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Economic Policy Uncertainty, Corporate ESG Performance, and the Cost of Financing Debt

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Abstract: This paper examines the relationship between economic policy uncertainty (EPU), corporate ESG performance, and the cost of financing debt using a fixed effect model and finally discusses the impact of corporate ESG performance on the cost of financing debt against the backdrop of economic policy uncertainty. The results of this paper show that EPU has a positive impact on financing costs, but corporate ESG performance has a mitigating effect on this effect. According to the construction standards of ESG rating indicators, this paper further explores the impact of corporate ESG disclosure on the cost of corporate financing debt under the background of economic policy uncertainty. It concludes that ESG disclosure has the same moderating effect as ESG performance, and the effect of ESG disclosure is stronger.

Keywords: Economic Policy Uncertainty, ESG, Cost of Financing Debt

1. Introduction

How to reduce financing costs has always been the focus of well-run corporations. There are many studies on how companies reduce financing costs, and scholars believe that there are many factors that affect financing costs (e.g., the quality of internal control, external audit, corporate innovation, etc.) [1, 2]. In recent years, as society has increased the importance of sustainable development, scholars' research has begun to focus on the relationship between sustainable development goals (SDG) or corporate social responsibility (CSR) and corporate financing costs.

As the abbreviation of environment, society, and corporate management, ESG is broader than CSR, and it is an important factor affecting corporate performance and value, as well as an important measure for corporate sustainable development. In recent years, scholars have paid more attention to ESG, and using ESG as an evaluation indicator for asset evaluation has also been widely accepted by investors. Due to the high attention of investors and official departments, the total global ESG investment has exceeded 30 trillion US dollars, and many exchanges have announced ESG disclosure norms, and some countries have established mandatory disclosure systems [3]. With the increase in social attention, the exposure of news has increased the attention of investors, analysts, and other social figures, and companies have finally gained relevant benefits from ESG performance.

There are many studies on the relationship between ESG and the cost of corporate debt, and most studies show that ESG can effectively reduce corporate debt financing costs and improve capital allocation efficiency [4]. However, ESG disclosure is highly subjective, and ESG ratings may lead

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some companies to seek benefits by complying with social requirements [5]. The EPU is a measure of economic policy uncertainty, which represents the risks posed by the uncertainty of the government's policy and regulatory framework in the near future [6]. Due to the increasingly tense international situation, the EPU index in recent years has been much higher than before. Previous research results have shown that an increase in EPU makes firms more inclined to apply more conservative operating policies. For corporate internal use, the improvement of EPU reduces management's decision-making on risky behavior [6, 7]. Externally, increasing financial market friction and reduced capital supply force companies to choose to hold higher-value cash to avoid uncertainty and adopt more conservative investment policies [8, 9].

Previous studies have proved the negative impact of EPU on corporate financing, and a high EPU index will increase corporate financing costs and financing constraints [10, 11]. Difficult financial environments and high financing costs are problems that enterprises are facing. ESG disclosure is a good tool to reduce the difficulty of financing, and companies can subjectively disclose ESG information to investors and other relevant people in society. Therefore, a question naturally arises: in the context of economic policy uncertainty, can corporations reduce their own cost of financing debt through ESG disclosure? To address this issue, it is important to understand whether ESG ratings will reduce the cost of debt financing in the context of economic policy uncertainty.

This paper will investigate the effect of EPU on corporate cost of financing debt using a fixed effects model and whether corporate performance in ESG can effectively mitigate this effect using panel data of Chinese A-share listed companies as a sample. This paper has two main contributions: the first is to explore the impact of EPU on the cost of financing debt; secondly, this paper finds that corporate improvement in ESG performance can effectively mitigate the impact of EPU on the cost of financing corporate debt, but this effect is not relevant to state-owned enterprises.

The framework of this paper is as follows: Section 2 provides a theoretical analysis of the relationship between EPU, ESG, and the cost of financing corporate debt and proposes two research hypotheses; Section 3 describes the research design and data sources; Section 4 presents the analysis of the results of the benchmark regression, heterogeneity, and robustness tests; and Section 5 presents the research conclusions and discusses the limitations of this paper.

