

An analysis of the relationship between economic policy uncertainty and trade credit supply

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ABSTRACT : *Economic policy uncertainty is around the uncertainty related to macroeconomic events including the change of fiscal, regulatory or monetary policy. So, it is considered to be a kind of undiversifiable risk which has a significant impact on company financing and investment decisions through several mechanisms. This paper investigates the impact of economic policy uncertainty (EPU) on the supply of trade credit. The analysis is based on the panel data econometric model with fixed effects. Using firm-level data of Chinese A-listed companies from 2007 to 2021, I find that: (i) there exist a positive and significant relation between economic policy uncertainty and the supply of trade credit. (ii) This relation is weaker for firms with more long-term bank loan and stronger for firms with more short-term bank loan. (iii) This relation is stronger for firms with more liquidity and weaker for high-tech companies.*

KEYWORDS - *trade credit, economic policy uncertainty, bank credit, cash holding level, high-tech enterprise*

I. INTRODUCTION

Trade credit can provide access to capital for small enterprises which are unable to raise it through traditional channels. So trade credit is an important source of short-term external finance for small enterprises in China (Su et al., 2021). Internationally, trade credit even far exceeds short-term bank credit (Rajan and Zingales, 1995). Figures show that, in the UK, no less than 80% of company-to-company transactions are made on credit (Wilson and Summers, 2002), and more than 80% companies in the US provide their products on credit (Dionne, 2011).

Scholars have provided both theoretical and empirical evidence that show the role of trade credit for the supply and demand sides. Specifically, Cheng and Pike (2003) find that providers can use trade credit to reduce information asymmetry about the ability of users to pay. Aktas et al. (2012) find that providers can use trade credit to show the quality of their projects to external investors. Ferrando and Mulier (2013) believe that companies with limited access to external debt financing and fast-growing companies often rely heavily on trade credit. From the perspective of company development, Deloof and Jegers (1996) believe that providers can improve the competitive ability in the market by providing trade credit.

Why do companies provide trade credit? What are the important factors that affect the supply of trade credit? Scholars have provided both theoretical and empirical evidence that suggests that the supply of trade credit is influenced by many factors. Li et al. (2018) show that the degree of legal protection, buyer-supplier relationship affects the supply of trade credit. Wilner (2000) shows that the supply and demand of trade credit is influenced by the provision of concession and renegotiation. Other factors mentioned in the remaining literature that influence the supply and demand for trade credit include: ethnic bias (Fafchamps, 2000), financial factors (Ono, 2001), Supplier Monopoly Power, market competitiveness (Fisman and Love, 2003), banking restrictions (Burkart and Ellingsen, 2004), profitability, risk, level of inventory and liquidity (Bougheas et al., 2009), firm size (Miwa and Ramseyer, 2008), market share, sales volume and liquidity (Afrifa and Gyapong, 2005), etc. Meltzer (1960) pointed out that monetary policy affects the supply of trade credit. However, after Meltzer's study, there are relatively few studies from the perspective of macroeconomic environment. Therefore, it is important to examine the relationship between macroeconomic environment and firm's trade credit supply.

In this empirical analysis, I consider EPU index as the independent variable to examine the relationship between macroeconomic environment and firm's trade credit supply. Economic policy uncertainty (EPU) refers to the collection of economic risk where the government policy is uncertain. It includes the uncertainty about monetary and fiscal policy, the uncertainty about regulatory institutions, and the uncertainty over electoral outcomes. EPU affects many aspects of the economy, including macro- and micro-levels. From the macro level, Baker et al. (2016)'s research shows that an increase in EPU during 2005-2012 has a significant negative impact on the US economy. The data released by the media shows that the GDP declined by 1% and that the US industries production declined by 1.1% during this period. From the micro level, Kaviani et al. (2020) show that EPU has a significant positive impact on corporate credit spreads, and this effect was more significant for firms with higher exposure to government policies. Drobetz et al. (2018) show that EPU has a significant negative impact on the sensitivity of investment to the cost of capital, and the magnitude of the effect depends on a number of firms and country characteristics including industry dependence on government, the opaqueness of countries, firm coverage of analysts, credit rating and size. Phan et al.(2018) find that EPU intensifies firm's financial constraints by increasing the external financing cost and reducing the asset return. Phan et al. (2018) believe that EPU makes the future cash flow of enterprises more unstable, inducing enterprises to hoard cash to maintain stable operation. In conclusion, prior studies show that EPU has a significant impact on many aspects of enterprises, but surprisingly little is known about its effect on trade credit supply.

In this study, I empirically examine the impact of EPU on firms' trade credit supply by using data from Chinese A-share listed companies. Specifically, I study a sample of 28688 firm- annual observations, covering 4964 nonfinancial Chinese public firms from 2007-2021. We use the EPU index constructed by Baker et al. Recently, many scholars use EPU index to examine the relations between economic policy uncertainty and company decision. Similar to these studies, I use this EPU index to examine the relation between economic policy uncertainty and the supply of trade credit.

