# The effect of capital structure on profitability in Tongrentang

Mr. Ransuo Yang



An Independent Study Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts in Business and Managerial Economics
Field of Study of Business and Managerial Economics
FACULTY OF ECONOMICS
Chulalongkorn University
Academic Year 2019

-

นายหรานซาว หยาง



สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
สาขาวิชาเศรษฐศาสตร์ธุรกิจและการจัดการ สาขาวิชาเศรษฐศาสตร์ธุรกิจและการจัดการ
คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2562

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| Independent Study Title | The effect of capital structure on profitability in Tongrentang |
| By | Mr. Ransuo Yang |
| Field of Study | Business and Managerial Economics |
| Thesis Advisor | Chalaiporn Amonvatana |

Accepted by the FACULTY OF ECONOMICS, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Arts

INDEPENDENT STUDY COMMITTEE

............................................ Chairman
(SAN SAMPATTAVANIJA)

............................................ Advisor
(Chalaiporn Amonvatana)

............................................ External Examiner
(RATIDANAI HOONSAWAT)

หรานซาว หยาง : . ( The effect of capital structure on profitability in Tongrentang) อ.ที่ปรึกษาหลัก : ชลัยพร อมรวัฒนา



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# # 6284079029 : MAJOR BUSINESS AND MANAGERIAL ECONOMICS
KEYWORD:

Ransuo Yang : The effect of capital structure on profitability in Tongrentang. Advisor: Chalaiporn Amonvatana



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| Field of Study: | Business and Managerial Economics | Student's Signature ............................... |
| Academic Year: | 2019 | Advisor's Signature .............................. |

# ACKNOWLEDGEMENTS

Ransuo Yang

First and foremost, my deepest gratitude goes to Chalaiporn Amonvatana, my respectable supervisor, for her constant encouragement and valuable guidance as well as enlightening instruction in every stage of writing this thesis. Without her impressive patience and kindness, I could not have completed this paper.

Second, I would like to express my heartfelt gratitude to other teachers at the department of Business and Managerial Economics, whose keen, vigorous and persistent academic spirit inspires and enlightens me not only in this year of study but also in my future study.

Then, I shall extend my thanks to my dear family for their warming encouragement, trust and company during the whole process.

Finally, my sincere and heartfelt appreciation and gratitude also go to Valerie Dai, Xavier Peng，Maple Qin and J.Ting Yi for their endless love and selfless support.

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# Abstract

This essay focuses on the effect of different combinations of equity and debt on profitability of Tongrentang Group during the period from 2011 to 2019 quarterly in Chinese medical industry on the basis of the methods of correlation and regression examination, to prove whether the different combinations consists of the equity and debt over different periods affect the profitability. The paper collected the main financial data from related documents posted on annual report and Shanghai Stock Exchange as well as Tonghuashun iFinD. Through correlation analysis and regression analysis, the main findings tell that a positively relationship exists between debt (over different period) and profitability. It proves that debt acts as the main source for Tongrentang to finance their daily operations. Based on the main findings of this paper, Tongrentang Group should consider the components and proportion of its capital structure so as to generate maximum profit. Further research should concentrate on international medical market beyond Chinese market.

Key words: Tongrentang, Short-term debt, Long-term debt, Total debt, Return on equity

## 1. Introduction

Back to the last decades, human spare no effort to develop technology and economy, taking advantage from the proud intelligence as well as their manipulative ability. Providence does not let down a man who does his best, consequently technology has yield remarkable and meaningful fruits and enables people to explore and survive on novel stuffs, for example Internet, which connects the whole world and enables people manage to explore and achieve things that can not be done before. With the rapid progress of technology, people gradually put their attention and focus on some natural issues, like health problem. It acts as a significant signal that people starting considering about the life quality as well as the length of life. With the keen sense towards people’s concerns and the increasingly large demand of health product, based on the advanced skills, more and more businessmen are willing to invest in the health industry, which consist of medical supplies, pharmacy, health care products and so on, aiming at producing sustainable and considerable profit as well as meeting and satisfying the demand of the era. As for the segmentation of pharmacy, due to the different cultural background, different living habits as well as the diverse geographical location, the western people and the eastern people have generated their own medical philosophy. Western people are prone to improve healthy condition by assorted interaction between various chemical factors, observing and combining the beneficial chemicals together. However, for eastern people, especially Chinese, natural herbs become the best choice out of all other substitutes, because Chinese people always stick to the philosophy of man and nature living in harmony. In the profound and long history of Chinese medicine, it is inevitable to mention that Tongrentang acts as a brilliant and great monument. To some extent, it is regarded as one of the most time-honored enterprises in China, and considered as a respectful example of combining traditional industry and contemporary technology successfully and effectively. Established in 1669, Tongrentang always stick to the idea of making the high-quality medicine, providing people with the appropriate and effective medicine, saving people’s life from the suffering of diseases. With more than 300 years long development, Tongrentang evolves into the largest producer of traditional Chinese medicine nowadays. Since the period of reform and opening up in China, the reform and development of state-owned enterprise have been highly valued by the government. With persistent efforts as well as the steady resolve, China has continuously made significant headway in the reform and development of state-owned enterprise. In general, such transformation empowers a plenty of Chinese enterprises to supplement market economy, improve the efficiency of enterprise operations, and produce their own competitiveness in international market. Tongrentang also benefits from this precious trend, enhancing its integrative competence and making a contribution to medical progress worldwide.

