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Economic Policy Uncertainty Sense and the Debt Structure of Tourism Corporations: Evidence from China Listed Companies

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Abstract. In recent years, the extended financing periods for tourism enterprises have become increasingly evident, presenting a significant threat to the sustainable and healthy development of both businesses and the industry. Concurrently, the rising uncertainty index associated with domestic economic policies appears to be a key factor contributing to the growing reliance on short-term financing among tourism enterprises. Through the establishment of a theoretical model and empirical analysis of microdata from listed tourism firms between 2002 and 2022, this paper demonstrates that an increase in Economic Policy Uncertainty (EPU) corresponds with a heightened proportion of short-term financing for these enterprises. However, the effects manifest differently across three aspects: financing costs, external financing constraints, and investment returns. Further analysis reveals that EPU contributes to a decrease in banking and financial liabilities for tourism companies. As a result, these firms are likely to seek non-financial sources for their short-term funding needs.

Keywords: EPU; Tourism Enterprises; Maturity Structure; Partial Equilibrium Model; Two-way Fixed Effect Model.

1. Introduction

The uprising of current liabilities potentially damages the financial stability of firms by lifting rollover risk, liquidity pressure, investment constraints, and sloping performance [1,2,3]. After 2010, the proportion of short-term financing of listed tourism companies in China has shown an increasing trend, reaching nearly 32% at the peak. In 2022, more than 30% of the financing instruments used by large cultural and tourism groups were short-term and ultra-short-term. At the same time, the investment of tourism enterprises has shown large-scale and long-term characteristics. As of February 2024, there are more than 440 new investment projects in the domestic tourism industry, with a total investment of nearly 2 trillion RMB. In the context of high investment, relying on operating income, such as tickets, ancillary products, or services to achieve investment return, means that the payback period will be relatively long. Thus, such maturity mismatch caused by short-term borrowing and long-term investment often contains huge credit and liquidity risks [4,5,6,7,8].

So, what factors drive tourism companies to keep chasing short-term borrowing to support long-term investment? Theoretically, firms with hidden information tend to decrease in debt maturity and thus raise agency costs, signaling, and liquidity risk [2,3]. And firm's heterogeneous factors drive part of the trend in debt maturity. Additionally, creditors have incentives to shorten loans to specific institution. This may lead to "maturity rat race" [9].

Moreover, it is also believed that the maturity mismatch between borrowing and investment of enterprises is mainly related to two factors: on one hand, it stems from the restriction of external financing constraints. On the other hand, the asset boom creates the illusion of Too Big to Fail, and creditors will roll over the short-term debt to avoid the debtor's bankruptcy [10]. However, combined with the characteristics of the tourism industry's volatility and vulnerability, both types of factors seem to exist. However, it is difficult to perfectly explain all the motivations of tourism enterprises for short-term loans and long-term investment.

Recent studies have concluded that policy uncertainty matters for the corporate maturity structure [11,12,13]. China's Economic Policy Uncertainty (EPU henceforth) index has risen rapidly since 2015. Despite some decline in early 2020, economic uncertainty has since reared a new head.

Theoretically, three channels are identified in the relationship between policy uncertainty and maturity mismatch. The theory of real options indicates that, in the case of imperfectly reversible investment, rising EPU will increase the waiting value of investment opportunities owned by firms, thereby discouraging fixed asset investment [14,15]. The precautionary savings theory remarks that when EPU rises, to avoid the shocks caused by the uncertainty of future cash flows, firms choose to hold cash for the precautionary motive of giving up current investment opportunities, thus reducing the cost of financial distress and avoiding liquidity distress [16,17]. The financing constraint theory points out that, along with the increase of EPU, the elevated probability of project default risk will increase the cost of external financing and equity risk premium, leading to a decline in the fixed asset investment rate [18,19]. In the existing literature, macro-level uncertainty indicators include economic fluctuations, political changeover and political map, micro-level uncertainty indicators include the standard deviation of stock prices, fluctuations in primary business income, etc. [20,21,22,23].

Therefore, EPU may also affect the maturity mismatch problem in China's tourism enterprises, and it is intertwined with the financing constraints and costs that have long plagued the financing of tourism enterprises and have a comprehensive impact through multiple channels.