Firstly, based on annual data of Chinese A-share listed companies from 2007-2021, I find that economic policy uncertainty has a significant positive impact on companies' supply of trade credit. On average, when EPU rises by one standard deviation, the trade credit will on average increase by 0.64 percentage points. Secondly, I find that changes in the supply of trade credit are associated with firm cash holding levels. Garcia-Appendini and Montoriol-Garriga (2013) find that companies with high cash holding level and good financial condition are more able to provide trade credit to the financially constrained companies. Thus, the effect of economic policy uncertainty on the supply of trade credit is more significant in the sample with higher levels of cash holdings. Thirdly, I find that changes in the supply of trade credit are associated with industry of samples. Specifically, the effect of economic policy uncertainty on the supply of trade credit is more significant in high tech companies.

Compared with other existing studies, my study contributes to the literature in two ways. Firstly, in the study of trade credit, most of the existing studies have paid more attention to the motivation of companies to provide trade credit, and less attention has been paid to changes in companies' trade credit supply after being affected by the macroeconomic environment. So my study adds somewhat to the literature examining the impact of EPU on companies' trade credit supply. Secondly, my study tries to add somewhat to the growing literature of the economic consequences of economic policy uncertainty. In the study of economic policy uncertainty, based on the EPU index constructed by Baker et al. (2016),scholars have examined the impact of economic policy uncertainty on firms' investment decisions(Gulen and Ion, 2016), cash holding levels and profitability(Phan et al., 2018). This paper investigates the impact of economic policy uncertainty on firms' decisions by examining the relationship between economic policy uncertainty and firms' trade credit supply.

The remainder of the paper proceeds as follows. In Section 2, I sort out the relevant literature. In Section 3, I present the sample selection and the construction method of variables. In Section 4, I give empirical results and explanations. Finally, Section 5 is the conclusion and policy recommendation of this paper.

II. LITERATURE REVIEW

2.1 The existence of trade credit

We can explain the existence of trade credit from different perspectives by reviewing the related literature. This literature describes the financial, operational or strategic motivation for firms to use trade credit. If the capital market is fully efficient, borrowers could simply contact any financial institution and borrow money from financial institution at the same interest rate. So, in a perfectly competitive market, bank credit and trade credit are the same for borrowers (Lewellen et al., 1980). However, the reality is that capital markets are not fully efficient because of the presence of transaction costs and information asymmetry. Therefore, trade credit can be an efficient capital redistribution channel for cash-deficient companies to raise capital from more financially advantageous companies. In this case, the advantages possessed by suppliers of trade credit over traditional financial institutions are obvious.

Firstly, Schwartz and Robert (1974) find that the suppliers of trade credit have a cost advantage over traditional financial institutions. There are at least three sources of cost advantage. Firstly, suppliers of trade credit have the advantage in information acquisition (Brennan et al., 1988; Nam Sang Cheng, 2003; Petersen and Rajan, 1997). Secondly, suppliers of trade credit have the advantage in controlling the borrowers (Petersen and Rajan, 1997). Thirdly, suppliers of trade credit have the advantage in salvaging value from existing assets.

Secondly, from the perspective of operational efficiency, G. W. Emery (1984) points out that trade credit can separate the exchange of money and the exchange of goods, which will reduce transaction costs and increase operational flexibility. Nilsen (2002) finds that trade credit is important for both the suppliers and borrowers because it can reduce the costs related to collection activities.

Thirdly, from the perspective of corporate strategy, Brennan et al. (1988) point out that the supply of trade credit can be interpreted as a subtle way to convey the strategic pricing strategy (price discrimination). Suppliers offer price reduction to borrowers by offering further discounts in the event of timely payment or extending trade credit periods. In this way, products are priced differently for different customers, which does a great help for suppliers to resist the price restrictions of regulatory authorities and the retaliation of competitors.

2.2 Linking trade credit and economic policy uncertainty

Economic policy uncertainty is around the uncertainty related to macroeconomic events including the change of fiscal, regulatory or monetary policy. So it is considered as a kind of undiversifiable risk which has a significant impact on company financing and investment decisions through several mechanisms. Many scholars point out that economic policy uncertainty will lead to the increased volatility of cash flow, the restriction of borrowing capacity, the increase of operational risk and the decline of investment efficiency (Datta et al., 2019; Morikawa, 2016; Pastor and Veronesi, 2012; H. Wang et al., 2021). Therefore, the increase of EPU will change the decision-making of companies including capital budgeting, financing, and working capital decisions by aggravating their financial risk.

How will economic policy affect the supply of trade credit? The substitution hypothesis argues that, as economic policy uncertainty increases, monetary policy will become tighter and reduce the supply of bank loans, which will increase the supply of trade credit. During this period of high EPU, customers' demand for products may shrink or fluctuate, which is not conducive to the company's operation. At the same time, to the extent that EPU affects the credit market and creates financial shortages for financial institutions (Matousek et al., 2020), firm's demand for trade credit will increase. Supplier can increase their sales revenue and expand their market share by providing additional financing to customers. Using US public and private manufacturing companies, Meltzer (1960) finds that large manufacturing firms expand trade credit to non-manufacturers to mitigate their credit constraints. G. W. Emery (1984) believes that companies will increase sales by adjusting production strategy, changing prices or production, or providing more trade credit. Emery points out that the suppliers of trade credit can effectively transfer the deviation of product demand to the deviation of accounts receivable balance by increasing the supply of trade credit.