2. Hypothesis

2.1. EPU and the Cost of Financing Debt

The impact of EPU is widespread. At the macro level, the increase in EPU usually generates a great deal of uncertainty and information asymmetry in the business environment, which is detrimental to the operation and growth of the economy [12]. At the micro level, even if analysts have a strong level of financial analysis, the increase in EPU will reduce the accuracy of their forecasts, which will affect their judgment on bond ratings, thereby affecting the cost of debt [13, 14]. Previous studies have shown that due to the increase in non-performing asset ratios during periods of economic policy uncertainty, banks under stress will raise loan prices or reduce capital expenditures, which will lead to increased financing difficulties for companies and a sharp decline in corporate borrowing [15, 16]. From the internal perspective of the corporation, managers will adjust their decisions based on the need to pay closer attention to policy changes and choose to reduce corporate investment in order to cope with current uncertainties, which will lead to high fluctuations in future cash flows and debt default risks of enterprises, which is the reason creditors increase the cost of debt [17-19].

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There are relatively few existing studies on the relationship between EPU and the cost of financing debt, and most of the conclusions are that EPU has a positive impact on the cost of corporate financing debt. Therefore, based on the above analysis, this paper proposes Hypothesis 1:

Hypothesis 1: EPU has a positive impact on the cost of financing debt.

2.2. EPU, ESG, and Cost of Financing Debt

According to the research of scholars in recent years, there are many factors that affect the cost of financing corporate debt through ESG performance. Corporates with excellent ESG performance can establish a good reputation in front of the public through the media and convey a positive image to stakeholders to obtain more opportunities, thereby affecting the corporate financing costs [20, 21].

For lenders (e.g., banks and other financial institutions), these key stakeholders are more sensitive to corporate social responsibility issues, and the ESG policies and performance of companies usually affect the construction of lending relationships [22, 23]. And good ESG performance can improve the transparency of corporate information and reduce information asymmetry and risks perceived by lenders, thereby reducing the agency costs of lenders and ultimately affecting the financing costs of companies that need financial support [24, 25].

In recent years, due to the introduction of green financial policies in many countries, green financial instruments have given financial support to "green" corporations. According to existing research, after China incorporated green finance into the MPA framework, it broadened the financing channels of enterprises and effectively reduced the financing costs of enterprises with high ESG scores, and the cost would drop once every time the ESG score was raised [26].

In the case of uncertain economic policies, the credit risk of enterprises will reduce capital expenditures and increase cash holdings, leading to a decline in corporate performance and shrinking asset values, making it more difficult for companies to obtain financing due to a decline in the value of collateral [27, 28]. However, corporate sustainability disclosure can effectively moderate the impact of economic policy uncertainty on corporate performance. Corporate environmental and social disclosure reduces policy-induced uncertainty by enhancing reputation, and corporate governance disclosure can moderate the negative impact of economic policy uncertainty on performance [29]. And some studies have shown that during periods of high economic policy uncertainty, corporations can obtain insurance-like benefits through higher ESG scores [30]. A better reputation and lower financing costs are benefits that ESG can bring to companies. Therefore, based on the above analysis, this paper proposes Hypothesis 2:

Hypothesis 2: Against the backdrop of economic policy uncertainty, the ESG performance of corporations can enable them to obtain a lower cost of financing debt.

3. Methodology

3.1. Model Construction

For Hypothesis 1 above, this paper uses the following model to test:

$$cost_{it} = \alpha + \beta EPU_{t-1} + \sum Control + \gamma_i + \varepsilon_{it} \quad (1)$$

Among them, $cost_{it}$ represents the cost of financing the debt of enterprise i at time t. EPU_{t-1} represents the EPU index of the t-1 period, which is the value lagging one period. The reason for this is to alleviate potential endogeneity problems. $\sum Control$ denotes the control variables. γ_i represents the individual fixed effects. ε_{it} denotes a random error term.

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In order to test the impact of corporate ESG performance on the cost of corporate debt financing against the background of economic policy uncertainty, this paper constructs a new equation by adding the ESG score and its interaction with the EPU in (1) as the test of null hypothesis 2 method. The equation is as follows:

$$cost_{it} = \alpha + \delta_0 EPU_{t-1} + \delta_1 ESG_{it} + \delta_2 (EPU_{t-1} * ESG_{it}) + \sum Control + \gamma_i + \varepsilon_{it} \quad (2)$$

Among them, ESG_{it} represents the ESG score of corporate i at time t.

3.2. Explanatory Variables

3.2.1. EPU

This paper uses the Chinese economic policy uncertainty index constructed by Baker, Bloom and Davis [31] to represent the EPU variable. The index is based on January 1995 as a benchmark of 100 and is an index of data compiled from public information such as newspaper news and expert reports through text analysis. In this paper, the annual data obtained by a weighted average of monthly data is used for testing. In addition, this paper also uses the quarterly EPU index obtained by a weighted average of monthly data for robustness testing.

