ISCTE Business School
University Institute of Lisbon

M&A in the Chinese pharmaceutical industry:

Shanghai Pharma and SIPI/SZXP Case study

Jie Wang

Project submitted as partial requirement for the conferral of Master of Science in Finance, at
ISCTE – University Institute of Lisbon, 2016

Supervisor:

Prof. Pedro Manuel de Sousa Leite Inácio,

ISCTE Business School, Department of Finance

February 2016

ISCTE Business School
Instituto Universitário de Lisboa

M&A in the Chinese pharmaceutical industry: Shanghai Pharma and SIPI/SZXP Case study

JIE WANG

- Spine -

Abstract

M&As are developing really fast in China, especially in pharmaceutical industry. But the road of M&A is not flat, some enterprises suffered bitter and unnecessary losses because of blind M&A and lack of comprehensive understanding of the target company. Shanghai Pharmaceutical Co., Ltd. (Shanghai Pharma) played an exemplary role for improving industrial concentration, optimizing the organizational structure and rationally allocating resources by means of M&As.

Event study methodology is used in this paper to test the effect of the merger case on the stock price of Shanghai Pharmaceutical Co., Ltd. The announcement of tender offer for the merger between Shanghai Pharma and Shanghai Industrial Pharmaceutical Investment Co. Ltd. (SIPI)/Shanghai Zhong Xi Pharmaceutical Co. Ltd. (SZXP) had a positive influence on the stock price at a statistical significant level, therefore it brought short term benefits for Shanghai Pharma.

Financial analysis revealed the operating and financial synergies generated by this merger, we can find a substantial increase of three growth indicators: The main business's increasing rate of revenues, Net profit growth rate and Net asset growth rate, which means a great improvement of the enterprise operating capabilities. The company's profitability and capital utilization improved a lot as we revealed after calculating ROS, ROA and ROE from 2006 to 2012. Shanghai Pharma also improved its capital structure and solvency through such large M&As.

Forecasting synergies for this case, Shanghai Pharma and SIPI occupied the most part of synergies during this acquisition, however the increase in the enterprise value of SZXP was not significant.

Key words: mergers & acquisitions, China, event study, SWOT analysis, synergy

JEL Classification: G14, G34

Resumo

As Fusões e Aquisições (F&A) estão a desenvolver-se rapidamente na China, nomeadamente na indústria farmacêutica. No entanto, este processo tem tido os seus problemas, algumas empresas tiveram perdas significativas e desnecessárias devido a F&A apressadas e à falta de uma compreensão adequada das empresas alvo por parte das oferentes. A empresa Shanghai Pharmaceutical (Shanghai Pharma) desempenhou um papel exemplar no aperfeiçoamento da sua concentração industrial, melhorando a sua estrutura organizacional através de uma alocação de recursos mais racional como consequência das suas operações de F&A.

Neste trabalho utiliza-se a metodologia dos estudos de eventos para testar o impacto das fusões no preço das ações da Shanghai Pharmaceutical. O anúncio da OPA visando a fusão entre a Shanghai Pharma e a Shanghai Industrial Pharmaceutical Investment (SIPI)/Shanghai Zhong Xi Pharmaceutical (SZXP) teve uma influência positiva no preço da ação estatisticamente significativa, pelo que se traduziu numa vantagem para a Shanghai Pharma e os seus acionbistas.

A análise financeira efetuada revelou as sinergias operacionais e financeiras geradas por esta fusão, tendo-se encontrado um aumento significativo em três indicadores de crescimento: na taxa de crescimento das receitas operacionais, no crescimento dos resultados líquidos e no crescimento dos ativos, o que se traduz numa grande melhoria do potencial operacional da empresa. A rendibilidade da empresa e a elevada rotação do seu ativo melhoraram substancialmente tal como se pode verificar pelo exame dos indiocadores ROS, ROA and ROE de 2006 a 2012. A Shanghai Pharma também reforçou a sua estrutura de capital e melhorou a sua solvência com esta operação de fusão.

As sinergias financeiras estimadas neste caso entre a Shanghai Pharma e a SIPI são as mais relevantes, já as provenientes da SZXP não são tão significativas.

Acknowledgement

I wish to highlight and express my gratitude to some people directly or indirectly, in this study.

To my **parents**, Shengli Wang and Xiaoqun Liu, who have provided me with all the needed financial and emotional support, I would have no way to insist on my study without their generous support.

To my **boyfriend**, Cheng Zhao, who accompanied me over the years and visited me from China last winter holiday, and gave me confidence to study.

My special thanks to my **supervisor**, professor Pedro Manuel de Sousa Leite Inácio, for his patient guidance and careful revision, for helping me, a original medical student, to be able to complete the thesis more smoothly and quickly.

Finally, I want to express my appreciation to **all friends** who had helped me to connect with officials in Portugal when I was in China, thanks for all your helps!

Index

Index of Figures

Index of Tables

List of Abbreviations

AR -- Abnormal Returns

AAR -- Average Abnormal Returns

ACAR -- Average Cumulative Abnormal Returns

CAR -- Cumulative Abnormal Returns

CAGR -- Compounded Annual Growth Rate

CAPM -- Capital Asset Pricing Model

DCF -- Discounted Cash Flow

FCFF -- Free Cash Flow of Firm

GDP -- Gross Domestic Product

GMP -- Good Manufacturing Practice

GSP -- Generalized System of Preference

NDRC -- National Development and Reform Commission

NPV -- Net Present Value

OLS -- Ordinary Least Squares

ROA -- Return on Assets

ROE -- Return on Equity

ROS -- Return on Sales

RMB -- Chinese currency name, same as Yuan (¥)

SASAC -- State-owned Assets Supervision and Administration Commission

SOE -- State-Owned Enterprises

WACC -- Weighted Average Cost of Capital

WTO -- World Trade Organization

1. Introduction

M&A continues to be a popular method to achieve expense reduction, increase market power and operating efficiencies. China, as the world's second largest economy, has maintained a high economic growth rate since the economic reform of 1978. Facing the increasing market competition pressure, Chinese companies have to enhance their own strength constantly to survive and develop in the fierce market competition. Generally speaking, there are two ways to develop and expand, the first is to realize the gradual development by accumulation of themselves; the second is to achieve leap-type development by external mergers and acquisitions, M&A can be more effective, many researchers have evidenced the role of mergers in improving firm performance (Datta, Narayanan and Pinches, 1992; King, Dalton, Daily, & Covin, 2004).

Pharmaceutical industry has high knowledge and technology intensity, high capital intensity, high added value, high risk and other high-tech industries basic characteristics. Since China entered into WTO, a large number of foreign enterprises have poured into China, a huge market, the state-owned pharmaceutical companies are facing huge competition pressure either from domestic pharmaceutical enterprises or foreign pharmaceutical enterprises. In order to improve the competition capability of state-owned pharmaceutical companies, M&A is an inevitable trend.

In recent years, state-owned pharmaceutical companies implement M&A actively under the help of State-owned Assets Supervision and Administration Commission (SASAC), they make full use of the advantage of each other, by reducing operating costs, and expanding business scale, in order to achieve the good performance of M&A. In this context, it is meaningful to study M&A of state-owned pharmaceutical companies, with the purpose of providing implications and references for mergers activities in China.

In this paper, we study the merger case of Shanghai Pharmaceuticals Holding Co., Ltd (Shanghai Pharma) at 2009 as a project, which had an important impact on the Chinese pharmaceutical industry. In October 2009, led by the Shanghai State owned assets supervision and Administration Commission (SASAC), Shanghai Pharmaceutical Co., Ltd. announced merger and reorganization plan, after the restructure, the new Shanghai Pharma became a large comprehensive pharmaceutical company covering the entire industry chain, and also becoming the only public pharmaceutical company subordinated by Shanghai SASAC.

There are four parts in this paper: the first part is a brief literature review, expounding the theoretical research on the merger and reorganization of enterprises, which provides a powerful support for the analysis and demonstration of the next study in this project; the second part is background research, we respectively analyzed the situations of M&A in China, Pharmaceutical industry of China, and M&A of Chinese pharmaceutical enterprises, to provide a general understanding of the research background; the third part is the performance analysis of Shanghai Pharma, event study methodology was used to test the important effect of the mergers reflected on the stock price of Shanghai Pharmaceutical Co., Ltd., we chose three events during 2008 to 2012, and use the statistical test to measure the significance of CARs, the announcement of tender offer for the merger between Shanghai Pharma and SIPI/SZXP had positive influence on the stock price at a significant level, it brought short term benefits for Shanghai Pharma; the fourth part is a case study, after overviewing the case, some financial indicators were used to evaluate the operating and financial synergies derived from the merger, we found a great improvement of the enterprise growth rate, the company's profitability and capital utilization improved a lot as we revealed after calculating ROS, ROA and ROE from 2006 to 2012, the capital structure and solvency of Shanghai Pharma were also improved. Next, DCF was used to estimate the enterprise value for forecasting synergies, and we calculated the synergies for each pair of companies and figured out how these synergies was separated among this three companies. Shanghai pharma and SIPI occupied the most part of synergies during this acquisition, but the increase of the enterprise value of SZXP was not significant. Finally, the conclusion derived from the performance of the bidding company summarizes the integration effects for this case, and explores the profound implications for guiding practical activities in the future.

2. Literature Review

2.1 M&A

M&A is an important form of capital operation and business expansion, an important way of industrial structure coordination and resource allocation optimization under market economy.

Merger is an economic behavior, it refers that an enterprise may take various forms for receiving other enterprise's property rights, making the target company lose the status of a legal person or changing the legal entity.

Acquisition refers to a company buying another enterprise' shares or assets with cash or securities, to obtain all the assets or the control of the enterprise.

Differences:

Merger often has a result that the target company loses the legal status, and becomes a part of the buyer; but in the act of acquiring, the legal person status of the target company can be retained.

Categories:

Federal trade Commission sorted M&A into horizontal merger, vertical merger, and conglomerate merger. Horizontal M&A is the situation that two or more than two companies in the same industry with similar production combine together (Stacey, 1966). Vertical merger refers to the merger between companies with the relationship of purchase - sale, for example: Merck Co merged the world's largest seller of prescription drugs—Medco Containment Services, Inc. at price of $6 billion in 1993. Conglomerate merger occurs between companies which are neither competitors nor in a purchases - sales relationship. Based on the case in this project, we focus on horizontal mergers. Eckbo (1983) also demonstrated that the combination of related firms usually can get a more cost-efficient corporate entity compared to the acquisition between unrelated firms.

Payment methods:

It can be paid in cash or securities, and also can be a mixture of them, the securities used by the payment can be the own stock of the acquiring company, or other securities. Stock exchange method, in which the exchange rate can be fixed or floating, usually saves considerable costs compared with cash merger, it also generates the expected growth effect of stock (Xu Minglei,

2014), and provides some tax benefits for the seller under the precondition that both parties have a unified understanding of the value of the securities used in the transaction (Gaughan, 2011).

Benefits or not:

M&A has always been a quick way for a company to seek development and increase value, Jensen and Ruback (1983) demonstrated that acquisitions in general create economic value. Andrade, Mitchell, and Stafford (2001) also argued that corporate mergers add wealth to stock-holders in general. However, Habeck et al. (2000) pointed out that most of M&A result in reducing shareholder value.

The sobering reality is that only about 20 percent of all mergers really succeed. Most mergers typically erode shareholder wealth…the cold, hard reality that most mergers fail to achieve any real financial returns…very high rate of merger failure…rampant merger failure…[1]

The value created from M&A stated by Bruner (2002), is determined by some factors which describe higher and lower profitability. Focus, relatedness, and adherence to strategy are determinants for value creating; while diversification, size maximization, empire building and hubris destroy value. That means the good deals are achieved not only by pricing, also by strategy and skills of post-merger integration. The critical insight is that choices made by managers can be materially influential to M&A profitability.

Ficery, Herd, & Pursche, (2007) demonstrated that M&A synergies are really controversial since the difficulty to calculate and capture. They pointed six points that why can M&A go wrong when enterprises trying to capture more synergies. First, acquiring companies often fail to capture all the synergies because of the narrow definition to synergies by executives at acquiring companies; the second problem is the missing of opportunity window; the third one is related to incentives as we will talk next in Motives; Fourth, enterprises always having the wrong people involved in synergy capture; Fifth, the cultural adaption in achieving synergies; finally, the process executed may be not right. Same topic also discussed by William (2013) that "Most research on M&A shows that a majority of deals fail to create value for owners of the firm…Failed M&A deals are often the result

---

[1] Grubb and Lamb (2000), pages 9, 10, 12, and 14.

of overemphasizing certain parts of the organization of not properly coordinating and involving the various constituencies in the organization appropriately".

Motives:

Malatesta (1983) concluded that acquisitions are motivated by agency, the same consequence as the point of Lewellen, Loderer, and Rosenfeld (1985), who indicated the returns of takeover are positively related to the level of management ownership in the bidding firm.

An empirical investigation was conducted by Berkovitch & Narayanan (1993), they found there is a positive correlation between the target and total gains in synergy motivated takeovers, negative if agency is the motive, where "managerialism" leads to overpayment for extending the benefits of managers at the sacrifice of shareholders (Seth, Song and Pettit, 2000: 387), and not significantly different from zero in hubris subsample, where vanity induces managers to overpay the premium (Roll, 1986).

Xu Minglei (2014) indicated that there is a motivation of tax avoidance in China, as the current enterprise income tax regulations, M&A enterprises can get tax benefits by using their own losses to reasonably avoid taxes.

2.2 Event study methodology

As Fama (1991) pointed, there was little empirical evidence in the corporate finance central issue before the event study methodology was applied.

Event study methodology refers that using financial market data to determine the impact of a specific economic event on the value of a listing corporation. Although the first published study about event studies was from Dolley (1933), who examined the stock price reaction to stock splits using 95 samples, the landmark papers originally emerged were Ball and Brown (1968) and Fama et al. (1969), they provided the central skeleton of typical event study. MacKinlay (1997) also argued "using financial market data" to "measure the impact of a specific event on the value of a firm", "given rationality in the marketplace, the effects of an event will be reflected immediately in security prices."

Halpem (1982) mentioned that using event study method to do the related research of the

company's M&A, and verify some financial theories about the merger and acquisition. Warren-Boulton and Dalkir (2001) explained the logic of the event study methodology in M&A, they found highly significant returns only for the rival firm in the relevant market. Based on these returns, they were able to estimate the price effect of the merger in the product market.

The rationale of event study methodology is: assuming the market is rational, the effect of relevant event would be reflected immediately in the security price. As a result, using a relative shorter observation period of stock price can determine the economic impact of an event.

The basic idea is: First we assume that the market is semi-strong efficient, then we define the time period for the event as the event window, and calculate the abnormal returns and the cumulative abnormal returns for the event window, finally use the statistical test of these two indicators to measure the impact of the event.

General steps as follows:

a. Define event and event window

We should focus on what kind of event it is, and we also need to identify the related event, or event window in which the event may affect the variables (price, profit). Usually, the event window includes a period of time before and after the event, since the time period before the event can display the changes of variables (e.g., price, profit), at the same time, the inspection of the stock price in the time period after the event can capture the impact of the prior warning and prior leaked information.

b. Define the estimation window and the post-event window

The purpose of defining the estimation window is to use data to estimate the variables under the situation that the event does not appear (the value of the expected profits), usually larger than or equal to 120 days. Comparing the expected profits and the practical profits, we can draw the abnormal returns caused by the event. In some cases, we need further define the post-event window, to improve the reliability of the expected profit estimates in case there is trend variation.
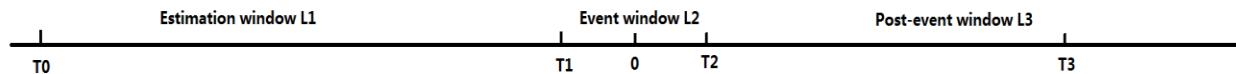
Figure 1 The windows of event study methodology

Source: Author

Khotari and Warner (2006) blurred the boundaries of the event window and post-event window, and according to the length of the event window, they classified the event study as the short-horizon event study (event window less than 1 year) and the long-horizon event study (event window greater than or equal to 1 year). It is believed that the study of the short-horizon event has been relatively mature and worthy of trust, while the long-horizon event study has limitations and needs to be further developed and perfected.

c.   Calculation of abnormal returns

Abnormal returns are the difference between the practical return and the expected return. The normal performance measuring models can be loosely grouped into two categories—statistical: constant mean return model, market model; and economic. Take the market model (MacKinlay 1997) as an example, the calculation formulas of the normal return (Rit) and the abnormal return (ARit) are:

We assume a linear relationship exists between the market return and the stock return.

$$R_{it} = a_{it} + \beta_{it}R_{mt} + \varepsilon_{it} \qquad \text{(Equation 1)}$$

Where:

$$E(\varepsilon_i) = 0$$

$$Var(\varepsilon_{it}) = \sigma_{\varepsilon_i}^2$$

$$AR_{it} = R_{it} - (a_{it} + \beta_{it}R_{mt}) \qquad \text{(Equation 2)}$$

Thus, abnormal profits is the error term of market model.

