
Market_return_prior	253	3.85	11.12	-39.49	30.84	0.39	5.83	9.78
Euronext	253	0.13	0.33	0	1	0	0	0

The sample of SEO firms during Covid-19 pandemic in sector breakdown is exhibited in Table 6 comprised of Panel A and B below. Details are described in Appendix 3. Most of sectors above have negative returns, however there are out-performed firms whose industry is essential during tough times.

Panel A shows, academic and education sector experienced the most negative market reaction, -5.72%, followed by energy sector -2.81%, including Oil & Gas Exploration and Production loses -4.12% (Appendix 3). The highest positive return is consumer non-cyclical with 1.5%, in which Food Retail & Distribution gains 5.47% (Appendix 3).

Panel B demonstrates a comparison of top 10 and bottom 10 industries based on average CARs. Household electronic and airline are the most profitable, 9.4% and 7.5% respectively while the opposite is toys and children's products -17.42% and recreational product -13.5%.

Table 6. Distribution of CAARs on economic sectors and industries

Panel A. Mean CAARs on economic sectors (%)

Sectors	Mean CAARs
Academic & Educational Services	-5.72
Energy	-2.81
Industrials	-2.76
Consumer Cyclicals	-1.90
Basic Materials	-1.72
Healthcare	-1.52
Technology	-1.21
Real Estate	-0.28
Consumer Non-Cyclicals	1.48

Panel B. 10 Top and 10 Bottom of CAARs per industry (%)

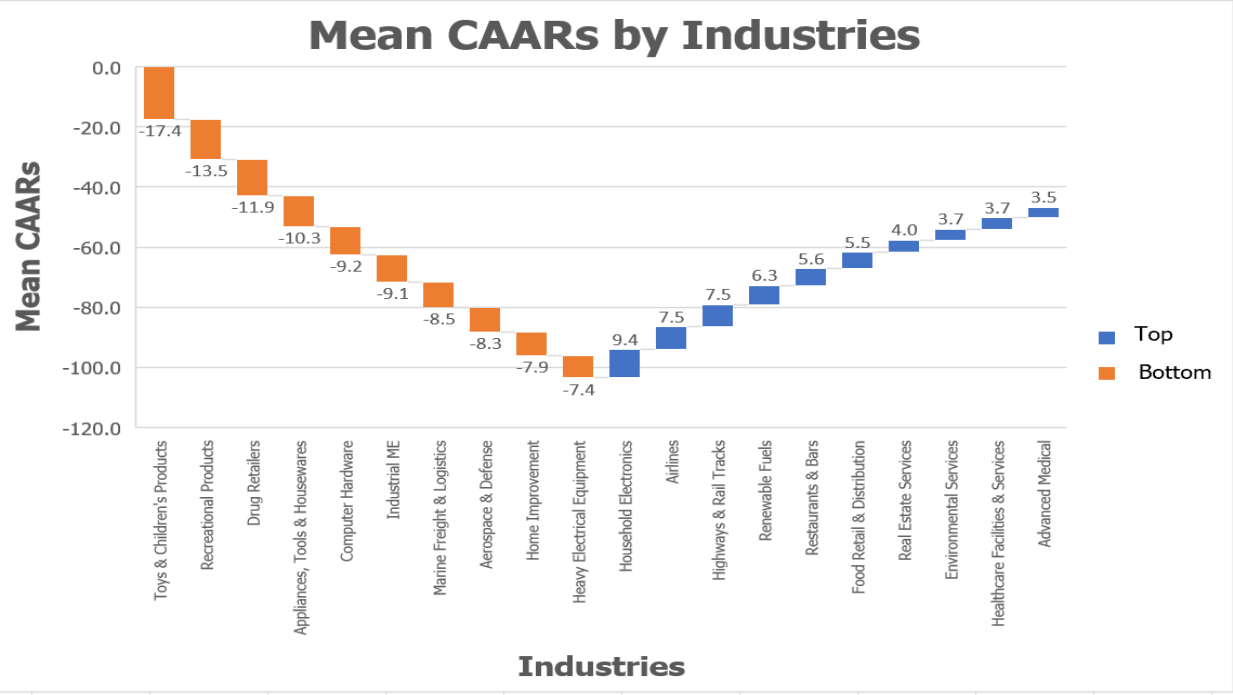


Table 7 shows distribution of ESG and its factors based on economic sectors (detailed industries are described in Appendix 4) and countries of SEO firms. Regarding Panel A, Consumer Non-Cyclicals sector attains its highest position among others in both combined, 60%, and separate E, S, G scores, 67%, 70%, 63 respectively. In contrast, Industrial ranks the lowest in combined

score and Healthcare accounts for the smallest score in Environmental factor. When it comes to countries in Panel B, Spain performs well on most of ESG components, around 80%, while Luxembourg arrives at the lowest score with average 30%.

Table 7. ESG score description

Panel A. In composition of economic sectors (%)

Sectors	**Mean ESG_score**	**Mean E score**	**Mean S score**	**Mean G score**
Consumer Non-Cyclicals	60	67	70	63
Basic Materials	58	60	57	64
Consumer Cyclicals	54	49	56	60
Energy	52	51	49	57
Real Estate	49	50	47	51
Technology	48	37	48	54
Healthcare	47	31	48	56
Industrials	45	36	47	56

Panel B. In composition of countries (%)

Countries	**Mean ESG_score**	**Mean E score**	**Mean S score**	**Mean G score**
Spain	77	77	83	65
Turkey	74	80	75	80
Russia	71	79	75	76
Greece	64	67	57	64
Austria	62	57	74	57
Italy	62	52	63	68
Ireland	60	53	67	68
France	58	66	67	59
Belgium	56	59	58	50
Netherlands	56	47	57	63
Germany	55	48	62	70
Switzerland	53	42	52	63
Norway	50	38	56	51
Poland	49	68	43	32
Portugal	48	93	91	63
Denmark	46	29	51	52
United Kingdom	44	37	41	52
Guernsey	43	7	33	88
Sweden	42	30	39	54
Finland	41	39	47	41
Malta	30	26	23	43
Luxembourg	27	34	27	20

Table 8 shows the result of univariate tests to compare the characteristics of firms in the group of high- ESG score and the other group of low ESG score. A company is defined as a High ESG firm if its ESG score is higher than the median score and otherwise. T-test is applied to check if the mean difference between two group is significantly different from zero. Regarding Size, Market capitalization and Leverage, high ESG score firms indicate significantly higher than low ESG score firms. Other characteristics are not significantly different from zero.

Table 8. Univariate tests

Variables	High ESG		Low ESG		Difference
	Obs.	Mean	Obs.	Mean	
SEO_CAR	126	-2.35	127	-1.29	-1.06
Size	126	15.28	127	13.29	1.99***
Market capitalization	126	15.25	127	13.64	1.61***
Leverage	126	43.28	127	32.75	10.53***
ROE	126	9.02	127	-1.40	10.42
Number of shared offered	126	6.13	127	9.82	-3.68
Secondary offer	126	3.06	127	2.80	0.26
Firm return prior SEO	126	9.12	127	10.78	-1.65

Note: ∗∗∗, ∗∗, and ∗ indicate significance at the 1%, 5%, and 10% level respectively.

