# Firm Value and ESG Performance During the Covid-19 Pandemic

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**ABSTRACT**
Since the outbreak of the new crown epidemic, ESG investment has received unprecedented attention among investors and scholars. A growing number of academics show interest in the link between ESG performance and corporate value, while mostly focusing on developed markets. This article aims to explore the relationship between ESG performance and corporate value in emerging markets, especially the impact of the crisis on this relationship caused by the COVID-19 pandemic. The article performs several multiple linear regressions on the firm value of Chinese manufacturing companies and concludes that ESG performance plays a positive role in the creation of firm value. Moreover, the results show that this positive impact has been blunted during the pandemic, which is partly because the increased importance of cash flow to business operations makes ESG activities costly investments for the manufacturing companies.

***Keywords:*** *ESG, Corporate finance, COVID-19, Manufacturing industry*

## 1. INTRODUCTION

### *1.1 Background*

In the era of pursuing high-quality growth and sustainable development, “Environment, Social and Corporate Governance” (ESG), which measures the specific performance of listed companies in the above three indicators, has received increased increasing attention in public. It’s widely considered as an important non-financial indicator to provide a reference for investors and regulators and has offered an avenue for investors to review firms’ business strategies and commitment in a more comprehensive manner.

The worldwide breakout of COVID-19 at the beginning of 2020 not only dealt a huge blow to the global economy and financial markets but also directly affected the liquidity of people and goods and the confidence of investors, causing a huge blow to many industries, especially physical industries such as manufacturing and catering. However, the focus on ESG investing has even been increased to a new level. According to Morningstar, worldwide inflows of ESG-themed exchange-traded fund (ETF) products totaled USD 38.8 billion from January to July 2020, an increase of 2.13 times over the same period in 2019. Ernst & Young believes that the reason is that the epidemic has strengthened the consideration of social factors (S), and makes consumers and investors expect companies to take social responsibility and believe that companies with such characteristics have a better ability to resist risks.

Over the past few decades, an increasing body of research has revealed the correlation between a company's performance and its level of ESG disclosure. Opinions on the impact of ESG activity are separated. Some scholars believe that ESG activities promote the value creation of enterprises, while others insist that taking environmental and social responsibilities hurts firm value due to the increase in costs. However, even with extensive empirical evidence, it’s worth mentioning that most of the existing research focuses on developed markets while ignoring emerging markets like China. Meanwhile, there is a scarcity of sectoral analysis in the literature on the impact of COVID-19 on financial markets.

### *1.2 Related research*

So far, many scholars have done theoretical research on the relationship between ESG performance and corporate value, and the causal effect of ESG attributes on firm value could plausibly be either positive or negative. Feng and Wu explored how ESG disclosure impacts REIT debt financing and firm value. The results show that REITs with higher levels of ESG disclosure have a lower cost of debt to total debt ratio with the key firm characteristics controlled, and ESG performance is positively related to firm value whether in normal times or during the COVID-19 pandemic. They pointed out that effective ESG disclosure positively affects REIT debt financing and firm value due to the increased corporate transparency [1]. Harjoto and Laksmana researched the mechanism through which ESG influences firm value. Empirical analysis results demonstrated that ESG performance is positively associated with firm value because it serves as a control mechanism that curbs excessive risk with the impact on firm risk-taking decisions, thus accounting for greater firm value [2].

Meanwhile, there still exists literature supporting the negative relationship between ESG performance and corporate performance. For example, Tommaso and Thornton found a negative relationship between European bank value and ESG scores despite that ESG performance has a positive indirect link with the bank value. They believe that the benefits ESG has brought to bank value by reducing the risk are not enough to compensate for the direct negative impact of resource waste [3]. In 2015, Friede et al reviewed more than 2000 related empirical studies and concluded that Roughly 90% of studies find a nonnegative ESG relation [4].

With the emergence of the new crown epidemic, many scholars have rethought this issue based on the crisis background. Although there are currently no papers directly exploring the relationship between ESG and corporate value during the COVID-19, the impact of the pandemic on the correlation between ESG and corporate value can be indirectly learned about from the literature focusing on the corporate performance.

Some studies believe that corporate ESG activities during the COVID-19 can lead to positive corporate performance. Zhang et al. investigated the influence of ESG performance on Chinese companies during the COVID-19. The findings show that better ESG performance significantly reduces the negative impact of the pandemic on financial constraints by increasing both internal and external financial intermediation, including liquidity and both short- and long-term debt, alleviating firm financial constraints [5]. Broadstock et al. examined the role of ESG performance during financial crises by analyzing the performance of CSI300 stocks during the COVID-19 global pandemic. The findings reveal that ESG performance is positively linked with CSI300 stocks' short-term cumulative returns during the COVID-19 crisis, emphasizing the durability of equities with strong ESG performance during financial crises [6].