Generally we employ ordinary least squares (OLS) as a consistent estimation procedure to estimate the parameters for the market model.

d. Cumulate abnormal returns

The calculation of the abnormal return above is just for a certain event date, in order to better describe the impact of events on the stock returns, we need to accumulate time to calculate the cumulative abnormal returns of the stocks.

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it} \qquad \text{(Equation 3)}$$

$$T_1 < t_1 \leq t_2 \leq T_2$$

When L1 is large enough, CAR_i variance is:

$$\sigma_i^2(t_1, t_2) = (t_2 - t_1 + 1)\sigma_{\varepsilon_i}^2 \qquad \text{(Equation 4)}$$

e. Statistical test

After calculating the abnormal returns, the statistical test can be used to determine whether the event has an impact on stock returns at a significant level, as well as ensuring the scientific reliability of event studies.

The steps are as follows:

First, put forward the null hypothesis (H_o): the event had no effect to the stock returns.

Second, construct statistic $CAR_i(t_1, t_2)$

$$CAR_i(t_1, t_2) \sim N\big(0, \sigma_i(t_1, t_2)\big)$$

Standardize the above statistics, and obtain:

$$\theta_i = \frac{CAR_i(t_1, t_2)}{\sigma_i(t_1, t_2)} \sim N(0,1) \qquad \text{(Equation 5)}$$

Third, according to a given level of significance (α), determine the rejection region of H_o.

$$\left\{\theta \| \theta | > Z\frac{\alpha}{2}\right\}$$

Since $\sigma_{\varepsilon_i}^2$ is unknown, we can approximately use the variance of sample to replace it.

Finally, when θ falls into rejection region, we can refuse the null hypothesis, we can say the outcome is "statistically significant", thus the event has an impact on stock returns; otherwise we accept H_o.

2.3 SWOT

SWOT stands for Strengths, Weaknesses, Opportunities and Threats, and determines the strategic positioning of enterprise, maximizes the use of the internal advantages and opportunities, reduces the disadvantages and threats to the minimum. Learned et al. (1969) described that SWOT analysis is a key tool for addressing complex strategic situations, but Turner (2002) insisted SWOT was attributed to Ansoff (1987). We do not know the origin of the term "SWOT", Haberberg (2000) pointed out that SWOT was used for the first time by Harvard academics in the 1960s.

SWOT is the key technique for presenting the results of strategic analysis, which provides a platform for going on to formulate the strategy for the future. The strengths and weaknesses should be based upon the internal analysis of the organization whilst the opportunities and threats should be based upon an analysis of the organization's external environment.[2]

Typically, managers first consider internal strengths and weaknesses (at the top row of the 2×2 grid) which can include image, structure, access to natural resources, capacity and efficiency, and financial resources. At the bottom row of the SWOT grid, external opportunities and threats include customers, competitors, trends in the market, partners and suppliers, social changes and new technology, and various environmental economic, political and regulatory issues (Helms & Nixon, 2010.).

---

[2] Evans, Campbell, & Stonehouse (2003) - *Strategic Management for Travel and Tourism*, Chapter 9, Routledge, Oxford.

Figure 2 SWOT Analysis

Source: Author

SWOT analysis procedures:

1. List the strengths and weakness, opportunities and threats of the enterprise.

2. Combined strengths, weaknesses, opportunities and threat, form SO, ST, WO, WT strategies.

3. Identify and choose among SO, ST, WO, WT strategies, and determine the concrete strategy that the enterprise should take at present.

2.4 Sinergy

An acquisition of a suitable company may bring some synergies to the buyer, but what is synergy?

Sirower (1997) argued that synergy can be defined as "Increases in competitiveness and resulting cash flows beyond what the two companies are expected to accomplish independently"

In the theory of static synergy, which was initially put forward by "the ancestor of strategic management" -- Ansoff (1960s), the synergy of enterprise merger and acquisition is, through the merger and acquisition, the enterprise's benefit can be greater than the sum of the two companies independently, to be short, synergy has the effect of 2+2=5, the Soviet Government also used the same expression as Ansoff when propagandizing for the first Five-Year Plan (1928). This definition is biased however, because according to this formula, this synergy effect not only includes the synergy of M&A, but also includes the growth potential of both sides before the merger, which leads to growth performance after the merger, so the synergy effect is overestimated.

The concept of dynamic synergy was initially proposed by an American merger expert Sirower (1997). He believed that synergy of enterprise merger and acquisition is that the company's operating performance should be better than the expected operating performance of the two companies when they were independent. He also pointed out that if the performance improvement of enterprises after the merger and acquisition was expected before the merger when these two companies were independent, it is not a synergy of mergers and acquisitions. Only the value beyond the expected could be the true realization of synergies.

Synergy may allow the combined firm to have a positive net acquisition value (NPV).

NPV = [Vab – (Va + Vb)] – (P + E)   **(Equation 6)**

Where:

- Vab: the combined value of the two firms
- Va: the value of firm A
- Vb: the value of firm B
- P: the premium paid for B
- E: expenses of the acquisition process

The synergy which is in the brackets must be greater than the sum of P + E, otherwise the bidding firm will fall under the risk of overpaying (Gaughan, 2011).

Whether M&As can lead to synergy is by no means guaranteed (Bradley, Desai and Kim, 1998). Sirower (1997) observed that companies, who paid too much, forecast too brightly, lose the acquisition game. He pointed out the "synergy limitation view", which hold that there are "severe limits to attainable synergies (i.e., a low expected value) in a competitive market relative to what most acquisition premiums would require". Besides, a value-destroying effect was identified: "an acquisition made at a premium to the market price will effectively raise the market's expectations of the combined firm's performance."

2.4.1 Operating synergy:

The combination of companies improves the efficiency of their producing and operating activities, which is the so-called operating synergies. These synergies always benefit from economies of scale and scope, reducing operating costs and/or capital investments, thus improving cash flow.

Economies of scale

Pursuing economies of scale is an important motive for M&A, and it is overwhelming as the motive of monopoly (Pratten, 1971). Silvestre (1987) defined in "the new Palgrave Dictionary of economics" that considering a given (invariant) technology condition, if the average cost of producing a single or composite product is reduced (or increased) in a certain interval, it can be said that there are economies of scale (or diseconomies of scale). Smith (1976) pointed out that the division of labor and specialization is the main reason of economies of scale, and on this basis, put forward the "Smith's theorem" argument: with the increase of market capacity, firm size has a tendency to unlimited expansion (White, Smith, Skinner,& Whilson, 1976).
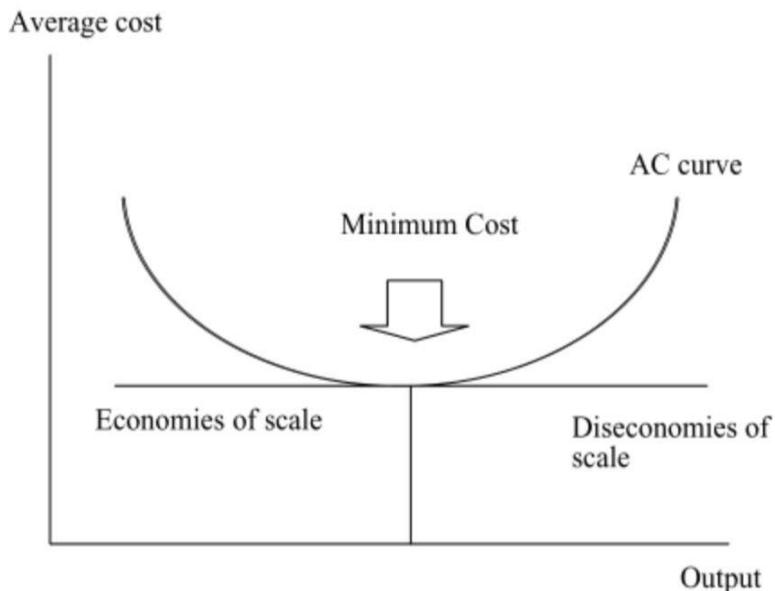
Figure 3 Economies and Diseconomies of Scale

Source: Patrick A.Gaughan[3]

As shown in Figure 1, economies of scale, the proper size expansion of the company leads to the decline of the unit cost. Diseconomies of scale mean that, with the expansion of the production scale, the marginal benefit is gradually declining, even below zero.

---

[3] Patrick A. Gaughan, 2011, *Mergers, Acquisitions, and Corporate Restructurings,* 136, John Wiley & Sons, Inc., Hoboken, New Jersey.

Economies of scope

Economies of scope are "efficiencies wrought by variety, not volume" (Goldhar and Jelinek, 1983), refers to a condition where the cost of producing two kinds of products together is lower than that of producing each product separately.

American economists Panzar and Willig（1975）initially defined from the perspective of industrial organization, that economies of scope are a kind of economy which is emerged when a firm who manufactures one kind of product changes to manufacture two or more kinds of products, and the long-term average cost is reduced. Baumol et al（1982）rely on the cost effect function to study economies of scope, they believe that in the multi - output environment, multi - product output synergies will produce a range of economic benefits.

2.4.2 Financial synergy:

Jensen and Ruback (1983, p. 24) stated that financial reasons could motivate mergers. Financial synergies for a company are the benefits coming from the financial aspects of the business. According to the viewpoint of Rong Xiang and Xinping Xia (2003), the project cash flow is composed as following:

$$CF = EBIT + DBT - T - Cn = R - Co - T - Cn \qquad \text{(Equation 7)}$$

Where:

EBIT = Earnings Before Interest and Taxes

DBT = Depreciation Before Taxes

T = Taxes

Cn = Capital requirements

R = Revenues

Co = Costs

then: $\triangle CF = \triangle EBIT + \triangle DEP - \triangle T - \triangle Cn = \triangle R - \triangle Co - \triangle T - \triangle Cn$ (Equation 8)

So, the calculation of the synergistic effect of the incremental cash flow $\mathbf{\Delta}$CF is decomposed into four parts: increase the revenue, reduce the product cost, tax cuts and capital requirements reductions. Thus, the pursuit of financial synergies from M&A is due to the fact that it can achieve the following financial objectives.

     a) Revenue increase ($\triangle$R), the increase of operating income mainly comes from marketing, strategic advantage, and the enhancement of market control power.

     b) Product cost reduction ($\triangle$Co), the achievement of economies of scale; the post-merger integration, coordination of related business activities is made easier as well as the realization of technology transfers, thereby reducing management costs and technology development costs; the co-ordinate use of other existing resources.

     c) tax cuts ($\triangle$T)

     d) reducing capital requirements ($\triangle$Cn)

2.4.3 Corporate Valuation (DCF) approach:

There are many approaches to estimate the synergy of M&A, one of the most famous is from Seth (1990), who measured synergy by comparing the value of the combined firm, which reflects all gains through the acquisition, with the group value of the bidder and target had there been no acquisition. Thus, the valuation of corporate become a primary task, we chose the Discounted Cash Flow approach to estimate the enterprise' value in this paper.

$$V = \sum_{i=1}^{\infty} \frac{FCFF_t}{(1+WACC)^t}$$ (Equation 9)

WACC (Weighted Average Cost of Capital) model:

$$WACC = R_E \times \frac{E}{E+D} + R_D(1-t) \times \frac{D}{E+D}$$ (Equation 10)

R_E = Shareholders Required Rate of Return (Levered)

E = Market Value of Equity

D = Market Value of Debt

R_D = Average Interest Rate on Debt

$R_D(1-t)$ = After Tax Cost of Debt

t = Income Tax Rate

In order to estimate R_E, the Capital Asset Pricing Model (CAPM) is mainly used in this study:

The capital asset pricing model (CAPM) emerged in the early 1960s. After researching the interdependence between the income securities, Lintner, (1965), Sharpe, (1964) and Mossin (196?) proposed respectively the CAPM theory which can be used to determine the individual stock expected returns, the model shows that stock expected returns and beta coefficient have linear positive correlation.

The basic formula of CAPM:

$$R_E = R_f + \beta \times (R_m - R_f) \qquad \text{(Equation 11)}$$

Where:

R_f = Risk Free rate

R_m = Expected Market Return

β = Firm Levered Beta

R_E = Security Expected Return

In view of the relative high risk of Chinese capital market, companies are generally considered to be sustainable, for this purpose, generally the long-term bond interest rates issued by Government is used as being the country risk-free interest rate. Also because the bond interest rate is a single

interest rate, while the discount rate of the corporate valuation is the compound interest rate, therefore, the bond interest rate should be amended by the following formula:

$$R_f = \sqrt[n]{1 + nr} - 1 \qquad \text{(Equation 12)}$$

Where:

R_f = Compound Risk Free rate

n = Years of Long-term Bond

r = Single Interest Rate of Long-term Bond

Estimate β:

$$R_t = \alpha + \beta R_{mt} + e_t \qquad \text{(Equation 13)}$$

Where:

R_t = Security Return

α = Intercept

β = Firm Levered Beta

e_t = Error Term

R_{mt} = Market Index Return

Through the historical data of the same period of the asset returns and market portfolio returns, we use linear regression equation to predict β.

This method needs a large amount of data in calculation process, if this data is not accurate, then the internal calculation model can be difficult to provide an appropriate method for the accurate measurement of synergy effect.

Moreover, this method is to evaluate the synergy effect after the M&A, that is to say, the method emphasis on the assessment of the post-merger. However, the synergy effect of M&A should be measured before the M&A, which can help us to make a decision and implement M&A smoothly.

3. Background research

M&A in China

Chil and Rodrigues (2005) indicated that M&A is a quick way for Chinese companies to obtain technology, security research and development skills. According to statistical data, Chinese M&A market developed rapidly from 2007 to 2013, the amount of Chinese M&A market in 2012 was
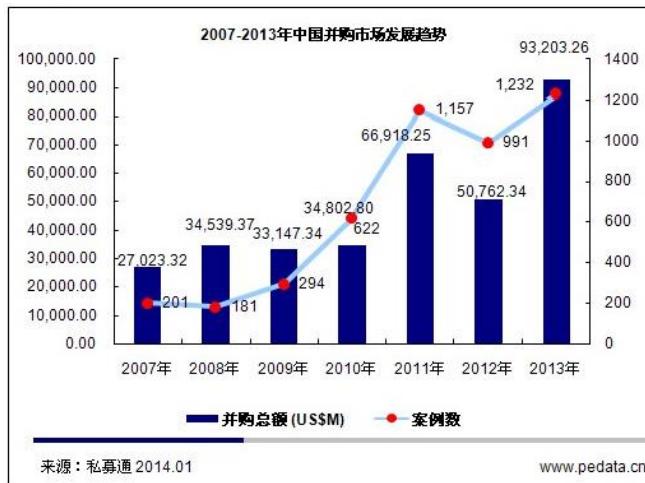

Figure 5 Trend of M&A market of China (2007-2013)

Source: 2013 年中国并购市场年度研究报告（2013 Annual Research Report of China M&A market）

Figure 4 Trend of domestic M&A of Chinese enterprise (2007-2013)

Source: 2013 年中国并购市场年度研究报告 （2013 Annual Research Report of China M&A market）

$50.762 billion, and in 2013 was $93.203 billion, year-on-year growth of 83.6%. In domestic M&A, $17.3 billion for 2012, $41.7 billion for 2013, so it increased 1.5 times.