Table 9 exhibits the pairwise correlation matrix among each variable. The bivariate correlation relationships demonstrate that most the control variables have significant influence on SEO_CAR. Thus, controlling in these variables for the model explaining SEO announcement effect is appropriate. Most of the correlation coefficients between regressors are lower than 0.60 (except for between ESG and each pillar score), indicating that multicollinearity is not a significant issue in my model.

In the first column, examining the relationship between SEO returns and ESG score, firm, and market factors, several noteworthy findings emerge. Firstly, G_score, Number_of_shares offered, and Secondary_offer display a significant negative correlation with SEO_CAR at a 1% significance level. Similarly, ESG_score, S_score, and ROE exhibit a significant negative correlation with SEO_CAR, a significance level at 5%. Conversely, Market-cap demonstrates a significant negative correlation with SEO_CAR at 10% significance level. In contrast, Leverage shows a positive correlation with SEO_CAR, although this correlation is significant only at 10% significance level. Overall, the observed correlations between SEO returns and control variables, such as Size, Leverage, Market-cap, Number_of_shares, and Secondary_offer, align with the expected signs of relationship.

When it comes to correlation with ESG score and each pillar score, most of firm characteristics are positively related while Number of shares offered have an opposite relationship. All is significant at 1%. Besides, the reputation of stock exchange in which SEO firm issues are positive correlated with environment and social score.

Table 9. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) SEO_CAR	1.000													
(2) ESG_score	-0.126**	1.000												
	(0.045)													
(3) E_score	-0.033	0.795***	1.000											
	(0.597)	(0.000)												
(4) S_score	-0.143**	0.878***	0.730***	1.000										
	(0.023)	(0.000)	(0.000)											
(5) G_score	-0.187***	0.686***	0.421***	0.506***	1.000									
	(0.003)	(0.000)	(0.000)	(0.000)										
(6) Marketcap	-0.116*	0.169***	0.200***	0.218***	0.106*	1.000								
	(0.065)	(0.007)	(0.001)	(0.000)	(0.094)									
(7) Leverage	0.105*	0.244***	0.247***	0.244***	0.154**	0.006	1.000							
	(0.095)	(0.000)	(0.000)	(0.000)	(0.014)	(0.929)								
(8) Size	-0.049	0.581***	0.582***	0.575***	0.429***	0.151**	0.246***	1.000						
	(0.438)	(0.000)	(0.000)	(0.000)	(0.000)	(0.016)	(0.000)							
(9) ROE	-0.136**	0.024	0.000	0.036	-0.005	0.014	-0.173***	0.005	1.000					
	(0.030)	(0.701)	(0.996)	(0.570)	(0.935)	(0.820)	(0.006)	(0.937)						
(10) Number_of_shares	0.319***	-0.234***	-0.172***	-0.237***	-0.213***	-0.122*	0.073	-0.178***	-0.193***	1.000				
	(0.000)	(0.000)	(0.006)	(0.000)	(0.001)	(0.053)	(0.247)	(0.004)	(0.002)					
(11) Secondary_offer	-0.380***	0.200***	0.126**	0.247***	0.173***	0.076	0.032	0.074	0.141**	-0.789***	1.000			
	(0.000)	(0.001)	(0.045)	(0.000)	(0.006)	(0.228)	(0.611)	(0.239)	(0.025)	(0.000)				
(12) Market_return_prior	-0.039	0.0214	0.0042	0.0373	-0.0537	-0.0322	-0.0053	-0.0011	0.0114	-0.0180	0.0472	1.000		
	(0.6433)	(0.7353)	(0.9469)	(0.5547)	(0.3950)	(0.6099)	(0.9327	(0.9861)	(0.8565)	(0.7753)	(0.4548)			
(13) Firm_return_prior	0.0326	0.0366	-0.0112	0.0121	0.0245	-0.1799***	-0.0210	-0.0671	-0.0023	-0.0610	0.0840	0.3914***	1.000	
	(0.6054)	(0.5628)	(0.8595)	(0.8486)	(0.6976)	(0.0041)	(0.7395)	(0.2879)	(0.9711)	(0.3342)	(0.1827)	(0.0000)		
(14) Euronext	0.002	0.127**	0.239***	0.175***	-0.037	0.196***	0.166***	0.114*	-0.097	-0.076	0.026	-0.091	-0.053	1.000
	(0.981)	(0.043)	(0.000)	(0.005)	(0.557)	(0.002)	(0.008)	(0.070)	(0.125)	(0.229)	(0.680)	(0.147)	(0.400)	

**** p<0.01, ** p<0.05, * p<0.1*

5.4. Impact of ESG performance on SEOs' cumulative abnormal returns

The following section of my research analyzes whether ESG score and three pillar scores might lessen the adverse announcement impact. The outcomes of the multiple OLS regression from equation (10) with dependent variables SEO_CAR are displayed in the Table 10. Standard errors in all regressions are clustered at the firm levels. My OLS models generate adjusted R-square around 14.4%-15.8%, which is higher than previous research about SEO events.

The coefficients of ESG combined score and Environment score indicate positive relationship, but not significant. Conversely, Social score has a negative sign of relationship, but still insignificant. Governance score has a negatively significant impact on announcement returns at the significance level 10% with a relatively small coefficient -0.0307, by which an increase of 1% in Governance score would result in a decrease in SEO announcement returns by 0.0307%. Therefore, it suggests that, during this Covid-19, ESG performance cannot mitigate negative market reaction to the SEO announcement. Therefore, the null hypothesis in this paper cannot reject. This result is partly in line with La Torre et al., 2020, research about ESG Index and stock returns with Evidence from the Eurostoxx50.

Besides, secondary offers and market capitalization are negatively associated with SEO returns at confidence interval 95%, aligning with previous study (namely Sagi Akron et et., 2013; Feng et al., 2018, La Torre et al., 2020). Specially, in model of ESG score, an increase by 1% in market capitalization would decrease in SEO returns by 0.0016%, and in model of each component – Environment, Social, Governance is relatively indifferent, also contribute to a fall in returns of 0.00159%, 0.00153% and 0.00147% respectively. Even though the magnitude of this factor is relatively small, this indicates small firms suffer less from negative effect of SEO announcement than large firms. It is plausible that small firms are more likely to have better returns than large firms. Secondary offer negatively impacts on returns a much higher degree with coefficients around 0.375% for all four scores, whereby the percentage of secondary decreases by 1%, SEO_CARs increase by 0.375%. The information of secondary offer, measuring degree of "skin in the game", is a crucial factor for investors to take into account in their investment choice. Clearly, according to signaling theory, when internal investors sell their shareholdings, it conveys a negative signal about the value of firms/ investment opportunities for outside investors.

Other control variables listed in Table 10 indicate absent explanation for SEO returns even though they show significant correlation in the correlation analysis section. In details, Size, Firm returns prior SEO, Number of shared, Euronext having positive impact, but negligible support to negative announcement returns in this sample. Leverage, ROE and market returns, on the other hand, associate with SEO returns in a negative way, but also statistically insignificant.

The findings also highly indicate the importance of business sectors in which firms primarily operate. SEO firm operating in Diversifying mining and Brewer have a significantly positive association with CAR, while other industries show little impacts.

Table 10. Regression results of announcement returns SEO_CAR with interval [-1;1] on the ESG score for SEO firms.