However, on the way to success, there are always countless challenges, troubles as well as various difficulties. Many of challenges facing Tongrentang are not only about the development of medical technology and increasingly huge demand of health product, but also the fierce competition nationwide and internationally. In addition to that, the fast-changing market also sets up an obstacle for the Chinese traditional medical giant. Facing the contemporary market, the survivor of old times finds it is not that easy to adapt to market changes. In other words, like Tongrentang, the traditional state-owned enterprises have to optimize their structure to cater to modern market. As one of the most critical support industries, pharmacy industry have significant impact on ordinary people’s life. In recognition of this fact, with the arrival of new challenges and increasingly huge demand of medicine, investors inevitably begin to reconsider and reevaluate the investment value of Tongrentang Generally speaking, investors attach great importance to the investment value of a company. Therefore, it is extremely meaningful and significant to enhance mutual understanding of the financial situation. Among all financial factors, capital structure plays a major role. Actually, capital structure is a combination of a company, which consists of various securities and aims at reach the maximum potential profit of its company. As one of the most vital elements of a company, capital structure to some extent certainly impacts and decides the running capacity of a company, like adjusting the proportion of short-term debt could result in different profitability. And profitability leaves the first impression on the investors’ minds, which represents the ability of business to earn a profit. Summarizing and analyzing the relationship between capital structure and profitability in a scientific way provide investors a path to a better understanding while assessing the investment value of Tongrentang. Beyond that, such analysis would be beneficial for Tongrentang to look through the development within last decade and have implications for Tongrentang considering the maximizing returns by adjusting the proportion of debt so as to improve its competitiveness.

This paper consists of following sections. The coming part will focus on the review of related literature. And next section will give a brief introduction to Tongrentang Group and its financial situation. Then coming with description of data and the analytical method adopted in this paper. Later would include the specified variables used in this analysis. The fifth part will give a brief overview regarding Tongrentang’s financial situation, and then the findings of research, the explanation of results as well as the ratio interpretation. Final section will summarize the main findings of this paper.

## 2. Literature review

As economy recovers and matures, more and more enterprises spring up like mushroom, devoting themselves with every effort to the development of their own countries and benefit from the trend. The first and the most significant issue a company should consider, to some extent, is having their concentration on the capital structure, ensuring the maximum profits. Capital structure literally appertain to the various components and different mixture of a company's liabilities, which would lead to different profitability. Unthoughtful decisions of capital structure generally would result in an situation where the cost of capital increases thus letting the net present value down, increasing financial burden for the company. However, effective and efficient capital structure decision would lead to the opposite side, bringing the company more profits. Due to the importance of capital structure, it always attracts entrepreneurs' attention and sparks heated discussion among researchers over which kind of combination of liabilities would bring the owners and shareholders the maximum profit and whether this supreme mixture of liabilities really exist. Back to the origination, when referring to capital structure, it spontaneously reminds us of Franco Modigliani and Merton Miller, who paved significant ways, contributing to the concept of capital structure in 1958 by proposing the Modigliani Miller theorem. According to the well-known Modigliani Miller theorem, there is no certain relationship between the way of financing and the company's value. In other word, in perfect market, whether the managers are prone to raise money by reinvesting, issuing stock shares or borrowing, there should be no influence on a firm's real market value for it is only susceptible to its current value of earnings made in the future and underlying assets.