China has a large scale of state-owned assets and a large amount of state-owned enterprises, according to the requirements of Chinese social and economic system of ownership, the government monopoly will continue as well as the control over the industries that relate to national security and that involve the lifeblood of the national economy. "China insists on the fundamental status of SOEs in the whole economy and supports them with materially beneficial policies", Zhou, et al. (2015) proposed "the value of political connections is positive in Chinese M&A market".

The motives of Chinese state owned enterprise merger and acquisition:

1．To meet the state-owned economic structure and overall configuration. This is the most important reason for M&A of Chinese state-owned enterprises, under the traditional planned

economy system, China adopts administrative means to allocate resources, which hinder the overall development of state-owned enterprises, made the industry resource allocation extremely dispersed and seriously wasted. State owned enterprise merger and acquisition is the need of industrial structure adjustment, in the case of the certain total amount of funds, it is the important way to optimize the industrial structure by improving the structure of enterprise capital.

2．To eliminate losses. Since the reform and open policy (1978), Chinese economy has been growing at a high speed, and on the other hand, the growth of the economy has been plagued by the deficit problem of the constantly expanding state-owned enterprises. Most of the loss-making enterprises occupy a large number of idle funds, while the good-operating enterprises cannot develop because of the restriction of funds, equipment, and sites. M&A has become a major way of eliminating these losses of state owned enterprises.

3．The need of international strategy. The state-owned large enterprises frequently merge and acquire to achieve strategic objectives for obtaining more strategically significant resources. There are no international strategic issues for our case in this study, so it is not detailed here.

However, under the socialist market economy system, the government, as the ultimate owner of the state-owned assets, has influenced the M&A process of state-owned enterprise even more than the market itself. Boycko *et al* (1993) showed that government-owned companies would be more enthusiastic to pursue social and political purpose than to create their own value. Liu Xiaodan, CEO of the Huatai United Securities Co., Ltd, delivered a speech in September 23rd, 2014, she pointed that the current M&A market in China is still in the primary stage, and there will be a huge space for development in the future. In China, government intervention is a very common phenomenon in mergers and acquisitions. Of course we know, M&A is a natural historical process, if the enterprise, which is the subject of a merger, lacks the inherent requirements, it is not available for government to simply rely on administrative means to promote the enterprise to scale up.

Besides, the merger and acquisition of enterprises should focus on the improvement of efficiency, not only the expansion of the scale. But such behaviors like blindly pursuing large-scale and diversified business, make the enterprises fall into the predicament, are not uncommon in Chinese mergers and acquisitions market.

In addition, the acquisition of Chinese enterprises through the stock market lacks of the necessary market conditions. This objective reason has greatly restricted the development of enterprise merger and acquisition activities in China, because the perfect capital market is an effective way to carry out the reorganization of enterprise assets and to realize scale expansion. Nevertheless, in the mature market, where competition is fierce and the securities market is effective, it is difficult to find if the value of a corporation is significantly underestimated, Chinese economy is in transition, therefore it should be easier to find the value of the listed corporations which are underestimated, and then improve the value of the company through mergers and acquisitions. Thus, it is impossible to reply the answer only by logic reasoning whether there is value creation in Chinese M&A, a comprehensive and in-depth empirical evidence is needed.

Pharmaceutical industry in China

The existing raw materials and pharmaceutical production enterprises in mainland China have many problems, such as the lag of development, the short supply of funds, and the high cost of production, etc.

The scales of Chinese medicine enterprises are generally small, which does not allow scale economies. According to the Shepherd classification standard of the relative market power theory, the pharmaceutical industry in mainland of China is definitely a perfect competition market, and the market concentration of Chinese pharmaceutical industry is significantly lower than that of foreign developed countries (Yang Shu-jie, Li Kai, 2009). Low market concentration will affect the ability of R&D investment. Objectively, only with a certain scale and financial strength, can enterprises withstand the cost of technology R&D and risks. Therefore, the market concentration of Chinese pharmaceutical industry needs to be further improved.

At present, Chinese pharmaceutical market is lacking price competition. We all know that before generating an effective society with maximizing social welfare and optimal level of production, the price of goods in this market would constantly rise and fall until the formation of a balanced price. There is a premise that consumers can accurately or low-costly determine the quality of goods, that is, the degree of information asymmetry in the commodity market is very low. But in Chinese pharmaceutical market, Yang Shu-jie, Li Kai (2009) mentioned the information asymmetry leads to an almost complete lack of price competition, consumers find it difficult to make a judgment on

the medical services and drug efficacy, and this is the reason for the low price elasticity of pharmaceutical products.

Mainly producing generic drugs[4], lacking of new products and influential famous brands, can be a disadvantage for Chinese pharmaceutical enterprises. We can find from product market sales information, the benefits of foreign-funded enterprises from new drug sales are huge, while the profits from generic drug sales of Chinese enterprises are very little. Moreover, foreign-funded enterprises operating in different countries and regions have already set up high brand awareness, Chinese pharmaceutical enterprises are limited in this respect.

While facing all sorts of troubles, Chinese pharmaceutical market still has a tremendous potential, a large amount of opportunities and accompanying policies make Chinese pharmaceutical market thrive rapidly.

The regional consumption proportion of the world medicine market is positively related to the overall situation of the world economy. Data shows that the United States, Europe and Japan in a very long period of time have been occupying the top three positions. In 2006, the medical expenses of these three economies accounted respectively for 41%, 19% and 10% of the global market. But as the market is gradually saturated, the world's pharmaceutical giants are trying to develop new markets, with a view to being a new point of sale. IMS[5] health expected that until 2016, the global share of medical expenses of the traditional developed countries, the United States, Europe and Japan, will continue to go down or flat, and respectively be 31%, 13% and 10%. In contrast, the proportion of emerging markets for medical expenses will rise from 14% in 2006 to 30% (Figure 6 Global pharmaceutical market share), it will be a good opportunity for China to obtain economies of scale and expand market share, in fact, China is already on this road.

---

[4] Generic drug: a special name in China which refers to conventional drugs or the drugs have been widely used for many years on clinic, it usually has some common characteristics, such as low technology, low prices, has formed the prescribing habits. Source from: Baidu cyclopedia (http://baike.baidu.com/view/1028863.htm)
[5] IMS Health Inc.: Global leader in providing professional information and strategic consulting services to medical and health industry, founded in 1954.
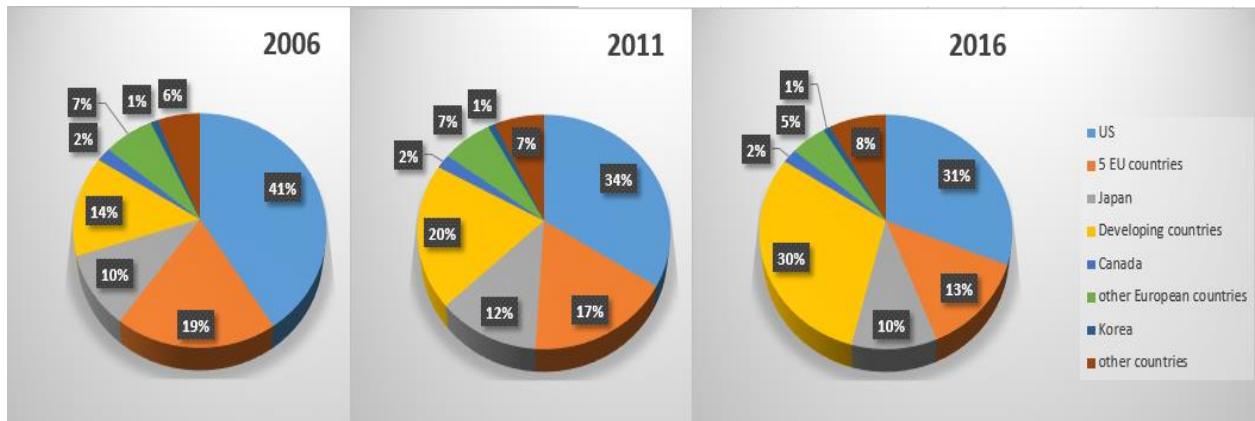
Figure 6 Global pharmaceutical market share

Source: IMS market forecasting (May, 2012)

Chinese pharmaceutical market will continue to grow rapidly, mainly due to two strong trends (view: http://www.360doc.com/content/14/0823/12/92853_404022660.shtml):

The first trend is continuing demographic change, this kind of change is driving demand growth, and Chinese population is aging: in 2020, 33% of the Chinese population will reach 50 years old or more, this ratio in 2010 was 24%; in addition, the chronic diseases are becoming more common; the number of middle class and affluent people is increasing, the number of small and medium-sized cities is also soaring, so that the popularization of modern medical treatment can be improved.

At the same time, the Chinese government has promised to bear a greater proportion of national health care expenditure. In particular, the government funded health insurance has been provided to almost all Chinese citizens, these factors will drive the total expenditure of health care grow at the compound annual rate of 14% before 2010, by then, the medical expenditure will account for about 7% of Chinese nominal GDP, higher than 5.1% in 2011.

The Chinese government has set two goals for health system reform, one is to improve the efficiency of the medical service system, the other is to reduce the relative cost of the medical main elements, and drugs are the most important element.
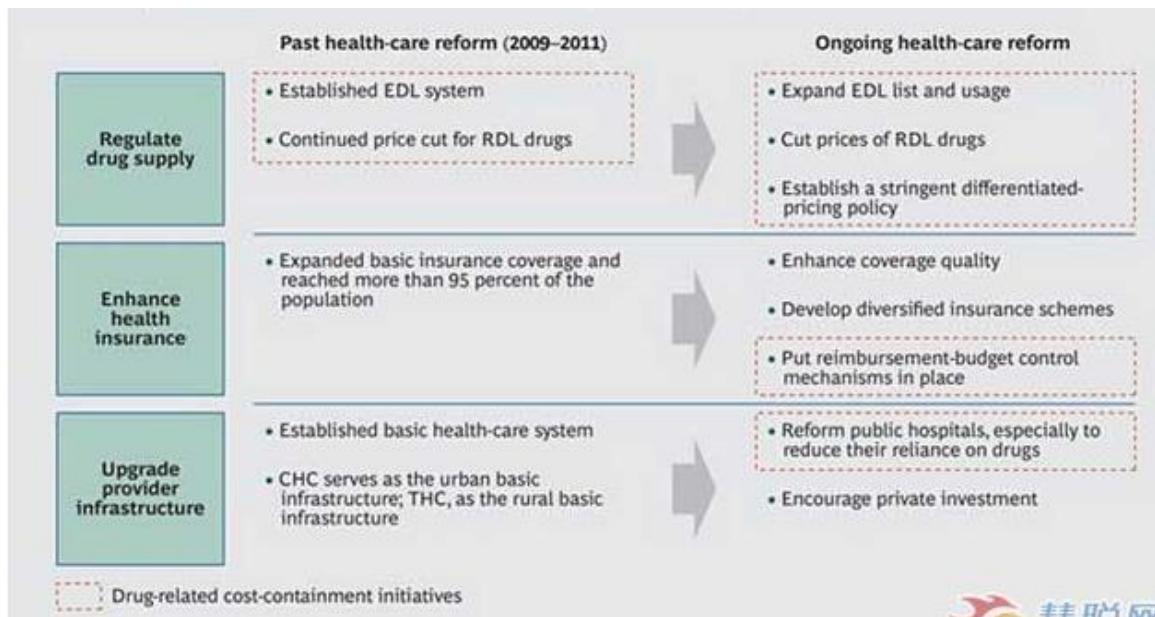
Figure 7 Ongoing health-care reform will emphasize drug-related lost containment

Source: National health and family planning commission

Note: CHC=community health care center THC=township health care center EDL=essential drug list RDL=reimbursement drug list

China health system reform has been conducted for many years, the influence of the reform will be reflected in the following aspects:

a. Cut the prices of drugs. The Chinese government efforts to reduce drug prices -- retail prices (the price of individual purchase of drugs) and the bid price (the price of public hospitals to buy drugs). This effort is focused on the generic drugs and the original drugs of patent expired drugs, which were previously subject to patent protection, but are now being sold without patent by the initial development enterprises. The government has paid a high premium on the patent expired original drugs since 2001.

b. Reduce the dependence of hospital on drug income. Previously, most of the hospital's revenue came from drugs, because the distorted incentives of doctors to prescribe more expensive drugs for patients. However, health care reform will reduce and eventually eliminate these distorted incentives. Reforming measures include: limiting the proportion of revenue from hospital drugs, changing the method of strategy-making of the overall drug budget, the government and hospital share the budget overruns.

c. Improve the coverage of medical insurance and the diversification of insurance plan. The Chinese government has taken effective measures to expand the coverage of basic insurance

to the whole population. At present, more than 95% of the population has been insured. Four levels of coverage are currently available: Basic insurance, Critical illness insurance (MDI), Negotiated reimbursement, Private insurance.

Chinese Pharmaceutical Enterprises M&A

M&A of Chinese pharmaceutical industry become increasingly fierce, the Characteristics of Chinese pharmaceutical enterprises merger and acquisition collated by Li Ting and Xu Huaifu (2013) were: smaller scales and more times; mainly in horizontal M&A; government plays a promoting role. But the most outstanding characteristics of mergers and acquisitions of Chinese pharmaceutical companies in recent years is the purpose of the implementation of M&A changed from the scale expansion to the effective resource synergy, to adjust the product structure of the enterprise, to effectively integrate the resources and expand the market position. The same conclusion as in a study from Zhang Yi (2006), the internal cause of the large-scale mergers and acquisitions in Chinese pharmaceutical industry is the developing requirements of scale economy to improve the industry concentration degree; and the external causes are a series of industry consolidation policies and the pressure from foreign investment in the industry, which promotes industry internal integration to enhance resistance capabilities.

Medicine distribution industry in the Twelfth Five-year Plan[6], focused on cultivating one or two enterprise with hundred-billion value, 20 enterprises with ten-billion value, solving the problems of low industry concentration and drug-maintaining-medicine. In 2009, the market share of the top three corporations in domestic medicine distribution industry was only 23%, while this ratio in the United States was more than 50%, in Japan and Europe it was also between 90% to 80% (Beijing Morning Post, 16/12/2010). The Twelfth Five-year Plan broke the local monopoly, promoting the effective integration of medical resources, encouraging national and regional advantage-leading companies to achieve economies of scale through mergers and acquisitions. The same content is mentioned by Cheng Chunhua (2009): "mergers and acquisitions will make companies, which are small and have certain characteristics, aggregate together, to generate a few really competitive pharmaceutical enterprises in China…using policy, background, and relationships advantages…"

---

[6] The Twelfth Five-year Plan: the Twelfth Five-Year Plan for National Economic and Social Development in People's Republic of China, 2011－2015.

Cheng Chunhua (2009) also put forward, as capital markets mature, more and more new financial instruments will be used in the pharmaceutical industry mergers and acquisitions; more deep the overseas mergers and acquisitions; more companies need legal, financial experts and other professionals, a full range of services with the help of agencies.

4. Event study

Shanghai Pharma had implemented many M&A activities every year, we can analyze the impact of the M&A as a joint operation, using daily share data to assess the impact of each operation on the share price.

From the annual reports we have chosen three critical mergers announcements, which are exhibited as follows:

2012/2/06 announcement of merging Comely pharmaceutical company

2010/11/30 announcement about the company would buy China Health System Ltd.（CHS）

2008/7/2 announcement of tender offer about Shanghai Pharma and SIPI/SZXP

We set the event window as 41 days: the announcement date is 0 day, then the event window is [-20, 20]. According to the Shanghai Composite Index (000001.SS) closed prices and Shanghai Pharma (601607.SS) closed prices, we can then do an event study analysis.