VARIABLES	(1)	(2)	(3)	(4)
ESG_score	0.00733			
	(0.0267)			
E_score		0.00259		
		(0.0180)		
S_score			-0.00661	
			(0.0192)	
G_score				-0.0307*
				(0.0180)
Marketcap	-0.160**	-0.159**	-0.153**	-0.147**
	(0.0635)	(0.0623)	(0.0641)	(0.0626)
Leverage	-0.407	-0.381	-0.313	-0.188
	(0.270)	(0.247)	(0.268)	(0.238)
Size	0.0188	0.0196	0.0210	0.0237
	(0.0200)	(0.0200)	(0.0199)	(0.0197)
ROE	-0.0660	-0.0652	-0.0644	-0.0647
	(0.0432)	(0.0431)	(0.0432)	(0.0435)
Number_of_shares	0.00394	0.00244	0.00149	-0.00626
	(0.0881)	(0.0880)	(0.0885)	(0.0864)
Secondary_offer	-0.381**	-0.380**	-0.375**	-0.376**
	(0.173)	(0.173)	(0.174)	(0.172)
Market_return_prior	-0.0641	-0.0634	-0.0630	-0.0681
	(0.0651)	(0.0652)	(0.0651)	(0.0658)
Firm_return_prior	0.0188	0.0192	0.0196	0.0229
	(0.0320)	(0.0319)	(0.0315)	(0.0319)
Euronext	0.602	0.591	0.624	0.468
	(0.618)	(0.637)	(0.619)	(0.631)
Constant	5.496	5.324	4.672	4.194
	(3.602)	(3.541)	(3.697)	(3.362)
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Observations	237	237	237	237
R-squared	0.365	0.365	0.365	0.376
Adjusted R-squared	0.1440	0.1437	0.1442	0.1579

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5.5. Robustness test

Using ESG and 3 pillar scores as explanatory variables in the regression can potentially arise with endogeneity issues which leads OLS estimators to be inconsistent. Thus, I conduct two-stage least squares (2SLS) with instrument variables (IV) for ESG performance. Based on argument from Chang et al. (2014) about CSR score and its similarity to ESG score, it is possible that average ESG score for all firms in the same nation could have an impact on the ESG performance of a particular firm due to some common geographic factors, but cannot affect an individual firm' s announcement returns on the SEO event. Thus, choosing average score of

overall ESG score and each component score per nation can be valid IVs as it meets requirements of exogeneity and relevance.

Following that, my research uses the IV for model of combined ESG score which is calculated by taking the average of ESG score of all SEO firms in each nation's issuers during Covid-19 period. The outcome from 2SLS instrument variable regression under control fixed effect for year and industry is displayed in Table 11.

The IV has relatively high F-test in the first stage (23 > 10), and obtains a significant result for Kleibergen-Paap rk LM statistic test ($p < 0.01$), meaning IV – average ESG score per nation (ESG_score_Nation) is relevant to endogenous variable – firm ESG score in the model. Plus, Stock-Yogo weak ID test critical values (16.38) are all smaller than Cragg-Donald Wald F statistic for IV (25.30), which indicates IV is not weak and therefore retains explanatory power for the endogenous variable. As I only use on IV in this model, Hansen J statistic is not needed. The detail result of these tests is included in Appendix 5. In reduced equation, the coefficient of IV is significantly positive ($p < 0.01$) and other control variables Market cap, Size and Leverage are positively associated with ESG_score ($p < 0.05$). In the structural equation, the model shows no difference much from the same result of OLS regression, ESG scores are still insignificant and secondary offer remains negatively significant at 5% with SEO_CAR.

Table 11. Instrument variable regressions of SEO announcement returns in [−1,1] on ESG combined score.

VARIABLES	ESG_score 1st stage	SEO_CAR 2nd stage
ESG_score_Nation	0.442***	
	(0.0920)	
ESG_score		0.0192
		(0.0819)
Marketcap	2.631**	-0.435
	(1.248)	(0.445)
Size	3.455**	-0.183
	(1.351)	(0.595)
Leverage	0.135**	0.00983
	(0.0544)	(0.0239)
ROE	0.0536	-0.0625
	(0.103)	(0.0454)
Number_of_share	-0.130	0.0182
	(0.245)	(0.0908)
Secondary_offer	-0.0693	-0.405**
	(0.486)	(0.179)
Market_return_prior	-0.0939	-0.0591
	(0.180)	(0.0682)
Firm_return_prior	0.126	0.0285
	(0.0861)	(0.0327)
Euronext	-2.619	0.295
	(2.092)	(0.659)
Constant	-64.07***	

VARIABLES	ESG_score 1st stage	SEO_CAR 2nd stage
	(8.737)	
Year fixed effect	Yes	Yes
Industry fixed effect	Yes	Yes
Observations	237	237
R-squared	0.633	0.135

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In the same way, 2SLS method is conducted to control for endogeneity bias for each pillar score in Table 12. IVs which are used in the reduced forms are average Environment score (E_Nation), Social score (S_Nation) and Governance score (G_Nation) for all SEO firms located in the same country during Covid-19. Repeating the process of assessing F- statistic, underidentifcation test and weak identification test, the result proves IVs' its validity and explanatory power for each component of ESG scores, details in Appendix 5. Coefficients of Environment, Social score are not statistically different from zero, which is in the line with OLS regression. Governance score changes to be insignificant. Even though G_Nation showed its validity in statistic tests, it is not strongly relevant and useful for explaining Governance score, which leads to an inconsistent result.

Table 12. Instrument variable regressions of SEO announcement returns in [−1,1] on Environment, Social, Governance pillar scores.

VARIABLES	E_score 1st stage	SEO_CAR 2nd stage	S_score 1st stage	SEO_CAR 2nd stage	G_score 1st stage	SEO_CAR 2nd stage
E_score		-0.0222				
		(0.0465)				
S_score				-0.0138		
				(0.0556)		
G_socre						-0.0294
						(0.0448)
E_Nation	0.440***					
	(0.0767)					
S_Nation			0.472***			
			(0.101)			
G_Nation					0.576***	
					(0.108)	
Marketcap	2.889**	-0.362	2.743**	-0.363	3.668**	-0.274
	(1.417)	(0.434)	(1.663)	(0.436)	(1.808)	(0.440)
Size	3.957***	0.0164	5.021***	-0.0161	2.282***	-0.0314
	(1.437)	(0.520)	(1.865)	(0.572)	(1.889)	(0.457)

VARIABLES	E_score 1st stage	SEO_CAR 2nd stage	S_score 1st stage	SEO_CAR 2nd stage	G_score 1st stage	SEO_CAR 2nd stage
Leverage	0.0705	0.0161	0.145*	0.0161	0.0858	0.0184
	(0.0729)	(0.0218)	(0.0742)	(0.0224)	(0.0796)	(0.0221)
ROE	-0.0984	-0.0622	0.0885	-0.0596	-0.0966	-0.0625
	(0.139)	(0.0451)	(0.155)	(0.0451)	(0.157)	(0.0452)
Number_of_share	-0.0502	0.00915	0.0160	0.0109	0.232	0.00393
	(0.326)	(0.0916)	(0.341)	(0.0903)	(0.344)	(0.0893)
Secondary_offer	-0.470	-0.401**	0.554	-0.391**	0.754	-0.398**
	(0.626)	(0.182)	(0.674)	(0.188)	(0.718)	(0.176)
Market_return_prior	-0.340	-0.0640	-0.00929	-0.0579	-0.264	-0.0652
	(0.255)	(0.0697)	(0.269)	(0.0677)	(0.259)	(0.0698)
Firm_return_prior	0.177	0.0320	0.0542	0.0296	0.115	0.0331
	(0.121)	(0.0320)	(0.127)	(0.0311)	(0.128)	(0.0321)
Euronext	0.918	0.476	-2.450	0.375	-2.048	0.204
	(2.667)	(0.763)	(3.094)	(0.689)	(2.330)	(0.638)
Constant	-74.31***		-91.08***		-64.65***	
	(11.75)		(11.77)		(12.55)	
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	237	237	237	237	237	237
R-squared	0.651	0.132	0.604	0.140	0.534	0.153

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6. Summary and conclusion

6.1. Discussion

In the light of corporate finance, the source of funding holds paramount importance for companies, influencing their ownership structure and capitalization. As businesses navigate the path of growth and development, the need for capital raising becomes inevitable, especially during economic downturns. Besides, the rising global focus on sustainability in investment practices has sparked my interest in exploring the role of ESG factors in firms' capital raising events.