Previous studies have been carried out on the aspects of enterprise diversification, investment strategies, and innovative financing models, but there have been few studies on the financing structure of tourism enterprises focusing on the lodging industry [24,25]. At the same time, although there is relatively rich domestic and foreign literature on how EPU affects corporate investment and financing decisions, little attention has been paid to the impact on tourism enterprises. Existing studies mainly focus on the impact of EPU on tourism development, including tourism consumption and tourism demand, but not tourism enterprises, and the methods applied are mainly time-series methods [26,27,28]. In addition, Bakers et al. provided a quantified measurement of EPU of various states and regions, which has been applied in numerous recent studies [29,30,31,32,33,34]. However, the index reflects state-level EPU that the transmission channel from macro to micro remains vague and does not mirror the heterogeneous effects at the firm level [35,36,37,38].

Given this, this paper constructs a three-period dynamic investment and financing model for tourism enterprises, including EPU. The model analyzes how the change of EPU affects the financing term structure through the interaction of the three channels, including expected returns, financing constraints, and financing costs of tourism enterprises. Then, the model produces the consequences of economic uncertainty that tourism corporations tend to utilize short-term debts supporting long-term investment. Subsequently, this paper empirically tests the theoretical model's hypotheses by using the firm-level data of China's listed tourism enterprises from 2002 to 2022. A series of robustness tests are also carried out to avoid the estimation bias caused by the measurement error, corporate policy sensitivity, and omission variable bias of EPU. Further exploration of the impact of EPU on the financing structure of tourism enterprises, this paper also analyzes the degree to which different sources of funds are affected by EPU and finds that the increase of EPU will lead tourism enterprises to use more short-term funds from non-financial institutions.

The following sections of the paper are organized like: we build a partial equilibrium model describe the representative tourism corporation's financial decisions reflecting to the EPU fluctuation in the 1st section. Based on the result of theoretical model, the key hypothesizes generated. In the 2nd section, we apply two way fixed-effect regression models to examine the hypothesizes with a novel designed independent variable *EPUSENSE.* The variables contained in the model and data that utilized are also displayed in this section. In section 3, we analyze the estimated results from regression models. The section 4 decompose the movements of short term debt according to EPU changes. We present the conclusion of this paper in the final section.

2. Theoretical Models and Research Hypotheses

2.1 Model setting and solving

The section headings are in boldface capital and lowercase letters. Second level headings are typed as part of the succeeding paragraph (like the subsection heading of this paragraph). All manuscripts must be in English, also the table and figure texts, otherwise $_sw$ we cannot publish your paper. Please keep a second copy of your manuscript in your office.

This paper constructs a three-period partial equilibrium model to illustrate the impact of EPU on the financing structure of tourism enterprises. Referring to the assumptions of Brunnermeier and Oehmke, consider the existence of a risk-neutral tourism enterprise that invests in a long-term project I_0. The investment starts from the period t=0 and is fixed in size [9]. In the 1st and 2nd period of the project, the investment can get a non-negative random return R_t, $R_t \in [0, R]$. Its distribution obeys a function $F(.)$. Looking forward from the t=0 period, the unconditional return on this long-term project is $E_0[R_t] = \int_0^R R_t dF(R_t)$ and the net present value is positive at that time$\Sigma_t \mathrm{E}_0[R_t] > \mathrm{I}_0$. For simplicity, it is assumed that there is no time discounting.

Once the project is implemented, its probability of success is affected by EPU. The company will perceive the current policy uncertainty signal in any period in the middle, where *t*=1,2. It is assumed that there are sufficient statistics S_t for all historical information $\mathrm{s_t}\{\mathrm{s_1}, \mathrm{s_2}\}$ to obtain the conditional distribution $F(R_t|S_t)$ of the project, as well as the expected returns $E(R_t|S_t)$. Let us assume that $F(.)$ is strictly monotonically decreasing to S_t. This means that at $\mathrm{S_t^A} > \mathrm{S_t^B}$, the first-order random prevails $F(R_t|S_t^B) > F(R_t|S_t^A)$.

Long-term projects can be monetized in part or in full and in part in perpetuity at any given moment $\mathrm{t} \leq 2$. However, early realization can only get a portion of the asset p, assuming it does not change over time. This means that early liquidation is inefficient and reflects the sunk costs of terminating the project early, i.e. early liquidation does not get back the total value of the investment pI_0.

Representative tourism firm does not have initial capital and must raise funds for long-term projects through external financing. Most companies in China's tourism industry must use debt instruments to finance their operations. As a result, companies here use a more representative debt financing model to obtain funds for projects and daily operations. Suppose the company borrows a total of loans in installments in term 0, that $B_0 = C_0 + I_0$. Among them, C_0 refers to the cash retained by the company to protect against risks up to the first period. Enterprise often encounters external financing constraints, requiring them to secure both short-term and long-term funds to fulfill their financial requirements. Short-term financing αB_0, $\alpha \in (0,1)$, entails lower financing costs, while long-term financing $R^S(1-\alpha)B_0$ involves higher costs R^L. Despite the lower interest rates associated with short-term financing compared to long-term financing, tourism enterprises cannot entirely forgo long-term financing as it would be uneconomical, that is $R^S < R^L < 2R^S$.

