Supply Chain Finance, Accounting Conservatism and Corporate Financing Efficiency

Li Zhu[1, a], Te Liang[1, b], Ning Yang[1, c], Caixia Li[1, d]

[1]School of Economics and Management, China University of Mining and Technology, Xuzhou 221000, China;

[a]liz_yzcs4226@163. com ,[b]1724865969@qq. Com ,[c]1822358457@qq. Com ,

[d]Li_Cai_xia@163. com

Abstract: This paper takes all listed companies from 2016 to 2021 as research samples to study the impact of supply chain finance and accounting conservatism on corporate financing efficiency, and explore whether they have a substitution effect on financing efficiency or complement each other. The results show that supply chain finance and accounting conservatism can significantly improve financing efficiency. Accounting conservatism can be divided into conditional robustness and conditional robustness, among which conditional robustness and non-conditional robustness have positive effects on financing efficiency. The influence of accounting conservatism and supply chain finance on financing efficiency can be replaced by each other, that is, the existence of one variable will weaken the promoting effect of the other variable on financing efficiency.

Keywords: Supply chain finance; conditional robustness; conditional robustness; financing efficiency; regression analysis

1. Introduction

The COVID-19 pandemic has severely impacted trade and supply chains, with the global trade finance gap increasing by 15 percent in 2021, and nearly one third of surveyed companies said "access to finance" remains a major obstacle to future growth, according to a survey released by the Asian Development Bank. In this context, supply chain finance is widely popular as a financing method with lower threshold and higher efficiency. Supply chain finance consists of two parts -- "supply chain" and "finance", which determines that supply chain finance has both industrial and financial attributes. Supply chain finance can reduce corporate financing costs and alleviate corporate financing constraints, thus affecting financing efficiency. Starting from this perspective, this study proves that supply chain finance has a significant promoting effect on financing efficiency.

Accounting conservatism is based on the principle of accounting prudence and comes from the uncertainty of accounting estimation. Accounting conservatism reflects the quality of information disclosed by enterprises, and it also has the role of contract and governance. In this paper, the EVA rate is used to measure the financing efficiency of enterprises, and the influence of conditional and non-conditional accounting conservatism on financing efficiency is tested respectively. It is found that the former can promote the financing efficiency, while the latter can hinder the improvement of financing efficiency. Conditional robustness requires more evidence for good news than bad news and provides incremental information, so it can improve the reliability of information and thus enhance the trust degree of financial service providers. The difference in conditional conservatism is rooted in the choice of accounting methods. The principle of prudence often leads to the understatement of net assets, thus affecting the lending services of capital providers.

Both supply chain finance and accounting conservatism can reduce the degree of information asymmetry in the capital market, so both can improve the financing efficiency of enterprises to a certain extent. On this basis, this paper builds a model to further study the substitution or complementary effects of the two variables. The results show that the addition of supply chain finance or accounting conservatism will reduce the positive impact of the corresponding index on financing efficiency.

2. Theoretical analysis and research hypothesis

2.1 Supply chain finance and its operation mode

Due to the different concerns or emphases of the two aspects of the society, there are differences in their understanding and understanding of the concept of supply chain. Lam[1]They divide supply chain finance into "supply chain" orientation and "finance" orientation. When supply chain finance is more "financial", "supply chain" becomes the means. The typical feature is the new credit model of commercial banks based on the supply chain. When "supply chain" is more prominent, "finance" is the means, aiming to use finance to promote the efficient integration of logistics, capital flow and information flow in the supply chain, so as to improve the overall performance of the supply chain. The former takes commercial banks as the main body of supply chain finance, while the latter broadens its vision to the whole industrial chain. The main body of supply chain finance can be all the participants in the supply chain, so as to integrate all the financial resources in the supply chain, so it has more strategic value[2].