These events, particularly seasoned equity offerings, have been documented in the corporate finance literature. Giving an overview of financing decision, signaling theory (Leland and Pyle, 1977), adverse selection (Myers and Majluf, 1984), agency problem (Jung et al., 1996), all offer explanations for the negative market reaction when firms announce SEOs' decision. Many papers prove it by empirical results and show this adverse impact is more severe during economic crisis. Furthermore, there are findings that ESG factors can contribute to firm stock returns, raising questions about the relationship between ESG factors and announcement period returns of SEO firms during challenging times, such as the Covid-19 pandemic. My paper has attempted to unravel it by investigating the sample of 253 companies in Europe from 03/2020 to 05/2022.

The event study is conducted to analyze the announcement effect. The result reveals a significantly negative CAARs in different intervals, in which a short interval, 3 days [-1,1], has a significant average return of -1.82% (from Mom model). This negative reaction aligns with theoretical predictions and previous research. Following that, the impacts of overall ESG score and each of 3 main components on announcement period returns is estimated by using cross-sectional analysis. In OLS method, overall ESG score, Environment score and Social Score have minimal effects on SEO returns, while Governance score is negatively associated with SEO returns ($p < 0.1$). For robustness check, the result of 2SLS method exhibits none of the ESG indicators demonstrate a significant correlation with SEO returns. Therefore, it can be concluded that ESG factors do not appear to assist firms in mitigating the negative effects of SEO events.

My study is partly in line with La Torre et al., 2020 and Demers et al., 2020. La Torre et al., 2020 highlighted that ESG elements have an impact on returns, but only to a minimal level when returns are modeled incorporating the chosen ESG overall scores. Demers et al., 2020 stated that during the COVID-19 crisis, ESG failed to safeguard firm stocks while the investments in intangible assets shows its positive impact. In the context of pandemic period, detrimental impacts in the economies of affected nations spilled over into the stock market, which gave rise to inefficient market. Investors were more sensitive to risks and more likely to believe in material financial factors than on non-financial factors to deal with high volatility in stock market. Serafeim et al. 2022 showed stock prices only react to aspects of ESG information that are reasonably and likely to affect firms' financial performance.

On the other hand, my result is not consistent with previous research, namely Bermejo et al. (2021) and Engelhardt et al. (2021). Bermejo et al. (2021) presented Environment and Governance indicators have a considerably useful influence on portfolio return growth and an adverse impact on portfolio return volatility, however the social score has the reverse effect, as shown by data from Bloomberg's European ESG ratings. They also stated that the quality of result decreases by score accuracy and parameter estimations. Due to lack of precision in corporate and social responsibility metrics and lack of agreement in ESG ratings, this causes a problem for both investors and corporations, resulting in inconsistent impacts of corporate sustainability on performance indicators. Engelhardt et al. (2021) found better performance in overall ESG factor is associated with considerably larger cumulative abnormal returns as these sustainable factors assist firms in being more able to withstand in times of economic hardship.

In addition to my result, Secondary offer and Market capitalization are significantly negatively relevant to SEO returns, which is consist with research from Sagi Akron et al., (2013), Feng et al., (2018) and La Torre et al., (2020). Secondary offer factor delivers a negative message to investors about the value of stock, company or investment opportunities, as based on signal theory. For Market capitalization, it is also a determinant to stock returns. Small firms having low prices are more likely to have higher returns than large firms, so these firms are less prone to negative reaction from SEO events. Even though, it is suggested, by Masulis and Korwar (1986) performance of market and firm returns would play as an ex-ante market assessments for issue firms, my result shows lack of evidence for supporting that relationship under the effect of economic downturns. Other firm characteristics, including Size, Leverage, ROE and deal

information from Number of shares offered and Reputation of stock exchange – Euronext also have little impact on announcement period returns.

6.2. Implementation

The findings of this study hold valuable insights for both finance professionals and investors, enabling them to make informed decisions regarding stock returns and construct well-planned financing strategies and portfolios.

Market performance of firms in which stock prices determine the cost of equity for firms and therefore the cost of capital, so it is essential for finance managers to anticipate how the market reacts and incorporates relevant information to make assessment. Issuing equity will be much more costly during tough time due to the negative effect of announcement and higher degree of uncertainty in the economy. To achieve better performance, managers should focus on key financial factors, such as the market value of firms (linked to market timing concerns) and deal information relevant to inside investors, as these factors hold material significance and outweigh other determinants. Besides, investors are increasingly incorporating ESG information into their investment decisions, as it can provide a reliable basis for sustainable assessments. Although this paper does not empirically show the positive impact of the ESG index on announcement returns, previous research has indicated its influence. Therefore, enhancing ESG performance should be considered to gain better market assessment and fortify firms' resilience during challenging periods.

Since market capitalize has significant negative impact on announcement returns, small firms are less prone to negative SEO announcement effect. This insight provides investors with a strategic approach to portfolio selection. Furthermore, Dobrick et al. (2023) have identified a size bias in ESG scores which asset managers should take into consideration. In line with this, the correlation analysis indicates a strong positive relationship between a firm's ESG score and its size, with a correlation coefficient of nearly 60%. Univariate tests further demonstrate significant differences between firms with high and low ESG ratings in terms of size, market capitalization, and leverage. This can be explained by the fact that larger organizations have higher ESG ratings since they have better financial strength to improve their sustainability. Thus, investors should be mindful of size bias because choosing many highly ESG index firms in the portfolio could increase skewness in returns and therefore have less accuracy in the estimation of financial models.

6.3. Limitation and recommendation

Due to time constraints and data availability, this study focuses solely on European firms using Refinitiv Eikon as the data provider. It is crucial to acknowledge that in the context of the Covid-19 pandemic and corporate events, firms can be influenced by a myriad of factors. This includes the potential presence of self-selection bias, which has not been covered in this paper. In robustness check, due to the limited availability of data, only one instrumental variable for the regression of overall and individual ESG scores does not fully address the endogeneity problem. More choices for instrument variables would enhance the robustness of results. Additionally, the

accuracy of ESG indices, as mentioned in previous research, raises concerns about size bias in the Refinitiv Eikon ESG data (Dobrick et al., 2023), highlighting the need for future studies using alternative data providers.