Using market model (MacKinlay 1997), it is necessary to estimate the parameters by OLS for the estimation window. The table below shows the regression results of Shanghai Pharma and Shanghai Composite Index.

Table 1 Regression results

Source: Author

	2012.2.6	2010.11.30	2008.7.2
β_i	1.295123	0.603866	1.097526
α_i	-0.00092	0.002606	-0.00137

    a.   2012/2/06 announcement of merging Comely pharmaceutical company

Due to the different data availability, we chose the different estimate window for each event.
, we decided to use 123 observations to estimate the market model parameters for this event. According to the regression results, we could write the formula to estimate the normal returns as following:

E(R) = -0.00092+1.295123×Rm   (Equation 14)

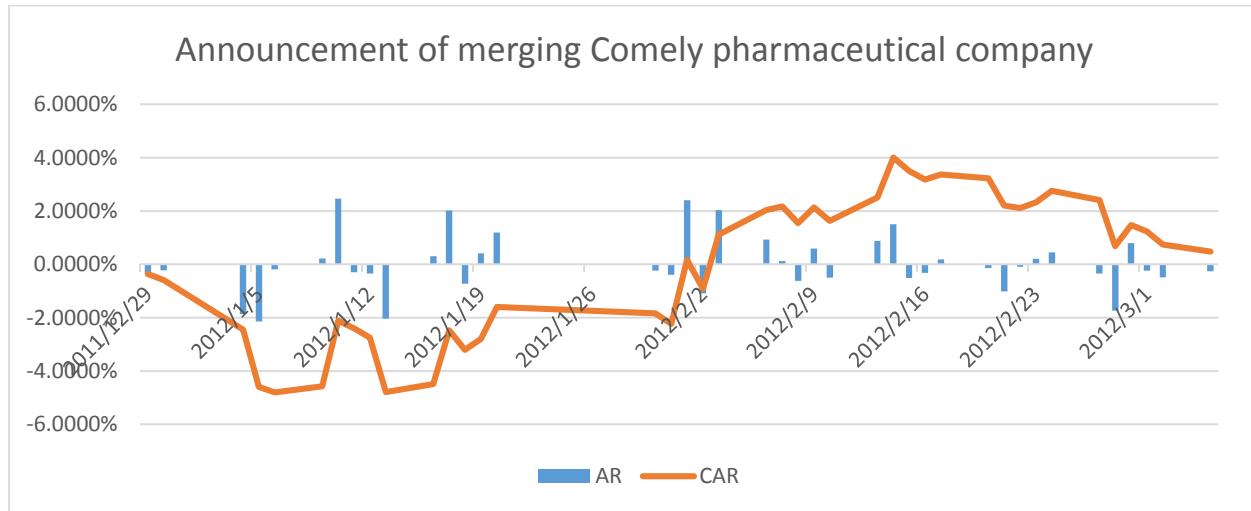Thus, the abnormal returns can be obtained, the trend of the stock price AR and CAR for the announcement is shown below:

Figure 9 Plot of CAR and AR for announcement of merging Comely

Source: Author

As showed in the figure above, the CARs basically keep steady and positive after the announcement day. But we checked in the table 2, the CARs only show significantly negative at time periods of [-17,-15] and [-11,-10], the positive values after the announcement day are not significant at all, thus we cannot say this merger activity brought the company any added value.

    b. 2010/11/30 announcement about the company would buy China Health System Ltd.（CHS）

The observations for the estimation window of this event are 157, according to the regression results, we could write the formula to estimate the normal returns as following:

E(R) = 0.002606+0.603866×Rm   (Equation 15)

Thus, the abnormal returns is the difference between the actual return and E(Ri) at that day, the abnormal return trend is shown as following figure:
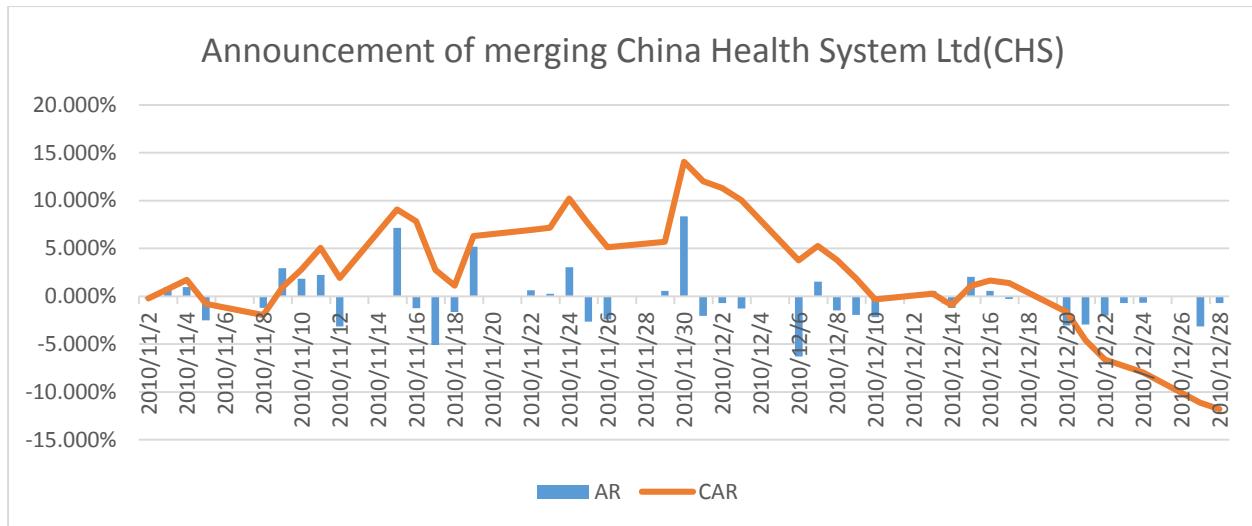
Figure 10 Plot of CAR and AR for announcement of merging CHS

Source: Author

From figure above, the CAR line shows a trend of decline from the announcement day. We can check in the table 2, the maximum value of CAR appears at the day of the announcement (day 0), which is 14.07%, the test result is highly significant (at the significance level of 5%). The CARs of three days after day 0 are significantly positive. But CAR values for day 19 to 20 are significantly negative, which shows that the market was not optimistic about the value creation coming from the Shanghai Pharma merger with CHS.

c. 2008/7/2 announcement of tender offer about Shanghai Pharma and SIPI/SZXP

The length of the estimation window for this case is 200, the formula to estimate the normal returns is: $E(R) = -0.00137 + 1.097526 \times Rm$ (Equation 16)

The following is the trend figure of stock price abnormal returns.
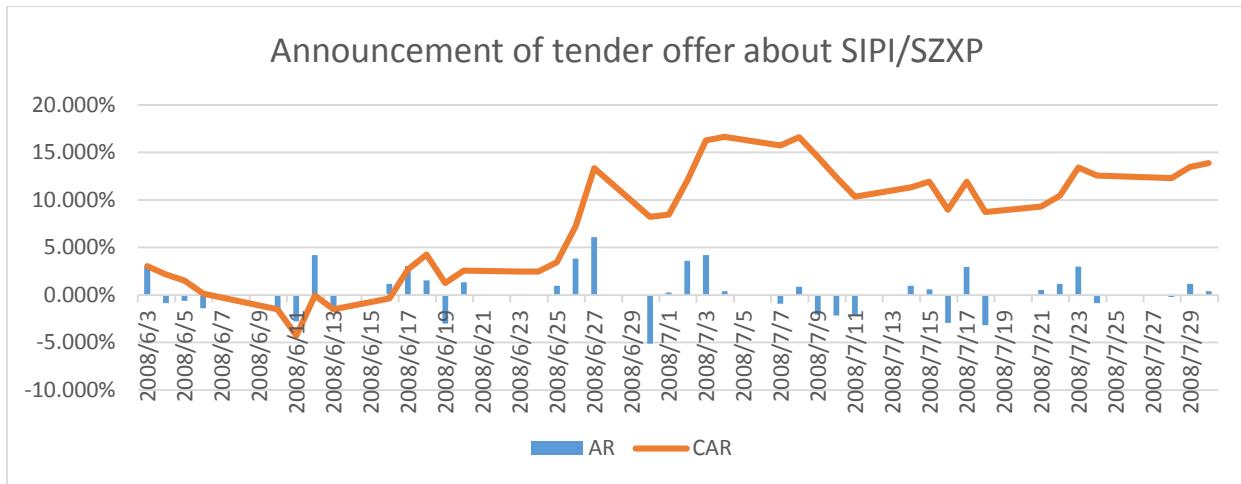
Figure 11 Plot of CAR and AR for the offering announcement

Source: Author

We can clearly see from the figure above, the cumulative abnormal returns rise and near to 16.7% within one or two days before and after the announcement, and maintain steady basically after that although slightly declining.

As we can see in table 2, there are five trading days where average excess returns were negative in the 20 trading days before the announcement of the plan. The maximum value of CAR comes out at the second day after the announcement, which was 16.66%, the test results are highly significant (at the significance level of 1%). Starting from the announcement day, almost all of the CAR are significantly positive.

We can conclude that the shareholders obtained positive wealth effects at this time, maybe the investors believed that Shanghai pharma can improve the industrial chain and expand the scale of assets by this plan, and further enhance the core competitiveness of the company, as a result, the stock market investors of Shanghai pharma would be very likely to increase its stake in Shanghai pharma stocks, which promoted the price rising of Shanghai pharma stocks, finally made the original shareholders of Shanghai pharma win huge wealth effect, thus from the point of view of the shareholder wealth effect, it can be seen that Shanghai pharma's short-term performance is good.

Table 2 CAR T test table

Source: Author

	T test of the double tail significant					
	2008 Event		2010 Event		2012 Event	
	CAR	θ	CAR	θ	CAR	θ
20	0.138761	2.355292**[7]	-0.11806	-2.00218*	0.004806	0.181407
19	0.134905	2.289833**	-0.11105	-1.88338*	0.007465	0.2818
18	0.12309	2.089294**	-0.07953	-1.3488	0.012377	0.467244
17	0.125098	2.123368**	-0.07292	-1.23659	0.014761	0.557224
16	0.12581	2.135463**	-0.06598	-1.11896	0.006796	0.256536
15	0.134235	2.278464**	-0.04599	-0.78	0.024136	0.911125
14	0.104389	1.771875*	-0.01639	-0.27792	0.027633	1.043138
13	0.092859	1.576163	0.014023	0.237813	0.023202	0.875871
12	0.087448	1.484317	0.016552	0.2807	0.021113	0.797005
11	0.119232	2.023801**	0.010924	0.185264	0.02206	0.832765
10	0.089739	1.523211	-0.00933	-0.1582	0.032199	1.215498
9	0.119281	2.024633**	0.002707	0.045907	0.033664	1.270816
8	0.113282	1.922821*	-0.00304	-0.05152	0.031782	1.19977
7	0.103478	1.756411*	0.01862	0.315783	0.034962	1.319797
6	0.12397	2.104223**	0.037979	0.644097	0.04007	1.512628
5	0.145632	2.471912**	0.052804	0.895515	0.02506	0.946016
4	0.166162	2.820391***	0.03756	0.636985	0.016286	0.614804
3	0.157469	2.672836**	0.100497	1.704339*	0.02135	0.805954
2	0.166607	2.827936***	0.113199	1.919749*	0.015433	0.582592
1	0.162716	2.761885***	0.120101	2.036808**	0.021647	0.817167
0	0.120733	2.049288**	0.140676	2.385736**	0.020366	0.768808
-1	0.084697	1.43762	0.057089	0.968169	0.011153	0.421015
-2	0.082133	1.394107	0.051405	0.871785	-0.00916	-0.34588

---

[7] *, ** And *** represent the test results significant respectively at 10%, 5% and 1% significance level;
0 represents the announcement, -1 represents one day before announcement, l represents one day after the announcement, and so on.

-3	0.133565	2.267094**	0.075576	1.281706	0.001671	0.06307
-4	0.07258	1.231943	0.102148	1.732341*	-0.02232	-0.84243
-5	0.034323	0.582586	0.071802	1.217694	-0.01838	-0.69398
-6	0.02455	0.416709	0.069272	1.17479	-0.01605	-0.60571
-7	0.024628	0.418021	0.063011	1.068611	-0.02798	-1.05619
-8	0.025752	0.437106	0.011348	0.192451	-0.03204	-1.20941
-9	0.012461	0.211501	0.027612	0.46828	-0.02469	-0.93216
-10	0.042576	0.722669	0.078408	1.329727	-0.04492	-1.69585*
-11	0.027025	0.458707	0.090649	1.537323	-0.04792	-1.80904*
-12	-0.00356	-0.0604	0.019145	0.32468	-0.02756	-1.04023
-13	-0.01508	-0.25594	0.050537	0.857064	-0.02406	-0.9081
-14	-0.00058	-0.00983	0.027984	0.474585	-0.0211	-0.79646
-15	-0.04259	-0.72298	0.009635	0.163397	-0.04575	-1.72702*
-16	-0.01496	-0.25394	-0.01966	-0.33336	-0.04799	-1.81159*
-17	0.001314	0.022305	-0.00774	-0.13121	-0.04605	-1.73850*
-18	0.015366	0.260814	0.017217	0.291979	-0.02456	-0.92712
-19	0.021622	0.367004	0.007442	0.126201	-0.0059	-0.22256
-20	0.030212	0.512811	-0.00226	-0.0383	-0.00362	-0.13652

Comparing these three mergers operated by Shanghai Pharma, only the announcement of tender offer in 2008 (Shanghai Pharma and SIPI/SZXP) had positive influence on the stock price at the significant level, it could bring the short term benefits for the company.

In a relatively sound capital market, the stock price is an objective response to the future and to the current operating performance of an enterprise. However, Chinese securities market is still in a period of continuous improvement, the fluctuation of stock price is largely influenced by both the political and the technical aspects, so the stock price cannot reflect the change of the enterprise value. Therefore, the event study methodology has its limitations.

Next we mainly take this event (Shanghai Pharma and SIPI/SZXP) as a case to analyze whether the merger of Shanghai Pharma and SIPI/SZXP not only brought short-term benefits for Shanghai Pharma, but also delivered long-term synergies to both bidding and target companies.

5. Overview of Case

Due to historical reasons, there was an overlap and cross phenomenon existed between the original three listed companies, Shanghai Pharma (600849.SS), SIPI (600607.SS) and SZXP (600842.SS)，which led to the failure in fully integrating industrial resources and implementing synergies; Besides, the market value of a single listing entity is not large enough and the market position is not well because of a decentralized listing platform, such situation cannot adapt to the demands for Shanghai's development of bio-pharmaceutical strategic industry and Shanghai Pharma's own development.

Therefore, it is urgent to integrate the pharmaceutical assets through the comprehensive reorganization, to establish a unified platform for industrial resources integration and financing, relying on R&D, manufacturing, sales and industry linkage advantages, to achieve synergies of the industry resource integration.

Acquirer Company

Shanghai Pharmaceutical Co., Ltd.

Shanghai Pharmaceutical Co., Ltd. (601607.SS) is one of the largest, the most extensive and powerful pharmaceutical companies in China. Since the restructuring and listing in September 1998, the company has built important partnerships with the world's top 20 multinational corporations, has maintained close business relationship with more than 4000 international and domestic customers, trading more than 6000 kinds of drugs.

