

The Impact of ESG Performance of China's Manufacturing Listed Companies on Corporate Value Assessment

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Abstract. Studies of ESG have been enriched here and abroad. The concept has also become a global mainstream in both company management and investments and will exert a huge influence on the transformation of China's manufacturing industries. Using extensive data from Chinese A-share manufacturing companies from year 2016 to 2020, this paper explores how the overall ESG performance contributes to corporate value. The results indicate that the relationship is as positive as speculated by the hypothesis, but in the regional analysis, the positive relationship is more robust in areas with low market levels than in those with high levels. According to these, companies are suggested to keep on implementing this concept to improve their value, while investors should identify and invest in manufacturing companies of ESG potential, promoting a sharing of economic, environmental and social benefits.

Keywords: ESG Performance; Manufacturing Industry; Corporate Value.

1. Introduction

ESG, referring to “environment”, “social” and “governance”, is often used by people to assess the enterprise operation and its influence. As the environmental and resource problems have been severe since the middle of last century, countries around the world consider environmental-friendly production as the new direction, and at the same time green investment has been on the rise. Under the wave of globalization, companies have been managed to transcending geographical boundaries, thus giving them a new test of how to get along with employees, customers, market supervisors and characters from different economic and cultural backgrounds. Besides, whether companies are able to seize the opportunities to develop sustainably depends on the construction of governance structure. In 2006 the United Nations-supported Principles for Responsible Investment (UNPRI) made the ESG evaluation system definite and clear for the first time, and encouraged companies to follow the requirements of ESG. In China, this idea has been promulgated and practiced in a short period of time. Shenzhen and Shanghai Stock Exchange issued documents with respect to holding listed companies more accountable for social responsibilities in 2006 and 2008 respectively. During periods from 2012 to 2016, documents of guidance about green-credit and green-finance policies were released in succession by China Securities Regulatory Commission and the People's Bank of China. Recently the goal of achieving carbon peaking and carbon neutrality has attached ESG great concerns and importance unprecedentedly.

The manufacturing industry, core of the domestic economy, is currently growing at a high speed and with complete departments, compared to a low speed and insufficiency before. Statistics from the World Bank show that in 2010 the incremental value of China's manufacturing industry outnumbered that of the U.S., making China rank first in the world for many years afterwards; the value in 2020 accounted for 28.5% of the world shares, meaning that China has become a strong force of global industrial development. However, the industry is currently afflicted with such problems as irrational industrial structures, inadequate innovation in high end areas and pursuit of economic benefits at environmental costs. Green transformation, one of solutions to these problems, is apparently consistent with ESG requirements. Green development refers to a way of utilizing resources effectively, protecting local communities and environments, and coordinating upstream and downstream enterprises to realize sustainable growth. Of course, a mature corporate governance structure is indispensable as well. So it is practical and necessary at present to study how ESG performance impacts the value of manufacturing companies, and listed companies in particular, as

participants walking at the front edge and embodiment of the whole industry, have great reference value.

This paper contributes to the literature in following aspects: (1) Previous articles focusing on the listed companies from diverse industries paid little attention to the manufacturing industry which constitutes the main body of this study, and the Price-to-Book ratio, proper measurement of the manufacturing companies, is used to convey the message about value assessment straightforwardly; (2) In the heterogeneity analysis, instead of dividing samples easily into western and eastern companies as previous studies did, this paper introduces the market index to match precisely the performance with the regional factor as a way to uncover the influence of market levels. The rest of the paper is organized as follows. Section 2 is about the literature review. Section 3 displays the hypotheses of study. Section 4 and 5 describe the research design and the empirical analysis respectively. Section 6 gives conclusions and recommendations.