This study suggests further research on firms and sustainability factors. To begin, investigating the link between the ESG index and stock returns could be extended to broader markets, longer observation periods, larger sample sizes, and different economic contexts. These aspects can combine with different models of expected returns, for example Fama and French 5 factors, and exploring various estimation windows and event windows would contribute to a more comprehensive understanding. Secondly, employing alternative approaches, such as the 2SLS approach with better instrument variables for ESG scores, would provide a more robust estimation of the model. Thirdly, it would be intriguing to examine the impact of ESG components on other types of firm events, firm decisions, or aspects beyond standard financial factors, such as the impact on firms' employees. Finally, one suggestion for policy maker should take action to reach an agreement about the ESG measurement in order to improve the efficiency of market.

6.4. Conclusion

Since corporate finance contributes to a backbone of business and current investing strategy places a major emphasis on sustainability, this encourages me to delve deep into how ESG factors influence stock returns in SEOs during Covid-19 pandemic. My finding indicates, ESG factors including total score and each component cannot help firms in minimizing the adverse impact of SEO announcement effect. By approaching crucial literature in corporate finance, recent research and providing evidence of European firms, my study contributes to relevant literature and practical implementations for finance managers, investors and policy makers.

It is evident that further research is needed to deepen our understanding of the role of ESG factors in the context of corporate events and economic crises. Addressing the limitations of data and the quality of ESG ratings, and exploring other potential aspects relevant to this topic can offer valuable insights for firm managers and investors in making better decisions in an ever-evolving market landscape.

7. Appendix

7.1. Appendix 1: Definition of ESG components

Pillar	Score	Definition
Environment	Resource use score	The resource use score reflects a company's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management.
	Emissions reduction	The emission reduction score measures a company's commitment and effectiveness towards reducing environmental emissions in its production and operational processes
	Innovation	The innovation score reflects a company's capacity to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies and processes, or eco-designed products.
Social	Workforce	The workforce score measures a company's effectiveness in terms of providing job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce.
	Human rights	The human rights score measures a company's effectiveness in terms of respecting fundamental human rights conventions
	Community	The community score measures the company's commitment to being a good citizen, protecting public health and respecting business ethics
	Product responsibility	The product responsibility score reflects a company's capacity to produce quality goods and services, integrating the customer's health and safety, integrity and data privacy
Governance	Management	The management score measures a company's commitment and effectiveness towards following best practice corporate governance principles.
	Shareholders	The shareholders score measures a company's effectiveness towards equal treatment of shareholders and the use of anti-takeover devices.
	CSR strategy	The CSR strategy score reflects a company's practices to communicate that it integrates economic (financial), social and environmental dimensions into its day-to-day decision-making processes

Source: Refinitiv methodology, updated version on May 2022

7.2. Appendix 2: Announcement returns - CAARs

7.2.1. Market model

t	NoFirms	CAAR	t_test	CDA	Patell	PatellADJ	Boehmer	Kolari	Corrado_ Cowan	Zivney_ Cowan	GenSign	GRANKT	Wilcox
20;20]	676	0.77			***	***							***
10;10]	676	-0.48			***	**			**		***	***	***
[-5;5]	676	-0.51			*				***		***	***	***
[-4;1]	676	-0.86	**	**	***	***			***	**	***	***	***
[-3;3]	676	-1.04	**	**	***	***	**	**	***	**	***	***	***
[-1;4]	676	-1.46	***	***	***	***	***	***	***	***	***	***	***
[-1;1]	676	-1.58	***	***	***	***	***	***	***	***	***	***	***
[0;1]	676	-1.76	***	***	***	***	***	***	***	***	***	***	***
[0;5]	676	-1.60	***	***	***	***	***	***	***	***	***	***	***
[0;10]	676	-2.04	***	***	***	***	***	***	***	***	***	***	***

7.2.2. CAPM

t	NoFirms	CAAR	t_test	CDA	Patell	PatellADJ	Boehmer	Kolari	Corrado_ Cowan	Zivney_ Cowan	GenSign	GRANKT	Wilcox
[20;20]	676	-1.86		*							**		***
10;10]	676	-1.87	**	***	***	***	*	*			***	***	***
[-5;5]	676	-1.30	**	**	***	***			**		***	***	***
[-4;1]	676	-1.31	***	***	***	***	**	**	***	*	***	***	***
[-3;3]	676	-1.56	***	***	***	***	***	**	***	**	***	***	***
[-1;4]	676	-1.94	***	***	***	***	***	***	***	***	***	***	***
[-1;1]	676	-1.86	***	***	***	***	***	***	***	***	***	***	***
[0;1]	676	-1.96	***	***	***	***	***	***	***	***	***	***	***
[0;5]	676	-2.09	***	***	***	***	***	***	***	***	***	***	***
[0;10]	676	-2.82	***	***	***	***	***	***	***	***	***	***	***

7.2.3. FF3 model

t	NoFirms	CAAR	t_test	CDA	Patell	PatellADJ	Boehmer	Kolari	Corrado_ Cowan	Zivney_ Cowan	GenSign	GRANKT	Wilcox
[20;20]	676	-1.74		*							**	**	***
[10;10]	676	-1.66	**	**	***	***	**	*	*		**	***	***
[-5;5]	676	-1.04	**	**	***	***			**		***	***	***
[-4;1]	676	-1.24	***	***	***	***	**	*	***		***	***	***
[-3;3]	676	-1.41	***	***	***	***	***	**	***		***	***	***
[-1;4]	676	-1.75	***	***	***	***	***	***	***	**	***	***	***
[-1;1]	676	-1.81	***	***	***	***	***	***	***	***	***	***	***
[0;1]	676	-1.90	***	***	***	***	***	***	***	***	***	***	***
[0;5]	676	-1.86	***	***	***	***	***	***	***	**	***	***	***
[0;10]	676	-2.55	***	***	***	***	***	***	***	***	***	***	***

7.2.4. Mom model

t	NoFirms	CAAR	t_test	CDA	Patell	PatellADJ	Boehmer	Kolari	Corrado_ Cowan	Zivney_ Cowan	GenSign	GRANKT	Wilcox
[20;20]	676	-1.74		*							**	**	***
[10;10]	676	-1.53	**	**	***	***	**	*	**		**	***	***
[-5;5]	676	-1.05	**	**	***	***			***		***	***	***
[-4;1]	676	-1.25	***	***	***	***	**	**	***	*	***	***	***
[-3;3]	676	-1.40	***	***	***	***	***	**	***	*	***	***	***
[-1;4]	676	-1.71	***	***	***	***	***	***	***	**	***	***	***
[-1;1]	676	-1.80	***	***	***	***	***	***	***	***	***	***	***
[0;1]	676	-1.90	***	***	***	***	***	***	***	***	***	***	***
[0;5]	676	-1.84	***	***	***	***	***	***	***	**	***	***	***
[0;10]	676	-2.44	***	***	***	***	***	***	***	***	***	***	***

