

A Study on Debt Sources Structure, Term Structure and Investment Level of Listed Retail Companies

Xu Anxin¹ and Lin Wenhe²

¹College of Management, Fujian Agriculture and Forestry University,
Fuzhou, Fujian, China 350002
E-mail: anxin5000@126.com

²College of Management, Fujian Agriculture and Forestry University, Fuzhou, Fujian 350002

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ABSTRACT Debt source structure, term structure and investment level have gained much attention from the academic community. Many scholars have done fairly deep research on them. However, most of the research mainly centered on the overall listed companies or listed manufacturing companies. Specialized studies on listed retail companies are rare. Obviously, listed retail companies are different from other listed ones that blind use of the findings from the research on overall listed companies or listed manufacturing ones are unscientific and unreliable. Therefore, based on dynamic panel data model, this paper investigates the interactive relation among debt source structure, term structure and investment level of the selected 180 listed retail companies by analyzing their financial data from 1989-2011. The findings show that both debt source structure and term structure have obvious negative correlations with the investment level of the retail companies in China; bank credit has higher inhibitory effects on investment than commercial credit does, and floating debt is weaker than non-floating debt in terms of their negative impacts on investment; compared with bank credit, commercial credit has a more long-term effect on investment; and, compared with non-floating debt, the influence of floating debt on investment is much shorter.

INTRODUCTION

In Perfect Market of neoclassical theory (Modigliani and Miler 1958), enterprises' financing methods have nothing to do with their investment decisions. However, with the development of New Institutional Economics and Information Economics, there has been much more attention from the academic circle to contract incompleteness and information asymmetry as well as the imperfection of capital markets as a result of the former two factors. Based on the premise of imperfection, the relation between enterprises' financing methods and investment strategies shall be questioned. Meanwhile, with enterprises' deeper exploration of investment practice, conflicts of interests between bailors and agents have become an inevitable fact. Usually, agents would make some suboptimal investment decisions to maximize their own interests. But more and more scholars found that appropriate financing methods could effectively re-

lieve or even restrain the conflicts so that agents would make the best investment decisions for bailors. It is thus clear that no matter for the development of theories or the requirement of practice, there hides a certain kind of inseparable relation between enterprises' financing methods and their investment behaviors; and, the dependency and relevance of debt, as an important part of financing methods, with enterprises' investment is of greater value for this research and exploration. Listed retail companies have their own characteristics, and their debts' influence upon investment is surely different from other listed ones'. This paper, with selected listed retail companies as the research objects, restudies debts' source structure, term structure and investment level and fully explores their interactive relation, with a hope to provide necessary complement and beneficial instructions to the theories and practice in this field.

Literature Review

The Relation between Debt Source Structures and Investment Levels of Companies

Debt's constraints and inhibitions to companies have been proved by more and more litera-

Address for correspondence:

Xu Anxin
College of Management
Fujian Agriculture and Forestry University
Fuzhou, Fujian, China 350002
E-mail: anxin5000@126.com

tures. Jensen and Meckling (1976) and Myers (1977), from the perspective of Principal-agent Theory, held that debts weakened companies' initiative of pursuing some profitable projects, which resulted in under-investment. Aivazian et al. (2005) and Zhu et al. (2014) studied the negative effects of debt on corporate investment, in terms of business growth and ownership. The former believed that the constraints of debt to invest in the low-growth enterprises significantly were greater than high-growth enterprises. The latter believed that debt was positively correlated with corporate investment, the greater the debt, the higher enterprises investment spending.

Enterprises' debt sources are mainly from the following three aspects of bank credit, commercial credit and corporation bonds. Generally speaking, corporation bonds take a very small proportion in the whole debt amount. Therefore, when studying debt source structure, related scholars mainly compared the proportions of bank credit and commercial credit. In foreign countries, Smith (1979) pointed out that debt's negative impact on investment mainly came from debtor's constraints to management layers in companies, especially from the strict supervision and detailed provisions for the loan; therefore, bank credit had a greater negative impact on enterprises' investment than commercial credit did. Then, based on Smith (1979), Lins et al. (2004) had a further thought that actually not all types of bank credits had inhibitory effects on enterprises' over-investment; but in general, bank credit still had a greater negative impact on enterprises' investment than commercial credit did. However, scholars at home disagreed with the viewpoints mentioned above. Wang and Zhou (2007) had a regression analysis of the listed non-financial companies in China from 1998 to 2004. They argued that bank credit didn't play an obvious role of contingent governance mentioned by the above Western scholars; on the contrary, it was commercial credit did in the process. In addition, Gu (2014) believed that there was refinancing problem wingspread on business credit, so it can effectively stop excessive investment. Due to intervene by government and policies, banks and credit was difficult to form effective supervision and restraint of these enterprises.