2. Literature Review

Foreign scholars began to study the relationships between ESG performance and corporate value in the 1970s. Deep and thorough as the process is, no consensus has been reached so far. Friedman (1970) pointed out that as agents, the management would use up the input of stockholders, which is clearly against their responsibilities of shareholder benefits maximization and thus reduces corporate value, if they approved the investments in ESG programs, such as environmental and customers' interest's protection. Meanwhile as for empirical studies, Alexander and Buchholz (1978) found that no significant relationship existed between corporate ESG rankings and the risk adjusted performance based on the data from 1970 to 1974 of listed companies in the U.S. As ESG is given attention around the world, relevant research has been increasingly diverse. Garcia et al. (2017) were proponents of the positive relationship between ESG performance and corporate value of the listed companies in major developing countries, the relevance being especially strong in sensitive industries. While in other studies, ESG performance contributed significantly to corporate value only under such conditions as weak market institutions (Ghoul et al., 2017). Though starting late, studies on ESG based on the conditions of China have been productive. On one hand, good ESG performance of listed companies led to stock returns through premiums and increased corporate value via the mediator of investors' confidence (Guangyong Lei et al., 2012). Besides, good ESG information disclosure system help improves corporate value as well if it could be implemented in a long term (Rong Wang, 2022). On the other hand, the correlation between social responsibility and corporate value was hard to confirm because of the distinct natures of industries (Yuqing Chen et al., 2005). From the time angle, the contribution of ESG performance was negative in the short run while strongly positive in the long run (Subin Wen et al., 2008).

ESG performance affects financing costs as well. Ashbaugh et al. (2004) concluded that outstanding corporate governance measures, including good quality information disclosure and independence of committees, were conducive to reducing cost of equity capital. Eliwa et al. (2021) found that good ESG performance resulted in low cost of debt in 15 EU states, the situation is especially significant in districts where stakeholders' benefits were valued. Considering from a risk perspective, companies' undertaking social responsibility would reduce systematic and unsystematic risks, and thus decrease their financing costs, according to data from 2012 to 2014 in European areas (Sassen et al, 2016). Recently under the background of ecological civilization construction, Chinese scholars Muyuan Qiu et al. (2021) pointed out that a robust negative relationship was established between financial costs and the performance of environments and corporate governance, and that the contribution of environmental factors was getting even stronger.

Studies on corporate value assessment experienced a long history. In the last century, the American economist Irving Fisher elaborated on two factors to explain the value of capital goods: the first one is the expected revenue which is positively correlated, and the second one is the discount rate which is negatively correlated. Companies, as special capital goods, apply equally here. However, this idea

is difficult to practice and it gave birth to many different valuation models, such as the economic value-added model and the residual income model. Papers are rare on valuation in China's manufacturing industry. Basing on the samples of manufacturing listed companies from 2007 to 2018, Shixiang Qiu(2020) conducted an analysis using the residual income model and found that the effect of the model was getting stronger, and that most companies were over-valued.

3. Research Hypotheses

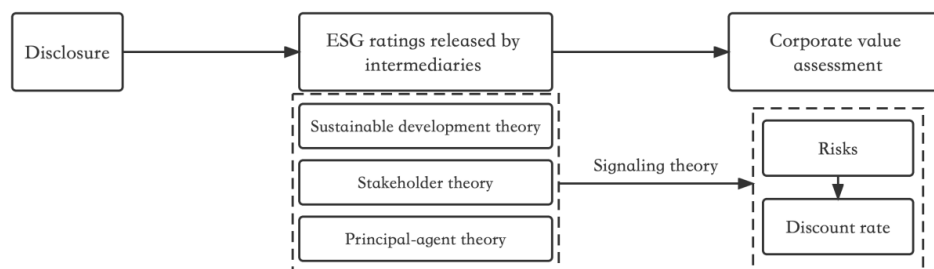


Fig. 1 Influential Mechanism of ESG Performance on Corporate Value Assessment

How ESG performance influences corporate value is subject to realistic conditions. Information disclosed actively or passively by companies is collected and assessed by professional intermediaries which then release comparable ratings. Finally, investors could make rational decisions depending on these useful information collections. At present information disclosure is still not mandatory in China, but as both Chinese and overseas investors, together with supervisors, are giving concerned about it, disclosure has become a consensus for companies pursuing long-term development, and listed companies, in particular, should be active in doing so. Ministry of ecology and environment distributed a reform plan of legal systems of environmental information disclosure in 2021, which constitutes an important part of information disclosure for manufacturing companies. Besides, most ESG rating systems in China, focusing on a single aspect of ESG and targeting listed companies, incorporate both objective data and subjective judgment for weight adjustment (Yiming Yan et al., 2020), which meets the basic needs for assessment.