7.3. Appendix 3: Distribution of CAARs on industries

7.3.1. Detailed industries

Industries	Mean CAARs	Industry	Mean CAARs
Academic & Educational Services	**-5.72**	**Healthcare**	-1.52
Professional & Business Education	-5.72	Advanced Medical Equipment & Technology	3.51
Basic Materials	**-1.72**	Biotechnology & Medical Research	**-5.86**
Commodity Chemicals	-1.42	Healthcare Facilities & Services	3.71
Construction Materials	-2.65	Medical Equipment, Supplies & Distribution	0.00
Diversified Chemicals	-7.05	Pharmaceuticals	0.12
Diversified Mining	2.15	**Industrials**	**-2.76**
Forest & Wood Products	2.72	Aerospace & Defense	-8.26
Gold	-5.20	Airlines	7.51
Iron & Steel	-2.60	Airport Operators & Services	-4.91
Non-Gold Precious Metals & Minerals	-0.84	Business Support Services	-1.71
Non-Paper Containers & Packaging	-3.88	Business Support Supplies	-5.97
Paper Packaging	-1.37	Commercial Printing Services	-1.12
Specialty Chemicals	3.31	Construction & Engineering	-1.51
Specialty Mining & Metals	-7.34	Courier, Postal, Air Freight & Land-based Logistics	-5.24
Consumer Cyclicals	**-1.90**	Electrical Components & Equipment	-2.33
Advertising & Marketing	-6.38	Employment Services	-3.01
Apparel & Accessories	1.27	Environmental Services & Equipment	3.73
Apparel & Accessories Retailers	-3.03	Heavy Electrical Equipment	-7.40
Appliances, Tools & Housewares	-10.31	Heavy Machinery & Vehicles	-1.29
Auto & Truck Manufacturers	-5.21	Highways & Rail Tracks	7.46
Auto Vehicles, Parts & Service Retailers	-3.68	Industrial Machinery & Equipment	-9.07
Auto, Truck & Motorcycle Parts	-3.19	Marine Freight & Logistics	-8.46
Broadcasting	-1.35	Passenger Transportation, Ground & Sea	-1.81
Casinos & Gaming	-3.54	Professional Information Services	-1.92
Computer & Electronics Retailers	-6.53	Shipbuilding	0.17
Construction Supplies & Fixtures	-1.46	**Real Estate**	**-0.28**
Consumer Publishing	-2.14	Commercial REITs	1.01
Department Stores	-0.21	Diversified REITs	-4.42
Entertainment Production	-2.27	Real Estate Rental, Development & Operations	-0.56
Footwear	-3.33	Real Estate Services	4.03
Home Furnishings	-2.65	Residential REITs	-5.18
Home Furnishings Retailers	-6.46	Specialized REITs	0.23
Home Improvement Products & Services Retailers	-7.88	**Technology**	**-1.21**
Homebuilding	1.33	Communications & Networking	-1.24
Hotels, Motels & Cruise Lines	-0.89	Computer Hardware	-9.24
Leisure & Recreation	0.51	Electronic Equipment & Parts	-6.38
Miscellaneous Specialty Retailers	3.19	Household Electronics	9.44

Industries	Mean CAARs	Industry	Mean CAARs
Recreational Products	-13.48	Integrated Telecommunications Services	-1.54
Restaurants & Bars	5.57	IT Services & Consulting	-0.22
Textiles & Leather Goods	-4.78	Office Equipment	1.39
Toys & Children's Products	-17.42	Online Services	-3.37
Consumer Non-Cyclicals	**1.48**	Semiconductor Equipment & Testing	-0.45
Brewers	3.11	Semiconductors	2.12
Consumer Goods Conglomerates	0.69	Software	-1.32
Distillers & Wineries	-0.92	Wireless Telecommunications Services	-3.95
Drug Retailers	-11.94	**Energy**	**-2.81**
Fishing & Farming	1.82	Oil & Gas Exploration and Production	-4.12
Food Processing	1.90	Oil Related Services and Equipment	-1.21
Food Retail & Distribution	5.47	Renewable Energy Equipment & Services	-3.74
Personal Products	-3.85	Renewable Fuels	6.29
		Uranium	-0.50

7.3.2. Comparison between Top 10 and Bottom 10 Industries

10 Bottom		10 Top	
Industries	**Mean CAARs**	**Industry**	**Mean CAARs**
Toys & Children's Products	-17.42	Household Electronics	9.44
Recreational Products	-13.48	Airlines	7.51
Drug Retailers	-11.94	Highways & Rail Tracks	7.46
Appliances, Tools & Housewares	-10.31	Renewable Fuels	6.29
Computer Hardware	-9.24	Restaurants & Bars	5.57
Industrial Machinery & Equipment	-9.07	Food Retail & Distribution	5.47
Marine Freight & Logistics	-8.46	Real Estate Services	4.03
Aerospace & Defense	-8.26	Environmental Services & Equipment	3.73
Home Improvement Products & Services Retailers	-7.88	Healthcare Facilities & Services	3.71
Heavy Electrical Equipment	-7.40	Advanced Medical Equipment & Technology	3.51

7.4. Appendix 4: Mean ESG scores per industry

Industries	Average of ESG_score	Average of E score	Average of S score	Average of G score
Basic Materials	**58**	**60**	**57**	**64**
Commodity Chemicals	60	60	59	63
Construction Materials	52	53	50	54
Diversified Mining	86	90	78	94
Gold	47	38	43	65
Iron & Steel	53	62	55	60
Paper Packaging	81	81	79	86

Industries	Average of ESG_score	Average of E score	Average of S score	Average of G score
Specialty Chemicals	27	25	28	28
Specialty Mining & Metals	74	64	70	93
Consumer Cyclicals	**54**	**49**	**56**	**60**
Advertising & Marketing	65	69	58	74
Apparel & Accessories	72	66	74	74
Apparel & Accessories Retailers	58	56	40	78
Auto & Truck Manufacturers	55	96	87	91
Auto Vehicles, Parts & Service Retailers	40	29	39	59
Auto, Truck & Motorcycle Parts	65	54	66	75
Broadcasting	62	42	62	70
Casinos & Gaming	30	24	29	35
Construction Supplies & Fixtures	42	36	43	48
Consumer Publishing	55	41	53	62
Department Stores	52	46	59	66
Footwear	78	85	88	80
Home Furnishings Retailers	62	74	67	52
Homebuilding	54	52	52	62
Hotels, Motels & Cruise Lines	22	28	24	11
Leisure & Recreation	40	34	44	37
Miscellaneous Specialty Retailers	53	45	54	58
Recreational Products	67	36	72	75
Restaurants & Bars	62	53	66	63
Consumer Non-Cyclicals	**60**	**67**	**70**	**63**
Brewers	65	67	52	87
Consumer Goods Conglomerates	52	58	71	70
Distillers & Wineries	56	51	63	51
Drug Retailers	71	70	71	73
Food Processing	59	59	61	60
Food Retail & Distribution	65	87	83	61
Energy	**52**	**51**	**49**	**57**
Oil & Gas Exploration and Production	63	54	61	79
Renewable Energy Equipment & Services	47	50	43	46
Healthcare	**47**	**31**	**48**	**56**
Advanced Medical Equipment & Technology	53	46	59	51
Biotechnology & Medical Research	54	21	53	77
Healthcare Facilities & Services	60	55	62	62
Medical Equipment, Supplies & Distribution	35	19	39	40
Pharmaceuticals	46	32	45	56
Industrials	**45**	**36**	**47**	**56**
Aerospace & Defense	34	22	43	35
Airlines	26	38	50	44
Airport Operators & Services	59	39	56	83
Business Support Services	42	28	40	54
Business Support Supplies	69	61	74	69