At present, the traditional or mainstream view of the supply chain financing model includes accounts receivable financing, inventory pledge financing and prepaid financing, and few existing studies break through this framework for reclassification. Xu Yangyang[3]The authors summarized the financing methods of supply chain finance from the perspectives of internal and external financing. External financing includes bank financing, credit guarantee, inventory financing, guarantee agent and purchase order financing, while internal financing includes trade financing and buyer financing. Li Jian, Wang Yajing[4]The development of supply chain finance is divided into four stages. The first stage is the traditional financial model dominated by commercial banks, that is, banks provide financial support for financing enterprises with the help of the credit of core enterprises. The second stage is financing in the form of industrial enterprises as the main body and financial institutions participating. In this stage, the role of financial service providers extends to the whole supply chain, including core enterprises, e-commerce platforms, circulation enterprises, etc. In the third stage, supply chain finance shows the characteristics of network, refinement and platform, using supply chain network platform to make more subjects join in the development of supply chain finance layout. The fourth stage is to use big data, blockchain, cloud computing and other fintech to enable supply chain finance. Under the impact of the global pandemic, it is more necessary to innovate and develop supply chain finance models to solve the financing difficulties of enterprises, especially smes.

2.2 The mechanism of supply chain finance affecting financing efficiency

The three models of supply chain finance help enterprises make full use of current assets to solve the problem of lack of collateral[5]. For example, in the accounts receivable financing mode, financing enterprises can take the uncollected funds of the core enterprises as collateral and carry out financing with the credit guarantee of the core enterprises, which revitalizes a considerable part of the current assets of enterprises and improves the utilization rate of funds. In addition, supply chain finance can weaken the influence of information asymmetry among participants, thus reducing borrowing costs[5]. Because core enterprises often have a deeper understanding of the overall operation of the supply chain and industrial conditions, taking the credit of core enterprises as the guarantee not only reduces the credit risk of financial institutions, but also provides the supply chain enterprises with lower cost of financial support, such as low interest rate. It can be seen that supply chain finance can reduce financing costs and alleviate financing constraints, and the corresponding financing efficiency will be higher.

First of all, supply chain finance relies on real trade and has sufficient information support to reduce risks to a certain extent[6]. Secondly, supply chain finance bundles the credit of multiple enterprises, which has lower risk compared with the single enterprise credit mode. Moreover, because the default cost is higher than the traditional mode, the default risk of financing enterprises

is effectively controlled. Finally, supply chain financing relies more on the strength of core enterprises and is more trustworthy than the credit level of the upstream and downstream enterprises with smaller scale or influence. Therefore, risk reduction will increase the confidence of financial institutions to lend, thus improving the efficiency of financing.

Therefore, based on the above theoretical basis, this paper puts forward the first hypothesis:

H1: Supply chain finance can significantly improve the financing efficiency of enterprises

2.3 Accounting conservatism

Accounting conservatism refers to the asymmetric timeliness of recognition of income and loss[7]. Accounting information is robust when the firm has a higher standard for confirming "good news" than "bad news".

Watts first conducted a systematic study on accounting conservatism in 1993, and then (2003) studied the causes of accounting conservatism from the perspectives of contract, shareholder litigation, regulation and taxation[8]. LaFond, Watts[9]A study in 2008 showed that the information asymmetry between internal management and investors exacerbated the generation of accounting conservatism. Baus[10]Accounting conservatism is defined as the asymmetric reflection of accounting earnings as good news and bad news, and the reverse regression model is used to quantify accounting conservatism for the first time. Khan[11]On the basis of Baus, et al. created the C-score model, which has also become a classic model to measure the degree of accounting conservatism. Chinese scholars Zheng Baohong and Liu Yawei[12]Integrating the data of China's A-share listed companies confirms that C-score model is also applicable to the Chinese scenario.

2.4 The mechanism of accounting conservatism affecting financing efficiency

The economic consequences of accounting conservatism are mainly from two aspects, namely investment and financing. Wang Jing, Hao Dongyang[13]The study of et al. found that accounting conservatism is negatively correlated with the cost of equity capital, and can effectively restrain overinvestment and underinvestment, thus improving financing efficiency. If managers can follow the requirements of conservatism and confirm "bad news" in time, shareholders can timely stop their losses and replace incompetent or self-interested managers. Therefore, conservatism can reduce agency costs and potential investment risks, so investors will demand lower risk premiums for companies that provide high-quality information[13]. Most other scholars have explained the role of accounting conservatism in reducing debt or financing cost from the perspective of risk[14, 15] . Accounting conservatism can reduce the degree of information asymmetry, prevent managers from manipulating financial reports to a certain extent, increase the cost of manipulating earnings data, and reduce managers' personal interests.

