Macro-Economic Uncertainty, Capital Structure and Corporate Investment
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ABSTRACT
The capital structure and Investment of enterprises is the basis for the existence and development of them. However, there are many unstable factors in Chinese macro-economy. Our research shows that macro-economic uncertainty has a significant effect on the relationship between Capital structure and Corporate investment (RCSCI in brief). The increasing of uncertainty can decrease the positive effect of capital structure on investment. The research also shows that both state-owned enterprises and financial enterprises’ RCSCI are less sensitive to the Macro-economic uncertainty so we eliminated these two sorts of companies.

Keywords: finance, accounting, corporate finance

1. INTRODUCTION
With the development of global economy, enterprises are facing more and more fierce competition and challenges. So it is very important for enterprises to have good capital structure and investment management. In order to get higher profits, it is highly necessary for companies to understand how macro-economic uncertainty affect the relationship between their capital structure and investment so that they can correct decision in the appropriate time.

The financial theory shows that the increase of macro-economic uncertainty makes it difficult for the company to form a stable forecast for the future economic trend, this prompt the company to change the investing behaviour and their capital structure. In the exiting research, Keynes(1936) highlighted that when firms forecast the rate of return on investment, they will deliberate the level of macro-economic uncertainty. The higher the uncertainty, the greater the risk implicit in the companies’ investment, so the demand for investment will be lower. Another argument is that Beaudry(2001) said higher macro-economic uncertainty leads to a lower rate of investment. But as the money supply becomes more and more predictable, the companies’ expected earnings will also be more predictable, which eventually leads to higher investment. The classic theory also told that macro-economic uncertainty influences enterprises’ financing as well. Moreover, Modigliani and Miller(1958) believed that in a perfect market, the external capital and internal capital of an enterprise could be completely replaced, so the investment behavior was not affected by the financial status of the company, but only related to the investment demand of the enterprise. But in fact, there will never be a perfect market and a lot of research (Bernanke,1989; Gertler, 1990; Gertler,1992) both show that financing has a significant impact on investment.

So how should firms change their financing and investing strategy under different macro-economic uncertainty? What is the relationship between the enterprises’ capital structure and their investment? How macro-economic uncertainty influence these relationships? The extant researches mostly focus on how the uncertainty impacts companies’ capital structure or investment. However, the research on the combination of macro-level and micro level is lacking. Our contribution is to solve those three questions with some detailed data of Chinese listed companies and to help enterprises to make the correct decision in financing and investing.

2. SAMPLE, VARIABLES AND SUMMARY STATISTIC
We start our sample with all the listed Chinese firms in the CSMAR database during the years 2002-2018. We exclude financial firms and utility firms because their balance sheet is always higher than others and was less sensitive to the macro-economic uncertainty. We winsorize each of the accounting variables at the top and bottom 1% to reduce the influence of outliers.

2.1. Sample and Firm-Level Variables
The enterprise-level variables are as follows:
Size. We measure companies’ size with the natural logarithm of their total assets. We choose this measure because it is the broadest possible measure of companies’ size.
Tobin’s q(q). We measure Tobin’s q with total assets value divided by total market value.
MB. The ratio of market value to book value.
Lev. Assets liability ratio of enterprises.
Stock(S). Inventory of the current quarter divided by total assets of the preceding quarter.
Firm Investment). (Net fixed value of the current quarter - Net fixed value of the preceding quarter + construction in process) divided by Net fixed value of the preceding quarter.

2.2. Measuring macro-economic uncertainty.

Mu1. We use Mu1 to measure the level of macro-economic uncertainty. We use GRACH(1,1) model to measure the conditional variance of the quarterly rate of change in the GDP of China, all scaled by lagged data. The GRACH(1,1) model is as follows.

\[ m_i = \alpha_0 + \alpha_i \sum_{i=1}^{n} m_{i-1} + e_i \quad (1) \]

\[ h_i = r_0 + r_i e_{i-1}^2 + r_i h_{i-1} \quad (2) \]

In these two functions, \( m \) is the logarithmic first-order difference of macro-economic variables and \( e \) is the error term. \( H \) is the conditional variance of the error term estimated by the GRACH(1,1) model. According to the equation (1) and (2), we measure the quarterly real GDP change rate of China by GRACH(1,1) model and then we do the first-order autoregression analysis. The conditional variance obtained by the GRACH(1,1) model is used as the measurement index of the macro-economic uncertainty of China.