The Relation between Debt Term Structure and Companies Investment Level

Debt's impact on company investment not only lies in debt amount, leverage ratio, and

source structure, but also in another non-negligible aspect, that is, debt term structure. Currently, there were some representative viewpoints from Myers (1977), Diamond (1991), and Johnson (2003). First, Myers (1977) thought that when confronted with under-investment situation, management layers in companies could realize the expansion of investment by shortening debt term structure, which was subsequently proved by Barclay's empirical study (1995). However, Diamond (1991) held different points that shortening debt term would easily cause enterprises falling into liquidity risks and giving rise to extremely low effective investment, while liquidity risks would be reduced correspondently, and effective investing would also be largely increased by lengthening debt term; therefore, debt term structure should be positively correlated with companies' investment level.

As for debt term structure, scholars at home also did some significant explorations. Hu (2014) studied the 948 A-shares of non-financial listed companies and found that debt maturity can reduce the alternative behaviors of "insiders" to curb excessive investment, and thus benefited from the protection of investors interests; Feng et al. (2014) used the 2004 - 2011 A-shares listed companies as samples through correlation test and regression analysis, concluded that the long-term debt and short-term debt could weaken the over-investment behavior.

Brief Commentary

It should be mentioned that previous research on debt source structure, term structure and investment level of companies deserves to be conscientiously summed up and referred to. But previous literatures and findings still show some problems. First of all, scholars did not reach a consensus on the relation between debt source structure and companies' investment level or the one between debt term structure and companies' investment level; and, which viewpoint being more reasonable for retail business in China remained unknown. Second, previous research mainly centered on the overall listed companies or A-share listed companies while few retail companies were studied; apparently, retail companies were distinguished from others, so the relation among debt source structure, term structure and investment level shown in overall listed companies was not applicable in this field. What's

more, some of the previous research was confined to the relation between debt source structure and companies' investment level; some were restricted to the relation between debt term structure and companies' investment level, while research on the relation among these three aspects as a whole was rare. Obviously, source structure and term structure are important parts of the description of debts; it is unscientific to separately study their relations with investment level. For the reasons mentioned above, based on dynamic panel data model, this paper selects 180 listed companies in China from 1989 to 2011 and studies the interaction among the debt source structure, term structure and investment level.

METHOD DESIGN

Index Selection

The analyses of the interactive relation among debt source structure, term structure and the investment level of listed companies require appropriate indexes for the three variables. The process of index selection in this paper is shown as follows.

1. The Variable of Debt Source Structure. Using the viewpoints of Tong and Lu (2005) and Wen Fang (2010) were as references, two indexes are mainly selected, that is, Bank Lending Rate (BLR), as the bank credit rate, and Commercial Credit Rate (CCR) for reflating the debt source structures of enterprises. Of which, BRL= (long-term loans+short-term loans)/total assets and CCR= (deposit received+account payable+notes payable+other payables)/total assets.

2. The Variable of Debt Source Structure. According to the research of Zhang Zhihong and Xiong Nianchun (2007) and Li Shengkun and Qi Yanfeng (2007), the variable of debt term structures can be roughly described as Liquid Debt Rate (LDR) and Non-Liquid Debt Rate (NLDR). Of which, LDR= liquid debt book value/ total assets and NLDR= not-liquid debt/ total assets.

3. The Variable of Enterprise' Investment Level. According to related materials from home and abroad about the enterprise investment decisions and investment behaviors (Cheng and Tahmiscioglu 1997; Nini et al. 2009), the indexes to measure enterprises' investment levels are shown as I_1/A , I_2/A , I_3/A . Among which, I_1 refers

to fixed assets and the annual changing amount of projects under construction, I_2 refers to fixed assets as well as the annually changing amount of projects under construction and long-term equity investments, I_3 refers to fixed assets and the annually changing amount of projects under construction, long-term equity investment, and intangible assets, while A refers to initial total assets in the corresponding year. To be more rigorous, an empirical analysis of the three indexes is made one by one with source structures and term structures.

