



ESG Performance, Corporate Social Capital, and Total Factor Productivity

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Abstract. In the context of pursuing high-quality and sustainable development in the new era, focusing on improving the total factor productivity of enterprises has become an important issue. The article is based on data from A-share listed companies from 2009 to 2021, exploring how ESG performance affects a company's total factor productivity (TFP) and the mediating effect of corporate social capital (CSC). Research shows that ESG performance has a positive impact on a company's TFP; There is a mediating effect of CSC between ESG performance and TFP. This article explores the enhancement effect of corporate green governance on high-quality development of enterprises, in order to provide theoretical support and practical guidance for sustainable development of enterprises.

Keywords: ESG performance, Total factor productivity, Corporate social capital

1 Introduction

As the main body of socio-economic activities, enterprises are an important cornerstone and focus for promoting high-quality macroeconomic development (Pang et al., 2019)^[2], and the core of promoting high-quality economic growth is to improve the total factor productivity of enterprises (Wang Yiming, 2020)^[5]. At the same time, as the main body of social activities, enterprises must comply with the requirements of the times, pay attention to their own financial performance, and focus on their own green, high-quality, and sustainable development. With the deep promotion of the concept of green development, ESG has become a hot topic of concern in both practical and academic circles. Generally speaking, companies with good ESG performance have advantages in environmental behavior, talent development, and corporate governance, which can establish a good corporate image (Xie et al., 2019; Zhou Fangzhao et al., 2020)^[8, 9], help companies and stakeholders establish more sustainable business models and long-term corporate development strategies, reduce corporate risks, and thus enhance the competitiveness of the company. However, in existing literature, there are

few studies that directly focus on the relationship between ESG performance and TFP of enterprises. Based on the above background, using corporate social capital as an intermediary, this study explores the relationship between ESG performance and TFP of enterprises, in order to provide suggestions for enterprises to achieve sustainable and high-quality development. It can also provide important references for government departments to formulate relevant policies, promote the construction of ecological civilization in China, and promote high-quality economic development.

2 Hypothesis Formulation

2.1 Analysis of the Impact of ESG Performance on Total Factor Productivity

According to stakeholder theory, the ultimate goal of enterprise production and operation is to achieve a balance of interests among all stakeholders. The ESG performance of enterprises is good, which can convey positive information about safeguarding the rights and interests of stakeholders, strengthen the interaction between enterprises and stakeholders, thereby gaining more social attention, forming a good cooperative relationship between enterprises and various stakeholders, accumulating more social resources, obtaining more customer resources, reducing the threshold for enterprises to obtain strategic development resources (Yang Jianchun et al., 2023)^[6], while promoting the accumulation of enterprise funds and human capital, and improving total factor productivity (Yang Jinhua et al., 2023)^[7]. Enterprises use ESG reports to send signals to the capital market, ultimately influencing investors' views and final decisions on the company through ESG rating scores, increasing investors' confidence in the company's prospects (Tian&Twite, 2011)^[10].

Based on the above analysis, this article proposes research hypothesis H1:

H1: The ESG performance of a company has a positive impact on total factor productivity.

2.2 Analysis of the Mediating Role of Social Capital

Social capital refers to the collection of actual and potential resources obtained by enterprises through establishing good relationships with stakeholders in the social network in which they operate, which is equally important as the human and material costs of enterprises. On the one hand, through good ESG performance, enterprises strive to improve their environmental protection level and actively assume social responsibility, enhance their internal governance level, establish a good corporate image, and continuously increase internal social capital. At the same time, they strengthen the external social network of the enterprise, enhance the connection between the enterprise and various stakeholders, and accumulate external social capital; On the other hand, the trust and cooperation represented by corporate social capital with stakeholders, as an informal system, is beneficial for enterprises to obtain scarce resources from both internal and external sources, provide the necessary resource foundation for technological progress, and improve the efficiency of internal resource allocation, thereby enhancing the TFP of enterprises.

Based on this, this article proposes research hypothesis H2:

H2: CSC has a mediating effect on the relationship between ESG and TFP.

3 Research Design

3.1 Sample Selection and Data Sources

This study selected A-share listed companies in Shanghai and Shenzhen as the sample source, with a time interval from 2009 to 2021. Among them, the ESG rating data comes from the Huazheng ESG rating report, the internal control data comes from the DiBo internal control index, and other financial data comes from the China Research Data Service Platform (CNRDS) and the Guotai An Database (CSMAR). Process the sample as follows: exclude financial listed companies; Exclude listed companies marked as ST, ST * or; Exclude sample observations with missing variable data or abnormal data values; For the main continuous variables used, perform Winsorize truncation at the 1% and 99% levels. Finally, 15925 unbalanced panel data were obtained from 3145 listed companies.

3.2 Variable Definition and Measurement

Explained variable: Total factor productivity (TFP). This article refers to the practices of Lu Xiaodong et al. (2012)^[1] and uses the LP method to estimate the total factor productivity level of enterprises for benchmark analysis.

Explanatory Variables: The explanatory variable of this article is ESG performance. Using Huazhong ESG rating as a proxy variable for the ESG performance of listed companies.