3. THE RELATIONSHIP BETWEEN ENTERPRISES’ CAPITAL STRUCTURE AND INVESTMENT

3.1. Regression Framework

In these sections of the paper, we developed our regression framework. Consider a cross-sectional, quarterly regression of capital structure scaled by lagged data on contemporaneous investment:

\[ \frac{L_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_i \times EM_i + \beta_i \times (EM_i \times MU_i) \cdot + \beta_i \times \text{Lev}_{i,t-1} + \beta_i \times \text{LSD}_{i,t-1} + \beta_i \times \text{S}_{i,t-1} \quad (3) \]

Table I reports summary statistics for the primary variables used in this study. EM is the variable to measure the assets liability ratio under different circumstances. Tobin’s q is measured by total assets value divided by total market value. It is used to show the firm investment. (Here we use tobinqa to represent the investment.) If q>1, the market value of company is higher than the replacement cost of capital. As a result, enterprises will tend to spend more money in investing. If q<1, the result will be opposite to the former. MB shows the ratio of market value to book value. Lev shows the assets liability scale of firms. Accounts is the variable to describe companies’ receivables and it is the current quarter divided by the total assets of the former quarter. We measure companies’ size with the natural logarithm of their total assets. Roa is pre-tax profit divided by total investment and MU1 is used to measure the macro-economic uncertainty. We defined Investment as the Net fixed value of the current quarter minus the Net fixed value of the preceding quarter and then plus the construction in process, eventually use the former result divided by Net fixed value of the preceding quarter. All of these variables are scaled by lagged assets.
3.1.1. Empirical Findings

3.1.1.1. Mean Difference Comparison

In Table II, the datum shows the gap of investment opportunity between the enterprises with high capital structure and low capital structure. G1(0) are the groups of lower capital structure and G2(1) are the groups of higher asset-liability ratio. We use 5 ways to measure the capital structure. (Can be found at the former of our essay.) The graph reports that no matter what methods we use to define the capital structure, the groups consist of firms with higher capital structure always have stronger trends to do investment. And because the result of the differences of investment tendency are all significant at 1%, we purpose that the level of capital structure might have a positive influence on investment. (*Significant at 10%, **Significant at 5%, ***Significant at 1%)

| Variables | G1(0) | Mean1 | Mean2 | MeanDiff |
|-----------|-------|-------|-------|----------|
| tobinga (EM1) | 27229 | 2.131 | 2.283 | -0.151*** |
| tobinga (EM2) | 27251 | 2.056 | 2.573 | -0.517*** |
| tobinga (EM3) | 25568 | 1.818 | 2.647 | -0.829*** |
| tobinga (EM4) | 26954 | 2.217 | 2.308 | -0.091*** |
| tobinga (EM5) | 23502 | 2.168 | 2.370 | -0.102*** |

3.1.1.2. The Basic Regression

Table III is the basic regression of the research. The dependent variable is an investment. See Table I for variable definitions. For the basic regression formula, see equation (1). All regressions include firm and year fixed effects. From the combination of the graph and the regression, we conclude that when the level of macro-economic uncertainty goes higher, the influence of capital structure on investment will be slightly decreased. And if the macro-economic uncertainty is at the same level, the higher the assets liability ratio is, the more investment firms will make. Standard errors are clustered on both firm and year. Robust t-statistics are reported in the parentheses. (*Significant at 10%, **Significant at 5%, ***Significant at 1%, because of the compatible issues, standard errors are shown in the second line of each variable.)