4. The Other Control Variables. There are many factors in enterprises' investment levels, which include not only debt source structures and term structures, but also enterprises' investment opportunities, financial conditions and profitability as well as enterprises' sizes. (Liu et al. 2014). Here, MAS value is used for reflecting the investment opportunities of enterprises (Li Xiaojun et al. 2008), ROA (return on assets) for describing the profitability of enterprises (Goddard et al. 2009), and SIZE (natural logarithm of total assets) for measuring enterprises' sizes (Nguyen and Dijk 2012). Among which, MAS= (number of circulation stocks×end-of year closing price + number of circulation stocks×net asset value per share)/owner's equity, TCF=free cash flow/free cash flow, and ROA= EBIT/the final total assets, SIZE= \ln (total assets).

Empirical Model

For one thing, financial data in listed companies reveal not only individual differences but also time differences, which is a typical panel structure. Meanwhile, enterprises' investment decisions cannot manifest immediately when being influenced by debt source structures and term structures. It has a time lag effect. So, Dynamic Panel Data Model which has a variable time lag item may be more conducive to the revelation of the problem's essence. In addition, since the macro-economic fluctuation in different years usually facilitates or inhibits the investment levels of retail enterprises, setting a dummy variable of time may be able to illustrate the problems. Finally, the empirical model is set as follows.

$$(I/A)_t = \mu + \sum_{k=1}^a \alpha_k BLR_{t-k} + \sum_{k=1}^b \beta_k CCR_{t-k} + \sum_{k=1}^p \phi_k LDR_{t-k} + \sum_{k=1}^q \theta_k NLDR_{t-k} + \eta CONTROL_{t-k} + \gamma_k DUMMY_YEAR + \varepsilon_t$$

Here, I/A refers to investment level, μ is constant intercept, $CONTROL$ refers to all control variables (include MAS, TCF, ROA and SIZE), $DUMMY_YEAR$ is dummy variable of time, α_k , β_k , ϕ_k , and η and γ are regression parameters to be estimated.

For a common panel data model, Generalized Method of Moments (GMM) posed by Arellano and Bond (1991) is used for regression analyses. But, for the above dynamic panel data model, GMM may be difficult to have its function. When explaining a variable which is not exogenous but endogenous, GMM being used for regression model will cause bias and inconsistency of the parameters being estimated, thus it will severely affect the deduction and judgment. To solve this problem, Blundell and Bond (1998) developed the approach putting forward the so-called System GMM, which integrated the characteristics of level equation method and differential equation method. By using Monte Carlo simulation, Blundell and Bond (2000) found that System GMM had smaller deviation and higher efficiency than others did. Therefore, this paper is going to use System GMM for the empirical study.

RESULTS

Data Sources

Considering the availability of data, this paper selects 180 listed retail companies in China from 1989 to 2011 as the research samples. After picking out parts of incomplete data and some data which have obvious anomalous changes, 2104 observed values are finally acquired for the empirical analysis. All required financial data come from RESSET, and the analysis software is STATA12.0.

Regression Results

In order to explore the relation among debt source structures, term structures and enterprises' investment levels, dynamic panel data model is employed to the regression analysis of the sample data. Here, I_t/A_t is a dependent variable, while lag variables of BLR, CCR, LDR and NLDR are independent variables, and lag variables of MAS, TCF, ROA and SIZE are control variables. By adding year dummy variables, the following results are acquired as Table 1.

Table 1: System GMM regression results with I_t/A_t as dependent variable

	<i>coefficients</i>	<i>t-statistics</i>	<i>p-value</i>
BLR(t-1)	-.2993779	-2.11	0.038
BLR(t-2)	-.1232806	-1.89	0.062
CCR(t-1)	-.0641716	-2.77	0.007
LDR(t-1)	-.0797058	-2.29	0.025
NLDR(t-1)	-.1989539	-2.15	0.035
NLDR(t-2)	-.4569173	-3.42	0.001
NLDR(t-3)	-.3873875	-1.74	0.086
NLDR(t-4)	-.1994451	-2.07	0.042
	<i>statistics</i>	<i>df.</i>	<i>p-value</i>
F-statistics	9.08	(24, 76)	0.000
Sargan- statistics	1353.60		
Hansen-statistics	47.05	253	1.000
AR(1)Z-stat	-1.98		0.047
AR(2)Z-stat	0.16		0.874