However, more research than ever before has demonstrated a non-positive relationship between ESG activity and corporate performance in the context of the pandemic. Using a sample of 889 completed M&As announced by US firms, Tampakoudis et al. found that mergers and acquisitions by companies with high ESG performance have hurt the wealth of acquirer shareholders during the COVID-19 pandemic. They pointed out the negative impact of ESG investing on firm value and highlighted that the impact appears to be stronger during the pandemic, suggesting that markets perceive sustainable development activities as costly during the economic meltdown [7]. Choosing European electricity companies as the research sample, Boldeanu et al. demonstrated the significant negative impact of the COVID-19 pandemic on abnormal returns of the power sector (especially traditional and renewable energy companies) and the impact of ESG scores by the virtue of study methods and multivariate regression. The findings show that ESG pillar ratings have a sector-specific impact on power firms. Environmental ESG ratings had a beneficial impact on returns for renewable power firms, whereas governance ESG scores had a negative impact [8]. Demers et al. undertook a series of analyses including regression on the buy-and-hold abnormal returns to explore how ESG influenced the COVID period returns of the firm. They found out that there is no significant correlation between ESG and the returns, concluding that ESG did not immunize stocks during the COVID-19 crisis [9].

### *1.3 Objective*

This article is aimed to examine the correlation between ESG performance and firm value, and meanwhile exploring the impact of the COVID-19 on this correlation. The Chinese manufacturing companies, the typical representation of corporates in emerging markets, are chosen as the research sample, on the value of which the article performs a multiple linear regression to find their relationship with ESG performance. Moreover, the results are discussed based on the specific realities of the manufacturing industry to inspire corporate managers, investors, government, and policymakers.

The rest of the paper is organized as follows. In the next part of Section 1, hypotheses are developed after the review of the relevant literature. Section 2 presents the methodology and data. Section 3 reports the empirical results and discussions, and Section 4 concludes.

In light of the above discussion, 2 hypotheses are developed to test as follows：

$H_1$. ESG performance is positively correlated with manufacturing corporate value.

$H_2$. ESG performance has a weaker positive correlation than usual with manufacturing corporate value during the COVID-19 pandemic.

## 2. METHODS

### *2.1. Model settings*

The following model of firm value is set to test the hypotheses:

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 CF_{i,t} + \beta_5 Growth_{i,t} + \beta_6 Top1_{i,t} + \varepsilon_{i,t} \quad (1)$$

where i and t are subscripts referring to company and time, respectively.

Tobin's Q is chosen to characterize the firm value, which is an important indicator to measure the market value and business performance of a company and is extensively used in ESG-performance literature.

According to previous relevant research, several variables have been controlled for both the company's financial level and management level. At the corporate management level, company size, asset-liability ratio, corporate growth, and operating cash flow are controlled. At the corporate management level, the ratio of the largest shareholder and the independence of the board of directors are controlled.

The definition of each variable in this paper is shown in Table 1.

**Table 1.** Variables and Definitions

| Variable | Definitions |
|---|---|
| Tobin's Q | Book value of total assets minus the book value of common equity plus market value of common equity / book value of total assets |
| ESG | ESG Score |
| Size | Natural logarithm of total assets at the end of the period |
| Lev | Total Liabilities/Total Assets |
| CF | Net cash flow from operating activities/current liabilities |
| Growth | (Total assets at the end of the period - total assets at the beginning of the period) / total assets at the beginning of the period |
| Top1 | The proportion of shares held by the largest shareholder in the total share capital |
| Independence | The ratio of independent directors to the total number of directors |

## 2.2. Sample and data

China's A-share listed manufacturing companies are chosen as the research sample, of which the samples from the financial industry and real estate industry and companies in special treatment status have been excluded. In addition, abnormal data samples with the asset-liability ratio greater than 1 are removed. All the corporate data is extracted from the wind database, the leading provider of financial and economic data for China.

The quarterly ESG score is provided by the Hua Zheng ESG rating system. As is shown in Table. 2, Hua Zheng ESG rating system includes 14 themes, 26 key indicators, and more than 130 sub-indicators under the three pillars of environmental, social, and corporate governance which is based on the publicly disclosed data, Periodic Reports and Temporary Announcements, Social Responsibility, and Sustainable Development Reports report of Listed Companies, government and relevant regulatory authority website data, and news media data, covering all A-shared listed companies. Among the existing ESG rating systems for listed companies in China, the Hua Zheng rating system has demonstrated advantages in various dimensions and has been widely recognized by many Chinese researchers.