Table III reports estimates of equation (1) in which investment in the dependent variable. In the fourth model, which uses EM4 and EM2MU1 to measure the capital structure and the macro-economic uncertainty, both EM4, Lsdebt and Constant are positive and significant. And both EM4MU1, MB and Size are negative and significant, consistent with the findings in previous studies (e.g., Wang Yizhong, Frank M. Song(2014)). The EM4 coefficient is 10.84 (standard deviation (SD)==2.047), so the regression shows that a 1-SD increase in EM4MU2 results in a 22.19 increase in investment. Investment (tobinga) has a mean value of 2.225, so this denotes an increase of 32.1%. The EM4MU1 (interaction of capital structure defined by EM4 and macro-economic uncertainty) coefficient is -8.989 (standard deviation (SD) =2.648), showing that a 1-SD increase in EM4MU1 lead to a 23.80 decrease in total investment, which is about a 31.8% decrease. These report that the assets liability ratio has a positive and significant relationship with the firms’ investment while the macro-economic uncertainty can negatively affect these relationships. That means the higher the economic uncertainty is, the smaller the capital structure investment coefficient is.

In the other regressions, we use different ways to measure the capital structure. (The definitions of each EM can be found at I. Sample, variables and summary statistic of our essay.) All of the regressions report the same relation of the variables which eventually matches our findings.

3.2. Regression Testing.

3.2.1. Variables Controlled

In this part, we control the variables and find out those enterprises with a similar datum at other aspects except the capital structure. That means we want to show how the macro-economic uncertainty impacts the relationship between capital structure and investment visually. After controlling other variables, the sample size has a decrease of about 50000. These make our research become clearer and reduce the error caused by other samples. (*Significant at 10%, **Significant at 5%, ***Significant at 1%, because of the compatible issues, standard errors are shown in the second line of each variable)

$$I_{it} = \alpha_i + \alpha_t + \beta_1 \times EM_i + \beta_2 \times (EM_i \times MU_{ij}) + \epsilon_{it}$$ (4)

Using equation (2). We found that all EM1 to EM5 has a positive relationship with investment and both EM2 and EM4 are significant. In the fourth regression of the Table IV, which uses EM4 to measure the asset-liability ratio and use EM4MU1 to measure the macro-economic uncertainty. The EM4 coefficient is 7.479 (standard deviation (SD)=1.757), so this regression shows that in enterprises which have similar datum in other aspects but just different in capital structure, a 1-SD increase in EM4 lead to a 13.14 increase in investment. It reports a 30.8 % increase. The EM4MU1 coefficient if-5.115 (standard deviation(SD)==2.147), showing that a 1-SD increase in EM4MU1 results in a 10.98 decrease in investment, which is about a % decrease. Although in regression (1), regression (3) and regression (5) the EM1MU1, EM3MU1 and EM5MU1 all have a positive relation with investment; they are all insignificant. Combining with the result of Table III, we find that the reliable significant results all report a negative The basic Regression correlation between EM(n)MU1 and investment. (The definitions of each EM can be found at I. Sample, variables, and summary statistic of our essay.)
TABLE 3. BASIC REGRESSION

| INV  | INV2 | INV3 | INV4 | INV5 |
|------|------|------|------|------|
| EM1  | 1.156 |      |      |      |
| EM2MU1 | 0.0006 |      |      |      |
| EM2  | 1.86 | 6.34*** | 1.97 |      |
| EM2MU1 | -2.806 | 2.102 |      |      |
| EMS  | 1.028 |      | 14.65 |      |
| EM3MU1 | 24.05 | 30.95 |      |      |
| EM4  | 16.84*** | 2.047 |      |      |
| EM4MU1 | 46.92*** | 2.047 |      |      |
| EMS  | 3.845 | 2.86 | 0.628 | 5.017 |