Most existing studies tend to believe that tourism enterprises are often subject to stricter external financing constraints due to the small number of collateralized assets and strong vulnerability. Therefore, concerning the practice of existing literatures, the financing constraints to be subject to by representative tourism enterprises in Phase 0 are set as:

$$0 \leq B_0 \leq (1-\tau)pI_0 \tag{1}$$

where, represents the mortgage deduction rate of the enterprise's assets.$\tau \in (0,1)$

The expected return of the project that the enterprise can obtain in period 1 are $E_0[R_1|S_1] = \int_0^R R_1\, dF(R_1|S_1)$. At this time, for the enterprise, if the income level meets the following conditions, the project continues, otherwise, the project is liquidated early:

$$\int_{\underline{R}}^R R_1\, dF(R_1|S_1) I_0 + C_0 \geq R^S \alpha B_0 \tag{2}$$

Therefore, the expected benefits of period 1 are:

$$\int_{\underline{R}}^{R} R_1 \, dF(R_1|S_1) I_0 + C_0 - R^S \alpha B_0 \tag{3}$$

Companies need to roll over short-term financing to secure working capital for period 2, including:C_1

$$C_1 = \int_{\underline{R}}^{R} R_1 \, dF(R_1|S_1) I_0 + C_0 + \alpha B_0 - R^S \alpha B_0 \tag{4}$$

At this time, the financial constraints faced by the enterprise are $0 \leq \alpha B_0 \leq (1-\tau) p I_0$, and the project returns are:

$$\int_{\underline{R}}^{R} R_2 \, dF(R_2|S_2) I_0 + C_1 - R^S \alpha B_0 - R^L (1-\alpha) B_0 \tag{5}$$

Therefore, the optimization problem of the enterprise is:

$$Max\, N = \int_{\underline{R}}^{R} R_1 \, dF(R_1|S_1) I_0 + \int_{\underline{R}}^{R} R_2 \, dF(R_2|S_2) I_0 + - 2R^S \alpha B_0 - R^L (1-\alpha) B_0$$
$$s.t.\, 0 \leq B_0 \leq (1-\tau) p I_0;\; 0 \leq \alpha B_0 \leq (1-\tau) p I_0 \tag{6}$$

Since tourism enterprises will obtain as much external financing as possible under the financing constraints, and, therefore, the financial constraints of the two periods can be re-expressed as $\alpha B_0 < B_0$

$$B_0 = (1-\tau) p I_0 \tag{7}$$

Solve equation (6) to obtain the first-order condition:

$$\alpha = \left(\frac{1}{2R^S - R^L}\right)\left(\left(\frac{1}{(1-\tau)p}\right) R^e - R^L\right) \tag{8}$$

where

$R^e = \int_{\underline{R}}^{R} R_1 \, dF(R_1|S_1) + \int_{\underline{R}}^{R} R_2 \, dF(R_2|S_2)$ to indicate the expected return matured if the project is successful.

2.2 Comparative static analysis and research hypotheses

The core conclusion of the model is given by Eq. (8), and a combination of factors determines the proportion of short-term financing. Among them, the project's expected return R^e reflects the direct impact of EPU that we are concerned about. Since $F(.)$ is strictly monotonically decreasing to S_t, it means that when EPU rises, the expected benefits of a project will fall regardless of whether it can run successfully or not. As a result, the project's expected returns are negatively affected by EPU. Furthermore, when R^e declines, if other factors remain unchanged, the second term on the right-hand side of the equation decreases, and the corresponding proportion of short-term financing decreases.

However, project returns are not the only way for EPU to affect firms, debt structure and in the second item of Eq. (8), external financing constraints $(1-\tau)p$ also affect the relationship between expected return R^e and long-term financing costs R^L. Existing empirical studies suggest that EPU will increase the financial constraints faced by enterprises and the impact of EPU on financing constraints may be more severe for more vulnerable tourism enterprises Observing the form of financing constraints entering Eq. (8), it can be found that because $(1-\tau)p < 1$, when financing constraints rise, $\frac{1}{(1-\tau)p}$ will fall, so EPU will increase the proportion of short-term financing of firms by tightening financing constraints.