Industries	Average of ESG_score	Average of E score	Average of S score	Average of G score
Construction & Engineering	46	40	44	59
Courier, Postal, Air Freight & Land-based Logistics	36	15	52	41
Electrical Components & Equipment	45	39	42	62
Employment Services	45	26	38	66
Environmental Services & Equipment	79	60	88	79
Heavy Electrical Equipment	48	55	69	51
Heavy Machinery & Vehicles	61	64	64	53
Industrial Machinery & Equipment	39	30	43	43
Real Estate	**49**	**50**	**47**	**51**
Real Estate Rental, Development & Operations	46	46	43	48
Real Estate Services	59	55	61	64
Residential REITs	69	85	65	56
Specialized REITs	77	93	64	71
Technology	**48**	**37**	**48**	**54**
Computer Hardware	69	61	75	63
Electronic Equipment & Parts	41	33	50	42
Integrated Telecommunications Services	38	25	40	52
IT Services & Consulting	55	42	59	56
Office Equipment	57	38	52	86
Online Services	48	22	47	61
Semiconductors	55	65	55	50
Software	43	30	41	50
Wireless Telecommunications Services	55	46	53	66
Total	**51**	**45**	**52**	**57**

7.5. Appendix 5: Statistic tests in 2SLS

Variable	F-score	Underiden-tifciation test	P-value	Weak identificantion test		
				CD Wald F-statistic	KP rk Wald statistic	Stock-Yogo weak ID test (10% maximal IV size)
ESG_score	23.24	16.55	0.00	25.30	23.14	16.38
E_score	32.94	22.15	0.00	36.35	32.94	16.38
S_score	21.71	15.96	0.00	24.87	21.71	16.38
G_score	28.56	19.73	0.00	34.36	28.56	16.38

8. References

Al Amosh, H., Khatib, S.F.A (2022). ESG performance in the time of COVID-19 pandemic: cross-country evidence. *Environmental Science and Pollution Research*, Volume 30, pp. 39978–39993. https://doi.org/10.1007/s11356-022-25050-w

Akhigbe, A., & Whyte A. M. (2015). SEO announcement returns and internal capital market efficiency. *Journal of Corporate Finance,* Volume 31, pp. 271-283. https://doi.org/10.1016/j.jcorpfin.2015.02.006

Bae, K., Ghoul, S. El., Gong, Z., & Guedhami O. (2021). Does CSR matter in times of crisis? Evidence from the COVID-19 pandemic. *Journal of Corporate Finance*, Volume 67, 101876. https://doi.org/10.1016/j.jcorpfin.2020.101876 .

Baig, A. S., Butt, H. A., Haroon, O., & Rizv S. A. R. (2021). Deaths, panic, lockdowns and US equity markets: The case of COVID-19 pandemic. *Finance Research Letters*, Volume 38, 101701. https://doi.org/10.1016/j.frl.2020.101701

Baker, E. D., Boulton, T. J., Braga-Alves M. V., & Morey M. R. (2021). ESG government risk and international IPO underpricing. *Journal of Corporate Finance*, Volume 67, 101913. https://doi.org/10.1016/j.jcorpfin.2021.101913 .

Baker, M. and Wurgler,J. (2002). Market Timing and Capital Structure. *The Journal of Finance*, Volume 57, No. 1, pp. 1-32. https://www.jstor.org/stable/2697832

Baker, S.R., Bloom, N., Davis, S.J., Kost, K., Sammon, M., Viratyosin, T. (2020). The unprecedented stock market reaction to COVID-19. *The Review of Asset Pricing Studies*, Volume 10, Issue 4, pp. 742–758. https://doi.org/10.1093/rapstu/raaa008

Beloskar, V.D., & Rao, S.V.D. (2022). Did ESG Save the Day? Evidence From India During the COVID-19 Crisis. *Asia-Pacific Financial Markets, Volume* 30, p. 73–107. https://doi.org/10.1007/s10690-022-09369-5

Bermejo, C. R., Garrigues, I.F.F-F., Paraskevopoulos, I., & Santos, A (2021). ESG Disclosure and Portfolio Performance. *Risks*, 9 (10), 172. https://doi.org/10.3390/risks9100172

Bofinger, F., Heydenb, K. J., & Rock, B. (2022). Corporate social responsibility and market efficiency: Evidence from ESG and mis-valuation measures. *Journal of Banking & Finance*, Volume 134, 106322. https://doi.org/10.1016/j.jbankfin.2021.106322

Cardillo, G., Bendinelli, E., & Torluccio, G. (2022). COVID-19, ESG investing, and the resilience of more sustainable stocks: Evidence from European firms. *Business Strategy and The Environment*. https://doi.org/10.1002/bse.3163

Carhart, M. M. (1997). On Persistence in Mutual Fund Performance. *The Journal of Finance*, Volume 52, Isuue 1, pp. 57-82. https://doi.org/10.1111/j.1540-6261.1997.tb03808.x

CFA Institute (2023). *Sustainable Investing and Investment Management*. https://www.cfainstitute.org/en/research/esg-investing/sustainable-investing

CFA Institute (2023). *ESG Investing*. https://www.cfainstitute.org/en/research/esg-investing

CDC (2020). *Timeline Covid-19*. https://www.cdc.gov/museum/timeline/covid19.html#Early-2020

Cornell, B., & Damodaran A. (2020). Valuing ESG: Doing Good or Sounding Good? *NYU Stern School of Business*. http://dx.doi.org/10.2139/ssrn.3557432

Corwin, S. A. (2003). The Determinants of Underpricing for Seasoned Equity Offers. *The Journal of Finance*, Volume 58, No. 5, p. 2249-2279. https://doi.org/10.1111/1540-6261.00604

Demers, E., Hendrikse, J., Joos, P., & Lev, B. I. (2021). ESG Didn't Immunize Stocks During the COVID-19 Crisis, But Investments in Intangible Assets Did. *Journal of Business Finance & Accounting*, 48, pp. 433-462. https://doi.org/10.1111/jbfa.12523

Dierkens, N. (1991). Information asymmetry and equity issues. *The Journal of Financial and Quantitative Analysis*, Volume 26, No. 2, pp. 181-199. https://doi.org/10.2307/2331264

Dobrick, J, Klein C., & Zwergel B. (2023). Size bias in Refinitiv ESG data. *Finance Research Letters*, 55 (2023) 104014. https://doi.org/10.1016/j.frl.2023.104014

Duque-Grisales, E., Aguilera-Caracuel, J (2021). Environmental, Social and Governance (ESG) Scores and Financial Performance of Multilatinas: Moderating Effects of Geographic International Diversification and Financial Slack. *Journal of Business Ethics*, Volume 168, Issue 2, No 7, pp. 315-334. https://doi.org/10.1007/s10551-019-04177-w

Dutordoir, M., Strong, N. C, & Sun P. (2018). Corporate social responsibility and seasoned equity offerings. *Journal of Corporate Finance,* Volume 50, pp. 158-179. https://doi.org/10.1016/j.jcorpfin.2018.03.005

Eckbo, B. & Masulis, R.W. (1995). *Handbooks of Operations Research and Management Science: Seasoned equity offerings: A Survey*, Volume 9, pp. 1017-1072 https://doi.org/10.1016/S0927-0507(05)80075-1

Eckbo, B. & Masulis, R.W. (2007). *Handbook of Empirical Corporate Finance: Security Offerings*, Volume 1, pp. 233-373. https://doi.org/10.1016/B978-0-444-53265-7.50020-2