3.2.2. ESG performance

In this paper, Sino-Securities' ESG rating is used as a variable representing the company's ESG performance. A higher ESG rating in Sino-Securities indicates that the company is performing better in ESG. The ESG rating takes the international ESG standard as its core, combines the information disclosure of Chinese companies with the characteristics of the corporate sector, constructs three-level indicators, and adds them up according to the industry weight matrix from top to bottom. There are more than 100 bottom-level rating indicators, and there is enough breadth to judge the overall performance of a corporate ESG policy in all aspects. In addition, this paper also uses the ESGCD rating published by Bloomberg for robustness testing.

3.3. Explained Variable

Cost of debt financing: This paper mainly uses the ratio of corporate financial expenses to total liabilities as the construction method of the cost. This indicator is positively correlated with the cost of corporate debt financing. In addition, the ratio of the sum of financial expenses and related handling fees to total liabilities is used as the cost indicator for robustness testing. According to the methods of Pittman and Fortin [32] and Minnis [33], the ratio of interest expenses to average long-term and short-term liabilities is also a cost index that was tested for robustness.

3.4. Control Variable

According to the existing research results, the control variables in this paper are composed of macroeconomic variables and micro variables at the corporate level. The variables at the corporate level mainly refer to the control variables used in the research of Xiang and Li [10]. These control variables include: corporate assets (Assets), expressed by the logarithmic value of the total assets of the enterprise; the value of Tobin Q (TobinQ), expressed by the value of market capitalization to total assets; corporate age (Age), expressed as the year of the reporting period minus the year of establishment; and the tangible asset ratio (TangibleAssetRatio), calculated as the difference between total assets, net intangible assets, and net goodwill, divided by total assets. The macro control variables in this paper are GDP, CPI, and M2. All three macro control variables are expressed as annual growth rates.

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3.5. Descriptive Statistics

Table 1 shows the definitions of the main variables and the descriptive statistics of the variables. Among them, the average value of the ESG score is 6.471, the maximum value is 9, and the minimum value is 1, indicating that listed companies that have disclosed their ESG have better performance.

Table 1: Descriptive statistics.

Variables	Definition	(1) N	(2) mean	(3) sd	(4) min	(5) max
EPU	Logarithm of EPU ratio	35,267	3.862	2.352	0.989	7.919
ESG_HZ	ESG Ranking	35,267	0.0647	0.0110	0.01000	0.0900
FinCost	Financial cost/total liabilities	35,190	0.00674	0.0360	-0.182	0.0655
TangibleAssetRatio	(Assets – net intangible assets - net goodwill)/ Assets	35,237	0.927	0.0881	0.528	1
Age	Reporting year – setup year	35,267	18.56	6.010	1	64
ASSETS	Logarithm of total assets	35,256	22.13	1.300	19.21	26.11
TobinQ	Book to market/total Assets	34,653	2.072	1.346	0.861	8.807
CPI	Year-on-year CPI growth	35,267	0.0217	0.0116	-0.00690	0.0539
GDP	Year-on-year GDP growth	35,267	0.0706	0.0196	0.0235	0.106
M2	(M2 in current period - M2 in previous period)/M2 in previous period	35,267	0.120	0.0443	0.0817	0.276
Number of stkcd		4,009	4,009	4,009	4,009	4,009

Notes: ESG_HZ represents Sino-Securities ESG Rating; FinCost represents the cost of corporate debt financing.

4. Empirical Result

Column (1) in Table 2 shows the regression results of the impact of EPU on corporate debt financing costs. The results in column (1) show that, in the absence of any other variables, there is a significant positive relationship between economic policy uncertainty and corporate debt financing costs, which means that an increase in economic policy uncertainty may lead to an increase in corporate debt financing costs. The results in column (2) show that after adding the micro-control variables at the corporate level, economic policy uncertainty still has a significant positive effect on the cost of corporate debt financing. Column (3) is the regression result with the addition of macro variables, and the result is still the same as the first two.

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The content of column (4) in Table 2 shows the panel regression results for the null hypothesis 2. Both ESG and interaction items are significant at the 1% level, and the coefficient of the ESG item is 0.07, which is positive, which means that ESG seems to have a positive effect on corporate debt financing costs. But the absolute value is smaller than the coefficient of the interaction term between ESG and EPU; the coefficient of the interaction term is -.0.2, and the sum of the two coefficients is less than zero.

Table 2: EPU、ESG and Cost of Financing Debt.