From Table 1, under the premise of F-statistics being significant, the search from lag order 5 of variable is started according to the principle of maximizing Sargan statistics, and on lag orders of each variable are finally decided that BLR is lag order 1~2, CCR is lag order 1, LDR is lag order 1 and NLDR is lag order 1~4. From the regression results, p-value of Hansen statistics in the model is significant (for 95% confidence interval). Meanwhile, p-value of AR (1) Z-statistics is less than 0.05 (The null hypothesis is rejected), while p-value of AR (1) Z-stat is greater than 0.05 (The null hypothesis is accepted), showing that there is no correlation with the model residual error. But from parameter regression, all variables' coefficients are less than 0, and the significance of CCR (t-1) and NLDR (t-2) is greater than 1%, the significance of BLR (t-2), BLR (t-1), LDR (t-1), NLDR (t-1) and NLDR (t-4) all reaches 5%, and the significance of BLR (t-2) and NLDR (t-4) is 10%.

In statistical sense, no matter BLR and CCR or LDR and NLDR, all of them have inhibition effects on I_t/A_t . Besides, as to the influence degree, BLR is stronger than CCR, while LDR is weaker than NLDR. That is to say, reducing one unit of BLR and increasing one unit of CCR may increase 0.06~0.24 of the future enterprises' I_t/A_t ; while reducing one unit of LDR and increasing one unit of NLDR may increase 0.12~0.38 of the future enterprises' I_t/A_t .

Robustness Analysis

In order to further test the results of Table 1, I_2/A_t and I_3/A_t are respectively substituted for

I₁/A to make two regressions of System GMM, according to the steps as the last section, and determine lag orders in accordance with F-statistics and Sargan statistics. The results are shown in Tables 2 and 3.

Table 2: Regression results of system GMM with I2/A as dependent variable

	<i>coefficients</i>	<i>t-statistics</i>	<i>p-value</i>
BLR(t-1)	-.1594729	-2.05	0.044
BLR(t-2)	-.0881956	-1.85	0.068
CCR(t-1)	-.0462124	-5.33	0.000
LDR(t-1)	-.0310226	-2.07	0.042
NLDR(t-1)	-.2176246	-2.68	0.009
NLDR(t-2)	-.1851275	-2.20	0.031
NLDR(t-3)	-.2665081	-1.97	0.052
NLDR(t-4)	-.2279579	-1.14	0.259
	<i>statistics</i>	<i>d.f.</i>	<i>p-value</i>
F-statistics	10.08	(24, 74)	0.000
Sargan- statistics	940.86		
Hansen-statistics	54.23	251	1.000
AR(1)Z-stat	-2.33		0.020
AR(2)Z-stat	0.13		0.894

Table 3: Regression results of system GMM with I3/A as dependent variable

	<i>coefficients</i>	<i>t-statistics</i>	<i>p-value</i>
BLR(t-1)	-.2225895	-2.21	0.030
BLR(t-2)	-.0965958	-2.49	0.015
CCR(t-1)	-.0836135	-3.21	0.002
LDR(t-1)	-.0607484	-1.90	0.062
NLDR(t-1)	-.1400208	-2.61	0.011
NLDR(t-2)	-.3500377	-4.57	0.000
NLDR(t-3)	-.1061897	-1.39	0.170
NLDR(t-4)	-.3495933	-2.06	0.043
	<i>statistics</i>	<i>d.f.</i>	<i>p-value</i>
F-statistics	7.77	(24, 73)	0.000
Sargan- statistics	915.80		
Hansen-statistics	56.73	250	1.000
AR(1)Z-stat	-2.13		0.033
AR(2)Z-stat	0.52		0.606

As shown in Tables 2 and 3, even though their results are different from that in Table 1 in terms of the regression coefficients, they show some similarities with Table 1; that is, the coefficients of all independent variables are negative, and except for a very few variables (NLDR (t-3) and NLDR (t-4), all other variables' significance reaches 5% confidence level, of which some even exceed 1%. This further tests the viewpoints proposed in Table 1 that all BLR, CCR, LDR and NLDR have negative effects on I/A; in addition, seen from the influence degree, BLR(t-1) and BLR (t-2) are stronger than CCR (t-1), and NLDR

(t-1)~NLDR (t-4) are also stronger than LDR (t-1), which is consistent with the results in Table 1.

DISCUSSION

This paper, using the financial data of the selected 180 listed retail companies in Shanghai and Shenzhen from 1989 to 2011 and establishing dynamic panel data model, empirically analyzes the dynamic relation among debt source structure, term structure and the investment level of these companies and thus gets many significant findings.