Hua Zheng ESG rating system divides the companies' ESG performance into 9 grades according to their ESG disclosure from C to AAA, which are assigned to 1~9 points for the empirical analysis respectively, namely the variable "ESG scores".

**Table 2.** Overview of Hua Zheng ESG rating system tiers

| Pillar | Theme | Key indicator |
|---|---|---|
| E (Environment) | Management<br>Business objectives<br>Green products<br>External certification | Environmental management system, low-carbon plan, environmental certification, environmental violations…… |
| S (Social) | System<br>Business activities<br>Social Contributions<br>External certification | Social Responsibility Report, Negative Operations, Social Responsibility-related Donations, Poverty Alleviation, Quality Certification…… |
| G (Government) | System<br>Governance structure<br>Business activities<br>Operational risk<br>External risk | Related transactions, independence of the board of directors, asset quality, financial credibility, related information disclosure, violations of laws and regulations |

To facilitate the comparison of data and results before and after the pandemic, the data is divided into two groups according to the period with the sample (1) from 2016Q1 to 2019Q4 and sample (2) in 2020Q1, representing the samples during normal times and during the COVID-19 pandemic, respectively.

### *2.3. Descriptive statistic*

The descriptive statistics of the variables are reported in Table 3. Before the COVID-19 pandemic, the mean value of Tobin's Q pandemic in the sample is about 2.2339. The average ESG scores of manufacturing companies in the sample are about 6.2818 with a standard deviation of 2.7717, revealing the relatively satisfying ESG disclosure in the Chinese manufacturing industry.

Compared with normal times, the average value of Tobin’s Q during the COVID-19 was dropped by almost 10%, from 2.2339 to 2.0663, indicating the negative effect the pandemic had caused on the Chinese manufacturing industry and the investor confidence. The average ESG scores of manufacturing companies also slightly decreased from the initial 6.2818 to 6.2734 during the pandemic. Moreover, companies suffered a significant reduction of 57% in CF (net cash flow from operating activities/ current liabilities) during the pandemic from 0.0934 yuan to 0.0402 yuan, which shows that the company suffered a serious cash flow crisis to a certain extent during the COVID-19.

These values appear reasonable for their falling within the bounds of estimates reported in previous work on this topic.

**Table 3.** Descriptive statistic

| Variable | Mean | | Std. Dev. | | Min | | Max | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) |
| Tobin’s Q | 1.9655 | 2.0663 | 1.4656 | 1.7150 | 0.7008 | 0.6695 | 30.4520 | 30.5679 |
| ESG | 6.2366 | 6.2734 | 1.1141 | 1.1737 | 2.0000 | 2.0000 | 9.0000 | 9.0000 |
| Size | 22.1245 | 22.1672 | 1.1950 | 1.1940 | 17.9544 | 19.1102 | 27.5470 | 27.4487 |
| Lev | 0.3877 | 0.3921 | 0.1847 | 0.1826 | 0.0062 | 0.0068 | 0.9990 | 0.9724 |
| CF | 0.1226 | 0.0402 | 0.3245 | 0.2034 | -6.4901 | -3.0804 | 4.2121 | 2.0033 |
| Growth | 0.1849 | 0.1709 | 1.7111 | 1.4466 | -0.9326 | -0.9346 | 124.1035 | 79.4406 |
| Top 1 | 32.7071 | 32.4647 | 13.8439 | 13.8744 | 2.8657 | 3.0029 | 89.0930 | 88.2353 |
| Independence | 0.3788 | 0.3792 | 0.0575 | 0.0571 | 0.2000 | 0.2000 | 0.8000 | 0.7500 |

Note： The sample (1) period is 2016Q1 to 2019Q4, and (2) is 2020Q1.

## 2.4. REGRESSION ANALYSIS

The corporate data is divided into two groups according to the period with the sample (1) from 2016Q1 to 2019Q4 and sample (2) in 2020Q1, representing the samples during normal times and the COVID-19 pandemic, respectively.

This study performed multiple linear regression analysis on the sample (1) and sample (2) with the least-squares method, after performing Pearson's correlation test and VIF test to eliminate the possibility of multicollinearity.

In addition, to eliminate the influence of the macroeconomic environment and other unconsidered time-varying factors, the time-fixed effects are considered for both regressions. Meanwhile, to avoid the impact of subdivisions in the manufacturing industry on the regression results, the industry-fixed effect is also included in the model.

## 3. RESULTS AND DISCUSSION

Table 4 presents the estimated results for the model.

Column (1) shows the ESG coefficient before the COVID-19 pandemic, and column (2) shows the results during the pandemic.