Continuing to observe Eq. (8), it can be found that external financing costs will affect the short-term financing decisions of tourism enterprises in two aspects: one is the long-term financing interest rate, and the other is the gap between long-term and short-term financing costs. In general, as EPU rises, companies are more likely to default. As a result, banks will demand higher interest rates on long-term financing as compensation for risk. Looking at the changes in long-term interest rates, it seems that increased EPU will reduce the proportion of short-term financing for tourism companies. However, as long-term interest rates rise, one possible consequence is that the gap between long-term and short-term interest rates widens, which means that $2R^S - R^L$ will fall,

increasing the expected returns of the project and reducing the impact of rising long-term interest rates.

The following research hypotheses are proposed based on the relevant conclusions of model derivation.

Hypothesis 1: The increase in EPU will lead to an increase in short-term financing for tourism enterprises.

Hypothesis 2: EPU may lead to higher long-term financing costs so that companies will turn to short-term financing.

Hypothesis 3: EPU will tighten the financing constraints faced by enterprises so that tourism enterprises will turn to short-term financing to avoid the impact of financing constraints.

3. Empirical analysis

3.1 Econometric model

To empirically analyze the degree and channel of EPU on the financing structure of tourism enterprises, this paper uses a standard linear function formal model for regression analysis for the three hypotheses derived from Eq. (8). The specific test strategies are as follows: firstly, to determine the average impact of EPU on the proportion of short-term financing of tourism enterprises; Then, the role of financing cost channels and financing constraint channels is examined.

To test hypothesis 1, a benchmark panel data regression model is designed as follows:

$$CurrentLiab_{i,t} = \alpha_0 + \alpha_1 EPUSENSE_{i,t} + \alpha_2 X_{i,t} + u_t + v_i + \epsilon_{i,t} \quad (9)$$

Where, $CurrentLiab_{i,t}$ indicates proportion of short-term financing; $EPUSENSE_{i,t}$ indicates the level of perception of tourism enterprises on the uncertainty of current economic policies; $X_{i,t}$ is a series of control variables that may affect the financing structure of tourism enterprises, including enterprise size, leverage ratio, proportion of fixed assets, cash flow, return on assets and return on net assets. In order to characterize the potential influencing factors that do not change with individuals and cannot be observed, the model introduces a fixed time effect u_t. To characterize the inherent characteristics of enterprises that do not change over time and are not observable, the model introduces individual fixed effects v_i. In Eq. (9), this paper focuses on the coefficient α_1, which depicts the average impact of EPU on the financing structure of tourism enterprises. If the coefficient is significantly positive, it indicates that the increase of EPU will lead to more short-term financing choices for tourism enterprises.

In order to test Hypothesis 2, that is, to identify the financing cost channels of the impact of EPU on the financing structure of tourism enterprises, this paper designs a panel data regression model with cross-multiplication terms:

$$CurrentLiab_{i,t} = \beta_0 + \beta_1 EPUSENSE_{i,t} + \beta_2 FundingCost_{i,t} \times EPUSENSE_{i,t} + \beta_3 FundingCost_{i,t} + \beta_2 X_{i,t} + u_t + v_i + \epsilon_{i,t} \quad (10)$$

where, $FundingCost_{i,t}$ denotes the financing cost of the enterprise, and the rest of the settings are consistent with Eq. (9). In Eq. (10), this paper focuses on the coefficient β_2, which depicts the joint impact of EPU and financing cost, if the coefficient is significantly positive, it indicates that EPU and financing cost jointly affect the proportion of short-term financing of tourism enterprises, and then shows that financing cost is the channel through which EPU affects the proportion of short-term financing of tourism enterprises.

Rising financing constraints may lead firms to use short-term loans more to finance long-term projects. Therefore, to test Hypothesis 3, that is, to identify the financing constraint channels of the impact of EPU on the financing structure of tourism enterprises, this paper designs the following regression model of the following panel data

$$Finconstr_{i,t} = \gamma_0 + \gamma_1 EPUSENSE_{i,t} + \gamma_2 X_{i,t} + u_t + v_i + \epsilon_{i,t} \quad (11)$$

Among them, the $Finconstr_{i,t}$ indicates financing constraints faced by tourism enterprises, and the rest of the settings are consistent with Eq. (9). If the coefficient is significantly positive, it

indicates that EPU has a significant impact on financing constraints, and correspondingly, it is not uncommon to see research on the impact of financing constraints on short-term loans and long-term investment of enterprises.