Theoretically speaking, ESG information can be interpreted from three dimensions. The core of sustainable development theory is to satisfy the needs of both contemporaries and future generations, which requires companies to be moderate in resource allocations or to be punished due to their destruction of environment. Under the goals of carbon peaking and carbon neutrality, companies have incentives to restrain pollution so as to avoid penalties and thus build good brand images (Guojun An et al., 2022). Although costs are necessary payments in the short term, they will pay off in the long term. More directly, companies' environmental performance will contribute positively to their economic counterpart and the relationship is more significant for high growth industries (Russo & Fouts, 1997). The stakeholder theory, distinct from traditional rules of maximizing shareholders' profits, considers the benefits of all participants involved and promotes social responsibility to realize steady growth. Companies with good ESG performance often sit with customers by continuously researching and providing green products or services in order to improve and maintain customers' loyalty. For employees, prominent ESG performance means a human resource system of high proficiency, in which a proper performance appraisal and promotion system give employees impetus and a sense of belonging, leading to productive talent cultivation and daily operation (Bridges & Harrison, 2003). Moreover, if companies are able to regulate themselves and commit to ESG programs, there is no doubt that they could build benign relationships with governments and be supported by preferential policies including green credits, wining market spaces of flexibility and independence (Lin Liu, 2016). The last one is the principal-agent theory. Proper corporate governance structures, operational and institutional protection for performance improvement, save companies from afflicting with principal-agent problems and losing long-term opportunities due to myopic

investments, promoting professionalism, independence and coordination to ensure their abilities to make decisions, supervise and manage.

The signaling theory is indispensable in the process that the items above could affect investors' decisions. Companies willing to disclose constantly and comprehensively release positive signals because people believe that only those profitable have additional energies to undertake environmental and social responsibilities, and that only those with promising futures are ready to report. It is like an invisible promise which they will suffer the loss from failing to realize. As vital supplement of non-financial information, ESG lowers the information asymmetry risks to some degree. Risks have always been important factors in valuation. According to the Capital Asset Pricing Model (CAPM), a huge variation in the expected rate of return is the risk premium. The bigger risks are, the higher rates of return to compensate for risk-bearing, namely that companies have to assume higher discount rates. When the speculation above works well, corporate operations can be steadier and under control, and then face decreasing risks and costs of equity. A research from Menghua Tong et al. (2020) supports this hypothesis that better environmental information disclosure reduces the cost of equity significantly. Companies with good ESG performance are also rewarded with lower costs of debt. One source is the trust of creditors so that part of liabilities can be prolonged and constraints of debt financing will be relieved. The other involves in bank credit policies. Recently China has improved the green financial system and provided favorable interest rates for companies conforming to the green standards.

Regional performance of economy, including resource distribution, infrastructures, business philosophy, institutional settings, and financial & taxation policies, are obviously disparate in China. The developed regions have seen dense populations, high educational levels, close connections among industries and communities, and high efficiency of resource allocation; customers and investors thus have high expectations and requirements for companies' devotion to environmental and social responsibilities. In addition, the corporate governance philosophy is more mature and advanced, giving companies more incentives to implement ESG initiatives. The market of developed regions is also extensively regulated, making companies contribute more to ESG in order to relieve the pressure of supervision and public opinion (Bo Wang et al., 2022).

Based on the analysis above, this paper assumes that: H1: good ESG performance has a positive relationship with cooperating value assessment; H2: ESG performance leads to stronger effects of value promotion in regions of high market levels.