The dominant shareholder of Shanghai Pharmaceutical Co., Ltd. is Shanghai Pharmaceutical (Group) Co., Ltd. On July 1st, 2008, Shanghai State-owned Assets Supervision and Administration Commission (SASAC) decided to gratuitously transfer respectively 30% state-owned shares of Shanghai Pharmaceutical (Group) Co., Ltd, which were owned by Shanghai industrial investment (Group) Co., Ltd., and Shanghai Hua Yi (Group) Company, to the Shanghai Industrial Investment (Holding) Co. Ltd.
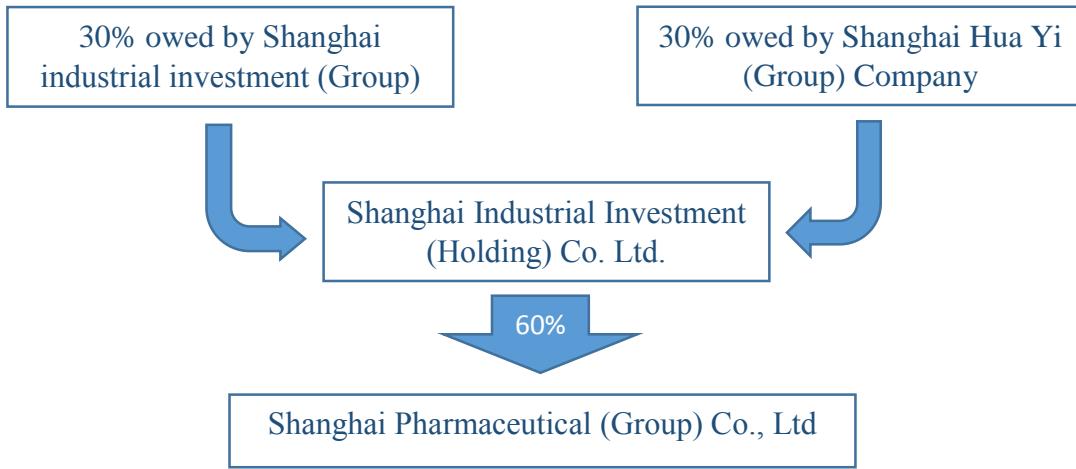
Figure 12 Equity transfer diagram

After the Stock rights change, Shanghai Industrial Investment (Holding) Co. Ltd held 60% shares of Shanghai Pharmaceutical (Group) Co., Ltd. While China Worldbest Group Co., Ltd held the remaining 40%. Shanghai Industrial Investment (Holding) Co. Ltd. became the indirect controlling shareholder of Shanghai Pharmaceutical Co., Ltd., such arrangement of controlling shareholder of Shanghai pharmaceutical Co., Ltd. provided a good foundation for the next merger activity of Shanghai pharmaceutical Co., Ltd.

SWOT Analysis

Table 3 SWOT matrix of Shanghai Pharma

Source: Author

Strengths:	Weaknesses:
1. The largest scale, financial strength. 2. Comprehensive business covers the whole industrial chain. 3. R&D of drug including a platform of Academia Sinica as research institution and three state-level technology centers. 4. Pharmaceutical manufacturing including chemical, biological, Chinese medical, health care and chemical raw medicines, etc.	1. The majority of managers lack of market concept, not yet really established system to adapt to the market economy. 2. Generic drug dominant, specialties and leading products' percentage is limited. 3. State-owned enterprise with many subsidiaries, it remains to

5. Pharmaceutical distribution: the strongest ability of consumption in China. 6. Pharmacy retail: more than 1600 famous retailers.		be improved about the group resource integration within the enterprise and adjustment of industrial structure.
Opportunities: 1. Chinese medicine industrial output steadily growth year by year, the medicine business marketing grow with stability, the potential of medical market is tremendous. 2. The new health care reform policy makes the demand of drug to continue to grow, giving rise to a sharp market expansion. 3. The potential of development of TCM products trade.	**SO strategy** a. Seize the opportunity, relying on the existing scale, to develop (S1,S2,O1,O2) b. Using limited funds to expand a variety of appropriate business (S5,S6,O1) c. Increasing investment in technology, improving the level of R&D, developing high-tech medical trade (S3,S4,O3)	**WO strategy** a. Strengthen the adjustment of the company's business organizations (W1,O2) b. Actively develop the combined traditional Chinese and Western medicine products trade (W2,O3) c. Establish market concept, improve the operating network system (W1,W3,O1)
Threats: 1. Policy pressure: NDRC issued command to reduce the medicine price many times, GMP and GSP, under the dual pressures of rising costs and declining prices.	**ST strategy** a. Improve technology, reduce costs (S3,S4,T1) b. Consolidate the existing status of the domestic market,	**WT strategy** a. Actively introduce special talents, optimize capital operation (W1,W3,T3)

2. The challenge of multinational pharmaceutical company: increasing investment in China, especially in R&D investment, form threat to the domestic enterprises from the source. 3. Competition for talent faculties with multinational companies	Strengthen the cooperation with multinational Medicines Co (S1,S2,S3,T2,T3)	b. Increase R&D investment, protect innovation of new drug (W2,T1,T2) c. Develop more series products trade, and spread the risk (W2,W3,T2,T3)

According to the SWOT strategies, Shanghai Pharma should change the past business positioning, build a whole industry chain of pharmaceutical group, including pharmaceutical R&D, distribution and retail.

Target Company

a) Shanghai Industrial Pharmaceutical Investment Co. Ltd.

Shanghai United Textile Industrial Co., Ltd., the predecessor of Shanghai Industrial Pharmaceutical Investment Co. Ltd., was the first Sino-foreign joint venture joint-stock listed Corporation in Shanghai. In June 1997, Shanghai Industrial Investment (Holding) Co. Ltd. became the controlling shareholder of the company by the way of an agreement transfer of equity. In 2004, Shanghai Industrial Holdings Ltd (0363HK) acquired 56.63% of the company's shares, became the controlling shareholder of the company. The company changed its name to Shanghai Industrial Pharmaceutical Investment Co., Ltd. (hereinafter referred to as SIPI) on 2nd November, 2006.

Since the acquisition, SIPI has been committed to adjust the structure of assets, integrate the medical services, develop dominant industries, improve the core competitiveness, and boost profitability. In 2000, the company successfully implemented an additional issue of 50 million A

shares[8], raised funds of more than 8 hundreds million Yuan. At present, the company's business has covered biological medicine, chemical drugs, Chinese patent drugs, medical apparatus and instruments.

b) Shanghai Zhong Xi Pharmaceutical Co., Ltd.

Shanghai Zhong Xi Pharmaceutical Co., Ltd. (hereinafter referred to as SZXP) is an established firm with more than one hundred year of history. Its predecessor was "Chinese and western big pharmacies", the pioneer of western medicine distribution and production, which was self-financing founded by Chinese businessmen. SZXP adhered to the road of specialized characteristic management, the market-oriented and benefit-centered principle, after several years of efforts, the business capacity enhanced significantly.

Process

On 29th April, 2009, Shanghai Pharmaceutical (Group) Co., Ltd. transferred 60% stock equities to Shanghai Industrial Investment (Holding) Co. Ltd. Shanghai Pharmaceutical (Group) Co., Ltd. held respectively 39.69% and 55.09% shares in two listed companies: Shanghai Pharma and SZXP. And Shanghai Industrial Holdings Ltd., which was belonged to Shanghai Industrial Investment (Holding) Co. Ltd., controlled SIPI by 43. 62% share, after the equity transfer, all of the three pharmaceutical listed companies were under the control of Shanghai Industrial Investment (Holding) Co. Ltd., it was convenient for Shanghai Pharma to merge SIPI and SZXP. In order to eliminate the peer competition emerged after the integration of Shanghai Pharmaceutical (Group) Co., Ltd. and Shanghai Industrial Investment (Holding) Co. Ltd., the first step in the announced plan was to combine these three companies by share swap absorption.

Shanghai Guosheng Group Co. Ltd., and Shenergy Company Limited, two State owned group, acted as the independent third parties. After the transaction, SIPI and SZXP would delist and cancel their legal personalities, and Shanghai Pharma would become a new asset integration platform of Shanghai Industrial Investment (Holding) Co. Ltd. and Shanghai Pharmaceutical (Group) Co., Ltd.

---

[8] A share: Ordinary shares of RMB, which is issued by the company in China, provided for domestic institutions or individuals to subscribe and exchange by Yuan.
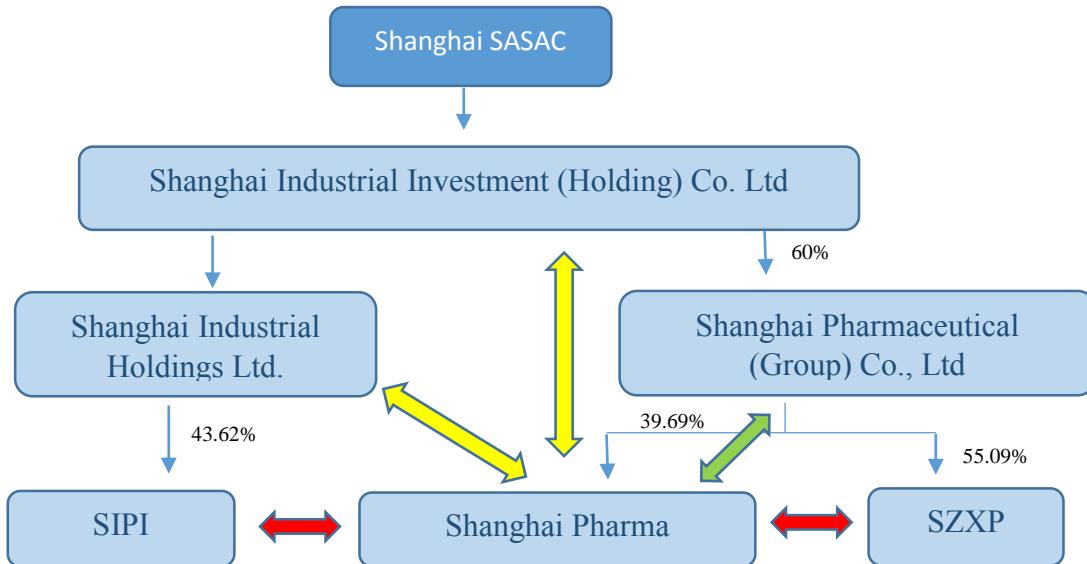
Figure 13 Asset restructuring program

Source: Shanghai pharmaceutical bulletin

Red arrows: The 20-day average prices before the suspension were respectively 11.83 ￥/share, 19.07 ￥/share and 11.36 ￥/share for Shanghai Pharma, SIPI, and SZXP. The exchange ratio of SIPI and Shanghai Pharma was 1:1.61, the number was 592,181,860 shares and the exchange ratio of SZXP and Shanghai Pharma was 1:0.96, exchanged 206,970,842 shares.

Green arrow: As the second part of the reorganization, Shanghai Pharmaceutical (Group) Co., Ltd. injected core pharmaceutical assets which were valued about 5,385 billion yuan, for subscribing 455,213,700 shares issued by Shanghai Pharma.

Yellow arrows: At the same time, Shanghai Industrial Investment (Holding) Co. Ltd. injected 2 billion yuan in cash to subscribe for 169,028,200 shares issued from Shanghai pharma, Shanghai pharma used these money to purchase equivalent assets from Shanghai Industrial Holdings Ltd. After injection of assets, the core assets of Shanghai Pharmaceutical (Group) Co., Ltd. and Shanghai Industrial Holdings Ltd. are almost injected into the surviving enterprise.

After the three steps of the restructuring processes, Shanghai Industrial Investment (Holding) Co. Ltd would eventually be the controlling shareholder of Shanghai pharmaceutical Co., Ltd.

6. Synergy analysis

6.1 Financial indicators analysis

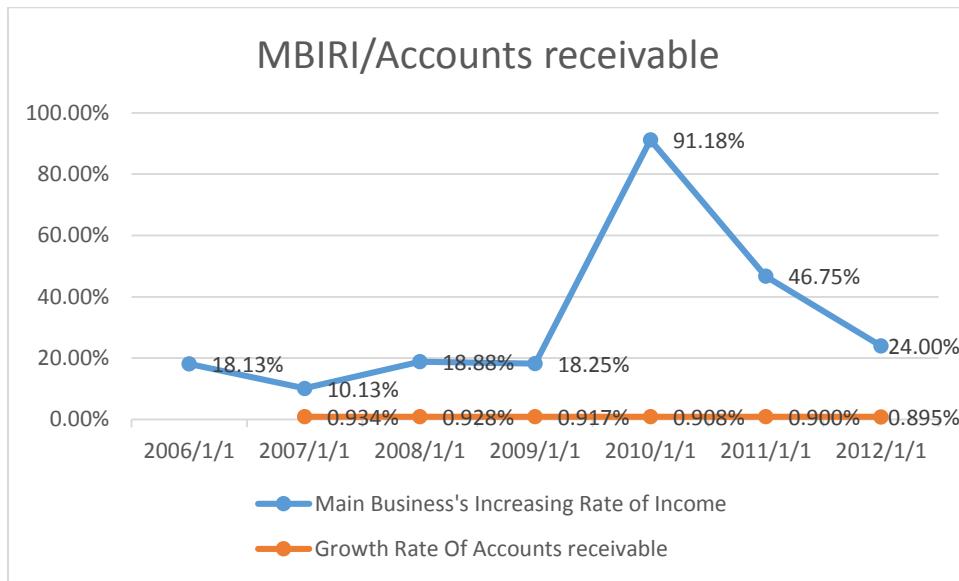## 6.1.1 Operating synergy

Growth rate analysis

Figure 14 Main business's increasing rate of income

Source: Author

The Main Business's Increasing Rate of Income can be used to measure the company's product life cycle, to determine the stage of development of the company. It is easy to find from figure 4, The Main Business's Increasing Rate of Income from 2006 to 2012 were higher than 10%, that is mean the products of Shanghai Pharma were in the growth period and would continue to maintain a good momentum of growth, this company had not yet been faced with the risk of product updates, it was a growth firm. From the figure above, we can see a big increase in 2010, which reveals that the acquisition of Shanghai Pharma with SIPI/SZXP brought a lot of new developed products, so that the company could maintain a good market share. The Main Business's Increasing Rate of Income from 2006 to 2012 were much higher compared to the growth rate of accounts receivable, we can say that the growth rate of sales was very fast, the main business of the enterprise kept in good condition.
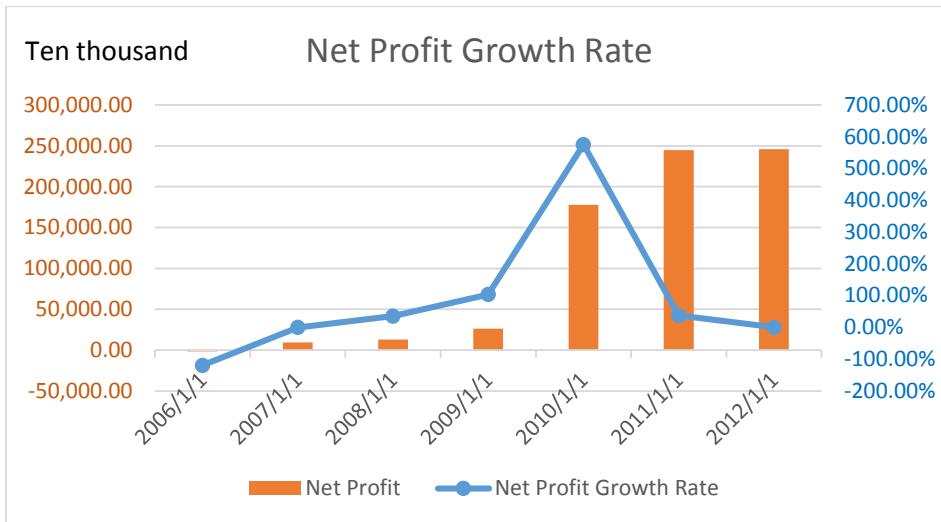
Figure 15 Net Profit Growth Rate

Source: Author

Net profit growth rate represents the growth rate of the net profit of the company over that previous period, the greater the rate, the more powerful the enterprise's profitability. Obviously, the net profit growth rate had a substantial increase in 2010. The net profit increased from 26348.20 ten thousand yuan of 2009/12/31 to 177898.00 ten thousand yuan of 2010/12/31, we can conclude that the acquisition of Shanghai Pharma and SIPI/SZXP had greatly increased the profit of Shanghai Pharma from the second half of 2009 to the first half of 2010, and greatly improved the enterprise management benefit.
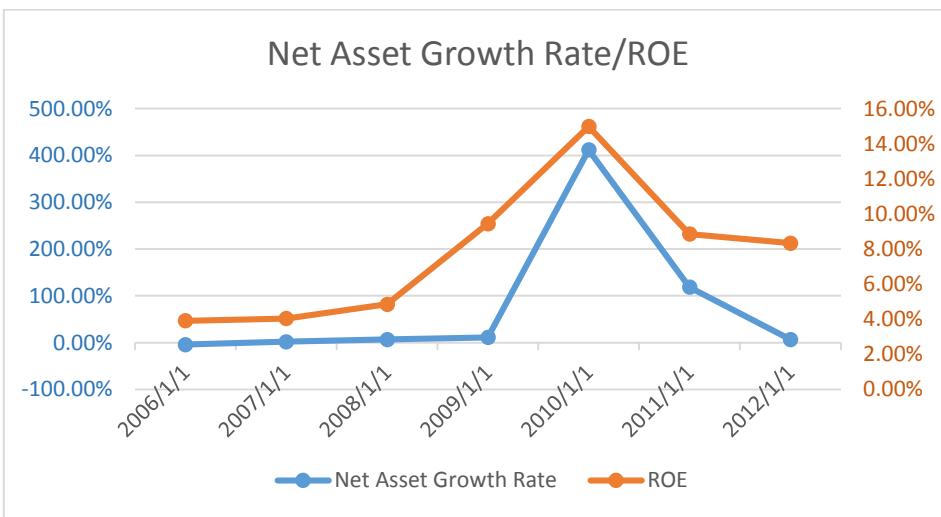
Figure 16 Net Asset Growth Rate

Source: Author

Net asset growth rate reflects the expansion rate of the enterprise capital scale, it is an important indicator to measure the change of the total business size and growth condition. The net asset growth rate was 411.72% in 2010, significantly higher than 11.13% in 2009, which reflects the M&A finished in the first half of 2010 had greatly increased the company's assets and expanded the size of Shanghai Pharma. For the business operation, the higher ROE represents the strong vitality, so we can see ROE reached its peak in 2010, which was 14.98%, it means that the future development of enterprise is going to be more robust.