As trade credit is used as an alternative source of short-term financing during the period of monetary tightening (Atanasova, 2007; Nilsen, 2002; Pastor and Veronesi, 2012), the supplier companies may extend their

trade credit length or volume or both amid high EPU to help their customers to overcome the crisis because reducing trade credit may exacerbate the economic downturn, leaving customers and even losing business. Increasing the supply of trade credit has two main purposes: the first is to increase sales, and the second is to release signals for long-term cooperation. Actually, Kim and Choi (2003) find that both accounts payables and receivables would increase during the period of macro financial shock. Similarly, Love et al. (2007) point out that the accounts receivable of companies increase under the adverse economic environment. Annalisa Ferrandoa and Klaas Mulierb (2013) believe that the supply of trade credit from non-financial companies plays a buffering role in the financial crisis of the Euro area in 2007-2009.

III. MATERIALS AND METHODS

In this study, I examine the relationship between economic policy uncertainty and trade credit supply. Considering that listed companies are generally larger and have higher market positions, they have financing advantages and are more likely to offer trade credit. All A-shares listed on Shanghai Stock Exchange have been included in my sample, excluding financial companies. We collected financial and ownership data of sample companies from the CSMAR database from 2007 to 2021, and the sample is screened according to the following procedure: excluding data of financial companies, excluding loss-making enterprises for more than two consecutive years, excluding companies with total assets less than or equal to zero, excluding missing data. We winsorised all data at 1% and 99% levels. A total of 28688 annual companies observations remained in the sample.

3.1. Empirical methods

As mentioned in the literature review, the impact of EPU on the supply of trade credit is not clear according to the existing trade credit theory. On the one hand, companies may provide less trade credit during the period of high EPU because the high EPU increases their concerns about the customers' ability to repay debt, which is called the negative effect of EPU. On the other hand, some scholars believe that companies may provide more trade credit during the period of high EPU, which is called the positive effect of EPU. Customers may obtain fewer loans from traditional financial institutions amid high EPU. Therefore, during the period of high EPU, long-term relationship is valuable, and suppliers of trade credit will be willing to provide more trade credit to maintain this relationship. Generally, the net impact of EPU on the supply of trade credit relies on which effect dominates. If the positive effect dominates, the net impact is positive, and if the negative effect dominates, the result is reversed.

Firstly, in order to examine the impact of EPU on the supply of trade credit of Chinese listed firms, I use the following regression model:

$$TC_{i,t} = \beta_0 + \beta_1 EPU_t + \sum CONTROLS_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where $TC_{i,t}$ is the proxy variable for the trade credit supply of firm i in period t , which includes TC_COST and TC_INCOME . EPU_t refers to the economic policy uncertainty index in period t . $CONTROLS_{i,t}$ refers to the control variables involved in the regression. My study focuses on the coefficient β_1 . If β_1 is significantly less than 0, it indicates that EPU is negatively related to the trade credit supply of Chinese listed companies.

3.2. Variables

3.2.1. Trade credit supply measures

Following prior studies (Annalisa Ferrandoa and Klaas Mulierb, 2014; Mariassunta et al., 2011), I compute following measures of company trade credit:

On the basis of operating cost:

- $TC_COST = (\text{accounts receivable} + \text{bills receivable} + \text{prepaid accounts}) / \text{operating cost}$

On the basis of operating revenue

- $TC_INCOME = (\text{accounts receivable} + \text{bills receivable} + \text{prepaid accounts}) / \text{operating revenue}$

In addition, in order to increase the robustness of the results, my study uses the net trade credit variable.

On the basis of operating cost:

- $NTC_COST = (\text{accounts receivable} + \text{bills receivable} + \text{prepaid accounts} - \text{accounts payable} - \text{bills payable} - \text{deposit received}) / \text{operating cost}$

On the basis of operating revenue:

- $NTC_INCOME = (\text{accounts receivable} + \text{bills receivable} + \text{prepaid accounts} - \text{accounts payable} - \text{bills payable} - \text{deposit received}) / \text{operating revenue}$

3.2.2. Economic policy uncertainty measures

In my study, the reliability of economic policy uncertainty index is very important because economic policy uncertainty is my independent variable. I use the monthly index of China's economic policy uncertainty published by Baker et al. (2016) to measure the uncertainty of China's economic policy, and transform it into an annually one by computing the arithmetic mean value of the corresponding year for China and dividing it by 100. Baker et al. (2016) constructed the EPU index through textual analysis of mainstream news media evaluation of economic policy uncertainty. Baker et al. have freely distributed monthly updates to the China EPU metric since 2016. This index captures "who will make economic policy decisions, when and what economic policy actions will be taken, and the economic effects of policy actions". The index can not only reflect the economic policy uncertainty including monetary policy, fiscal policy and tax policy, but also reflect the mainstream news media's understanding and expectation of economic policy changes. So this index can measure economic policy uncertainty more accurately and overcome the shortcomings of previous related variables. Table 1 indicates that the mean value of EPU index is 1.96, the median value is 1.29, and the standard deviation is 1.08.