NB | -1.11*** | -1.11*** | -1.11*** | -1.11*** | -1.11*** |
| Ldshft | 0.0122*** | 0.0127*** | 0.0099*** | 0.0134*** | 0.0134*** |
| Accounts | -2.849 | -2.849 | -2.849 | -2.849 | -2.849 |
| Stock | 2.15 | 2.15 | 2.15 | 2.15 | 2.15 |
| Size | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Lev | 2.10 | 2.10 | 2.10 | 2.10 | 2.10 |
| constant | 0.611*** | 0.611*** | 0.611*** | 0.611*** | 0.611*** |
| Firm fixed effects | yes | yes | yes | yes | yes |
| Year fixed effects | yes | yes | yes | yes | yes |
| N | 32685 | 32685 | 32685 | 32685 | 32685 |
| r2 | 0.0415 | 0.0456 | 0.0046 | 0.0035 | 0.0053 |

3.2.2. Sample Selection Bias Analysis

In this part of our essay, we analyse the sample selection bias and use invmillsl values to find out that if our research has these problems. We deduce that the sample selection bias of our paper might come from the sorts of firms that we choose. That is because our datum is gained from CSMAR database which only includes the datum of listed companies. It means the datum we use may all consist of high-capital-structure companies because listed firms tend to do more financing than others. Following (James J. Heckman 1979), we use invmills values to measure whether there is sample selection bias in our research. If invmills values are significant, it means there is a sample selection bias in our study. If not, it means our sample selection can represent the entirety. (*Significant at 10%, **Significant at 5%, ***Significant at 1%)

We set up control groups. In regression (1) and (2), we have not put the invmills values into regression but in regression (3) to (5), we do so. Although we put the invmills values into regression (4) and have not put it into regression (2), the coefficient of EM(n) is both positive and significant while that of EM(n)MU1 are both negative. And the invmills values of regression (3) to (5) are all not significant. As a result, we think there is no sample selection bias in our study. (The definitions of each EM can be found at I. Sample, variables, and summary statistic of our essay.)

COMPARING THE FOUR REGRESSION OF TABLE IV AND TABLE V, WE FIND THAT THE HIGHER THE LEVEL OF MACRO-ECONOMIC UNCERTAINTY IS, THE LOWER THE EM COEFFICIENT WITH THE INVESTMENT WILL BE. IN TABLE IV, EM4 COEFFICIENT IS 7.479, WHILE EM4MU1 COEFFICIENT IS -5.115, SO THAT THE MU1 COEFFICIENT IS -0.68. IN TABLE V, EM4 COEFFICIENT IS 6.637 WHILE EM4MU1 COEFFICIENT IS -4.86, SO THAT THE MU1 COEFFICIENT IS -0.73. THAT MEANS THE HIGHER MU1 COEFFICIENT IS, THE LOWER EM4 COEFFICIENT WILL BE.

TABLE 4. VARIABLES’ CONTROLLED

| INV  | INV2 | INV3 | INV4 | INV5 |
|------|------|------|------|------|
| EM1  | 0.117 |      |      |      |
| EM2MU1 | 18.75 |      |      |      |
| EM2  | 2.93 | 1.49 |      |      |
| EM2MU1 | -1.934 | 1.177 |      |      |
| EM3  | -0.872 |      | 19.55 |      |
| EM3MU1 | -0.941 | 31.37 |      |      |
| EM4  | 6.637*** |      | 2.806 |      |
| EM4MU1 | -4.86*** | 3.48 |      |      |
| PWS | 0.972 |      | 0.756 |      |
| PWSMU1 | 2.238 |      | 6.56 |      |
| invmills | 3.352 | 7.55 | 4.311 |      |
| constant | 13.34*** | 14.61*** | 2.927 | 6.415 |
| Control variables | yes | yes | yes | yes |
| Firm fixed effects | yes | yes | yes | yes |
| Year fixed effects | yes | yes | yes | yes |
| N | 31412 | 20910 | 74324 | 20955 |
| r2 | 0.00431 | 0.00229 | 0.00429 | 0.00317 |

482
3.2.3. Intervening Analysis of ROA

In this section, we discuss how the capital structure has an influence on investment. We try to find out how the capital structure make an influence on firms' investment by impacting the rate of capital return. This means we deduce that the higher the capital structure is, the higher the capital return will be, and the higher the ROA will be, the more investing the enterprises will make. In Panel A, we will talk about if the capital structure has a dominant relationship with the ROA. And then, in Panel B, we will discuss if the ROA has a positive and significant relationship with investment to prove that the capital structure impacts the investment by making a difference in the ROA. And we use regression to measure if the ROA has a dominant relation with the macro-economic uncertainty. If not, the conclusion that the capital structure makes an influence on investment via the ROA will be proved. (**Significant at 10%, **Significant at 5%, ***Significant at 1%, because of the compatible issues, standard errors are shown in the second line of each variables.)