4. Research Design

4.1 Sample Selection

This paper using annual data covers the listed companies included in the Chinese A-share manufacturing industries for the years 2016 - 2020. The initial samples are selected according to the following conditions to ensure validity and rationality: (1) All the firms with special treatment and particular transfer are eliminated. In general, there are severe problems with the operation of those firms, so they are more likely to whitewash the financial reports to avoid delisting. As a result, those samples are removed to reduce the potential bias. (2) All the firms with missing and abnormal values are eliminated. Finally, 9856 annual observations which are extremely large are produced to constitute the unbalanced panel data. The source of ESG ratings is the Social Responsibility Report of Listed Companies released by Chinese Hexun and the source of other data is the CSMAR database.

4.2 Variable Definition and Interpretation

4.2.1 Dependent Variables

The Price-to-Book ratio, a measurement of the company's stock price per share divided by its book value per share, is used here to measure corporate market value, and generally companies with low P/B ratios are of high value in investment. This index is suitable for asset-heavy industries including

the manufacturing industry. In the robust test, return on assets (ROA), a ratio of a company's net profits to its total assets, is used to measure the book value, and it reflects the profitability of assets.

4.2.2 Independent Variables

The ESG rating, issued by Hexun is used as a measurement of ESG performance, incorporates five different sources of responsibilities: shareholders, employees, customers, environments and society. Such a comprehensive and quantitative index can reflect the variability of performance more directly than rankings can do.

4.2.3 Control Variables

Four control variables are displayed in Table 1: company's size (Size), solvency (Lev), age (Age) and an index of market level (Market).

Table 1. Variable Definition

Symbol	Name	Type	Definition
PB	Price-to-Book ratio	Explained	Number of shares outstanding×closing price/net assets Net profits/total assets
ROA	Return on Assets		
ESG	ESG Ratings	Explanatory	ESG performance ratings issued by Hexun
Market	Market Level Ratings	Control	Provincial market level ratings issued by Gang Fan
Size	Size		Natural logarithm of the number of total assets
Lev	Solvency		Total liabilities/total assets
Age	Age		Year of observation—year of establishment

4.3 Model Setup

In this model, the superscript i denotes the individual and the subscript t denotes the year. β_0 is the intercept. β_1 is the regression coefficient of the explanatory variable? ϕ_i represents the regression coefficients of the control variables. μ_i and μ_{year} denote the fixed effects of firms and years respectively. $\varepsilon_{i,t}$ refers to the residual error.

$$PB_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \sum \phi_i \text{Controls}_{i,t} + \mu_i + \mu_{\text{year}} + \varepsilon_{i,t}$$

5. Empirical Analysis

5.1 Descriptive Statistical Analysis

Table 2 describes the sample size, mean, standard deviation, minimum, median and maximum in detail, and they are all within a reasonable range. The standard deviation of ESG is 10.8664 and the range is large, indicating a huge difference in the companies' ESG performance. Second only to ESG, PB has a standard deviation of 2.8833, meaning great distinctions among samples. Before the empirical analysis, all the variables are winsorized at levels 1% and 99% for each year to mitigate the influence of outliers.

Table 2. Descriptive Statistics of Major Variables

	N	MEAN	SD	MIN	MEDIAN	MAX
PB	9856	3.4961	2.8833	0.6027	2.6720	29.1025
ROA	9856	0.0393	0.0717	-0.4270	0.0408	0.2170
ESG	9856	20.3134	10.8664	-4.3100	20.6500	75.2900
Market	9856	9.8096	1.4864	4.4480	10.0520	11.9340
Size	9856	22.1234	1.1619	19.8870	21.9921	25.7505
Lev	9856	0.3896	0.1850	0.0575	0.3821	0.8977
Age	9856	19.2948	5.1646	8.4603	19.0329	34.4630

5.2 Regression Analysis

According to the regression result (1), the ESG rating has a negative impact on P/B ratio, showing significance at 5% level. The result is basically in agreement with the hypothesis that listed companies

with good ESG performance tend to be under-valued, namely that they deserve higher value assessment.