EPU is considered to be an exogenous variable of any specific companies because it is not within the control of the companies and is a macroeconomic variable, which may affect the behavior of companies. So, this feature alleviates my concern about the endogenous problem in the regression. In addition, the value of EPU in the last period will be used in the part of endogenous test, since this measure can help to reduce the potential endogeneity.

3.2.3. Control variables

I use the fixed effect model for regression. However, some company-level characteristics are also considered affecting the motivation of companies to provide trade credit. Following prior studies (Petersen and Rajan, 1997), I control these enterprise-specific variables: company size, asset-liability ratio, return on assets, company growth, cash flow from operating activities, company age, proportion of independent directors, Tobin Q value, short-term bank loan level, high-tech companies and cash holding level.

Table 1. The description of variables

| Variable Name | Variable Abbreviation | Meaning of Variables |
|---------------|-----------------------|--|
| Trade credit | TC_COST | (accounts receivable + bills receivable + prepaid accounts)/operating cost |
| | TC_INCOME | (accounts receivable + bills receivable + prepaid accounts)/operating revenue |
| | NTC_COST | (accounts receivable + bills receivable + prepaid accounts - accounts payable - bills payable - deposit received) / operating cost |
| | NTC_INCOME | (accounts receivable + bills receivable + prepaid accounts - accounts payable - |

| | | |
|--|--------|---|
| | | bills payable - deposit received) / operating revenue |
| Economic policy uncertainty | EPU | EPU annual average/100 |
| asset-liability ratio | LEV | Ratio of ending liabilities to total assets at the end of the period |
| company size | SIZE | Natural logarithm of total assets at the end of the period |
| cash flow from operating activities | OCF | Ratio of cash flow from operating activities to total assets at the beginning of the period |
| company growth | GROW | The ratio of the increase in operating revenue of the current year to the operating revenue at the beginning of the period |
| company age | AGE | Ln(time from the year of establishment to the current year plus 1) |
| proportion of independent directors | INDIR | Proportion of the number of independent directors in the number of directors |
| return on assets | ROA | Net profit/total asset |
| Tobin Q value | TOBINQ | The ratio of market value of the enterprise for the year to total assets at the end of the period |
| Short-term bank loan level | SLOAN | Assign a value of 1 to companies with short-term borrowings greater than the industry annual median, otherwise 0 |
| High-tech companies | HTECH | High-tech enterprises are assigned a value of 1, otherwise 0 |
| Cash holding level | CASH | Assign a value of 1 to companies with cash holding level greater than the industry annual median, otherwise 0 |

3.3 Data and descriptive statistics

Table 2 is the descriptive statistics of samples, which includes the number of observations, mean value, standard deviation, 25th percentile, minimum value, 50th percentile, 75th percentile and maximum value. From Table 2, I can see that the mean values of TC_COST and TC_INCOME is 0.33 and 0.30 respectively, which

indicates that trade credit accounts for more than 30% of operating income for the sample companies and there is a significant amount of trade credit provided by Chinese A-share listed companies. The mean value of EPU is 1.96, and the fluctuation range of EPU is relatively large, which fluctuates between 0.5 and 3.9.

Table 2. Summary statistics

| variable | N | mean | sd | min | P25 | P50 | P75 | max |
|------------|-------|-------|------|---------|-------|-------|-------|-------|
| TC_COST | 28688 | 0.33 | 0.25 | 0.0060 | 0.14 | 0.27 | 0.45 | 1.53 |
| TC_INCOME | 28688 | 0.30 | 0.23 | 0.0057 | 0.13 | 0.25 | 0.41 | 1.49 |
| NTC_COST | 28688 | 0.01 | 0.39 | -1.6635 | -0.11 | 0.01 | 0.16 | 1.07 |
| NTC_INCOME | 28688 | 0.01 | 0.27 | -1.6109 | -0.11 | 0.01 | 0.15 | 0.95 |
| EPU | 28688 | 1.96 | 1.08 | 0.5044 | 1.06 | 1.29 | 2.80 | 3.90 |
| SIZE | 28688 | 22.13 | 1.23 | 19.41 | 21.23 | 21.97 | 22.87 | 26.14 |
| LEV | 28688 | 0.43 | 0.20 | 0.0510 | 0.27 | 0.43 | 0.59 | 0.98 |
| ROA | 28688 | 0.04 | 0.05 | -0.315 | 0.01 | 0.03 | 0.07 | 0.20 |
| GROW | 28688 | 0.15 | 0.58 | -0.9654 | -0.05 | 0.09 | 0.26 | 6.52 |
| OCF | 28688 | 0.03 | 0.05 | -0.2381 | 0.00 | 0.03 | 0.05 | 0.18 |
| AGE | 28688 | 24.01 | 5.34 | 6.0000 | 21.00 | 24.00 | 29.00 | 64.00 |
| INDIR | 28688 | 0.19 | 0.05 | 0.0000 | 0.16 | 0.19 | 0.22 | 0.35 |
| TOBINQ | 28688 | 1.97 | 1.15 | 0.8604 | 1.25 | 1.60 | 2.26 | 9.90 |
| SLOAN | 28688 | 0.41 | 0.49 | 0.0000 | 0.00 | 0.00 | 1.00 | 1.00 |
| HTECH | 28688 | 0.28 | 0.45 | 0.0000 | 0.00 | 0.00 | 1.00 | 1.00 |
| CASH | 28688 | 0.49 | 0.50 | 0.0000 | 0.00 | 0.00 | 1.00 | 1.00 |