**Table 4.** Regression results of Tobin’s Q value.

| | (1) | (2) |
|---|---|---|
| ESG | 0.0925*** | 0.0503*** |
| | (6.097) | (2.205) |
| Size | -0.8765*** | -0.2476* |
| | (-54.445) | (-9.502) |
| Lev | 1.6930*** | -1.0028*** |
| | (17.403) | (-6.165) |
| CF | 0.4433*** | 1.1146*** |
| | (8.105) | (8.832) |
| Growth | -0.0028*** | 0.0259 |
| | (-0.296) | (1.534) |
| Top 1 | -0.0047 | 0.0002 |
| | (-4.214) | (0.113) |
| Independence | 0.2640*** | 1.0656* |
| | (0.977) | (2.481) |
| Constant | 21.077688 | 7.2202 |
| Observations | 29158 | 4229 |
| Adj-$R^2$ | 0.1457 | 0.1623 |

Note: This table presents results from an OLS estimation of the following regression equation: Tobin’s

$$Q_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 CF_{i,t} + \beta_5 Growth_{i,t} + \beta_6 Top1_{i,t} + \varepsilon_{i,t} \quad (1)$$

It should consider time fixed effects and industrial fixed effects. The sample (1) period is 2016Q1 to 2019Q4, and (2) is 2020Q1. t values are given in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$, denote significance at the 1%, 5%, and 10% levels, respectively.

### *3.1 ESG and firm value*

The results show that the coefficient of ESG is significantly positive ($p < 0.01$) whether in normal times or during the COVID-19. To be specific, in normal times, the value of Tobin's Q rises by 0.0925 as the ESG score increases by one point, accounting for 4.14% of the mean Tobin's Q value of the sample company. The same is true during the COVID-19 pandemic, although Tobin's Q isn't promoted as much as before, with the value rising by 0.0503 as the ESG score increases by 1 point.

Generally, it's vividly revealed that the capital markets favor manufacturing companies with good ESG performance and acknowledge their higher value, which supports Hypothesis $H_1$.

### *3.2 The impact of COVID-19 in manufacturing enterprises*

Comparing the data in column (1) and column (2) in Table.4, it's shown that the coefficient of ESG dropped from 0.0925 to 0.0503 during the COVID-19 pandemic, a sharp decrease of about 46%, indicating that the impact of ESG on enterprise value has been significantly weakened during the COVID-19, which supports Hypothesis $H_2$.

The result is not difficult to explain, based on the dilemma China's manufacturing industry had been facing during the pandemic. COVID-19 has severely affected not only the movement of people and goods but also industrial activity. For manufacturing, risks have risen including supply chain disruption owing to raw material and spare component production halts, numerous logistics failures, and an unclear recovery timescale [10]. Particularly, a series of measures that China has taken to stop the spread of the virus, such as making citizens travel less, increasing social distancing, and reducing gatherings and crowds, have resulted in a shrinking workforce, all of which made the manufacturing industry suffer from significantly increased operating costs and declining market demand. As reported by the National Bureau of Statistics, China's manufacturing purchasing managers' index (PMI) in February decreased to 35.7 with 14.3% lower than the PMI in January.

On the other hand, economic uncertainty during the epidemic may also affect decision-making on external financial issues such as bank loans, resulting in a reduction in external financing for companies.

Considering the above factors, it's undeniable that corporate cash flow plays a pivotal role in the survival and value creation of the manufacturing companies during the crisis brought by the pandemic, which to some extent is reflected in the regression results with the coefficient of cash flow almost tripled during the pandemic, from 0.4433 to 1.1146.

Consequently, during the COVID-19, the negative effect of ESG activities on enterprise value due to the increase in enterprise costs was greatly enhanced, which eventually led to a dramatic decrease in the ESG coefficient.

## 4. CONCLUSION

This article examines whether ESG activity affects the value of manufacturing companies in emerging markets through multiple regression analysis, and explores the changes in ESG's impact on corporate value mechanisms in the context of a crisis such as the COVID-19 pandemic.

The results show that ESG performance plays a positive role in the creation of firm value. However, the impact has been significantly weakened during the pandemic, which is partly because the increased importance of cash flow to business operations makes ESG activities costly investments for the manufacturing companies.

The main results hold several significant implications for government regulators, policymakers, corporate managers, and investors. Given the positive effect of ESG activities on corporate value creation, it's wise for government regulators and policymakers to facilitate, promote, and encourage ESG disclosure. Also, managers can appropriately increase ESG activities for better corporate performance. It's worth noting that managers should be cautious about it because sometimes ESG activities can be a low-return investment that affects business operations by reducing the cash flow, especially in crises when firms suffer from poor cash flow. Managers had better get the most out of their limited cash flow to maximize the interests of the whole company. Moreover, investors are supposed to view and make ESG investments more rationally during the epidemic. It's wise to conduct more research and consideration based on the intrinsic value of the company rather than investing in ESG gimmicks.

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