Based on this, this paper proposes the second hypothesis of the research:

H2: Accounting conservatism is positively correlated with financing efficiency.

2.5 Supply chain finance, accounting conservatism and corporate financing efficiency

Supply chain finance and accounting conservatism can reduce the effect of information asymmetry. Supply chain finance mainly reduces the degree of information asymmetry and transaction costs between supply chain and supply chain financial service providers, and then helps enterprises to make full use of existing resources to improve financing efficiency and solve the problem of financing difficulties for most enterprises. Accounting conservatism reflects the health of accounting information, and banks tend to trust enterprises with high accounting information quality. Therefore, high accounting conservatism can also encourage banks to lend money and enterprises to obtain more financing.

H3a: The application of accounting conservatism strengthens the correlation between supply chain finance and debt financing efficiency.

H3b: The application of accounting conservatism weakens the correlation between supply chain finance and debt financing efficiency.

3. Study design

3.1 Sample selection and data sources

In this paper, all listed companies in China are selected as research objects, and data of five consecutive years from 2015 to 2019 are selected according to the following principles: (1) Financial listed companies are excluded. The business model of financial industry is special and cannot be compared with that of other industries. (2) Eliminate ST and *ST companies to avoid the impact of abnormal data on the results; (3) Enterprises missing data during the study period are excluded, such as enterprises without short-term loans and notes payable business. After screening, 8825 observed values of 1876 listed enterprises were obtained. The financial data and accounting conservatism data used in this paper are all from CSMAR database. At the same time, in order to eliminate the influence of extreme values on the regression results, the continuous variables were treated with 1%Winsorize. SPSS26. 0 was used for statistical and regression analysis.

3.2 Variable design

Domestic academia has not reached a consensus on how to accurately measure financing efficiency. However, most researches basically believe that the financing efficiency depends on the cost of obtaining funds and the effectiveness of making full use of the funds raised[16, 17], i. e. cost of capital and return on investment. This article refer to Jia Zhengyuan[18]Yang yi,[19]In the research method of scholars like et al. , EVA rate is used to reflect the financing efficiency of enterprises. Because economic value added (EVA) not only takes into account the cost of debt capital and the cost of equity capital, but also reflects the residual earnings after deducting the cost of financing. At the same time, in order to eliminate the impact of capital scale, EVA is divided by capital occupation, and the EVA rate is calculated to reflect the financing efficiency of enterprises.

Table 1: Variable definitions and explanations

Variable name	Variable definitions	Explaining
FE	The financing efficiency	EVA rate
SCF	Supply chain finance	
Cscore	Robustness of conditions	The incremental timeliness of accounting earnings in response to bad news rather than good news
MTB	Nonconditional robustness	Market price/book value of assets
Debt	Asset-liability ratio	Liabilities/assets times 100%
EPS	Earnings per share	
RE	Return on stock	Buy-and-hold yield for 12 months from May of that year to April of the following year, based on the monthly return of individual stocks taking into account reinvested cash dividends.
OC	Concentration of ownership	Shareholding ratio of the top three shareholders
Size	The enterprise scale	We take the log of our total assets at the end of the year
Indus	industry	Virtual variable
Year	year	Virtual variable

4.   The empirical analysis

4.1 Empirical test model

To verify all assumptions, models is adopted in this paper:

$$FE_{i,t} = \alpha_0 + \alpha_1 SCE_{i,t} + \alpha_2 Debt_{i,t} + \alpha_3 EPS_{i,t} + \alpha_4 RE_{i,t} + \alpha_5 OC_{i,t} + \alpha_6 Size_{i,t} + \alpha_7 Indus_{i,t} + \alpha_8 Year_{i,t} + \varepsilon_{i,t}$$

$$FE_{i,t} = \beta_0 + \beta_1 Cscore_{i,t} + \beta_2 MTB_{i,t} + \beta_3 Debt_{i,t} + \beta_4 EPS_{i,t} + \beta_5 RE_{i,t} + \beta_6 OC_{i,t} + \beta_7 Size_{i,t} + \beta_8 Indus_{i,t} + \beta_9 Year_{i,t} + \varepsilon_{i,t}$$