First of all, as far as debt source structure is concerned, both bank credit and commercial credit have a negative correlation with enterprises' investment levels. Bank credit has higher inhibition effects on enterprises' investment than commercial credit does. So, what's the difference between this paper's research on retail companies and the above two scholars' research on many different companies? The answer is that debt's influence and effect on investment levels is from creditors' restraints to debtors, and the degree of the restraints depends on the relative position between creditors and debtors when negotiating loans and credit. On one hand, banking industry has the absolute monopoly position in China, and compared with it, other enterprises including retail business are in a condition of passively accepting the loan pricing and treaties, which will severely restrict the enterprises from further investment plans and expansion plans. Therefore, bank credit has greater inhibition effects on the investment levels of enterprises. On the other hand, Hu and Shieh (2013) stated manufacturing companies are in an upstream position in the industry chain, while retail companies are in the downstream position. Because what the upstream manufacturing companies mostly produce are some products with similar quality and functions (like toothpaste, soap, shower gel, shampoo, etc.), their competition is comparatively fierce. What's more, when negotiating commercial credit, upstream companies are obviously placed in an inferior and unfavorable position. Therefore, retail companies will be easier to obtain the commercial credit without interest and mortgage. Since there are few provisory clauses and constraints of commercial credit, it has little influence on enterprises' investment levels.

Second, in terms of the debt term structure, both floating debt and non-floating debt can ef-

fectively inhibit the investment levels of the enterprises. But the opinion that floating debt's inhibition is weaker than non-floating debt and shortening debt term structure can effectively relieve the under-investment of enterprises does not conform to Diamond's. How can the result be explained? It is interpreted that the reason why shortening debt term structure cannot solve the problem of under-investment is that he thought the shortening of that would cause the enterprises falling into the trap of liquidity risks which resulted in over-low effective investment. It should be mentioned that, for most manufacturing companies, this assumption is correct, but for retail companies, it is not. Retail companies are in the downstream of the industry chain. When they shorten the debt term structure and face liquidity risk that most companies do, they can always avoid the possibility of that risk by getting commercial credit (deposit received or notes payable) without interest, mortgage and less constraints and nearly-zero financing cost from the upstream companies. Hence, the influence of liquidity risk is excluded. Floating debt is weaker than non-floating debt in terms of the inhibition effects on enterprises' investment, because retail companies are less influenced by the constraints.

Third, as for lag orders of debt source structure and term structure, bank credit and commercial credit are one-period delay and two-period delay respectively, and floating debt and non-floating debt are one-period delay and three-to-four period delay. That is to say, bank credit's influence is longer than commercial credit's on enterprises' investment, while non-floating debt's influence is more far-reaching than floating debt. It is easy to understand the latter one. The payment time of floating debt is within one year that creditors don't need to wait too long for taking back the principal and interests; so, creditors' constraint to debtors (retail companies) is also within one year, which will not affect debtors' investment decisions of two years or more. While the payment time of non-floating debt is more than one year, which will make the payment time of principal and interests longer. In this case, debtors' moral hazard problem will be more prominent. Therefore, creditors have to make restrictive clause for many years to debtors, and non-floating debt's impact on debtors' (retail companies') investment levels will be much more far-reaching. For the former, when retail companies

obtain bank credit, they need to sign definite and detailed provisory clauses with the bank. Banks have all kinds of strict rules and regulations, so that even retail companies have better performance and investment opportunities, they are still difficult to negotiate and change the relevant clauses with banks. Therefore, bank credit's influence on enterprises' investment is much longer. However, commercial credit is different. Retail companies are in an obviously superior position when obtaining commercial credit. And, when retail companies have better performance and investment opportunities, they can negotiate and even amend relevant provisory clauses with the creditor (which generally is manufacturing companies) at any time, thus sweeping obstacles for further investment and expansion. Therefore, commercial credit's impact on enterprises' investment is much shorter.

CONCLUSION

Based on dynamic panel data model, this paper selected 180 listed companies in China from 1989 to 2011, and studied the interaction among the debt source structure, term structure and investment level. The results showed that: first of all, whether it is debt source structure or term structure, they are obvious negative correlation with investment level for China's retail company. Second, the inhibitory effect of bank credit to investment was higher than commercial credit, and the negative impact of current debt on investment was weaker than that of non-current debt. Furthermore, the commercial credit had more long-term effect than bank credit on investment. Current debt had more fleeting impact than non-current debt on investment.

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