The graph reports that all the measurements of capital structure are positive and significant to the ROA. And from the former Tables, we have concluded that the capital structure has a positive and significant relationship with investment. So we deduce that the capital structure might impact the investment by making a difference in the ROA.

### PANEL A. INTERVENING ANALYSIS OF ROA (1)

|      | inv1 | inv2 | inv3 | inv4 | inv5 |
|------|------|------|------|------|------|
| EM1  | 0.117 |      |      |      |      |
| EM1MU1 | 10.34 |      |      |      |      |
| EM2  | 18.75 |      |      |      |      |
| EM2MU1 | 25.94 |      |      |      |      |
| EM3  | -6.807 |      |      |      |      |
| EM3MU1 | 19.55 |      |      |      |      |
| EM4  | 0.667** |      |      |      |      |
| EM4MU1 | 2.956 |      |      |      |      |
| EM5  | -3.8 |      |      |      |      |
| EM5MU1 | 0.972 |      |      |      |      |
| invall1 | 3.452 | 7.5 | 4.411 |      |      |
| constant | 13.58** | 14.81** | 2.247 | -6.715 | 5.104 |
| Control variables | yes | yes | yes | yes | yes |
| Year fixed effects | yes | yes | yes | yes | yes |
| N | 39565 | 39566 | 38215 | 38935 | 37618 |
| r2 | 0.314 | 0.327 | 0.312 | 0.315 |      |

### PANEL B. INTERVENING ANALYSIS OF ROA (2)

|      | tohinmp1 | tohinmp2 | tohinmp3 | tohinmp4 | tohinmp5 |
|------|-----------|-----------|-----------|-----------|-----------|
| EM1  | 5.393**   | 6.505**  | 5.925**  | 5.281**  | 5.063**  |
| EM1MU1 | 0.36 |      |      |      |      |
| EM2  | 0.021 |      |      |      |      |
| EM2MU1 | 6.021 |      |      |      |      |
| EM3  | 12.36**  | 1.017 |      |      |      |
| EM3MU1 | 4.004** |      |      |      |      |
| EM4  | 9.764*** | 1.747 |      |      |      |
| EM4MU1 | -0.002** |      |      |      |      |
| EM5  | 1.625*** |      |      |      |      |
| EM5MU1 | -0.206*** |      |      |      |      |
| roa | 5.03***  | 4.19***  | 5.17***  | 4.19***  | 4.18***  |
| roaMU1 | -0.27 | -0.145 | -0.364 | -0.003 | 0.315 |
| Firm fixed effects | yes | yes | yes | yes | yes |
| Year fixed effects | yes | yes | yes | yes | yes |
| N | 89285 | 89285 | 89285 | 89285 | 89285 |
| r2 | 0.206 | 0.205 | 0.205 | 0.205 | 0.205 |

In the first regression, the EM1 coefficient is 0.0186 (standard deviation (SD)=0.00696), so this regression shows that a 1-SD increase in EM4 leads to a 12.98% increase in the ROA. In the other regressions, EM4 always has a positive and significant relation with the ROA. Although the coefficients are no so big that we can
conclude the capital is the dominant factor acting on the ROA, it does have a strong correlation between them.
In Panel B, the term ROA and ROAMU1 are put into the basic regression in order to show the relationship between ROA and investment. The term ROAMU1 is used to show the relationship between ROA and MU1. In all of the five regressions, ROA terms are positive and significant with Tobinga terms. All of ROA terms are significant at 1% and all of roaMU1 terms are not significant with Tobinga terms. This phenomenon means that the capital structure affect firms’ investment by influencing ROA, regardless of the level of the macro-economic uncertainty.