According to the analysis of Eq. (8) above, the increase in EPU may lead to a decline in investment yields, which will inhibit the increase in the proportion of short-term financing. To verify this conclusion, this paper further constructs the cross-multiplication term model based on Eq. (10) as follows:

$$CurrentLiab_{i,t} = \delta_0 + \delta_1 EPUSENSE_{i,t} + \delta_2 Return_{i,t} \times EPUSENSE_{i,t} + \delta_3 Return_{i,t} + \delta_2 X_{i,t} + u_t + \nu_i + \epsilon_{i,t} \quad (12)$$

Among them, $Return_{i,t}$is the return on investment of the enterprise, which is represented by the indicators *Roa* and *Roe*, and the rest is consistent with Eq. (9). In Eq. (12), this paper focuses on the coefficient to be estimated, which depicts $\delta_2$the joint impact of EPU and investment return rate, if the coefficient is significantly negative, it indicates that EPU and investment return jointly inhibit the increase in the proportion of short-term financing of tourism enterprises.

3.2 Discussion of endogeneity

This section discusses the possible endogeneity problems and the solutions in the regression model setting. First, this paper adopts two ways to measure EPU, which reflect the level of policy uncertainty at the macro level, and the explanatory variable of interest comes from the microdata of listed tourism enterprises. The tourism industry in China has experienced notable advancements in recent years, characterized by a marked increase in the number of publicly listed tourism enterprises. This trend reflects the sector's growth and the expanding role of market mechanisms in China's economic landscape. However, both in terms of scale and quantity, listed tourism enterprises have a large gap with other types of enterprises. Their contribution to the total market value is relatively limited, so it is difficult to have a reverse causal problem, that is, the impact of the financing structure of tourism enterprises on the uncertainty of economic policy. Second, concerning the problem of missing variable bias, this paper not only connects the firm-level data with the macro-level data but also constructs the individual heterogeneity of the core explanatory variables to avoid the multicollinearity problem after the introduction of the time-fixed effect. Consequently, this paper employs a two-way fixed-effect model to account for potential influencing factors at both the temporal and individual levels. This approach further mitigates the estimation bias that may arise from omitted variables by incorporating additional control variables at the firm's micro level. Thirdly, this paper selects multiple surrogate indicators of the core explanatory variable and the explanatory variable to reduce the possible impact of measurement error. Specifically, this paper uses the uncertainty perception data of corporate economic policies obtained by Nie et al. through sentence frequency recognition and word frequency recognition, combined with the macro uncertainty index from the South China Morning Post by Baker et al., and the macroeconomic uncertainty index obtained by Huang and Luk based on the text recognition of newspapers in the mainland China [39,32,40] . It constitutes four equivalent indicators: *EPUSENSE_1*, *EPUSENSE_2*, *EPUSENSE_3,* and *EPUSENSE_4*. Fourthly, in the process of regression, this paper clusters robust standard errors at the industry level and reduces the impact of the interaction between industry characteristics and individual characteristics.

3.3 Variables and data sources

For the explanatory variables selected in this paper, the measurement methods are as follows: the proportion of short-term financing *is CurrentLiab*, which is normalized by dividing short-term financing by total assets. Financing constraint *Finconstr*, which is measured by the commonly used FC index and SA index. Further, combined with the previous literature, the construction methods of the control variables selected in this paper are as follows: the size of the enterprise, which is measured by the natural logarithm of the total assets of the enterprise; *Leverage*, which is measured by dividing the total liabilities by the total assets of the enterprise; return on assets *(Roa*), which is

measured by dividing net profit by total assets; return on equity (*Roe*), which is measured by dividing net profit by net assets, where net assets are the sum of owners' equity and minority shareholders' equity; the proportion of tangible assets, which is measured by dividing net fixed assets by total assets; *Cashflow* is measured by the proportion of monetary funds in total assets. In addition, the variable financing cost used in the construction of the cross-multiplication term model *in this paper, FundingCost*, is the mainstream practice in the literature, which is obtained by dividing the bank's interest expense by the average of all long-term and short-term financing [41].