In the regional analysis of heterogeneity, this paper matches each firm with its place of registration and introduces the provincial market level index by Gang Fan from years 2016 to 2020. Then regions of high market levels and of low levels are divided according to the median of samples from each year in order to explore the influence of ESG performance on companies' value when disparate market levels are considered. Result (2) shows that in places of high market levels, the negative impact mentioned above is not notable while in places of low levels, it is significant at 5% level, which is similar to the results produced by Ghoul et al. (2017). A possible explanation is that ESG performance is subject to marginal effects. In other words, because of various limitations, in places of low market levels listed companies with good ESG performance are more likely to stand out against their peers, attract attention from stakeholders including customers and suppliers, and obtain support from governments to improve their value effectively than those in high levels do.

Table 3. Multiple Regression Results

	(1) PB	High market levels PB	(2) Low market levels PB
ESG	-0.0062** (-2.34)	-0.0045 (-1.23)	-0.0081** (-2.08)
Size	-1.2400*** (-6.10)	-1.1677*** (-5.62)	-1.3025*** (-3.74)
Lev	4.0379*** (6.79)	3.3203*** (5.47)	4.6120*** (4.50)
Age	0.4315* (1.76)	0.5673* (1.91)	0.2500 (0.56)
_cons	24.0241*** (3.85)	21.7883*** (3.15)	27.0499** (2.49)
Firm	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	9856	5213	4643
R2	0.264	0.290	0.247
adj. R2	0.263	0.289	0.245

Note: *, ** and *** represent significant levels of 10%, 5% and 1% (two-tailed test).

5.3 Robust Test

Here the P/B ratio is replaced by ROA. According to the regression result in Table 4, ESG ratings have a positive impact on ROA, showing significance at 1% level. This is also consistent with H1 which confirms the impact of ESG performance on book value.

Table 4. Regression Results (ROA as explained variable)

	(1) ROA
ESG	0.0024*** (21.12)
Size	0.0450*** (10.12)
Lev	-0.2417*** (-17.41)
Age	0.0041 (0.70)
_cons	-0.9763*** (-6.83)
Firm	Yes
Year	Yes
N	9856
R2	0.308
adj. R2	0.307

6. Conclusion and Recommendations

The concept of ESG, a general trend of global economy and popular sentiment, requires us not only to bring it into operations and investments, but also to make theoretical summaries at the same time, even to provide forward-looking recommendations. This paper based on China's manufacturing listed companies explores the contribution of ESG ratings on corporate value and reaches the following conclusions. First, good ESG performance results in an undervaluation of both market and book value, so firms that assume ESG responsibilities contain enormous potential for development and investment. Second, the impacts of ESG performance are distinct in regions with varying degrees of market levels and in areas with weak markets, the implementation of ESG leads to considerable improvements of value.

Based on these, this paper makes the following recommendations for both companies and investors.

For companies: (1) They should practice ESG programs of different emphasis relying on their own circumstances. An immediate task for the manufacturing industry is to upgrade production in line with the national strategy of carbon peaking and carbon neutrality to reduce the energy consumption of production. Besides, equipping with advanced business philosophy is necessary to help build mature boards, committees, personnel and operating rules. They should also be innovative to keep in step with the new directions of industrial development. (2) By following the practice of their excellent peers, they are suggested to collect ESG information actively in a planned way, incorporate disclosure into standard reports, and convey effective messages to inform supervisors and markets, enhancing the information quality in the industry.

Investors are encouraged to follow the development of ESG assessment systems and the issuance of ESG ratings and rankings in order to identify those companies of prominent performance. Fund practitioners and large institutional investors should promote ESG focused investments actively and participate in market supervision so as to refrain from supporting companies with ESG scandals and thus push them to pursue ESG initiatives.

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