3.2.4. Intervening Analysis of Financing Constraints

In this section, we continue to discuss how capital structure affect investment. We use financing constraints as mediating variable. This means, the higher the capital structure is, the higher the capital return will be, and the higher the ROA will be, the more the firm will invest. In Panel F, we will talk about if the capital structure has a dominant relationship with the ROA. And then in Panel G, we will discuss if the ROA has a positive and significant relationship with investment to prove that the capital structure impact the investment by make a difference to the ROA. And we use a regression to measure if the ROA has a dominant relation with the macro-economic uncertainty. If not, the conclusion that the capital structure makes an influence on investment via the ROA will be proved. (*Significant at 10%, **Significant at 5%, ***Significant at 1%, because of the compatible issues, standard errors are shown in the second line of each variables.)

**PANEL C. INTERVENING ANALYSIS OF FINANCING CONSTRAINTS (1)**

|          | inv1 | inv2 | inv3 | inv4 | inv5 |
|----------|------|------|------|------|------|
| EM1      | 2.923* |      |      |      |      |
| EM1MU1   | 1.301 |      |      |      |      |
| EM2      | 1.825* |      |      |      |      |
| EM2MU1   | 0.206 |      |      |      |      |
| EM3      | 1.202 |      |      |      |      |
| EM3MU1   | 0.439 |      |      |      |      |
| EM4      | 3.697* |      |      |      |      |
| EM4MU1   | 1.661 |      |      |      |      |
| EM5      | 2.025** |     |      |      |      |
| EM5MU1   | 0.941 |      |      |      |      |

**PANEL D. INTERVENING ANALYSIS OF FINANCING CONSTRAINTS (2)**

|          | GFin1 | GFin2 | GFin3 | GFin4 | GFin5 |
|----------|-------|-------|-------|-------|-------|
| EM1      | 0.063*** |     |      |      | 0.0215 |
| EM2      | 0.195*** |     |      |      | 0.0235 |
| EM3      | 0.0252 |      |      |      | 0.0474 |
| EM4      | 0.273*** |     |      |      | 0.0479 |
| EM5      | 0.159*** |     |      |      | 0.0221 |

**PANEL E. STATE OWN ENTERPRISES**

|          | GFin1 | GFin2 | GFin3 | GFin4 | GFin5 |
|----------|-------|-------|-------|-------|-------|
| EM1      | 0.063*** |     |      |      | 0.0215 |
| EM2      | 0.195*** |     |      |      | 0.0235 |
| EM3      | 0.0252 |      |      |      | 0.0474 |
| EM4      | 0.273*** |     |      |      | 0.0479 |
| EM5      | 0.159*** |     |      |      | 0.0221 |

**PANEL F. EUROSphere ENTERPRISES**

|          | inv1 | inv2 | inv3 | inv4 | inv5 |
|----------|------|------|------|------|------|
| EM1      | 2.923* |      |      |      |      |
| EM1MU1   | 1.301 |      |      |      |      |
| EM2      | 1.825* |      |      |      |      |
| EM2MU1   | 0.206 |      |      |      |      |
| EM3      | 1.202 |      |      |      |      |
| EM3MU1   | 0.439 |      |      |      |      |
| EM4      | 3.697* |      |      |      |      |
| EM4MU1   | 1.661 |      |      |      |      |
| EM5      | 2.025** |     |      |      |      |
| EM5MU1   | 0.941 |      |      |      |      |

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484
In this section, we try to find out if financing constrains make an influence on investment. This means we think financing constrains may also the mediating variable between capital structure and investment. In Panel C, the first, second, fourth and fifth regression all show that the capital structure has a positive and significant correlation with financing constrains. And all of them are significant at 1%, thus, we come up with a hypothesis that the capital structure affect investment by make an influence on financing constrains.