Profitability Analysis:
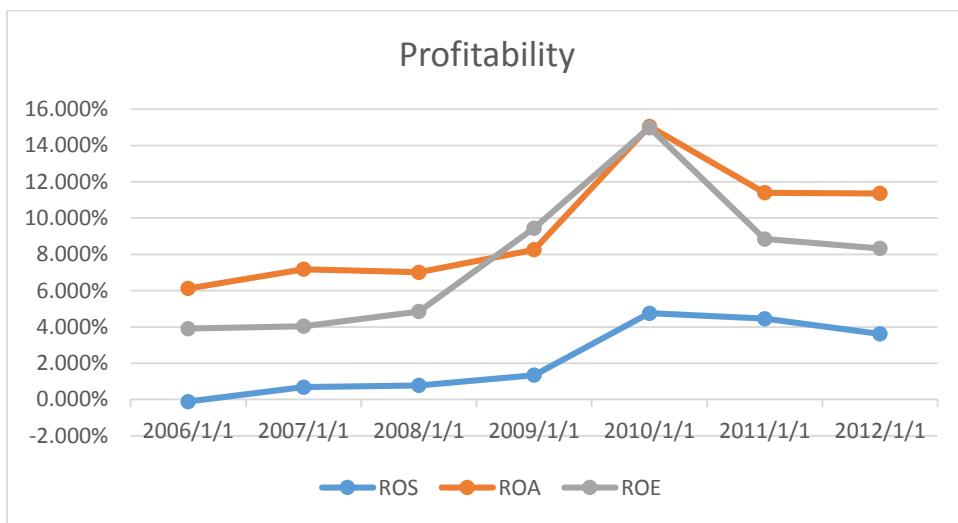
Figure 17 ROS, ROA, and ROE of Shanghai Pharma

Source: Author

ROS measures the profit produced by company, as we can see from the figure above, there is a dramatic increase in ROS from 2009 to 2010, which indicates Shanghai Pharma had become more efficient, and it also kept high-efficient growing trend after 2010, respectively at 4.76% for 2010, 4.46% for 2011, 3.61% for 2012. Thus we can conclude, the merger between Shanghai Pharma and SIPI/SZXP increased by a large margin the bidding company's operating efficiency.

A high ROA represents a high utilization efficiency of the enterprise assets, a profitable use of the asset creation, a strong profit making ability of the whole enterprise, and a high level of management. After the merger's completeness, ROA achieved a higher ratio of 15.06% in 2010

compared to 8.26% in 2009, which means this merger significantly improved the efficiency of assets utilization.

ROE reflects the level of the shareholders' equity income, it measures the utilization efficiency of the company's own capital. The higher the ROE, the higher the income of the investment. Similarly, we can find ROE reached a top level of 14.98% in 2010, in that way, too, the company's profitability and capital utilization improved a lot.

6.1.2 Financial synergy

Capital structure and Debt coverage:
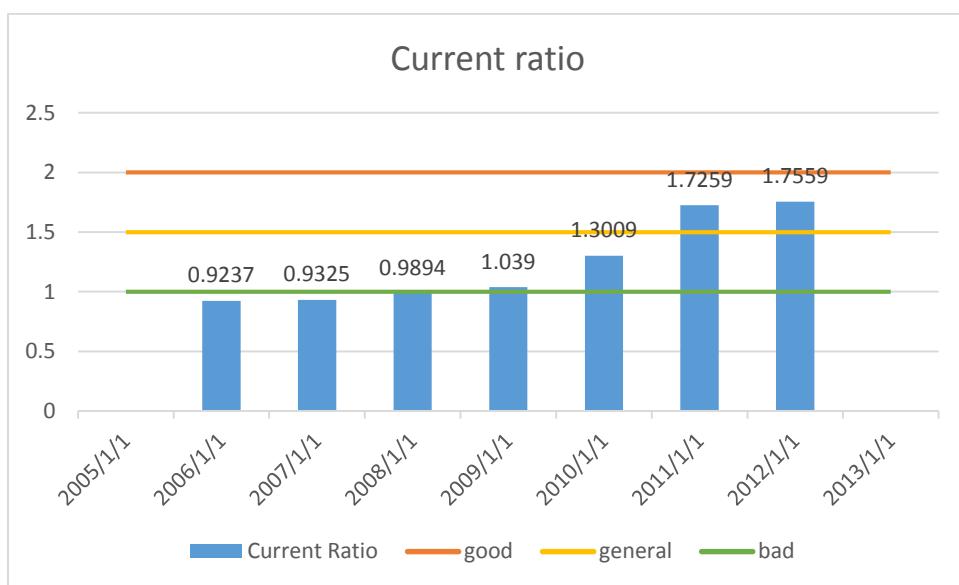
Figure 18 Current ratio

Source: Author

Current ratio is also known as working capital ratio which refers to the ratio of current assets to current liabilities. It is a measure of a company's ability to meet its short-term liabilities. We can easily see the figure above, the current ratio had improved largely from 1.039 in 2009 to 1.7259 in 2011. Shanghai Pharma elevated its current ratio above general level (1.5) through such large M&A and reduced the company's short term risk, however it still didn't reach the good level.
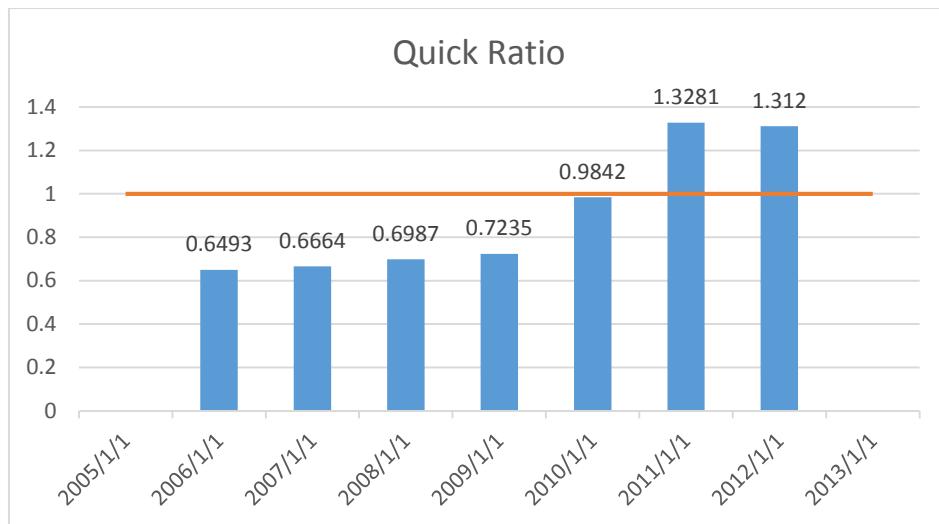
Figure 19 Quick ratio

Source: Author

The quick ratio or liquid ratio measures the ability of a company to use its near cash or quick assets to extinguish or retire its current liabilities immediately. If the company's quick ratio is less than 1, it cannot currently fully pay back its current liabilities. In general, the higher the ratio, the greater the company's liquidity (i.e., the better able to meet current obligations using liquid assets). Here we can see the bar before 2010 are all lower than orange line, the bar of 2010 is very near to 1, after that the bar increased to around 1.3, which abundantly represents Shanghai pharma improved its debt paying ability a lot after the M&A.
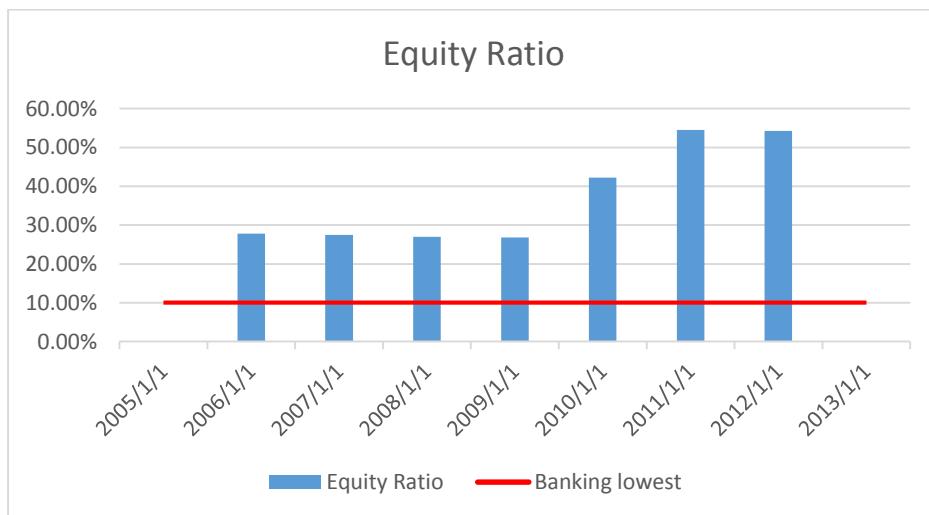
Figure 20 Equity ratio

Source: Author

The equity ratio indicates the relative proportion of equity used to finance a company's assets, a higher equity ratio indicates a company's better long-term solvency position. From the figure above, the equity ratio of Shanghai pharma was always keeping a good solvency state, the company would pay less interest, and thus have more free cash on hand for future expansions, growth and dividends.

6.2 Synergies forecasting

6.2.1 Enterprise valuation (DCF)

a) **Shanghai Industrial Pharmaceutical Investment Co. Ltd.**

Free cash flow for the firm:

For growth rate of sales revenues, we take CAGR of 2006 ~ 2009 to estimate the growth rate in the 2010, which is 1.333%; the average arithmetic returns of 2007~2009, used to be the estimated growth rate in the 2011, is 2.206%; and we assume the growth rate in the continuing year is 3%. The ROS after 2009 maintain the ratio of 2009 but slightly lower, which assumed as 21%. We take a figure between the average NWC/Sales of 2006 ~ 2009 and the average NWC/Sales of 2006 ~ 2008, which is 28%, as the NWC/Sales ratios for the year after 2009, since the data of 2009 seemed to be weirdly high. For Fixed Assets/Sales, the average Fixed Assets/Sales of 2006 ~ 2009 could be appropriate, which assumed as 22%.

Table 4 Free cash flow table for SIPI

Source: Author

Ten-thousand-yuan	Historical		planning horizon		continuing
	-1	0	1	2	3
Time	2008	2009	2010	2011	2012
Revenues	320,752.00	269,372.00	272,963.69	278,984.18	287,353.71
Growth Rate			1.333%	2.206%	3%
ROS	10.033%	21.387%	21.000%	21.000%	21.000%
EBIT (1 - t)	27016.98	35895.90	42991.78	43940.01	45258.21
NWC/Sales			28.000%	28.000%	28.000%
Net Working Capital	89,688.00	187,395.0	76,429.83	78,115.57	80,459.04
∆NWCN	17,452.00	97,707.00	-110,965.2	1,685.74	2,343.47

Fixed Assets/Sales			22.000%	22.000%	22.000%
Fixed Assets	64760.50	65190.10	60052.01	61376.52	63217.82
ΔFixed Assets	5,252.30	429.60	-5,138.09	1,324.51	1,841.30
FCFF	4,312.68	-62,240.70	159,095.0	40,929.76	41,073.45

WACC estimation

7-year treasury yield (December, 2009) is used to estimate risk free rate, which was 3.28%

$$R_f = \sqrt[n]{1 + nr} - 1 = \sqrt[7]{1 + 7 \times 3.28\%} - 1 \approx 0.029967 = 2.997\% \qquad \text{(Equation 17)}$$

The daily closing prices of Shanghai Industrial Pharmaceutical Investment Co. Ltd. (600607.SS) and SSE Composite Index (000001.SS) were selected from 18th January, 2006 to 17th June, 2009, to calculate the daily returns of SIPI and market returns rate, then we can do regression analysis with these data using EXCEL regression tool, thus the results are as follows:

Table 5 Regression results of returns for SIPI and SSE composite index

Source: Author

	df	SS	MS	F	Significance F	
Regression	1	0.376612221	0.376612221	382.0804924	1.70706E-69	
Residual	776	0.764894019	0.000985688			
Total	777	1.14150624				
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	-0.002184993	0.001731791	-1.261696113	0.207437267	-0.005584543	0.001214556
X Variable 1	0.898968774	0.045990399	19.54687935	1.70706E-69	0.808688438	0.98924911

Thus, β = 0.898968774

Next, we check the data of risk premium for China from DAMODARAM website, then average the data from 2003 to 2009 to get the estimated risk premium of 6.28%.

So we can find out the shareholders required rate of return:

$$R_E = R_f + \beta \times (R_m - R_f) = 2.997\% + 0.898968774 \times 6.28\% \approx 0.086425 = 8.643\% \text{ (Equation 18)}$$

For cost of debt, we take the three-year average debt structure for SIPI from 2006 to 2009 as a reference, the rate for current liabilities is the bank six months short-term loan interest rates, and we take the bank three to five years long-term loan interest rates as long term liability rate.

Table 6 Rd estimation for SIPI

Source: Author

	2006			2007			2008			2009		
	rate	amount	weight	rate	amount	weight	rate	amount	weight	rate	amount	weight
current liability	5.58%	78,996.20	0.98	6.48%	85,651.60	0.96	6.21%	102,892.00	0.99	4.86%	107,459.00	0.983216
long term liability	6.48%	1,834.39	0.02	7.65%	4,032.38	0.04	7.56%	1,527.48	0.01	5.76%	1,834.39	0.016784
total		80,830.59			89,683.98			104,419.48			109,293.39	
weighted interest rate			5.600%			6.533%			6.230%			4.875%
Average rate	5.809%											

Then, we could get the $R_D = 5.809\%$

$$\frac{E}{E+D} \approx 0.7133632 = 71.34\%, \quad \frac{D}{E+D} \approx 0.2866368 = 28.66\%$$

Assuming that SIPI maintained the capital structure unchanged, the normalized tax rate was 25%, according to the formula:

$$\text{WACC} = R_E \times \frac{E}{E+D} + R_D(1-t) \times \frac{D}{E+D} = 8.643\% \times 0.7133632 + 5.809\% (1\text{-}25\%) \times 0.2866368$$
$$\approx 0.07414403 = 7.4144\% \qquad \text{(Equation 19)}$$

Enterprise Value = $PV_{@WACC}$ of FCFF = 9.90 billion yuan **(Equation 20)**

b) **Shanghai Zhong Xi Pharmaceutical Co., Ltd.**

Free cash flow for the firm

For growth rate of sales revenues, we take CAGR of 2006 ~ 2009 to estimate the growth rate in the 2010 and 2011, which is 7.100%, and we assume the growth rate in the continuing year is 3%. The ROS is assumed to be the average ratio of 2006 ~ 2009, which is 9.116%. We find the downtrend of NWC/Sales and it could be estimated as -5% after 2009, which is similar as the ratio of 2009. The same method used in estimating Fixed Assets/Sales, we got the ratio of 50% after 2009.