IV. RESULTS

4.1. The impact of EPU on trade credit supply

I present the results of testing the correlation between EPU and the supply of trade credit in Table 3. The dependent variable in columns (1) (3) is the supply of trade credit defined on the basis of operating costs (TC_COST). The dependent variable in columns (2) (4) is the supply of trade credit defined on the basis of operating revenues (TC_INCOME). The dependent variable in column (5) is the net supply of trade credit defined on the basis of operating costs (NTC_COST). The dependent variable in column (6) is the net supply of trade credit (NTC_INCOME) defined on the basis of operating income. Time and industry fixed effect is controlled in Columns (1) and (2), and time, industry and province fixed effect is controlled in Columns (3)-(6). We find that the coefficient of EPU index is positive and significant at the 5% level in the (1) and (2) columns. Adding to the province fixed effect, the coefficient of EPU index is positive and significant at the 1% level in the (3) and (4) columns. This result shows that in the period of high economic policy uncertainty, customers' demand for trade credit will increase. According to substitution theory, as economic policy uncertainty increases, monetary policy will become tighter and reduce the supply of bank loans, which will increase the demand of trade credit. Supplier can increase their sales revenue and expand their market share by providing additional financing to customers. In order to increase market share, retain customers and release signals of long-term cooperation, trade credit suppliers tend to increase the supply of trade credit. In column (3) the coefficient of EPU index is 0.0064, which suggests that one standard deviation increase in economic policy uncertainty will increase the average firm's trade credit supply by about 3.7%. Additionally, in the (5) and (6) columns, the coefficient between EPU and the net supply of trade credit is positive and significant at the 10% level, which enhances the robustness of the results. This conclusion is consistent with the argument of Lawrenz and Oberndorfer (2018) that suggests that, considered as a kind of substitute for the traditional financial institution debt, trade credit will increase during the period of high economic policy uncertainty.

Table 3. Impact of EPU on trade credit policy

| VARIABLES | (1) TC_COST | (2) TC_INCOME | (3) TC_COST | (4) TC_INCOME | (5) NTC_COST | (6) NTC_INCOME |
|---------------|-------------------------|--------------------------|-------------------------|-------------------------|--------------------------|--------------------------|
| EPU | 0.0053** (2.2275) | 0.0052** (2.4406) | 0.0063*** (2.6356) | 0.0063*** (2.8903) | 0.0052* (1.8110) | 0.0025* (0.9760) |
| SIZE | -0.0165*** (-5.2640) | -0.0162*** (-5.7255) | -0.0167*** (-5.3035) | -0.0164*** (-5.7702) | -0.0221*** (-5.8998) | -0.0186*** (-5.5066) |
| LEV | -0.0802*** (-3.9339) | -0.0552*** (-2.8828) | -0.0921*** (-4.6243) | -0.0657*** (-3.5070) | -0.6794*** (-26.2158) | -0.6290*** (-26.3905) |
| ROA | -0.6331*** (-9.8395) | -0.6761*** (-10.0862) | -0.5788*** (-9.2262) | -0.6264*** (-9.5989) | -0.2917*** (-4.2658) | -0.3202*** (-4.4804) |
| GROW | -0.0047* (-1.9228) | -0.0045** (-2.0757) | -0.0050** (-2.0486) | -0.0048** (-2.2280) | 0.0107*** (3.8605) | 0.0109*** (4.3124) |
| OCF | 0.6822*** (9.1691) | 0.0215 (0.2776) | 0.6729*** (9.1551) | 0.0134 (0.1764) | 0.3227*** (3.8517) | 0.3229*** (3.7289) |
| AGE | -0.0040*** (-6.2960) | -0.0036*** (-6.3482) | -0.0041*** (-6.4611) | -0.0038*** (-6.5093) | -0.0034*** (-4.9126) | -0.0031*** (-4.8405) |
| INDIR | 0.0225 (0.5755) | 0.0352 (1.0073) | 0.0519 (1.3531) | 0.0618* (1.7974) | -0.0473 (-1.0285) | -0.0183 (-0.4412) |
| TOBINQ | -0.0012 (-0.4750) | 0.0005 (0.2342) | -0.0013 (-0.5537) | 0.0004 (0.1696) | 0.0114*** (4.4685) | 0.0095*** (4.0540) |
| SLOAN | 0.0092 (1.6334) | 0.0082 (1.5779) | 0.0116** (2.1031) | 0.0104** (2.0528) | 0.1441*** (19.8340) | 0.1328*** (19.9709) |
| HTECH | 0.4501*** (4.7507) | 0.3536*** (6.4739) | 0.4940*** (6.8469) | 0.3961*** (10.6724) | 0.0606*** (7.5440) | 0.0559*** (7.5058) |
| CASH | 0.0270*** (6.1339) | 0.0273*** (6.7835) | 0.0271*** (6.2888) | 0.0271*** (6.9055) | 0.0341*** (6.4779) | 0.0312*** (6.5862) |
| Constant | 0.6881*** (9.5432) | 0.6629*** (10.1051) | 0.6238*** (8.5388) | 0.6025*** (9.0460) | 0.7630*** (9.4982) | 0.6669*** (9.1804) |
| Industry/Year | yes | yes | yes | yes | yes | yes |
| Province | no | no | yes | yes | yes | yes |
| Observations | 28,688 | 28,688 | 28,688 | 28,688 | 28,688 | 28,688 |
| R-squared | 0.3015 | 0.3192 | 0.2472 | 0.2407 | 0.3015 | 0.3192 |