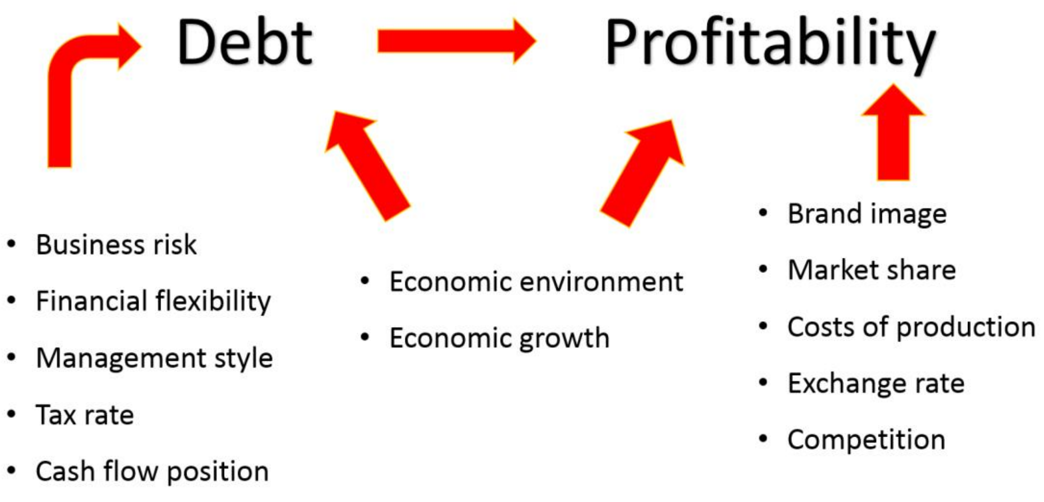


However, with the further study and investigation of different combinations of debt and equity as well as its essence, this prominent assumption is considered as a theoretical outcome publicly. Since then, several studies regarding capital structure are generally growing into different branches, researchers trying to comprehend it from different angle. Titman and Wessels adopted manufacturing industry as their research object in 1988, striving to puzzle out the elements that influenced the choice of the combination of debt and equity. They proposed that the factors of profitability, non-debt tax shield, growth, company size and collateral value of assets all have the determinant influence on the decisions of capital structure. Within all these points, profitability, company size and non-debt tax shield show a reverse signal with capital structure, which implies a negative relationship exits. Beyond that, the extension rate and collateral value of assets of the company own a correspondingly positive relationship with capital structure decisions. Harris and Raviv also left a deep impression in the development of capital structure theory in 1991. Based on the data and information of the listed enterprises in USA, they concluded that the distinction of leverage ratio exists within various industries. For those elements that influenced the final decision of the combination of debt and equity, the likes of fixed assets ratio, non-debt tax shield and liability ratio are positively related. In addition, there is negative correlation between company’s expenditure on advertisement, risk and the profitability of bankruptcy. Weston and Brigham (1992) hold that the precondition of an optimal capital structure is to maximize the value of floating shares. Roden and Lewellen (1995), through their study, discovered a positive relationship existing within the profitability and total debt based on the data of 107 companies. Brealey and Myers (2003) attribute capital structure to a marketing problem, where firms are seeking to a particular portfolio of securities that maximizes the market value from countless combinations. Abor (2005) collected 22 firms listed on Ghana Stock Exchange during the period of 1998 to 2002 and discovered a positive correlation existing within the ratio of long-term or total debt to total assets and ROE. Mokhova and Zinecker implemented their study in 2013, which concentrates on figuring out the impact of internal factors on capital structure. They took the emerging market of European developed countries as primary object. With the analysis on the influence of external macroeconomic and the subdivision research between monetary scheme and national fiscal scheme, they discovered that government debt showed a positive correlation with the emerging market’s combination of equity and debt, but produced a reverse influence on the combination of equity and debt of other groups in countries with sound economic power. Meanwhile, inflation benefited both emerging market and developed countries generally. Bhaird and Lucey conducted their research of the interrelationship between cultural elements and the choice of combination of equity and debt of small and medium business on the basis of firm-level observation collected from thirteen countries with a seven-long year duration. With the control elements of company size, industry effect as well as national system, they discovered that the significant transnational difference in capital structure is resulted by, to some extent, the culture. Beyond that, power distance, which refers to the internal relationship between the upper side officers and their subordinates within a social environment, is also regarded as an outcome of culture, and it is negatively related to the debt. Anna and Sotiria branched out the investigation of capital structure in 2015. They put their emphasis on the 117 internationally listed shipping enterprises so as to seek for the potential and influential elements of combination of debt and equity decisions within different period of economic cycle. Through investigation and research, Anna and Sotiria found that the main factors which influence the combination of equity and debt are company size and company performance. Interestingly, during the peak section, they found the leverage ratio and profitability have a positive relationship, however, for the other periods, these elements are negatively related. Finally, they proposed that profitability should act as primary engine to realize the optimal capital structure; with more equity financing, there are more chances for a company to gain better profitability no matter in which segment of economic cycle. Considering 70 firms from footwear industry from 2010 to 2013, Pacheco and Tavares conducted a research regarding the capital structure of small and medium business. Adopting panel data methodology, they pointed out that profitability, total liquidity and risk degree are the major factors that certainly impact the capital structure decisions. In addition to these factors, dimension of enterprise, tangibility of assets and other tax preferences are irrelevant to the capital structure decisions. Markus and Jerome implemented their study in 2017, under the theme of analyzing seven critically influential factors of tangible assets, non-debt tax shields, market-to-book value, firm growth, firm size, earnings volatility, and profitability. Through massive and careful analysis of 3890 reports based on the concept of multiple regression, they pointed out that between tangible assets and the mixture of equity and debt, a positive relationship exists; market-to-book value and profitability both have a reverse signal or correlation with capital structure. Among these seven significant elements, tangible assets, market-to-book value and profitability have the most noticeable influence for the decision regarding the mixture of equity and debt. According to further explanation, the financial cost caused by outside issues could be effectively lowered by the tangible assets and it could provide preferential environment for outside fund-raising. For those enterprises with relatively vigorous capability to earn profit, instead of reduce their leverage ratio, they are prone to raise fund from the internal. Based on the sample of 157 Chilean companies, Martin and Saona analyzed the traditional energies of capital structure. Unlike the preceding researches, this essay contains the novel variables which did not appear before, like the ownership concentration that belonged to the Chilean enterprises. They proposed that according to the result, a correspondingly positive correlation exits between company size and leverage ratio, ownership concentration and leverage. Beyond that, the likes of payment policy, growth of a company, non-debt tax shield shows a reverse signal with the combination of equity and debt. Zeitum and Temimi carried out their research on the influence to GCC firms resulted by the economic crisis in 2008, which covers 10 years long period over 8 different industries. After that, they pointed out corporate demand for debt acts the primary energy of leverage advance the crisis, and corporate demand for debt and debt supply of lending institutions are the determinants of leverage after the crisis.

### 2.1 Definition of Capital Structure

Generally speaking, a firm's capital structure alludes to the combination or mixture of securities a company issued in order to raise fund to maintain or expand daily operation, enlarging business size and generate profit as well. Within this process, the combination of raising fund of a firm is defined as the firm's capital structure. From the financial angle, capital structure generally is made by a certain proportion of debt and equity. According to Brealey and Myers (2003), they attributed this concept of combination or mixture of equity and debt to a marketing thing, where firms are seeking to a particular portfolio of securities that maximizes the market value from countless combinations. In essence, it reveals the different thinking of firm's managers. Because they have to decide how they should divide a certain amount of fund into two entirely different part, where one is primarily responsible to meet the obligations of debt, while other one mainly belongs to the equity shareholders.

As mentioned, debt acts as a main component of capital structure, which would lead to different profitability of a company. The conceptual below presents how debt could influence the profitability and what factors have impact on the debt and profitability.




According to capital structure theory, adjusting the combination of equity and debt could result in a lower a company's financial cost and hence improving profitability. However, other factors can impact profitability, including the likes of brand image, market share of the company, cost of production, exchange rate, competition within this industry, and so on. Beyond that, there are also some elements can influence the debt, for example business risk, financial flexibility, management style, tax rate as well as cash flow position.

**3. Company profile of Tongrentang**

Found in the eighth year of Kangxi of Qing Dynasty, Beijing Tongrentagn Group is a wholly state-owned company authorized by the municipal government to operate state-owned assets. The brilliant technique and unique understanding of Chinese medicine help Tongrentang enjoy reputation nationwide. Tongrentang began to offer and be responsible for the imperial medicine in 1723. With more than 300 years long history, Tongrentang almost witnessed and represented the development of Chinese medicine.

Sticking to the business strategies of “Regarding the traditional Chinese medicine as the core, advancing the health product industry, making Tongrentang an internationally famous modern Chinese medical company”, all successors of generations are in line with the policy of growing longer, stronger and bigger, taking innovation as the main drive and technology as priority. With the selection and test of market, Tongrentang generates a contemporary business model, which consists of modern pharmaceutical, retailing and medical services. It has created a precious and strict spirit of being cautious and striving for excellence in the pharmaceutical process. Superior medical materials, unique formula, exquisite craftsmanship and effective drug action make Tongrentang famous all over the world.