For the core explanatory variable, *EPUSENSE*, we adopt a different approach from the previous practice. Many related studies directly use the monthly index of China's EPU constructed by Baker et al., which is obtained by using text information from the South China Morning Post in Hong Kong [9]. However, the index measures uncertainty at the macro level and cannot distinguish between the differences in EPU faced by individual firms. At the same time, because the traditionally used EPU indicators are time series data, it is impossible to add a fixed time effect in the regression process of panel data, so it is difficult to capture the potential impact of other macro factors fully. Therefore, this paper uses the enterprise EPU perception data constructed by Nie et al. as a supplement and constructs a new metric index, *EPUSENSE*, the product of macro EPU and enterprise micro perception [39]. The benefit of this approach is that the impact of macro EPU can be captured simultaneously and directly linked to corporate behavior. Specifically, the variable *EPUSENSE* is constructed as follow:

$$EPUSENSE_{i,t} = EPUPercption_{i,t} \times EPU_t$$

This paper selects the non-balanced panel micro data of 46 A-share listed companies in China from 2002 to 2022, and the original data comes from the CSMAR database, and 600 observations are obtained after processing. The EPU index is derived from both Baker et al. and Nie et al., and since the firm-level data is annual, we process the EPU data by calculating the annual average [32, 39].

4. Results analysis

4.1 Baseline regression results

To test hypothesis 1, a regression based on Eq. (9) is performed. Table 1 shows the results of the correlation regression. In these columns, (1) and (2) use the sentence frequency to identify the *EPUSENSE_1* of the firm's uncertainty perception data combined with the EPU data of Baker et al.; Column (3) uses word frequency to identify the *EPUSENSE_2* of combining firm uncertainty perception data with Baker et al.'s EPU data; Column (4) uses sentence frequency to identify the *EPUSENSE_3* of combining firm uncertainty perception data with Huang and Luk's EPU data; Column (5) uses word frequency to identify the *EPUSENSE_4* of the firm's uncertainty perception data combined with the EPU data of Huang and Luk [40]. In Table 1, columns (1) did not include control variables, but controlled for individual fixed effects and time-fixed effects; Columns (2), (3), (4), and (5) control all control variables. It can be found that although the coefficients are different, the *EPUSENSE* coefficient of economic uncertainty indicators measured by different methods is significantly positive at the level of more than 5%, indicating that the proportion of short-term financing of tourism enterprises increases when EPU increases. In column (6) of Table 1, the regression result is still significantly positive at the 1% level by excluding the transportation industry sample with a high proportion of fixed assets and, therefore, fewer financing constraints and using *EPUSENSE_1* as the core explanatory variable. Column (7) is the test that excludes the impact of the pandemic; that is, the sample after 2020 is excluded, and the *EPUSENSE_1* is still used as the core explanatory variable, and the regression result is also significant at the 1% level.

In terms of control variables, the coefficient of enterprise size is significantly negative, indicating that the larger the enterprise, the lower the proportion of short-term financing, and the results are in line with the theoretical description and practical experience, that is, the larger the enterprise, the easier it is and more inclined to obtain long-term funds to match the term of the asset side. The

leverage coefficient of enterprises is significantly positive, indicating that enterprises with higher debt ratios or enterprises with less own capital have a more significant proportion of short-term funds.

In conclusion, the regression results in Table 1 validate Hypothesis 1 of this paper, indicating that the proportion of short-term financing of firms increases when EPU increases.

Table 1 Baseline regression results

CurrentLiab	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EPUSENSE_1	0.023**	0.020***				0.019***	0.012**
	(0.01)	(0.00)				(0.00)	(0.00)
EPUSENSE_2			0.249***				
			(0.04)				
EPUSENSE_3				0.011***			
				(0.00)			
EPUSENSE_4					0.120***		
					(0.02)		
SIZE		-0.052**	-0.052**	-0.052**	-0.052**	-0.062***	-0.039*
		(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.02)
Leverage		0.575***	0.575***	0.575***	0.575***	0.658***	0.603***
		(0.08)	(0.08)	(0.08)	(0.08)	(0.02)	(0.07)
ROA		0.097	0.097	0.097	0.097	0.134	0.025
		(0.09)	(0.09)	(0.09)	(0.09)	(0.08)	(0.08)
ROE		0.005***	0.005***	0.005***	0.005***	0.005	0.030***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.01)
TANG		0.002	0.002	0.002	0.002	0.006	-0.040
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
CashFlow		-0.021	-0.021	-0.021	-0.021	-0.016	-0.093
		(0.08)	(0.08)	(0.08)	(0.08)	(0.07)	(0.10)
Constant terms	0.167***	1.078**	1.106**	1.045**	1.097**	1.286***	0.856*
	(0.02)	(0.28)	(0.29)	(0.28)	(0.29)	(0.13)	(0.38)
Observations	546	542	542	542	542	350	411
R^2	0.664	0.840	0.840	0.840	0.840	0.886	0.823
Individual fixed effect	YES	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES	YES

4.2 Regression analysis of different influencing mechanisms

Based on the analysis of Eq. (8) above, it can be found that the impact of EPU on the proportion of short-term financing of tourism enterprises is realized through several different channels, including expected return, financing cost, and financing constraints. Among them, financing costs and financing constraint channels play a joint positive impact. Here, a regression test is performed on the role of the three influencing channels.