Economidou, C., Gounopoulos, D., Konstantios D., & Tsiritakis E. (2022). Is sustainability rating material to the market? *Financial Management*, Volume 52, Issue 1, pp. 127-179 https://doi.org/10.1111/fima.12406

Engelhardt, N., Ekkenga, J., & Posch, P. (2021). ESG Ratings and Stock Performance during the COVID-19 Crisis. *Sustainability*, 13(13), 7133. https://doi.org/10.3390/su13137133

Fama, E. F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*, Volume 25, No. 2, pp. 383-417. https://doi.org/10.2307/2325486

Fama, E. F., & French, K. R. (1992). The Cross-Section of Expected Stock Returns. *The Journal of Finance*, Volume 25, No. 2, pp. 383-417. https://doi.org/10.1111/j.15406261.1992.tb04398.x

Fama, E. F., & French, K. R. (2004). Financing decisions: who issues stock? *The Journal of Financial Economics*, Volume 76, Issue 3, pp: 549–582. https://doi.org/10.1016/j.jfineco.2004.10.003

Fama and French three factors and Momentum factor. Retrieved from: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Feng, Z., Chen, C. R., & Tseng Y. (2018). Do capital markets value corporate social responsibility? Evidence from seasoned equity offerings. *Journal of Banking and Finance*, Volume 94, p. 54-74. https://doi.org/10.1016/j.jbankfin.2018.06.015

Gillan, S.L, Koch A., & Starks, L. T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, Volume 66, 101889. https://doi.org/10.1016/j.jcorpfin.2021.101889

Hartzmark, S. M., & Sussman, A. B. (2019). Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows. *The Journal of Finance*, 74(6), 2789–2837. https://doi.org/10.1111/jofi.12841

Holderness, G. C. (2018). Equity issuances and agency costs: the telling story of shareholder approval around the world. *Journal of Financial Economics,* Volume 129, Issue 3: pp. 415–439. https://doi.org/10.1016/j.jfineco.2018.06.006

Jung, K., Kim, Y., Stulz, R. (1996). Timing, investment opportunities, managerial discretion, and the security issue decision. *Journal of Financial Economics*, Volume 42, Issue 2, pp.159-185. https://doi.org/10.1016/0304-405X(96)00881-1

Kim, E. H., & Purnanandam, A. (2006). Why Do Investors React Negatively to Seasoned Equity Offerings? *Ross School of Business Working Paper Series*, Working Paper No. 1043. http://dx.doi.org/10.2139/ssrn.1823682

La Torre, M., Mango, F., Cafaro A., & Leo S. (2020). Does the ESG Index Affect Stock Return? Evidence from the Eurostoxx50. *Sustainability*, 12(16), 6387. https://doi.org/10.3390/su12166387

Leland, H. E., & Pyle, D. H. (1977). Informational Asymmetries, Financial Structure, and Financial Intermediation. *The Journal of Finance,* Volume 32, No. 2, pp. 371-387. https://doi.org/10.2307/2326770

Li, Z., & Wang, P. (2022). Flotation costs of seasoned equity offerings: Does corporate social responsibility matter? *European Financial Management*, Volume 28, Issue 3, pp. 771–808. https://doi.org/10.1111/eufm.12327

Lins, K.V., Servaes, H. & Tamayo, A. (2017). Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis. *The Journal of Finance*, 72: 1785-1824. https://doi.org/10.1111/jofi.12505

Lucas, D. and McDonald R. (1990). Equity issues and stock price dynamics. *The Journal of Finance*, volume 45, pp. 1019-1043. https://doi.org/10.2307/2328713

Mackinlay, A. C. (1997). Event Studies in Economics and Finance. *The Journal of Economic Literature*, Volume 35, No. 1, pp. 13-39. https://www.jstor.org/stable/2729691

Masulis, R.W., & Korwar, A.N. (1985). Seasoned equity offerings. *The journal of Financial Economics*, 15, 91-118. https://doi.org/10.1016/0304-405X(86)90051-6

Myers, S.C. (1984). Capital structure puzzle. *The journal of finance*, Volume39, Issue 3, pp. 574-592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x

Myers, S. C., & Majluf, N. S. (1984). Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have. *Journal of Financial Economics*, 13, pp.187-221. https://doi.org/10.1016/0304-405X(84)90023-0

Piserà, S., & Chiappini, H. (2022). Are ESG indexes a safe-haven or hedging asset? Evidence from the COVID-19 pandemic in China. *International Journal of Emerging Markets*. ISSN: 1746-8809. https://doi.org/10.1108/IJOEM-07-2021-1018

Prasad, M., Bakry, W., & Varua, M. E. (2021). Abnormal volatility in seasoned equity offerings during economic disruptions. *Journal of Behavioral and Experimental Finance*, Volume 30, 100509. https://doi.org/10.1016/j.jbef.2021.100509

Reber, B., Gold, A., & Gold, S (2021). ESG Disclosure and Idiosyncratic Risk in Initial Public Offerings. *Journal of Business Ethics*, 179, p. 867–886. https://doi.org/10.1007/s10551-021-04847-8

Savio, R., D'Andrassi, E., & Ventimiglia F. (2023). A Systematic Literature Review on ESG during the COVID-19 Pandemic. *Sustainability*, 15 (3), 2020. https://doi.org/10.3390/su15032020

Serafeim, G., & Yoon A. (2022). Which Corporate ESG News Does the Market React to? *Journal of Financial Analysts*, 78:1, pp. 59-78. https://doi.org/10.1080/0015198X.2021.1973879

Spiess, D. K., & Affleck-Grave, J. (1995). Underperformance in long-run stock returns following seasoned equity offerings. *Journal of Financial Economics*, Volume 38, Issue 3, pp. 243-267. https://doi.org/10.1016/0304-405X(94)00817-K

Szilárd, E. (2022). Take it with a pinch of salt—ESG rating of stocks and stock indices. International *Review of Financial Analysis*, Volume 83, 102308. https://doi.org/10.1016/j.irfa.2022.102308

Wadhwa, K., Reddya, V. N., Goyal, V. N., & Mohamed A. (2016). IPOs and SEOs, real investments, and market timing: Emerging market evidence. *Journal of International Financial Markets*, Institutions and Money. Volume 45, p. 21-41. https://doi.org/10.1016/j.intfin.2016.05.007

Zaremba, A., Kizys, R., Aharon, D. Y. & Umar, Z. (2022). Term spreads and the COVID-19 pandemic: Evidence from international sovereign bond markets. *Finance Research Letters*, Volume 44, 102042. https://doi.org/10.1016/j.frl.2021.102042

Zenzius, M., Flore, C., & Schiereck, D. (2022). Tough times for seasoned equity oferings: performance during the COVID pandemic. *Journal of Business Economics*, Volume 92, pp: 1491–1510. https://doi.org/10.1007/s11573-022-01089-6

Zhang, D., Hu, M., & Ji, Q. Financial markets under the global pandemic of COVID-19. *Finance Research Letters*, Volume 36, 101528. https://doi.org/10.1016/j.frl.2020.101528

Zumente, I. & Bistrova, J. (2021). ESG Importance for Long-Term Shareholder Value Creation: Literature vs. Practice. *Journal of Open Innovation: Technology, Market, and Complexity*, Volume 7, Issue 2, 127. https://doi.org/10.3390/joitmc7020127