Robust t-statistics in parentheses

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

4.2. Heterogeneity analysis

The heterogeneous characteristics of a company will affect the trade-off between the costs and benefits of the trade credit supply. Therefore, I will test whether different bank lending level, different cash holding level and different industry affect the relationship between economic policy uncertainty and the supply of trade credit. The bank lending level, the cash holding level and the industry are internal characteristics of the company. The study wants to explore the effect of internal factor heterogeneity on this relationship.

4.2.1. Short-term loan level

Compared with small companies, listed companies have higher market position and more excellent assets. Therefore, listed companies can build better relationships with banks or other financial institutions, making it easier to obtain loans. In this case, listed companies are in a better position to provide trade credit to upstream and downstream small enterprises to obtain certain financial returns (Buchak et al., 2018; Duchin et al., 2017). Additionally, companies with less bank credit are more likely to be affected by the crisis and will provide less trade credit to upstream and downstream enterprises. When a company has the ability to obtain more bank credit, it will be willing to maintain relationships with customers and obtain certain financial returns by providing trade credit. Thus, the contribution of economic policy uncertainty to the supply of trade credit is more significant among listed companies that have access to more liquidity supplements like short-term bank loans.

Short-term loan is measured by dividing the company's short-term loan by the total loan. The values are grouped according to the industry annual median. SLOAN takes a value of 1 when the short-term loan index is greater than the industry annual median, and 0 otherwise. The regression results show that the coefficients of EPU*SLOAN are significantly positive at the 1% level. Additionally, in the (3) and (4) columns, the coefficient between the net supply of trade credit and EPU*SLOAN is positive and significant at the 5% level, which enhances the robustness of the results. This result indicates that the positive effect of economic policy uncertainty on trade credit supply is more pronounced when firms have more short-term loans. This result is consistent with prior finding that firms are more likely to transfer short-term loans in the form of trade credit because of the higher cost of long-term bank credit (Love et al., 2007).

Table 4. Short-term bank loan level

| VARIABLES | (1) TC_COST | (2) TC_INCOME | (3) NTC_COST | (4) NTC_INCOME |
|---------------|------------------------|------------------------|------------------------|------------------------|
| EPU | 0.0076** (1.9887) | 0.0068** (1.9881) | 0.0355*** (6.9104) | 0.0302*** (6.5256) |
| SLOAN | -0.0049 (-0.5992) | -0.0052 (-0.6844) | 0.0543*** (5.3311) | 0.0498*** (5.2598) |
| EPU*SLOAN | 0.0101*** (3.1395) | 0.0109*** (3.6919) | 0.0024** (0.6202) | 0.0023** (0.6532) |
| controls | yes | yes | yes | yes |
| Constant | 0.7192*** (10.6867) | 0.6664*** (10.8764) | 1.3338*** (15.0909) | 1.2031*** (14.8419) |
| Industry/year | yes | yes | yes | yes |
| Province | yes | yes | yes | yes |
| Observations | 28,688 | 28,688 | 28,688 | 28,688 |
| R-squared | 0.3015 | 0.3192 | 0.2472 | 0.2407 |

Robust t-statistics in parentheses

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

4.2.2. Cash holding level

A company's cash holding level reflects its ability to allocate funds. When the level of cash holdings is higher, firms are more able to provide trade credit to customers. Therefore, the effect of economic policy uncertainty on the supply of trade credit is more significant in the sample with higher cash holding levels. Cash holding level of companies is measured by dividing the company's money capital by total assets. The values are grouped according to the industry annual median. CASH takes a value of 1 when the cash holding level of companies index is greater than the annual industry median value, otherwise it is 0. The test results are shown in columns (1) and (2) of Table 5, which show that the coefficient of EPU*CASH is significantly positive at the 1% level, indicating that the positive effect of economic policy uncertainty on the supply of trade credit is more

significant in the sample with higher levels of cash holdings, which proves that companies with higher cash holdings are more capable of providing trade credit in periods of high economic uncertainty.