Mediating Variables: Corporate social capital (CSC). This article refers to relevant literature to construct a measurement index system for social capital from six dimensions: employees, customers, suppliers, government, academic institutions, and financial institutions (Shi Junwei et al., 2007)^[3]. The entropy method is used to assign weights to the indicators, and then measure the social capital of the enterprise.

Control variables: This article selects control variables based on the research of scholars Wang Kai et al. (2022)^[4] and Yang Jinhua et al. (2023)^[7].

3.3 Model Construction

To verify hypotheses 1 and 2, construct regression models such as (1) to (3):

$$TFP_LP_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 Controls_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (1)$$

$$CSC_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 Controls_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (2)$$

$$TFP_LP_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 CSC_{i,t} + \beta_3 Controls_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (3)$$

4 Empirical Analysis

4.1 Descriptive Statistics

The descriptive statistical results are shown in **Table 1**. Descriptive statistical analysis of variables. The average TFP_LP value is 8.229, and the standard deviation is 0.812. The distribution is skewed to the left, indicating that companies with more complete ESG information disclosure have relatively higher TFP; The average ESG rating is 4.215, indicating that the ESG performance of most listed companies in China is poor.

Table 1. Descriptive statistical analysis of variables.

VarName	N	Mean	SD	Min	Median	Max
TFP_LP	15925	8.229	0.812	5.442	8.173	12.565
ESG	15925	4.215	0.956	1.000	4.000	8.000
RD	15925	0.048	0.044	0.000	0.038	0.257
Cash	15925	0.200	0.133	0.025	0.165	0.649
Growth	15925	0.304	0.630	-0.587	0.141	3.951
LEV	15925	0.391	0.180	0.060	0.383	0.836
ROA	15925	0.043	0.055	-0.195	0.041	0.201
Top1	15925	33.553	13.999	9.130	31.510	72.150
Indep	15925	37.618	5.269	33.330	36.360	57.140
TobinQ	15925	2.117	1.259	0.864	1.723	8.137
INST	15925	40.457	24.925	0.204	41.806	90.612
CSC	15925	0.108	0.036	0.019	0.105	0.322

4.2 Main Effect Analysis

The main effect regression results are shown in **Table 2**. Regression Results. The results showed a significant positive correlation between ESG and TFP indicating that ESG performance of enterprises have a significant positive impact on TFP. H1 has been validated.

Columns (4) and (5) present the test results for the mediating effect of CSC. The significant positive impact of ESG performance on CSC and after adding CSC, the regression coefficient of ESG performance is still significantly positive, and the regression coefficient of CSC on TFP_LP is significantly positive, indicating that CSC plays a partial mediating role between ESG performance and TFP. H2 is validated.

Table 2. Regression Results.

	(1) TFP_LP	(2) TFP_LP	(3) TFP_LP	(4) CSC	(5) TFP_LP
ESG	0.2129*** (0.0065)	0.1502*** (0.0055)	0.0514*** (0.0053)	0.0007** (0.0004)	0.0512*** (0.0053)

CSC					0.3585** (0.1772)
Controls	NO	YES	YES	YES	YES
id	NO	NO	YES	YES	YES
year	NO	NO	YES	YES	YES
ind	NO	NO	YES	YES	YES
Constant	7.3319*** (0.0281)	6.5992*** (0.0468)	7.8996*** (0.0683)	0.1019*** (0.0044)	7.8631*** (0.0705)
Obs	15,925	15,925	15,925	15,925	15,925
R-square d	0.0629	0.3894	0.9272	0.7634	0.9273

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

5 Conclusions

This article takes A-share listed companies in Shanghai and Shenzhen from 2009 to 2021 as research samples. Based on signal transmission theory and stakeholder theory, following the framework of "ESG green governance corporate social capital high-quality development", it explores the impact of corporate ESG performance on TFP. On this basis, it studies the mediating role of corporate social capital, and finally explores the moderating effect of internal control between ESG performance and total factor productivity. The main research conclusions of this article are as follows: (1) ESG performance of enterprises can promote the improvement of total factor productivity. Compared with enterprises with poor ESG performance, enterprises with good ESG performance have higher TFP; (2) There is a mediating effect of corporate social capital on the relationship between ESG performance and TFP of enterprises.

6 Practical Insights

Firstly, for enterprises, it is important to cultivate ESG management concepts, improve ESG governance, make ESG a long-term strategic investment project, increase resource investment in ESG construction, elevate ESG to a strategic level, establish a good corporate image through ESG responsibility, reduce information asymmetry with the capital market, and enhance internal and external stakeholders' understanding of corporate information; Secondly, for the government, it is necessary to establish a sound ESG information disclosure policy, strengthen ESG supervision over enterprises, and ensure that their ESG disclosure behavior is regulated. The government is accelerating the transformation of its functions to serve the ESG transformation of enterprises. In the process of ESG transformation, enterprises will inevitably encounter some obstacles. The government should fully play the role of a service-oriented government, implement the concept of a service-oriented government, and assist enterprises in green transformation.

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