4.2.1. Financing costs

To test hypothesis 2, this paper performs regression based on Eq. (10), and to ensure the robustness of the conclusion, four proxy indicators of *EPUSENSE_1*, *EPUSENSE_2*, *EPUSENSE_3,* and *EPUSENSE_4* are still used, and *FundingCost* is combined with the proxy variable of financing cost to interact. If the coefficient is significantly positive, it indicates that the financing cost and EPU positively impact the proportion of short-term financing of tourism enterprises. Table 2 shows the regression results, and it can be found that although the absolute values of the coefficients are different, the coefficients of the interaction terms are all significantly positive at the 5% level, which verifies the content of hypothesis 2, that is, EPU will lead to an increase in the long-term financing cost of firms, and therefore firms will increase the proportion of short-term financing.

4.2.2 Financing constraints

In order to test hypothesis 3, this paper performs regression based on Eq. (11), and in order to ensure the robustness of the conclusion, we continue to use the two proxy indicators of EPU

EPUSENSE_1 and *EPUSENSE_2* as the core explanatory variables and use the proxy variables of financing constraints for interaction. Referring to the practice of existing literature, this paper uses the FC index (*FC_Index*) and SA index (*SA_Index*) as proxy indicators for the financing constraints of tourism enterprises. Among them, *FC_Index,* the method constructed by Guo et al., the value is between 0 and 1, and the larger the value of this index, the more serious the financing constraints faced by enterprises [42]. *SA_Index* constructed using the methods of Hadlock and Pierce and Ju et al., the SA index is negative, and the larger the absolute value, the higher the degree of corporate financing constraints [43,44].

Table 3 shows the regression results, where columns (1) and (2) reflect *the results using FC_Index* regression, and the coefficients are all significantly positive at the 1% level. At the same time, columns (3)-(4) reflect *the results of SA_Index* regression, and the coefficients are all significantly negative at the 1% level. The results of the four columns together verify the content of Hypothesis 3, which is that EPU will exacerbate the financing constraints firms face. Combined with relevant studies' conclusions, companies will use short-term financing more when financing constraints become tighter.

Table 2 EPU, financing cost and proportion of short-term financing

CurrentLiab	(1)	(2)	(3)	(4)
EPUSENSE_1	0.000			
	(0.02)			
FundingCost×EPUSENSE_1	2.285**			
	(0.83)			
EPUSENSE_2		0.004		
		(0.27)		
FundingCost×EPUSENSE_2		39.724**		
		(13.53)		
EPUSENSE_3			0.000	
			(0.01)	
FundingCost×EPUSENSE_3			1.222**	
			(0.45)	
EPUSENSE_4				0.003
				(0.12)
FundingCost×EPUSENSE_4				20.593**
				(7.34)
FundingCost	-5.632***	-5.960***	-5.376***	-5.512***
	(0.31)	(0.33)	(0.37)	(0.37)
Constant	0.897	0.904	0.898	0.915
	(0.88)	(0.88)	(0.91)	(0.90)
Observations	239	239	239	239
R^2	0.803	0.803	0.804	0.803
Control Variables	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES
Note: *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. In parentheses are clustering robust standard errors at the industry level. The selection of control variables is the same as in Table 1.				

4.2.3 Return on investment

Table 4 shows the regression results of Eq. (12). It can be found that the coefficients of the multiplication terms are significantly negative in the results of columns (1)-(4), indicating that the combination of EPU and investment returns will inhibit the increase in the proportion of short-term financing, and then verify the corresponding conclusion of Eq. (8).

5. Further discussion

Based on the relevant conclusions of the theoretical model and the corresponding empirical tests, this paper finds that EPU will affect the proportion of short-term financing of tourism enterprises through three channels: financing cost, external financing constraint, and investment return. Among them, the first two channels will increase the share of short-term financing of tourism enterprises when EPU rises, while the third channel will dampen. However, overall, the increase in EPU will increase the proportion of short-term financing for tourism enterprises.