To formulate our hypothesis, we put the term GFIN (financing constrains) and GFINMU1 into the basic regression which is shown as Panel D. In each of the regression in panel D, both GFIN terms and GFINMU1 terms are significant with Tobinqa terms. That means GFIN has a positive relationship with investment but it also has a significant correlation with macro-economic uncertainty, which denotes that capital structure impact investment by affecting GFIN and the coefficients are influenced by macro-economic uncertainty.

| Year fixed effects | Firm fixed effects | inv1  | inv2  | inv3  | inv4  | inv5  |
|-------------------|-------------------|-------|-------|-------|-------|-------|
| EM1               |                   | 8.767*** | 13.96 |       |       |       |
| EM1MU1            |                   | -18.63** |       |       |       |       |
| EM2               |                   | 5.623** | 1.676 |       |       |       |
| EM2MU1            |                   | -3.151** |       |       |       |       |
| EM3               |                   | 22.25  | 41.38 |       |       |       |
| EM3MU1            |                   | 47.70  | 23.94 |       |       |       |
| EM4               |                   | 10.59*** | 2.138 |       |       |       |
| EM4MU1            |                   | -10.01*** | 1.459 |       |       |       |
| EM5               |                   |       | 0.823 |       |       |       |
| EM5MU1            |                   |       | 2.596 |       |       |       |
| constant          |                   | 9.311*** | 15.83*** | 7.071** | 16.68*** | 15.03*** |
|                   |                   | 1.821 | 5.064 | 3.201 | 5.781 | 4.539 |
| Year fixed effects |                   | yes   | yes   | yes   | yes   |       |
| Firm fixed effects |                   | yes   | yes   | yes   | yes   |       |

In Panel F, which report the regression of private enterprises, both the first and the second regressions’ EM(n)MU1-coefficients are negative and significant at 5%. In the fourth regression, both the coefficients of capital structure and EM(n)MU1 are significant at 1%. And all EM(n)MU1-coefficients of regression (1) (2) (4) are negative. These report that in private enterprises, it is highly possible that the higher the macro-economic uncertainty is, the lower positive the coefficient between capital structure and investment will be.

### 3.2.5. State Own Enterprises and Private Enterprises

In the start of our essay, we have mentioned that state own enterprises’ datum is eliminated from our paper. In this section, we will report why we do so and show how macro-economic uncertainty affects the relationship between capital structure and investment of state own enterprises. Using the basic regression model, we set a control group, one of it uses private enterprises’ datum and the other uses state own enterprises’ datum. Because we have done the basic regression analysis, variables control, sample selection bias analysis and intervening analysis, in this table, we will directly analyse the relation between EM, EMU1 and investment. (**Significant at 10%, **Significant at 5%, ***Significant at 1%, because of the compatible issues, standard errors are shown in the second line of each variable.)

In Panel E, which reports the regression of state own enterprises, all the measurements of capital structure are positive and significant to investment while all EM(n)MU1 terms are not significant. This means the macro-economic uncertainty might just make a very slight influence on state own enterprises’ investing behaviour. This phenomenon is because state own enterprises will be affected by state intervention, which make them better funded than private enterprises. As a result, macro-economic uncertainty impact their investing behaviour slightly.

In Panel F, which report the regression of private enterprises, both the first and the second regressions’ EM(n)MU1-coefficients are negative and significant at 5%. In the fourth regression, both the coefficients of capital structure and EM(n)MU1 are significant at 1%. And all EM(n)MU1-coefficients of regression (1) (2) (4) are negative. These report that in private enterprises, it is highly possible that the higher the macro-economic uncertainty is, the lower positive the coefficient between capital structure and investment will be.

### 4. CONCLUSION

The results in this paper suggest that macro-economic uncertainty have significant and negative effects on the coefficient between capital structure and investment. In the introduction, we have explained how our essay relate to previous researches of finance and economy.

In a recent paper, J Jiang, X Xia and J Yang (2018) study the capital structure management based on investment. The authors point out that ‘the flexibility of dynamic investment and capital accumulation induces the firm to take the lower leverage at financing time.’ Our paper shows that the level of macro-economic uncertainty might also make an influence on the relationship of capital structure and investment, thus, considering the effects of macro-economic uncertainty may be useful for future papers researching the relation between capital structure and investment.
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