Table 5. Cash holding level and high-tech companies

| VARIABLES | (1) TC_COST | (2) TC_INCOME | (3) TC_COST | (4) TC_INCOME |
|--------------|-----------------------|-----------------------|------------------------|------------------------|
| EPU | 0.0011 (0.2986) | 0.0008 (0.2403) | 0.0073** (1.9782) | 0.0087*** (2.5793) |
| CASH | 0.0041 (0.5680) | 0.0059 (0.9011) | | |
| EPU*CASH | 0.0123*** (3.9925) | 0.0113*** (4.0818) | | |
| HTECH | | | 0.5199 (7.0452) | 0.4206 (10.7998) |
| EPU*HTECH | | | -0.0096** (-2.4416) | -0.0091** (-2.5322) |
| Controls | yes | yes | yes | yes |
| Constant | 0.6263*** (8.6581) | 0.6017*** (9.1351) | 0.6222*** (8.5513) | 0.6003*** (9.0500) |
| Observations | 28,688 | 28,688 | 28,688 | 28,688 |
| R-squared | 0.2743 | 0.2913 | 0.2743 | 0.2914 |

Robust t-statistics in parentheses

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

4.2.2. High-tech companies

High-tech companies face more severe financing constraints because of their higher capital requirements for innovation investment, higher operational risk and weaker resilience to external uncertainty. Compared with high-tech enterprises, non-high-tech enterprises have more financial ability to provide external trade credit. Therefore, the effect of economic policy uncertainty on the supply of trade credit is less significant in the sample of high-tech companies. In my study, the general equipment, special equipment, transportation equipment, electrical machinery, communication equipment, instruments and culture as well as office machinery in the manufacturing industry are classified as high-tech industries. The test results are shown in columns (3) and (4) of Table 5, which show that the coefficient of EPU*HTECH is significantly negative at the 5% level, indicating that the positive effect of economic policy uncertainty on the supply of trade credit is less significant in the sample of high-tech companies.

4.3. Robustness tests

In this section, I provide some robustness checks of my main results.

4.3.1. Substitution of explanatory variables

In this section, my study replace the EPU index in the baseline regression by the economic policy uncertainty index (EPU2) compiled by the wind database, which is obtained by scaling the frequency of policy-related economic uncertainty articles in the South China Morning Post (SCMP), the leading English-language newspaper in Hong Kong. The test results are shown in Table 6, which show that the coefficient of EPU is significantly positive at the 1% level. The regression conclusion is consistent with the previous section.

Table 6. Substitution of explanatory variables

| VARIABLES | (1) TC_COST | (2) TC_INCOME | (3) NTC_COST | (4) NTC_INCOME |
|---------------|-----------------------|-----------------------|------------------------|------------------------|
| EPU2 | 0.0047*** (4.0760) | 0.0046*** (4.4550) | 0.0045*** (-3.2978) | 0.0050*** (-4.0114) |
| controls | yes | yes | yes | yes |
| Industry/year | yes | yes | yes | yes |
| Province | yes | yes | yes | yes |
| Constant | 0.6231*** (8.5170) | 0.6018*** (9.0233) | 0.7044*** (8.1866) | 0.6188*** (7.9109) |
| Observations | 28,688 | 28,688 | 28,688 | 28,688 |
| R-squared | 0.2740 | 0.2910 | 0.3224 | 0.3177 |

Robust t-statistics in parentheses

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

4.3.2. Using the previous Economic Policy Uncertainty index

According to the study of Phan et al (2019), the value of EPU in the last period (FEPU) can replace the value in the current period for robustness testing, which can help to mitigate the potential endogeneity, since current trade credit should not adversely affect the past EPU. The test results are shown in Table 7, which show that the coefficient of EPU is significantly positive at the 1% level. The regression conclusion is consistent with the previous analysis.