$$FE_{i,t} = \gamma_0 + \gamma_1 SCF_{i,t} + \gamma_2 Cscore_{i,t} + \gamma_3 MTB_{i,t} + \gamma_4 Debt_{i,t} + \gamma_5 EPS_{i,t} + \gamma_6 RE_{i,t} + \gamma_7 OC_{i,t} + \gamma_8 Size_{i,t} + \gamma_9 Indus_{i,t} + \gamma_{10} Year_{i,t} + \varepsilon_{i,t}$$

4.2 The empirical results

In order to test hypothesis H1, H2 and H3, this study conducted regression analysis on models (1) to (3) respectively. Table 3 shows the results of regression analysis. It can be seen from the regression results of model (1) that supply chain finance is significant at the level of 10%, that is, supply chain finance is helpful to improve the financing efficiency of enterprises, and H1 is verified. It can be seen from models (1)~(3) in the table that the indicators of accounting conservatism are all significant at the 2% level. The regression coefficient of conditional robustness is positive, indicating that conditional robustness improves the financing efficiency of enterprises. The non-conditional robustness regression coefficient is negative, indicating that non-conditional robustness has a positive effect on the financing efficiency of enterprises. Therefore, accounting robustness significantly improves corporate financing efficiency, and H2 is verified. It can be seen from the results of model (3) that supply chain finance and accounting conservatism have positive effects on corporate financing efficiency. By comparing model (1) and model (3), it can be seen that the significance of supply chain finance increases after the introduction of conditional robustness and non-conditional robustness. From model (2) and (3) it can be seen that after join the supply chain financial indicators, the significance of accounting conservatism increases, and the sum of the absolute value of t value is reduced, thus can draw the conclusion: the effect of the financing efficiency, accounting robustness and supply chain finance has substitution effect, H3b verified, at the same time H3a proved.

Table 2: Results of regression analysis

Index	(1)	(2)	(3)
SCF	0. 051 *** (7. 264)		0. 048 *** (6. 766)
Cscore		0. 002 ** (2. 037)	0. 002 ** (2. 165)
MTB		0. 002 *** (4. 839)	0. 002 *** (3. 987)
Debt	0. 182 *** (29. 542)	0. 166 *** (29. 137)	0. 183 *** (29. 590)
EPS	0. 036 *** (42. 550)	0. 037 *** (44. 018)	0. 036 *** (43. 646)

RE	0. 031 *** (12. 243)	0. 032 *** (12. 701)	0. 032 *** (12. 649)
OC	0. 001 *** (7. 667)	0. 001 *** (7. 789)	0. 001 *** (7. 767)
Size	0. 013 *** (14. 706)	0. 010 *** (10. 848)	0. 012 *** (12. 369)
Indus	0. 001 ** (3. 153)	0. 001 *** (5. 374)	0. 001 *** (3. 535)
Year	0. 004 ** (6. 414)	0. 004 *** (6. 625)	0. 004 *** (6. 499)
Constant	7. 623 *** (6. 210)	7. 946 *** (6. 479)	7. 780 *** (6. 317)
N	8825	8825	8825
R^2	0. 582	0. 579	0. 582

4.3 Robustness test

In order to exclude the influence of the sample period, the data from 2011 to 2015 were selected for re-regression of model (1), model (2) and model (3), and the results were consistent with the above conclusions.

In order to test the reliability of the research results, this paper re-measures the financing efficiency index and conducts a robustness test. In this paper, the return on equity index (ROE) is used to replace the original financing efficiency index EVA rate, and the results are still robust.

Conclusions

In this paper, all non-financial listed companies from 2016 to 2021 are selected as research objects, and the mechanism of supply chain finance on corporate financing efficiency is deeply studied from the perspective of two types of accounting conservatism, and the empirical test is conducted. The research draws the following conclusions: First, supply chain finance can promote the financing efficiency of enterprises. Second, accounting conservatism has a positive effect on enterprise financing efficiency. Third, the application of accounting conservatism weakens the correlation between supply chain finance and debt financing efficiency.