Up to now, Tongrentang develops an enterprise structure of six secondary groups, three significant institutions (Tongrentang Research Institute, Tongrentang Traditional Chinese Medicine Hospital, and Tongrentang Educational College), and two reserve units. As mentoned above, three major sectors of modern pharmaceutical, retailing and medical services have covered over 1,500 different and various products such as Chinese herb, hospital SSRIs, health products, food, cosmetic and so on. In addition to these, Tongrentang owns twenty eight production bases, eighty three modern production lines, a national engineering center and a postdoctoral research station. In 2006, traditional Chinese medicine culture of Tongrentang was named as a national intangible heritage for its historical insistence on traditional Chinese medicine.

Since 1993, Tongrentang has successively opened 110 branches overseas. Registering trademarks in more than 70 countries and regions around the world, Tongrentang passes the technical certification of Japan, Australia as well as Israel and exports more than 680 kinds of Chinese medicine. Ding Yongling, the general manager of Beijing Tongrentagn Group, once said in an interview that according to an incomplete statistics, Tongrentang has more than 30 million patients overseas. As claimed by Tongrentang’s plan, its internationalization strategy is divided into three steps: rushing out, melting in, and going up. Before 1993, Beijing Medical Insurance Company was mainly responsible for the export of Tongrentang Group. Due to the small volume of product sales, it was a little bit difficult for Tongrentang to have its own store overseas. In 1993, Tongrentang obtained its own import and export rights. Since enjoying a good reputation in Hong Kong, Tongrentang opened a Hong Kong branch and considered it as a springboard for international operation. It is worth mentioning that when opening the Hong Kong branch, Tongrentang did not invest in cash, but instead invested 25% in brand and technology.

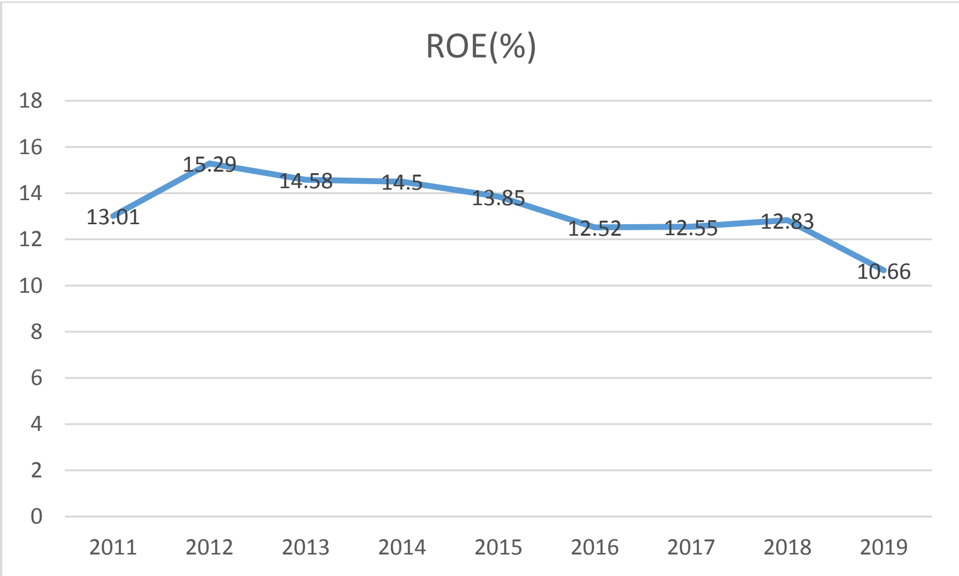
In 2003, Beijing Tongrentang International Co., Ltd. was established, being in line with its second step, taking the medicine culture as main drive. During the process of internationalization, Tongrentang followed the traditional Chinese medical culture, bringing the characteristic of “sitting doctor” overseas. With the implementation of its strategy – medicine first, culture follows, Tongrentang was capable to take roots overseas. Beyond that, Tongrentang managed to build each overseas store into a traditional Chinese medicine museum. Local patients were convinced by these hardworking and skillful eastern doctors, at the same time, Tongrentang shared traditional excising methods such as Tai Chi and Wu Qin Xi with local residents, in order to spread the unique culture of traditional Chinese medicine, especially those tested by more than hundreds of years..

In 2013, the listing of Beijing Tongrentang Sinopharm Co., Ltd. in Hong Kong marked the third step of Tongrentang’s strategy of overseas expansion. With the goal of establishing the entire and efficient Chinese medicine industry chain overseas, Tongrentang not only changed its strategy according to different location, but also upgraded the way of rushing out. For example, Tongrentang not only merged and acquired overseas community clinics and pharmacies, but also covered the whole industrial chain of planting and procurement, R&D and production, wholesale and retail, health and services, culture and education, continuing to implement international strategies across various difficulties. According to the official data from Tongrentang, it currently has 62 overseas companies and stores in Hong Kong, Thailand, South Korea, Malaysia, Indonesia, Australia, Singapore, Cambodia, Philippine, Brunei and Poland.