	(1)	(2)	(3)	(4)
Variables	FinCost	FinCost	FinCost	FinCost
EPU_lag1	0.006***	0.005***	0.004***	0.019***
	(27.591)	(11.415)	(8.225)	(13.441)
ASSETS		0.005***	0.004***	0.005***
		(12.223)	(11.883)	(12.962)
Age		-0.000***	-0.001***	-0.001***
		(-3.133)	(-4.119)	(-4.709)
TobinQ		0.002***	0.002***	0.002***
		(11.253)	(9.287)	(9.558)
TangibleAssetRatio		-0.066***	-0.064***	-0.062***
		(-24.498)	(-23.721)	(-23.234)
M2			-0.013*	-0.018**
			(-1.683)	(-2.411)
GDP			-0.073***	-0.069***
			(-7.606)	(-7.238)
CPI			-0.117***	-0.124***
			(-8.391)	(-8.937)
ESG_HZ				0.070**
				(2.219)
ee				-0.224***
				(-11.292)
_cons	0.000	-0.036***	-0.018**	-0.031***
	(1.328)	(-4.242)	(-2.028)	(-3.376)
N	35190	34586	34586	34586
adj. R2	-0.115	-0.078	-0.074	-0.066

Notes: EPU_lag1 represents the value of EPU with a lag of one order. ee represents the interaction item of ESG and EPU. t statistics in parentheses.
* p < 0.1, ** p < 0.05, *** p < 0.01.

4.1. Robustness Analysis

The robustness test will be carried out in five aspects: the measurement of the independent variables, the measurement of dependent variables, quarterly data, and model replacement.

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4.1.1. Dependent Variables

The ratio of interest expenses to total liabilities is used as an indicator of corporate debt financing costs and brought into the equation (2) for regression. According to the results in column (1) of Table 3, the ESG indicator is not significant, but the interaction item composed of ESG and EPU is still significant, so the results are not significantly different from the above result. And this paper refers to the methods of Pittman and Fortin [32] and Minnis [33], using the ratio of interest expense to average long-term and short-term liabilities as a corporate debt financing costs indicator, repeating the above empirical research, and conducting a robustness test. The data is trimmed at the 95th percentile. The regression results show that the interaction term between ESG and EPU is significant at the 0.01 level, and the sign of the coefficient for ESG is negative. This result can show that the interaction term between ESG and EPU strengthens the negative impact of ESG on corporate debt financing costs, so this conclusion remains unchanged from the above results.

4.1.2. Independent Variables

Since the annual EPU obtained by the arithmetic mean will smooth the extreme values in some months, for EPU, this paper construct the annual ESG through the geometric mean of the monthly EPU data. According to the results in column (2) in Table 3, it can be shown that after replacing the arithmetic mean with the geometric mean, the regression results are not significantly different from the above results, so the results are still valid.

For ESG, the ESGDS data from Bloomberg will be used to replace the Sino-Securities ESG rankings data from above. ESGDS can represent the level of ESG disclosure of enterprises. A score of 0 in the ESGDS means that the company has not disclosed anything, and a score of 100 means that the company has provided complete information in the ESG disclosure. After replacing the ESG indicators, the regression results are not different from the above results, and the conclusion still holds.

4.1.3. Quarterly Data

The advantage of using quarterly data to construct variables for testing is that the sample size can be expanded. Therefore, this paper attempts to use quarterly variables to carry out the above empirical research process. According to the regression results shown in column (3) of Table 3, the ESG indicator is significant at the 0.01 level, and the sign of the coefficient is negative. The interaction term between ESG and EPU is significant at the 0.1 level, and the sign is negative. The interaction term between ESG and EPU is significant at the 0.1 level, and the sign is negative. This result indicates that the interaction term enhances the impact of ESG on corporate debt financing costs, and the conclusion is consistent with the above.

4.1.4. Model Replacement: Dynamic GMM

Considering that the corporation may have long-term debts, the financing cost of the company has a high degree of continuity, and the dependent variables in the previous periods may have an impact on the dependent variables in the later period. According to previous research, there may be a two-way causal relationship between lender behavior and corporate ESG performance [23]. In theory, when borrowing companies issue debt, the three-year financial statements are an effective reference method. Therefore, this paper adds the first to fourth-order lags of the explanatory variables and the first to second-order lags of ESG performance to the regression. In order to estimate dynamic panel GMMs, ESG is used as an exogenous variable, while EPU and debt financing costs are used as instrumental variables. According to the results in column (4) of Table 3, it can be seen that the

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signs of ESG and interaction items are both negative, and ESG strengthens the impact on financing costs against the background of EPU, which is consistent with the above results.