References

[1] Lam H K S, Zhan Y, Zhang M, et al. The effect of supply chain finance initiatives on the market value of service providers[J]. International Journal of Production Economics. 2019, 216: 227-238.

[2] Wang Xiaodong, Li Wenxing. Review and Prospect of Supply Chain Finance Research -- Based on the Interaction mechanism between Industry and Finance [J]. Technical Economics & Management Research, 2015(07): 100-103.

[3] Xu Yangyang, Lei Quansheng. Review on Supply chain finance [J]. Guangxi Science. 2021, 28(06): 547-556.

[4] Li Jian, Wang Yajing, Feng Gengzhong, et al. A review of Supply chain finance: Present situation and future [J]. Systems Engineering Theory and Practice. 2020, 40(08): 1977-1995.

[5] Han Min, Gao Xuxu. The Role of Supply chain Finance in alleviating the Financing Constraints of Enterprises: A Comparative analysis of Industry and Finance Enterprises and Non-industry and Finance Enterprises [J]. Journal of Financial Economics, 2017, 32(04): 59-69.

[6] Yang Yanzhong. On Risk prevention of Supply chain Finance in commercial banks [J]. Financial Forum. 2007(10): 42-45.

[7]   Roychowdhury S, Watts R L. Asymmetric timeliness of earnings, market-to-book and conservatism in financial reporting[J]. Journal of Accounting and Economics. 2007, 44(1-2): 2-31.

[8]   Watts R L. Conservatism in Accounting Part I: Explanations and Implications[J]. Accounting horizons. 2003, 17(3): 207-221.

[9]   Lafond R, Watts R L. The Information Role of Conservatism[J]. The Accounting review. 2008, 83(2): 447-478.

[10] Basu S. The conservatism principle and the asymmetric timeliness of earnings1[J]. 1997, 24(1): 3-37.

[11] Khan M, Watts R L. Estimation and empirical properties of a firm-year measure of accounting conservatism[J]. Journal of Accounting and Economics. 2009, 48(2-3): 132-150.

[12] Zheng Baohong, Liu Yawei. The applicability of C-Score in our country [J]. Forecasting, 2014, 33(02): 71-74. (in Chinese)

[13] Wang Jing, Hao Dongyang, Zhang Tianxi. Robust Accounting Information, Cost of Equity Capital and Firm Investment Efficiency: Empirical Evidence Based on China's A-share Market [J]. Economics and Management Research. 2013(02): 52-61.

[14] Zhang Shengli. Property Rights Characteristics, Prudent Accounting Policies and Corporate Debt Financing Cost: Empirical Evidence from China's Securities Market [J]. Economics and Management. 2014, 28(06): 45-50.]

[15] Wu Yaling. The influence of accounting conservatism on the efficiency of corporate debt financing [J]. Economic Management, 2012, 34(10): 139-147.

[16] Zeng Kanglin. How to view direct Financing and indirect financing [J]. Financial Research. 1993(10): 7-11.

[17] Song Wenbing. Some Questions about financing methods need to be clarified [J]. Financial Research. 1998(01): 35-42.

[18] Jia Zhengyuan, Tian Li, Hong Haolin. Analysis of Financing Efficiency of Listed Electric Power Companies Based on EVA Model [J]. Finance and Accounting Communication. 2009(08): 22-23.

[19] Yang Yi, Gao Yue, Wu Jingjing. Does Supply chain Finance improve the Financing Efficiency of Listed Companies -- Based on Two Types of Accounting Conservatism Perspective [J]. Friends of Accounting. 2022(01): 52-60.

[20] Zhang Weibin, Liu Ke. Can the Development of Supply chain Finance Reduce financing constraints of smes? Based on the empirical analysis of small and medium-sized listed companies [J]. Economic Science. 2012(03): 108-118.

[21] Liu Ke, Miao Hongwei. Development of Supply chain Finance and Financing of Small and Medium-sized Enterprises: Based on Empirical analysis of Small and medium-sized Listed companies in Manufacturing industry [J]. Financial Forum. 2013, 18(01): 36-44.