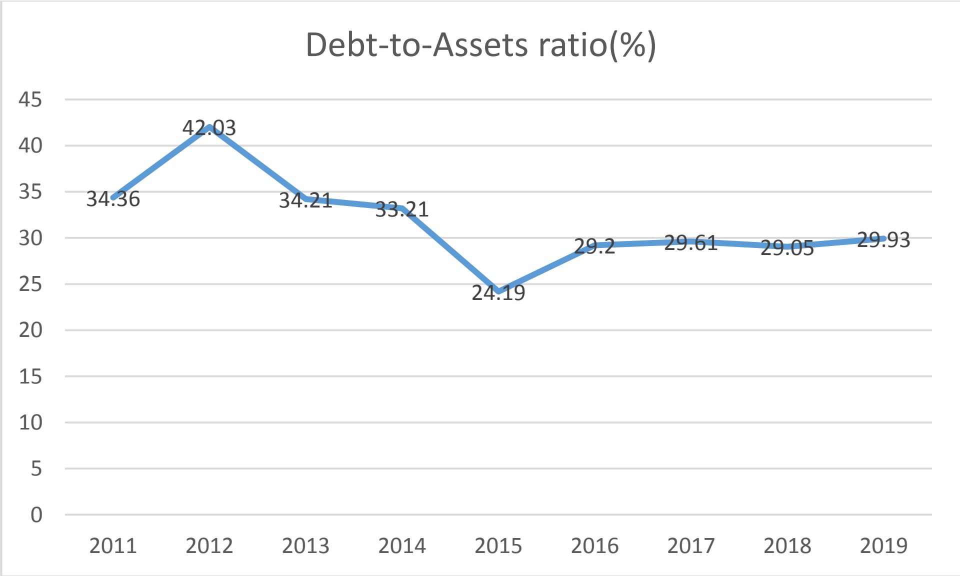
At present, Tongrentang’s global platform for Chinese medicine has covered the United States, Canada, the United Kingdom, Ireland, New Zealand, Australia, Singapore and the BRIC countries of India, Russia and Brazil. Its payment system supports more than 15 different currencies. The global supply chain and overseas direct delivery are integrated and achieved.

### 3.1 Overview of Tongrentang’s Financial Profile

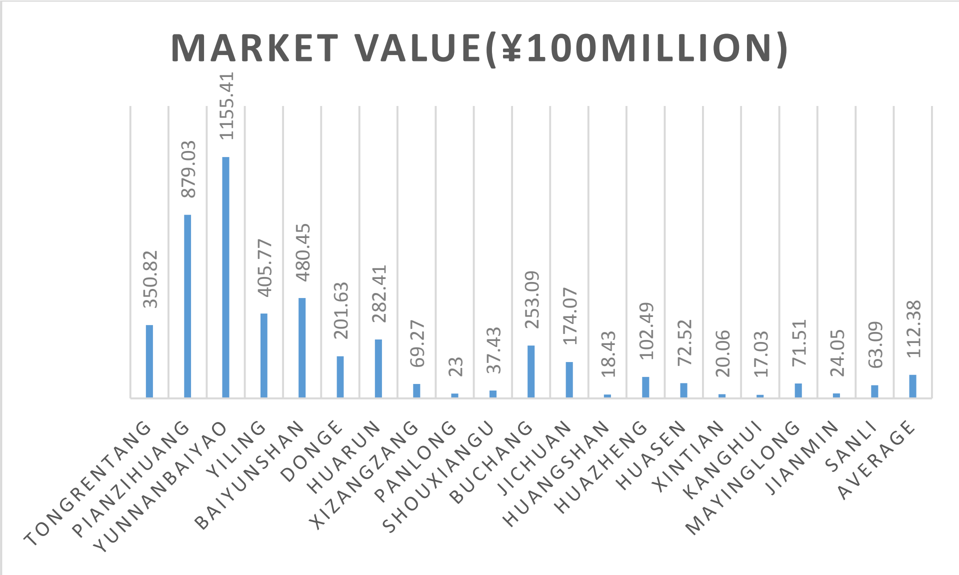
In this part, the necessary financial indicators of Tongrentang from 2011-2019 are collected in order to present an intuitive and comprehensive introduction to Tongrentang's financial position. In addition, the final section of this part would include a simple comparison between Tongrentang and its competitors in China. All data coms from Tonghuashun iFinD.



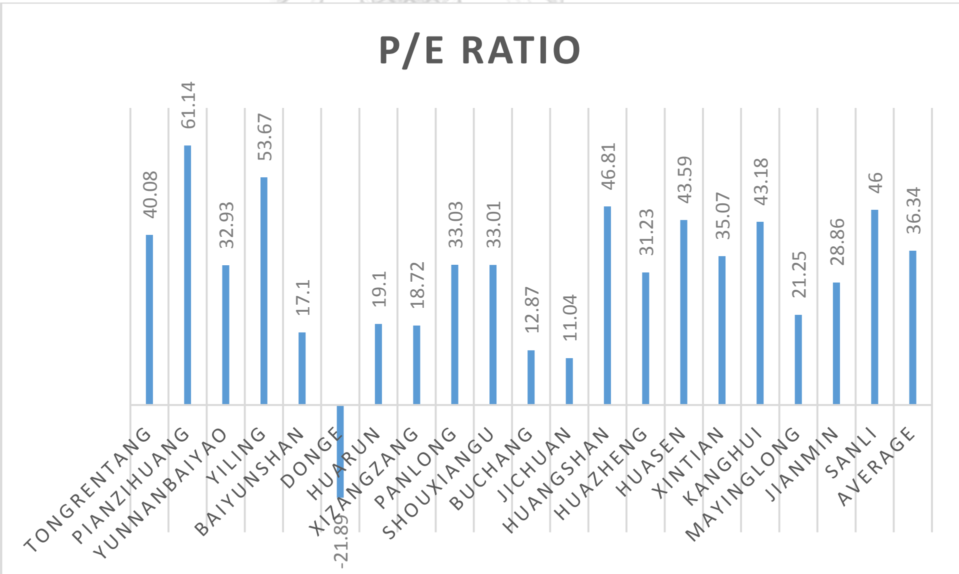

From the definition and equation of ROE, it is easy to know that it is explained by the net profit divided by the investment, which represents the capability of earning profit of a company with the investment from shareholders. Over other financial indicators that only simply shows a brief financial situation, ROE is able to mirror the company's elementals in a better and direct-viewing way. According to the chart above, we may see that Tongrentang's ROE waves between 10% and 15% roughly, with the peak point of 15.29% in 2012 and the lowest one of 10.66 in 2019. In general, it is on a slight downward trend.