Further intriguing questions arising from this conclusion include: how various types of liabilities are influenced by EPU; which short-term debts increase to drive the rise in the proportion of short-term debt of tourism enterprises. To address the first question, this paper further substitutes the explanatory variable in Eq. (9) with the ratio of bank borrowings (calculated as the sum of short-term and long-term borrowings and normalized by dividing by total liabilities and total assets, respectively). The regression results are shown in columns (1)-(3) of Table 5, and it can be found that both bank borrowing and financial liabilities decreased significantly when EPU increased, and bank borrowing decreased even more.

Table 3 EPU, financial constraints, and the proportion of short-term financing

	(1)	(2)	(3)	(4)
	FC_Index		*SA_Index*	
EPUSENSE_1	0.087***		-0.208***	
	(0.02)		(0.03)	
EPUSENSE_2		1.041***		-2.478***
		(0.19)		(0.37)
Constant terms	3.357***	3.486***	-1.653*	-1.959**
	(0.33)	(0.35)	(0.78)	(0.74)
Observations	458	458	496	496
R^2	0.908	0.908	0.938	0.938
Control variables	YES	YES	YES	YES
Individual fixed effects	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES

Note: *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. In parentheses are clustering robust standard errors at the industry level. The selection of control variables is the same as in Table 1.

Table 4 EPU, investment return rate, and proportion of short-term financing

	(1)	(2)	(3)	(4)
EPUSENSE_1	0.019***	0.019***		
	(0.00)	(0.00)		
EPUSENSE_1×Roa	-0.030**			
	(0.01)			
EPUSENSE_1×Roe		-0.006*		
		(0.00)		
EPUSENSE_2			0.231***	0.235***
			(0.04)	(0.04)
EPUSENSE_2×Roa			-0.535***	
			(0.13)	
EPUSENSE_2×Roe				-0.099*
				(0.04)
Roa	0.274**	0.077	0.283**	0.071
	(0.09)	(0.08)	(0.07)	(0.08)
Roe	0.005***	0.040**	0.005***	0.043**
	(0.00)	(0.02)	(0.00)	(0.02)
Constant terms	0.995**	1.031**	1.012**	1.055**
	(0.28)	(0.30)	(0.29)	(0.30)
Observations	542	542	542	542
R^2	0.841	0.841	0.841	0.841
Control variables	YES	YES	YES	YES

Individual fixed effect	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES
Note: *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. In parentheses are clustering robust standard errors at the industry level. The selection of control variables is the same as in Table 1.				

To analyze the hypothesis 2, we replace the explanatory variables in Eq. (9) with short-term borrowings and other short-term liabilities (normalized by current liabilities minus short-term borrowings and divided by total assets). The regression results are shown in columns (4) and (5) of Table 5, and short-term borrowings from banks decline significantly as EPU increases, while other short-term liabilities increase significantly. This indicates that in the process of rising EPU, tourism enterprises have less access to bank funds and have turned to non-financial sources for short-term funding.

Table 5 Decomposition of debt structure

	(1)	(2)	(3)	(4)	(5)
	Bank borrowing		Financial liabilities	Short-term borrowing	Other short-term liabilities
EPUSENSE_1	-0.094***	-0.053***	-0.049**	-0.044**	0.062***
	(0.01)	(0.00)	(0.01)	(0.02)	(0.01)
Constant terms	-1.190**	-0.902***	-1.988***	-0.200	1.154***
	(0.34)	(0.18)	(0.18)	(0.29)	(0.10)
Observations	409	409	542	472	472
R^2	0.680	0.825	0.779	0.512	0.669
Control variables	YES	YES	YES	YES	YES
Individual fixed effects	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES
Note: *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively. In parentheses are clustering robust standard errors at the industry level. The selection of control variables is the same as in Table 1.					

6. Conclusions

To analyze the impact of EPU on the financing structure of tourism enterprises, this paper first constructs a theoretical model. The derivation results show that EPU will affect the proportion of short-term financing of tourism enterprises through three channels: financing cost, financing constraint, and investment yield. Among them, both the financing cost channel and the financing constraint channel will cause the proportion of short-term financing of tourism enterprises to increase when the uncertainty of economic policy increases, while the investment yield channel will inhibit the increase of the proportion of short-term financing. To further verify the above conclusions, this paper uses the microdata of listed tourism enterprises to test the impact of EPU on the financing structure of tourism enterprises through the panel two-way fixed-effect model regression. The estimation results are consistent with the conclusions of the theoretical model. Overall, the increase in EPU will lead to an increase in short-term financing for tourism enterprises. Further analysis shows that when EPU rises, tourism enterprises' bank borrowings and financial liabilities will fall. There will also be less bank funding in short-term financing, and companies will turn to non-financial sources for short-term funding.

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