Ten-thousand-yuan	Historical		planning horizon		continuing
	-1	0	1	2	3
Time	2008	2009	2010	2011	2012
Sales Revenues	30,897.20	28,280.20	30,288.03	32,438.42	33,411.57
Growth Rate			7.100%	7.100%	3%
ROS	5.941%	16.490%	9.116%	9.116%	9.116%
EBIT (1 - t)	948.31	4919.57	2070.72	2217.74	2284.27
NWC/Sales			-5%	-5%	-5%
Net Working Capital	-5,096.00	-1,409.40	-1514.40	-1621.92	-1670.58
△NWCN	2,419.00	3,686.60	-105.00	-107.52	-48.66
Fixed Assets/Sales			50%	50%	50%
Fixed Assets	15218.40	14118.70	15144.02	16219.21	16705.79
△Fixed Assets	106.90	-1,099.70	1,025.32	1,075.19	486.58
FCFF	-1,577.59	2,332.67	1,150.40	1,250.06	1,846.35

WACC estimation

The daily closing prices of Shanghai Zhong Xi Pharmaceutical Co., Ltd. (600842.SS)R_i, and SSE Composite Index (000001.SS)R_m, were selected from 18th January 2006 to 17th June 2009, to calculate the daily returns of SIPI and market returns rate, then we can do regression analysis ($R_m - R_f$ as X and $R_i - R_f$ as Y) using EXCEL regression tool, thus the results are as follows:

Source: Author

	df	SS	MS	F	Significance F	
Regression	1	0.413352223	0.413352223	365.7456146	1.20019E-67	
Residual	816	0.922213146	0.001130163			
Total	817	1.335565368				
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.001364578	0.00191628	0.712097295	0.476608071	-0.002396841	0.005125997
X Variable 1	1.008032506	0.052709024	19.12447685	1.20019E-67	0.904571259	1.111493754

Thus, $\beta = 1.008032506$

$R_f = 2.997\%$ (7-year treasury yield, December, 2009)

So we could get the shareholders required rate of return:

$$R_E = R_f + \beta \times (R_m - R_f) = 2.997\% + 1.008032506 \times 6.28\% \approx 0.093274 = 9.327\% \text{ (Equation 21)}$$

Next, we take the three-year average debt structure for SZXP from 2006 to 2009 as a reference, the rate for current liabilities is the bank six months short-term loan interest rates, and we take the bank three to five years long-term loan interest rates as long term liability rate.

Table 9 Rd estimation for SZXP

Source: Author

	2006			2007			2008			2009		
	rate	amount	weight	rate	amount	weight	rate	amount	weight	rate	amount	weight
current liability	5.58%	41,171.60	1.00	6.48%	29,719.30	0.99	6.21%	32,982.70	1.00	4.86%	26,267.70	0.929248
long term liability	6.48%	0.00	0.00	7.65%	158.19	0.01	7.56%	0.00	0.00	5.76%	2,000.00	0.070752
total		41,171.60			29,877.49			32,982.70			28,267.70	
weighted interest rate			5.580%			6.486%			6.210%			4.924%
Average rate	5.800%											

Thus, $R_D = 5.8\%$

$$\frac{E}{E+D} \approx 0.460707 = 46.07\%, \quad \frac{D}{E+D} \approx 0.539293 = 53.93\%$$

Assuming that the SZXP maintains the capital structure unchanged, the normalized tax rate was 25%, according to the formula:

$$\text{WACC} = R_E \times \frac{E}{E+D} + R_D(1-t) \times \frac{D}{E+D} = 9.327\% \times 0.460707 + 5.8\% \ (1\text{-}25\%) \times 0.539293 \approx$$

$$0.0664294 = 6.64294\% \qquad \text{(Equation 22)}$$

Enterprise Value = $PV_{@WACC}$ of FCFF = 0.467433138 billion yuan **(Equation 23)**

6.2.2 Synergies estimation

Comparing the indexes as follows:

Table 10 Major indexes comparison

Source: Author

	SIPI (T1)	SZXP (T2)	Shanghai Pharma (A)
planning horizon growth rate	2.21%	7.10%	15.68%
perpetuity growth rate	3%	3%	5%
ROS	21.00%	9.12%	1.50%
NWC/Sales	28%	-5%	1.50%
Fixed Assets/Sales	22%	50%	4.00%

Based on the comparison above, we expect the following set of synergies:

Table 11 Expected synergies

Source: Author

	SIPI			SZXP		
G(planning horizon)	8.95%	instead of	2.21%	13.00%	instead of	7.10%
G(continuing)	4.00%	instead of	3.00%	4.00%	instead of	3.00%
ROS	11.25%	instead of	21.00%	7.10%	instead of	9.12%
NWC/Sales	14.75%	instead of	28.00%	-3.00%	instead of	-5.00%
Fixed Assets/Sales	13.00%	instead of	22.00%	14.50%	instead of	50.00%

RD	3.5%	instead of	5.809%	3.5%	instead of	5.8%
Debt/Invested Cap.	55%	instead of	40%	88.65%	instead of	80%
β	0.6	instead of	0.89897	0.8	instead of	1.00803

The basic information is as follows:

Table 12 Scales of SZXP, Shanghai Pharma, and SIPI (2009/6/17)

Source: Liu Yang, Cui Weichao, Yang Yiqun, (2010/6/22) NEW FORTUNE

Stock code	Name	Shares	Stock price/¥	Market value/¥
600842	SZXP	215,594,628.00	11.41	2,459,934,705.48
600849	Shanghai Pharma	569,172,884.00	12.18	6,932,525,727.12
600607	SIPI	367,814,821.00	19.33	7,109,860,489.93

a) Shanghai Industrial Pharmaceutical Investment Co. Ltd.

Next, we estimate the enterprise value of SIPI with expected synergies using WACC@Buyer:

The WACC@Buyer is estimated as follows:

$$R_E = R_f + \beta \times (R_m - R_f) = 2.997\% + 0.6 \times 6.28\% = 0.06765 = 6.765\% \qquad \text{(Equation 24)}$$

$$\text{Equity}(0) = 7{,}109{,}860{,}489.93 ¥$$

$$\text{Debt}(0) = 252{,}585.10 \times 55\% \times 10000 = 1{,}389{,}218{,}050.00 ¥$$

$$\frac{E}{E+D} \approx 83.65\%, \frac{D}{E+D} \approx 16.35\%$$

$$\text{WACC@Buyer} = R_E \times \frac{E}{E+D} + R_D(1-t) \times \frac{D}{E+D} = 6.765\% \times 83.65\% + 3.5\% (1\text{-}25\%) \times 16.35\% \approx$$
$$0.06088296 = 6.088\% \qquad \text{(Equation 25)}$$

Table 13 FCFF of SIPI with expected synergies

Source: Author

Ten-thousand-yuan	Historical		planning horizon		continuing
	-1	0	1	2	3
Time	2008	2009	2010	2011	2012
Revenues	320,752.00	269,372.00	293,467.89	319,719.20	332,507.97
Growth Rate			8.945%	8.945%	4%
ROS	10.033%	21.387%	11.250%	11.250%	11.250%
EBIT (1 - t)	27016.98	35895.90	24761.35	26976.31	28055.36
NWC/Sales			14.750%	14.750%	14.750%
Net Working Capital	89,688.00	187,395.00	43,286.51	47,158.58	49,044.93
△NWCN	17,452.00	97,707.00	-144,108.49	3,872.07	1,886.34
Fixed Assets/Sales			13.000%	13.000%	13.000%
Fixed Assets	64760.50	65190.10	38150.83	41563.50	43226.04
△Fixed Assets	5,252.30	429.60	-27,039.27	3,412.67	1,662.54
FCFF	4,312.68	-62,240.70	195,909.11	19,691.57	24,506.48

Enterprise Value = $PV_{@WACCbuyer}$ of FCFF = 12.448 billion yuan   **(Equation 26)**

Thus, the synergies could be:

Synergies of SIPI = $EV_{@WACCbuyer}$ - $EV_{@WACCseller}$ = 12.448 billion yuan - 9.90 billion yuan =

2.54836 billion yuan = 2,548,363,777.12 ￥   **(Equation 27)**

The exchange ratio between SIPI and Shanghai Pharma was discussed in the overview part, which was 1:1.61. Thus, 367,814,821.00 shares of SIPI stocks can be exchanged into 592,181,862 shares of Shanghai Pharma stocks.

367,814,821.00 × 1.61 = 592,181,861.81 ≈ 592,181,862 shares

After the Acquisition	
SIPI interest on the group	$= \dfrac{592,181,862}{592,181,862+569,172,884} = 50.991\%$

Former Shanghai Pharma shareholders	$= \dfrac{569{,}172{,}884}{592{,}181{,}862 + 569{,}172{,}884} = 49.009\%$

Sum value after the acquisition = Shanghai Pharma + SIPI + Synergies = 6,932,525,727.12 + 7,109,860,489.93 + 2,548,363,777.12 = 16,590,749,994.17 ¥   (Equation 28)

Each company gains:

△SIPI = 16,590,749,994.17 × 50.991% - 7,109,860,489.93 = 1,349,864,030.78 ¥

△Shanghai Pharma = 16,590,749,994.17 × 49.009% - 6,932,525,727.12 = 1,198,499,746.34 ¥

According to the results of our forecasting, the gains of the acquisition split into the two parties as follows:

Table 14 Distribution of the synergies between SIPI and Shanghai Pharma

Source: Author

	△/synergies	△/Before
SIPI	$\dfrac{1{,}349{,}864{,}030.78}{2{,}548{,}363{,}777.12} = 52.970\%$	$\dfrac{1{,}349{,}864{,}030.78}{7{,}109{,}860{,}489.93} = 18.986\%$
Shanghai Pharma	$\dfrac{1{,}198{,}499{,}746.34}{2{,}548{,}363{,}777.12} = 47.030\%$	$\dfrac{1{,}198{,}499{,}746.34}{6{,}932{,}525{,}727.12} = 17.288\%$

As we can see, the synergies were almost equally divided between target and bidding companies, the 52.970% of the synergies belonged to SIPI, and the enterprise value of SIPI after the acquisition improved 18.986%. Meanwhile, there were 47.030% of the synergies obtained by Shanghai Pharma, its enterprise value grew about 17.288%. So that we can say this acquisition was a win-win event, no matter for SIPI or Shanghai Pharma.

b) Shanghai Zhong Xi Pharmaceutical Co., Ltd.

We could estimate the enterprise value of SZXP with expected synergies using WACC@Buyer:

The WACC@Buyer is estimated as follows:

$R_E = R_f + \beta \times (R_m - R_f) = 2.997\% + 0.8 \times 6.28\% = 0.08021 = 8.021\%$ (Equation 29)

Equity(0) = 2,459,934,705.48 ¥

Debt(0) = 12,709.30 ×88.65% ×10000 = 112667280.21 ¥

$\frac{E}{E+D} \approx 95.620\%$, $\frac{D}{E+D} \approx 4.380\%$

WACC@Buyer = $R_E \times \frac{E}{E+D} + R_D(1-t) \times \frac{D}{E+D}$ = 8.021% ×95.620% + 3.5% (1-25%) ×4.380%
≈ 0.07784682 = 7.785%　　　　　　　(Equation 30)

Table 15 FCFF of SZXP with expected synergies

Source: Author

Ten-thousand-yuan	Historical		planning horizon		continuing
	-1	0	1	2	3
Time	2008	2009	2010	2011	2012
Sales Revenues	30,897.20	28,280.20	31,956.63	36,110.99	37,555.43
Growth Rate			13.000%	13.000%	4%
ROS	5.941%	16.490%	7.100%	7.100%	7.100%
EBIT (1 - t)	948.31	4919.57	1701.69	1922.91	1999.83
NWC/Sales			-3.000%	-3.000%	-3.000%
Net Working Capital	-5,096.00	-1,409.40	-958.70	-1083.33	-1126.66
ΔNWCN	2,419.00	3,686.60	450.70	-124.63	-43.33
Fixed Assets/Sales			14.500%	14.500%	14.500%
Fixed Assets	15218.40	14118.70	4633.71	5236.09	5445.54
ΔFixed Assets	106.90	-1,099.70	-9,484.99	602.38	209.44
FCFF	-1,577.59	2,332.67	10,735.98	1,445.16	1,833.72

Enterprise Value = $PV_{@WACCbuyer}$ of FCFF = 0.529095701 billion yuan　　　(Equation 31)

We could get the synergies as below:

Synergies of SZXP = $EV_{@WACCbuyer}$ - $EV_{@WACCseller}$ = 0.469347073 billion yuan - 0.529095701 billion yuan = 0.061662562 billion yuan = 61662562.32 ¥　　　(Equation 32)

The exchange ratio between SIPI and Shanghai Pharma was discussed in the overview part, which was 1:0.96. Thus, 215,594,628.00 shares of SZXP stocks can be exchanged into 206,970,843 shares of Shanghai Pharma stocks.

$215{,}594{,}628.00 \times 0.96 \approx 206{,}970{,}842.88 = 206{,}970{,}843$ shares

After the Acquisition	
SZXP interest on the group	$= \dfrac{206{,}970{,}843}{206{,}970{,}843 + 569{,}172{,}884.00} = 26.67\%$
Former Shanghai Pharma shareholders	$= \dfrac{569{,}172{,}884.00}{206{,}970{,}843 + 569{,}172{,}884.00} = 73.33\%$

Sum value after the acquisition = Shanghai Pharma + SZXP + Synergies = 6,932,525,727.12 + 2,459,934,705.48 + 61662562.32 = 9,454,122,994.92￥   (Equation 33)

Each company gains:

△SZXP = 9,454,122,994.92 × 26.67% - 2,459,934,705.48 = 61,154,800.47 ￥

△Shanghai Pharma = 9,454,122,994.92 × 73.33% - 6,932,525,727.12 = 507,761.84￥

Thus, the synergy separated as follows:

Table 16 Distribution of the synergies between SZXP and Shanghai Pharma

Source: Author

	△/synergies	∆/Before
SZXP	$\dfrac{61{,}154{,}800.47}{61662562.32} = 99.177\%$	$\dfrac{61{,}154{,}800.47}{2{,}459{,}934{,}705.48} = 2.486033\%$
Shanghai Pharma	$\dfrac{507{,}761.84}{61662562.32} = 0.823\%$	$\dfrac{507{,}761.84}{6{,}932{,}525{,}727.12} = 0.007324\%$

For Shanghai Pharma, the synergies obtained by the acquisition with SZXP were very limited, only 0.823% of synergies, and the added value of the enterprise was only 0.007324%, almost as much as 0. Although SZXP occupied 99.177% of synergies, the increase of enterprise value was still not significant, which was only 2.486033%.

7. Conclusion

The merger between Shanghai Pharma and SIPI/SZXP was unlike the previously simple financial restructuring, it was an essence of pharmaceutical industry restructuring under the Shanghai state property, as Lv Mingfang[9] told: "This time of Shanghai state owned pharmaceutical restructuring is under the fully consideration of the market wishes, not arbitrarily arranged."