Here is the trend of Tongrentang's total debt to total assets ratio. As we know, debt-to-assets ratio is considered as one of the most vital financial indicators and leverage ratio, which is explained by fraction value of total debt to the amount of debt a company owns. On the basis of the debt to total assets ratio, it is more easily to compare and analyze the difference of leverage between the company and other competitors' in the same industry. Through debt-to-assets ratio, we may roughly estimate how stable the company is in processing financial issues. Generally speaking, higher debt-to-assets ratio represents higher risk. According to the graph above, Tongrentang's debt-to-assets ratio fluctuates among 24% to 42%, with the peak point of 42.03% in 2012 and the lowest point of 24.19% in 2015. To sum up, Tongrentang shouldered a relatively higher debt in 2011 and 2012, then the ratio decreased and sustained at a stable phase of almost 29%.




According to the latest statistics in May 7th, 2020, Tongrentang's market value reached ¥350.82 million. As showed above, the highest market value in Chinese medical industry belongs to Yunnanbaiyaom of ¥1155.41 million. In addition, the average of market value in Chinese medical industry reached ¥112.38 million.




P/E ratio is explained by the share price divided by earnings per share, which provides information regarding valuing whether the stock of a firm is overvalued or undervalued. From the graph above, Tongrentang's P/E ratio reached 40.08, and the average P/E ratio of Chinese medical industry is 36.34.

As claimed by the statistics above, we may have a pretty clear message of how fierce the competition is in Chinese medical industry. From the part of market value, there are two companies: Yunnanbaiyao and Pianzihuang, exceeding Tongrentang's market value. And Yunnanbaiyao even owns a relatively lower P/E ratio compared with Tongrentang's. However, with a plenty of competitors in the Chinese medical industry, Tongrentang can not be underestimated. With its profound cumulative precipitation of nearly 400 years long history, good reputation as well as the unique, effective Chinese medical formula, Tongrentang still acts as one of the most significant drives in Chinese medical industry.

## 4. Data and Methodology

This part will include these sections as follow: research design, data collection, data analysis, the analytical model, the meaning of each variable and the hypothesis.

### 4.1 Research Design

According to the purpose of this paper, the main objective is defined to figure out the effect and influence of the mixture of equity and debt on profitability of Tongrentang, thus a descriptive survey design and quantitative data are employed on the basis of multiple regression analysis and correlation analysis. Before the multiple regression analysis and correlation analysis, a ratio analysis is adopted for the better understanding of the financial condition of Tongrentang.

### 4.2 Data Collection

As introduced above, this study concentrates on the financial analysis of the effect between the combination of equity and debt with different proportion and profitability in Tongrentang, therefore, secondary data is the best choice. The main source of the target data comes from the annual report and related documents of Tongrentang of 2011 to 2019, which are downloaded from Shanghai Stock Exchange http://english.sse.com.cn/ and Tonghuashun iFinD, because Beijing Tongrentang Group was listed in Shang Stock Exchange in 1997 and Tonghuashun iFinD summaries and provides a complete data base for Chinese information mainly. Panel data is chosen due to the purpose of this paper. Panel data enables to provide observation within different time period, which result in a relatively larger sample status.

### 4.3 Data Analysis

Nowadays, one of the most efficient methods to comprehend financial data is quantitative analysis, which enables people to solve management problems in a better way based on a grand overview of financial condition. To be specific, quantitative analysis transfers related data into an easy-looking set, which is helpful for people to summarize, comprehend and even making a prediction. In order to generate a more reliable evidence, this paper will adopt data quarterly.

**4.4 Analytical Model**

This research samples almost all the necessary financial indicators of Tongrentang Group over a 10 years long period, from 2011 to 2019. The variables of profitability and leverage ratios are included in this research. For the part of profitability, it is calculated based on the commonly adopted measurement: the ratio of earnings before interest and taxes, whose abbreviation is EBIT (hereinafter), divided by equity. As for the segment of leverage ratio, it is operationalized by three dimensions, which covers as follow: the short-term debt divided by the total capital, the long-term debt divided by the total capital as well as the total debt to total capital. In addition to these fundamental indicators, the natural log of sales and the sales extension rate are took as control variables in this model in order to reduce bias and smooth the model as much as possible. As mentioned above, panel data is chosen for the purpose of this study, because panel data comprise a relatively all-round data, which consists of plenty of sectional data over different time period. In other words, it generates a lager pooling of observations and enable to provide a more accurate result which are not solved in other researches, like the pure cross-sections or simply time-series researches.  Adopting this analytical model makes it more easily for researchers to value the panel data and conclude the difference among adopted variables. Therefore, the model would be used in this analysis is presented as follow:



$$Profitability_t = \beta_0 + \beta_1 SDA_t + \beta_2 SIZE_t + \beta_3 SG_t + \varepsilon_t$$

$$Profitability_t = \beta_0 + \beta_1 LDA_t + \beta_2 SIZE_t + \beta_3 SG_t + \varepsilon_t$$

$$Profitability_t = \beta_0 + \beta_1 DA_t + \beta_2 SIZE_t + \beta_3 SG_t + \varepsilon_t$$

Among the models above,

- Profitability stands for the return on equity (ROE, hereinafter), where EBIT is divided by the equity of Tongrentang in different time period.
- SDA stands for the short-term debt divided by the total capital in different duration.

- LDA stands for the long-term debt divided by the total capital in different duration.
- DA stands for the total debt divided by the total capital in different duration.
- SIZE stands for the natural logarithm of Tongrentang's sales.
- SG stands for the sales growth, where represent the sales of current year removes last year's sales and the result number is divided by last year's sales.
- $\varepsilon_t$ stands for the error term.

### 4.5 Research Hypothesis

According to the objective and analytical model of this paper, I hypothesized that:

- $H_0$: There is no relationship between short-term debt to total assets and profitability.
- $H_0$: There is no relationship between long-term debt to total assets and profitability.
- $H_0$: There is no relationship between total debt to total assets and profitability.