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Table 3: Robustness test.

	(1)		(2)		(3)	(4)
Variables	FinCost_rob	FinCost_pittman	FinCost	FinCost	FinCost_Quarter	FinCost
EPU_lag1	0.003***	-0.001		0.008***	0.004***	0.030***
	(4.802)	(-0.342)		(6.254)	(-2.692)	(0.009)
ESG_HZ	0.008	-0.115*	0.140***		-0.002***	-1.484*
	(0.602)	(-1.784)	(3.395)		(-9.243)	(0.895)
ee	-0.067***	-0.126***			-0.001*	-0.303**
	(-8.232)	(-3.172)			(-1.671)	(0.119)
ASSETS	0.001***	-0.010***	0.005***	0.005***	0.004***	0.023***
	(5.928)	(-12.730)	(12.794)	(6.869)	(-15.78)	(0.006)
Age	-0.000**	0.003***	-0.000	-0.001***	0.000***	-0.007***
	(-2.322)	(10.489)	(-1.154)	(-3.408)	(-3.163)	(0.001)
TobinQ	-0.000***	-0.001***	0.002***	0.002***	0.002***	0.010**
	(-7.100)	(-2.767)	(9.287)	(6.346)	(-18.078)	(0.005)
TangibleAssetRatio	-0.002*	0.032***	-0.062***	-0.066***	-0.064***	0.230***
	(-1.652)	(5.499)	(-23.059)	(-12.536)	(-36.809)	(0.044)
M2	-0.034***	0.042***	0.004	-0.113***	0.000**	-0.290***
	(-11.009)	(2.649)	(0.603)	(-4.371)	(-2.336)	(0.074)
GDP	-0.006	-0.010	-0.063***	-0.074**	-0.000***	-0.095*
	(-1.465)	(-0.493)	(-6.446)	(-2.260)	(-7.711)	(0.052)
CPI	0.080***	-0.026	-0.123***	0.037	-0.129***	-0.111
	(14.064)	(-0.883)	(-8.877)	(1.026)	(-12.719)	(0.265)
L1epu_GA			0.146***			
			(11.063)			
ee_GA			-1.874***			
			(-9.528)			
ee_bloom				-0.038***		
				(-7.605)		
ESGbloom				0.032***		
				(3.557)		
_cons	0.009**	0.250***	-0.049***	-0.006	-0.023***	-0.564***
	(2.268)	(12.691)	(-5.210)	(-0.338)	(-3.745)	(0.145)
N	34586	27235	34586	9694	135175	18802
adj. R-sq	-0.102	-0.149	-0.068	-0.069	0.002	
ar1						-3.625
ar1p						0.000289
ar2						1.501
ar2p						0.133
hansen						20.01
hansenp						0.13

Note: L1epu_GA represents the first lag of the EPU value obtained by the geometric mean. The ee_GA represents the intersection of ESG_HZ and L1epu_GA. ESGbloom represents an ESG index composed of ESGDS data. The ee_bloom represents the intersection of ESGbloom and EPU_lag1.The ar1 and ar2 represent results of Arellano-Bond test for AR(1) and AR(2).

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The hansen and hansenp represent results of Hansen test. The t statistics in parentheses are in column (1) to (3). The standard errors in parentheses are in column (4).
*** p<0.01, ** p<0.05, * p<0.1

5. Conclusion

This paper takes China's A-shares listed companies from 2009 to 2021 as a sample and uses a fixed-effect model to study the impact of corporate ESG performance on the cost of corporate debt financing in the context of EPU. The research results show that: 1. The increase of EPU has a positive impact on the cost of debt financing for corporations, and a high EPU will bring higher debt financing costs to corporations; 2. In the context of EPU, the improvement of a corporation's ESG score can effectively reduce the cost of corporate debt financing, and corporate ESG disclosure is also effective.

There are certain limitations to this research. The first is the lack of data on ESG ratings. This paper selects the Sino-Securities ESG Ratings, which have been the most referenced in the previous research, as the data source for ESG indicators. Compared with other public ESG ratings, this data has a long history and more companies involved. However, other data on ESG ratings of Chinese companies contain fewer samples, and the number of ESGDS samples selected in the robustness test of this paper is relatively small. The second is the construction of corporate debt financing cost indicators. In benchmark regressions, this indicator is constructed from total liabilities. The total liabilities shown in the balance sheet are a stock indicator with strong continuity, so they may be affected by previous data, which is not discussed in this paper.

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