Table 7. Using the Previous Economic Policy Uncertainty Index

| VARIABLES | (1) TC_COST | (2) TC_INCOME | (3) NTC_COST | (4) NTC_INCOME |
|-----------|-------------------------|-------------------------|--------------------------|--------------------------|
| L.EPU | 0.0113*** (4.8162) | 0.0109*** (4.9809) | 0.0088*** (3.2206) | 0.0086*** (3.3192) |
| L.SIZE | -0.0165*** (-4.8887) | -0.0182*** (-5.8769) | -0.0221*** (-5.6120) | -0.0198*** (-5.4678) |
| L.LEV | -0.1048*** (-5.2098) | -0.0745*** (-3.9295) | -0.5225*** (-20.8950) | -0.4839*** (-20.6861) |
| L.ROA | -0.4359*** (-5.9645) | -0.3936*** (-5.5186) | -0.1994*** (-2.6524) | -0.1955*** (-2.6214) |
| L.GROW | -0.0043* (-1.6775) | -0.0045* (-1.9539) | 0.0087*** (3.0835) | 0.0086*** (3.3966) |
| L.OCF | 0.5493*** (6.5924) | 0.0798 (0.9702) | 0.3283*** (3.6772) | 0.3096*** (3.5098) |
| AGE | -0.0040*** (-5.8838) | -0.0036*** (-5.7582) | -0.0021*** (-2.9541) | -0.0019*** (-2.8911) |
| INDIR | 0.0757 (1.5944) | 0.0549 (1.2785) | 0.0053 (0.0987) | 0.0122 (0.2495) |
| L.TOBINQ | 0.0033 (1.2141) | 0.0020 (0.8174) | 0.0114*** (4.0463) | 0.0091*** (3.4997) |
| SLOAN | 0.0150*** (2.7308) | 0.0193*** (3.7898) | 0.1069*** (15.9785) | 0.0988*** (15.9255) |
| HTECH | 0.2691*** (6.9125) | 0.2412*** (6.6018) | 0.0995* (1.9454) | 0.0913** (2.0756) |
| CASH | 0.0319*** (7.0784) | 0.0343*** (8.2247) | 0.0246*** (4.8526) | 0.0221*** (4.7662) |
| Constant | 0.5723*** | 0.6007*** | 0.6552*** | 0.5949*** |

| | | | | |
|---------------|----------|----------|----------|----------|
| | (7.1827) | (8.2141) | (6.9246) | (6.8510) |
| Industry/year | yes | yes | yes | yes |
| Province | yes | yes | yes | yes |
| Observations | 23,777 | 23,777 | 23,777 | 23,777 |

Robust t-statistics in parentheses

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

V. 4.3.3. TSLS

This study uses two-stage least squares to reduce the endogeneity problem. Because of the correlation between Chinese economic policy uncertainty and US economic policy uncertainty, this study uses the annual average of US economic policy industry uncertainty (USEPU) as an instrumental variable for Chinese economic policy uncertainty (EPU). The regression results of the second stage show that the regression coefficients of EPU are all significantly positive at the 1% level. The results of the Kleibergen-Paaprk LM statistical test indicate that there is no unidentifiable problem and the results of the Cragg-Donald Wald F statistical test indicate that there is no weak instrumental variable problem, indicating that EPU promotes the supply of trade credit, confirming the robustness of the benchmark regression results.

Table 8. Two-stage least squares method

| | (1) First stage EPU | (2) Second stage TC_COST | (3) Second stage TC_INCOME |
|--------------------------------|---------------------------|--------------------------------|----------------------------------|
| USEPU | 1.3927*** (377.78) | | |
| EPU | | 0.0312*** (9.39) | 0.0309*** (10.38) |
| Kleibergen-Paaprk LM statistic | | 1940.86*** | 1940.86*** |
| Cragg-Donald Wald F statistic | | 7341.523*** | 7341.523*** |
| observations | | 28688 | 28688 |
| R ² | | 0.0002 | 0.0146 |

Robust t-statistics in parentheses

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

VI. CONCLUSION

In this study, I investigate the relationship between the economic policy uncertainty and the supply of trade credit. My analyses are based on a wide sample of approximately 5000 A-share listed companies in China from 2007 to 2021. My empirical results show that (i) economic policy uncertainty has a significant positive impact on trade credit supply. (ii) The heterogeneous characteristics of a company will affect the trade-off between the costs and benefits of the trade credit supply. The contribution of economic policy uncertainty to the supply of trade credit is more significant among listed companies with access to more bank credit, listed companies with higher levels of cash holdings and non-high-tech companies.

Additionally, my study also has some limitations which can provide opportunities to my further study. The first limitation is the source of data. Compared with listed companies, small companies' data is more difficult to obtain, so most of the companies included in my study sample are large and may not adequately reflect the situation of many small companies. Therefore, it is unclear whether and to what extent the results of this study are applicable to small enterprises. For example, compared with large listed companies, small companies have less financing channels and less capacity to bear risks, so they may be more sensitive to economic fluctuations and have special business strategies to cope with the impact of EPU. In the future, I can collect more data of mall-scale and even micro-scale companies, and see whether the conclusions of the study are different. Secondly, although my study examines the relationship between the economic policy uncertainty and the supply of trade credit, I do not further investigate the intrinsic mechanisms or analyze the economic consequences of this behavior. For example, during the period of high EPU, I do not know whether it is wise for companies to increase the supply of trade credit from the perspective of long-term supplier-client relationship,

financial risk, profitability and sustainable growth. In future research, I should design more detailed empirical models to analyze relevant mechanisms and consequences.

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