## 5. Empirical Analysis

**Table 1 Description of Variables**



| Variable | ROE | SDA | LDA | DA | SIZE | SG |
|---|---|---|---|---|---|---|
| Mean | 3.33 | 0.1726 | 0.06 | 0.23 | 12.445 | 6.90% |
| Median | 3.5 | 0.1661 | 0.01 | 0.20 | 12.535 | 1.60% |
| Minimum | 1.42 | 0.1089 | 0.003 | 0.12 | 11.535 | -31.77% |
| Maximum | 4.66 | 0.2763 | 0.225 | 0.43 | 12.877 | 96.58% |
| Standard deviation | 0.76 | 0.0401 | 0.09 | 0.08 | 0.326 | 28.38% |

Table 1 is the summary of the dependent and independent variables adopted in this paper, which includes ROE, SDA, LDA, DA, SIZE and SG. As for the dependent variable of profitability, which is calculated by the measurement of return on equity (ROE), it claims that during the 10 years from 2011 to 2019, each quarter enjoys a 3.33% return on average. With the median of 3.5% and standard deviation of 0.76%, it reveals that Tongrentang has been moving forward all the time and it is a relatively quite stable trend. As we know, in 2008, the financial crisis caused by the US subprime mortgage crisis swept the whole world. The major developed economies such as the US, Japan as well as the European Union were deeply trapped, and the world economy recovered slowly. Maintaining a quite stable return on equity of 3.33% per quarter is a good signal, which reveals Tongrentang conservatively and steadily forging ahead. With almost the ROE of 12% per year, it is not suitable to regard Tongrentang as one of the most remarkable and fruitful group in the world, however, Tongrentang must be classified as one of the companies with maximum potential. SDA, as introduced before, is measured by the short-term debt divided by the total capital. The average amount of SDA is 0.1726, with the median of 0.1661. According to the median of SDA, it is easy to figure out that almost 16 percent of total assets of Tongrentang is occupied by short-term debt, which clarifies that Tongrentang would run its daily operations by this 16% short-term debt. Next, the variable of LDA measures similarly with SDA, the long-term debt to total capital. The maximum of LDA is 0.225, and the minimum is 0.003, with the mean of 0.06 and median of 0.01 respectively. As for DA, the average of DA is 0.23, and the median is 0.20, with the maximum of 0.43 and the minimum of 0.12 respectively. From the summary of DA, it tells that Tongrentang's total assets consists of 23% debt capital. Broadly speaking, these financial indicators enable us to conclude that Tongrentang is financially contained a relatively large percentage of total debt being short-term, around 17.26% per quarter. Then comes with the SIZE and SG, which is explained by the log of sales and the difference between current quarter's sales and previous quarter's sales divided by the previous quarter's sales respectively. For the SIZE, its mean stands at 12.445, with the median of 12.535, the minimum of 11.535, the maximum of 12.877. On the segment of SG, its mean comes to 6.9%, with the median of 1.60%, the minimum of -31.77%, the maximum of 96.58% per quarter.



**Table 2 Correlation Analysis**

| | ROE | SDA | LDA | DA |
|---|---|---|---|---|
| ROE | 1 | 0.3678 | 0.2742 | 0.4575 |
| SDA | 0.3678 | 1 | -0.3003 | 0.1621 |
| LDA | 0.2742 | -0.3003 | 1 | 0.8925 |
| DA | 0.4575 | 0.1621 | 0.8925 | 1 |

Table 2 is the summary of correlation coefficients of variables adopted in this analytical model. The results showed in the graph above reveals that the profitability, which is measure by the return on equity, is obviously positive correlated to the SDA (the short-term debt), LDA (the long-term debt) and DA (the total debt). It further proves that capital structure is of great importance for a company, for it could improve and increase the company's profitability. In the following part, the result operated by the ordinary square least (OLS) would be presented and explained for each equation respectively.

**Table 3 Regression Analysis of Model 1**

| | Model 1 (SDA&Profitability) |
|---|---|
| observations | 36 |
| coefficient | 6.92084 |
| std.error | 3.4533 |
| t-ratio | 2.004 |
| p-value | 0.0536 |

What is presented above is result of the OLS regression analysis for Model 1, which concentrates on the impact on profitability caused by short-term debt. It is easy to conclude that within this model, the coefficient for SDA, SIZE (which is explained by the log of sales in the current quarter), and growth are 6.92, -0.003 and 0.0159 respectively. As we all know, the coefficient stands the corresponding increase of dependent variable caused by the each additional increase in the independent one on average. For the part of ROE, it represents that profitability of Tongrentang, which is explained by return on equity, would increase 6.92% due to each additional increase of SDA on average. As for SIZE, which is represented by the log of sales in current quarter, it reveals that profitability of Tongrentang would decrease by 0.03% due to each additional increase of SIZE on average. Similarly, for SG, which is the growth rate of Tongrentang, it stands that profitability of Tongrentang would grow up by 0.016% due to each additional increase of sales growth of Tongrentang. To sum up, it is obvious to find that there is a correspondingly positive relationship exists between the SDA and profitability, or ROE of Tongrentang. This result can be explained by the cost of short-term debt tends to be cheaper than before, Tongrentang depends on the short-term debt to maintain daily operations so as to generate profitability. Furthermore, this result could be regarded as one of the proofs that short-term debt does enhance a company's profitability, which obeys the results of preceding studies over the effect on profitability caused by capital structure that a correspondingly positive relationship exists between the short-term debt to total assets and profitability. In addition to these empirical results, we should also pay attention to the R-squared of 0.1354, which means that only 13.54% of the variance of degree of profitability can be explained by the degree of short-term debt to total assets, natural logarithm of sales and sales growth of Tongrentang. Beyond that, we also found that the t-ratio of SDA is 2.004, which is greater than 2. Therefore, we may reject the null hypothesis we proposed above that there is no relationship between short-term debt to total assets and profitability.

**Table 4 Regression Analysis of Model 2**

| | Model 2 (LDA&Profitability) |
|---|---|
| observations | 36 |
| coefficient | 2.21271 |
| std.error | 1.5259 |
| t-ratio | 1.45 |
| p-value | 0.1568 |



What is presented above is result of the OLS regression analysis for Model 2, which concentrates on the impact on profitability caused by long-term debt. It is easy to conclude that within this model, the coefficient for LDA, SIZE (which is explained by the log of sales in current quarter), and growth are 2.212, -0.164 and -0.202 respectively. As we all know, the coefficient stands the corresponding increase of dependent variable caused by the each additional increase of independent one on average. For the part of ROE, it represents that profitability of Tongrentang, which is explained by return on equity, would increase 2.21% due to each additional increase of LDA on average. As for SIZE, which is represented by the log of sales in current quarter, it reveals that profitability of Tongrentang would decrease by 0.164% due to each additional increase of SIZE on average. Similarly, for SG, which is the growth rate of Tongrentang, it stands that profitability of Tongrentang would grow up by 0.202% due to each additional increase of sales growth of Tongrentang. To sum up, it is obvious to find that there is a positive correlation exists between the long-term debt and the profitability, or ROE of Tongrentang, which counters some preceding researches that hold long-term debt is negatively related to profitability. This result can be explained by the cost of long-term debt tends to be not that expensive like before, therefore, it could produce and generate some profit by financing a relatively high amount of long-term debt. Furthermore, this result could be regarded as one of the proofs that long-term debt does enhance a company's profitability. In addition to these empirical results, we should also pay attention to the R-squared of 0.0868, which means that only 8.68% of the variance of degree of profitability can be explained by the degree of long-term debt to total assets, log of sales in current quarter and sales growth of Tongrentang. Beyond that, we also found that the t-ratio of LDA is 1.450, which is smaller than 2. Therefore, we may not reject the null hypothesis we proposed above that there is no relationship between short-term debt to total assets and profitability.

**Table 5 Regression Analysis of Model 3**

| | Model 3 (DA&Profitability) |
|---|---|
| observations | 36 |
| coefficient | 4.40907 |
| std.error | 1.58915 |
| t-ratio | 2.774 |
| p-value | 0.0092 |



What is presented above is result of the OLS regression analysis for Model 3, which concentrates on the impact on profitability caused by total debt. It is easy to conclude that within this model, the coefficient for DA, SIZE (which is explained by the log of sales in current quarter), and growth are 4.409, 0.1914 and -0.105 respectively. As we all know, the coefficient stands the corresponding increase of dependent variable caused by the each additional increase of independent one on average. For the part of ROE, it represents that profitability of Tongrentang, which is explained by return on equity, would increase 4.4% due to each additional increase of DA on average. As for SIZE, which is represented by the log of sales in current quarter, it reveals that profitability of Tongrentang would grow up by 0.191% due to each additional increase of SIZE on average. Similarly, for SG, which is the growth rate of

Tongrentang, it stands that profitability of Tongrentang would decrease by almost 0.105% due to each additional increase of sales growth of Tongrentang. To sum up, it is obvious to find that there is a correspondingly positive correlation exists between the total debt and the profitability, or ROE of Tongrentang. This result can be explained by the previous two regression analysis. Because the cost of short-term debt and long-term debt tend to be lower than before, Tongrentang depends on the debt to maintain daily operations so as to generate profitability. Therefore, the total debt is obviously positively correlated to the profitability of Tongrentang. Furthermore, this result could be regarded as one of the proofs that debt does improve a company's profitability, which obeys the preceding studies over the effect on profitability caused by capital structure that total debt to total assets has a positive relationship with the profitability. In another words, higher debt, to some extent, would bring higher profitability. Of course, different economic environment would lead to different results, as we can see from the study of Shubita and Alsawaalhah's study in 2012. According to their further explanation, the economic downturn may act as the main reason that contributes to this phenomenon. In addition to these empirical results, we should also pay attention to the R-squared of 0.2156, which means that only 21.56% of the variance of degree of profitability can be explained by the degree of total debt to total assets, natural logarithm of sales and sales growth of Tongrentang. Beyond that, we also found that the t-ratio of DA is 2.774, which is greater than 2. Therefore, we may reject the null hypothesis we proposed above that there is no relationship between total debt to total assets and profitability.

## 6. Conclusion



The decision on the proportion of equity and debt within a company are one of the most significant financial decisions for a company, no matter which industry the company belongs to, capital structure to some extent directly impacts the profitability of this firm. On the one hand, different proportion of the components of capital structure would generate different profitability, for the difference of the cost of different debt. On the other hand, capital structure enables a company to adjust its structure so as to improve the competitiveness in the market. On the basis of the main findings of this paper, it is easy to conclude that from the year of 2011 to 2019, Tongrentang's profitability, or ROE, does be dominated by the combination of equity and debt. This paper reveals that:

- In Tongrentang, a positive correlation exists between the short-term debt to total assets and the return on equity.

- In Tongrentang, a positive correlation exists between the total debt to total assets and the return on equity.

To sum up, Tongrentang relies on debt to produce profit. In other words, the short-term profit acts as the main source for companies to finance their daily running and generate profit, which is in line with most previous studies. Considering the policies issued by Chinese government, it is pretty clear that the government has introduced many preferential policies to encourage and support most enterprises, for example, tax reduction, which contributes to the booming of Chinese market and the steady improvement of Tongrentang Group. Beyond these, we may also realize the importance of capital structure. Financing daily operations through debt is a beneficial approach for a company to make profit, which also means the optimal capital structure must consist of some proportion of debt.

This paper only concentrates on Tongrentang Group within Chinese market. As we know, different market is characterized by different elements. The findings of this study is only suitable for those companies with similar conditions. Further research can be conducted in the following directions: expanding the area to international medical industry, collecting the financial data from companies of different markets as many as possible so as to generate an overview of the impact of capital structure on profitability.

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# VITA

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|---|---|
| **NAME** | Ransuo Yang |
| **DATE OF BIRTH** | 24 May 1997 |
| **PLACE OF BIRTH** | Guiyang, Guizhou Province, China |
| **INSTITUTIONS ATTENDED** | Guiyang No.1 High School<br>Beijing Forestry University |
| **HOME ADDRESS** | Jiazhichang, Nanming District, Guiyang, Guizhou Province, China |
| **PUBLICATION** | No |
| **AWARD RECEIVED** | No |