The existing research provided us with a lot of theoretical support when we were trying to research this case. In the rapid development of Chinese pharmaceutical M&A boom, with a view to the inherent problem existing in this industry, we also need to explore more effective and scientific experience to solve the problems such as the waste of resource allocation, low efficiency, and other current situations. In event study methodology, an important positive effect of our case was reflected by the stock price of Shanghai Pharma at the significant level. During 2006 to 2012, Shanghai Pharma improved growth rate, profitability and capital utilization a lot, the capital structure and solvency also were promoted. Meanwhile, Shanghai pharma and SIPI received the most parts of synergies during this acquisition, which was 2,548,363,777.12 yuan, and they were split respectively as 47.03% and 52.97%. But the synergy of Shanghai Pharma and SZXP was limited, only 61662562.32 yuan, split as 0.823% and 99.171% respectively.

Shanghai Industrial Investment (Holding) Co. Ltd and Shanghai Pharmaceutical (Group) Co., Ltd injected all the operating pharmaceutical assets, except for the antibiotics business, into Shanghai pharma, undoubtedly reinforced the overall strength of the Shanghai Pharma. After this acquisition, new Shanghai Pharma had become a large-scale comprehensive pharmaceutical enterprise covering the whole pharmaceutical industry chain, at the same time, Shanghai Industrial Pharmaceutical Investment Co. Ltd. also obtained great amounts of synergies, due to the rational allocation of resources and the establishment of a comprehensive coverage distribution network in the industry, we could say this merger achieved a double improvement both in scale and profitability.

The limitation of this project is that, forecasting synergies cannot be accurate since Ficery, Herd, and Pursche (2007) had discussed that what we were talking about were expected increases in cash flow, not actual synergies. As most executives at acquiring companies had done, we used synergy

---

[9] Lv Mingfang: The board chairman of Shanghai Pharmaceutical (Group) Co., Ltd.

expectations to justify deal rationales, but actually, synergies could only be achieved after a deal is finished. Meanwhile, "synergy expectations often are not monetized; they are usually described as intangible benefits …… they should not be included in synergy calculations unless they can be translated into dollars (Ficery, Herd, & Pursche, 2007)." So the method of forecasting synergies in this project has some suppositions and inaccuracies, and our project aim is just to provide references for the implementation of learning theory and practice hereafter.

In addition to forecasting expected synergies itself, it should also consider the impact of other business-related features to the generation of synergies, such as the capital structure and human resources of both parties, in depth to find out what kind of feature promote synergies. A more comprehensive analysis is needed in the future.

Bibliography

Andrade, G., M. Mitchell, and E. Stafford. (2001). New Evidence and Perspectives on Mergers. *Journal of Economic Perspectives* 15:103-20.

Abarajithan William. (2013). WHY DO SOME MERGERS & ACQUISITIONS (M&A) LEADS FAIL? (Becoming Knowledgeable about M&A through Academic and Practioner Inputs). *IJMRR*

Ansoff, H.I. (1987), *Corporate Strategy*, rev. ed., Penguin Books, New York, NY.

Bradley, M., Desai, A. and Kim E.H. (1988). Synergistic gains from corporate acquisitions and their division between the stockholders of target and acquiring firms, *Journal of Financial Economics, 21(1)*: 3–40.

Bruner, R. F. (2002). Does M&A pay? A survey of evidence for the decision-maker. *Journal of Applied Finance*, *12*(1), 48-68.

Baumol W J, Panzar J C, Willig R O. (1982). Contestable markets and the theory of industry structure. *New York: Harcourt Brace Jovanovich*: 200-750

Berkovitch, E., & Narayanan, M. P. (1993). Motives for takeovers: An empirical investigation. *Journal of Financial and Quantitative analysis*, *28*(03), 347-362.

Boycko, M., Shleifer, A., and Vishny, R. (1993), 'Privatizing Russia ,'*Brookings Papers on Economic Activity,* Vol. 2 p. 139–192.

Ball, R., and P. Brown, (1968), An empirical evaluation of accounting income numbers, *Journal of Accounting Research* 6, 159–178.

Child, J. and Rodrigues, S.(2005), "The international is action of Chinese firms: a case for theoretical extension", Management and Organization Review, Vol. 3 No. 1, p. 381-410.

Datta, D, K., Narayanan, V.K., & Pinches, G.E. (1992). Factors influencing wealth creation from mergers and acquisitions. *Strategic Management Journal*, 13(January), 67-84.

Datta, D, K., Narayanan, V.K., & Pinches, G.E. (1992). Factors influencing wealth creation from mergers and acquisitions. *Strategic Management Journal*, 13(January), 67-84.

Dolley, J. C., (1933), Characteristics and procedure of common stock split-ups, *Harvard Business Review* 11, 316–326.

Eckbo, B. E.(1983) "Horizontal mergers, collusion, and stockholder wealth", *Journal of Financial Economics*, 11, p.241-274.

Evans, N, Campbell, D, & Stonehouse, G (2003), *Strategic Management for Travel and Tourism*, Chapter 9, Routledge, Oxford.

Fama, E. F., L. Fisher, M. C. Jensen, and R. Roll, (1969), The adjustments of stock prices to new information, *International Economic Review* 10(1), 1–21.

Fama, E. F. (1991). Efficient capital markets: ii. *Journal of Finance, 46*(5), 1575-617.

Ficery, K., Herd, T., & Pursche, B. (2007). Where has all the synergy gone? the m&a puzzle. Journal of Business Strategy, 28(5), 29-35.

Grubb, T. M., & Lamb, R. B. (2000). Capitalize on merger chaos. *NewYork-Free Press*, *9*, 10-12.

Habeck, M.M., Kroger, F. and Tram, M.R. (2000), After the Merger: Seven Strategies for Successful Post-Merger Integration, Financial Times/Prentice-Hall, Harlow.

Halpern, P. (1983). Corporate acquisitions: A theory of special cases? A review of event studies applied to acquisitions. *Journal of finance*, 297-317.

Haberberg, A. (2000), "Swatting SWOT", *Strategy, (Strategic Planning Society),* September.

Jensen, M.C. and R.S. Ruback. (1983) "The market for corporate control – the scientific evidence", *Journal of Financial Economics*, 11, p.3-50.

Joel D. Goldhar; Mariann Jelinek (November 1983). "Plan for Economies of Scope". *Harvard Business Review*.

King, D., Dalton, D., Daily, C., & Covin, J. (2004). Meta-analysis of post-acquisition performance: Indicators of unidentified moderators. *Strategic Management Journal,* 25, 187-200.

Kothari, S. P., & Warner, J. B. (2004). The econometrics of event studies. *Social Science Electronic Publishing, 1*(1), 3–36.

Lewellen, W., Loderer, C., & Rosenfeld, A. (1985). Merger decisions and executive stock ownership in acquiring firms. *Journal of Accounting and Economics*, *7*(1), 209-231.

Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *The review of economics and statistics*, 13-37.

Learned, E.P., Christiansen, C.R., Andrews, K. and Guth, W.D. (1969), *Business Policy: Text and Cases,* Irwin, Homewood, IL.

Malatesta, P. H. (1983). The wealth effect of merger activity and the objective functions of merging firms. *Journal of financial economics*, *11*(1), 155-181.

MacKinlay, A. C. (March 1997). "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. XXXV, Issue 1

Patrick A. Gaughan, (2011), *Mergers, Acquisitions, and Corporate Restructurings,* p.136, John Wiley & Sons, Inc., Hoboken, New Jersey.

Panzer J C, Willig R O.(1975). Economies of scale and economies of scope in Multi-Output Pruduction, *econ.disc.paper no.33,* Bell Laboratories

Pratten, C. F. (1971). Economies of scale in manufacturing industry. *University Press.*

Roll, R. (1986). The hubris hypothesis of corporate takeovers, *The Journal of Business*, 59(2): 197–216.

Silvestre, J. (1987). Economies and diseconomies of scale. *The New Palgrave: A Dictionary of Economics*, *2*, 80-84.

Stacey, N.A.H. (1966), Mergers in Modern Business, Hutchinson Co., London.

Sirower, M.L. (1997). *The Synergy Trap: How Companies lose the Acquisition Game,* The Free Press: New York.

Seth, A., Song, K.P. and Pettit, R. (2000). Synergy, managerialism or hubris? An empirical examination of motives for foreign acquisitions of U.S. firms, *Journal of International Business Studies,* 31(3): 387–405.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The journal of finance*, *19*(3), 425-442.

Seth, A. (1990). Value creation in acquisitions: A reexamination of performance issues. *Strategic Management Journal,* 11, 99-115.

Turner, S. (2002), *Tools for Success: A Manager's Guide*, McGraw-Hill, London.

White D, Smith A, Skinner A S, Whilson T. (1976). Adam Smith's Wealth of Nations Review of an Inquiry into the nature and causes of the wealth of nation's review of essays on Adam smith. *Journal of the history of ideas*, 37(4): 715-720

Warren-Boulton, F. and S. Dalkir. (2001). "Staples and Office Depot: An Event-Probability Case Study," *Review of Industrial Organization*, Vol. 19, No. 4.

Zhou, B. and A. J. Doukas, et al. (2015). "Does State Ownership Drive M&A Performance? Evidence from China." *European Financial Management* **21** (1): 79-105.

顾海峰, & 吴狄. Gu Haifeng, Wu Di (2014). 中国上市公司定向增发公告的股价效应研究——基于事件研究法的实证分析, The stock price effect of the private placement announcement of the listing Corporation in China -- An Empirical Analysis Based on the event study methodology. *武汉金融, Wuhan finance*, (9), 38-41.

李婷, & 徐怀伏. Li Ting, Xu Huaifu (2013). 我国医药企业并购研究, Research on M&A of Chinese pharmaceutical enterprises. *现代商贸工业, Modern Business Trade Industry (2)*, 5-6.

刘旸, 崔为超, & 杨以群. Liu Yang, Cui Weichao, Yang Yiqun (2010). 上实系重组: 典型的非典型性行业并购. *新财富 NEW FORTUNE,* (6), 100-101.

上海医药：并购带来机会 Shanghai Pharma: Mergers and acquisitions bring opportunities. *北京晨报 Beijing Morning Post*, 16/12/2010

徐明磊. Xu Minglei (2014). 换股吸收合并实现重组的策略和价值研究——基于上海医药换股吸并上实医药和中西药业. *商情 business conditions,* (39), 38-39.

向荣, & 夏新平. Xiang Rong, Xia Xinping (2003). 并购中的财务协同效应, Financial synergies in M&A. *中国地质大学学报: 社会科学版, Journal of China University of Geosciences (Social Sciences Edition)*, *3*(2), 24-26.

杨舒杰, & 李凯. Yang Shu-jie, Li Kai (2009). 中国医药企业市场行为研究, Marketing conduct of pharmaceutical industry in China. *世界临床药物, world clinical drugs*, *30*(1), 56-60.

张毅. Zhang Yi (2006). 我国医药行业并购重组现状研究, Research on the status of Chinese pharmaceutical industry mergers and acquisitions. *科技情报开发与经济，SCI-TECH INFORMATION DEVELOPMENT & ECONOMY, 16*(7), 121-123.

Websites:

Analysis of the Chinese market in the United States: new rules for winning the Chinese medicine market: http://www.360doc.com/content/14/0823/12/92853_404022660.shtml viewed: 6/11/2015

陈春华 Cheng Chunhua (2009). 中国医药并购整合六大趋势, The six tendencies of Chinese pharmaceutical industry mergers and acquisitions. *人民网-市场报, People's Network - market news January 5, 2009 14:51*: http://www.sina.com.cn viewed: 2016/1/7

和讯网 Hexun securities online: http://bond.money.hexun.com/data/new_income.aspx?bondtype=1&col=1&orderby=desc&selDate=2006-12-14 viewed: 25/10/2015

Damodaran online: http://pages.stern.nyu.edu/~adamodar/ viewed: 25/10/2015

百度百科 Baidu cyclopedia: generic drugs: http://baike.baidu.com/view/1028863.htm viewed: 8/11/2015

新浪财经 Sina Finance website: http://finance.sina.com

http://finance.yahoo.com/

Annexes

1. Event a:

time		Rit	Rmt	normal return	AR	CAR	θ
2012/3/5	20	-1.218%	-0.006396675	-0.009520997	-0.2659%	0.48%	0.181407463
2012/3/2	19	1.218%	0.014152647	0.017092902	-0.4912%	0.75%	0.281799672
2012/3/1	18	-0.489%	-0.000980513	-0.002506401	-0.2384%	1.24%	0.467244192
2012/2/29	17	-0.567%	-0.009577255	-0.013640239	0.7965%	1.48%	0.55722364
2012/2/28	16	-1.604%	0.001959616	0.001301428	-1.7340%	0.68%	0.256535798
2012/2/27	15	-0.080%	0.003040916	0.002701844	-0.3497%	2.41%	0.911124655
2012/2/24	14	1.926%	0.01240638	0.014831272	0.4431%	2.76%	1.043137897
2012/2/23	13	0.406%	0.002476555	0.001970927	0.2089%	2.32%	0.875870702
2012/2/22	12	0.981%	0.009262305	0.010759309	-0.0947%	2.11%	0.797005362
2012/2/21	11	-0.164%	0.007515267	0.008496679	-1.0139%	2.21%	0.832765302
2012/2/20	10	0.082%	0.002719891	0.002286078	-0.1465%	3.22%	1.21549824
2012/2/17	9	0.082%	0.000135765	-0.001060684	0.1882%	3.37%	1.270816435
2012/2/16	8	-0.981%	-0.004166355	-0.006632458	-0.3180%	3.18%	1.199770111
2012/2/15	7	0.571%	0.009309264	0.010820125	-0.5108%	3.50%	1.319797315
2012/2/14	6	0.987%	-0.003014936	-0.005141229	1.5010%	4.01%	1.512628384
2012/2/13	5	0.747%	-5.52741E-05	-0.001308103	0.8774%	2.51%	0.946016346
2012/2/10	4	-0.498%	0.001016682	8.02119E-05	-0.5064%	1.63%	0.614803987
2012/2/9	3	0.582%	0.000877133	-0.000100521	0.5917%	2.13%	0.805953512
2012/2/8	2	2.361%	0.023982544	0.029823827	-0.6214%	1.54%	0.582592401
2012/2/7	1	-2.194%	-0.01697625	-0.023222848	0.1281%	2.16%	0.817167267
2012/2/6	0	0.838%	0.000313201	-0.000830883	0.9213%	2.04%	0.768808476
2012/2/3	-1	2.904%	0.007689082	0.00872179	2.0315%	1.12%	0.421014877
2012/2/2	-2	1.308%	0.019421477	0.023916686	-1.0833%	-0.92%	-0.345879115
2012/2/1	-3	0.882%	-0.010757248	-0.015168475	2.3987%	0.17%	0.063070442
2012/1/31	-4	-0.089%	0.003307377	0.003046944	-0.3932%	-2.23%	-0.842425605
2012/1/30	-5	-2.275%	-0.014804274	-0.020409871	-0.2338%	-1.84%	-0.693982994
2012/1/20	-6	2.363%	0.009988838	0.011700257	1.1933%	-1.60%	-0.605714262
2012/1/19	-7	1.968%	0.013015121	0.015619666	0.4059%	-2.80%	-1.056189411
2012/1/18	-8	-2.674%	-0.014020682	-0.019395024	-0.7345%	-3.20%	-1.209413921
2012/1/17	-9	7.201%	0.040937481	0.051782556	2.0230%	-2.47%	-0.93216022
2012/1/16	-10	-2.058%	-0.017251375	-0.023579169	0.2998%	-4.49%	-1.695847849
2012/1/13	-11	-3.904%	-0.013466027	-0.018676677	-2.0366%	-4.79%	-1.809038697
2012/1/12	-12	-0.533%	-0.000457036	-0.001828434	-0.3500%	-2.76%	-1.040230967
2012/1/11	-13	-0.970%	-0.004248339	-0.006738637	-0.2957%	-2.41%	-0.908100594
2012/1/10	-14	5.778%	0.026532987	0.033126966	2.4651%	-2.11%	-0.796462048
2012/1/9	-15	3.788%	0.028475777	0.035643118	0.2240%	-4.57%	-1.727022371
2012/1/6	-16	0.581%	0.006934406	0.007744393	-0.1936%	-4.80%	-1.811589139
2012/1/5	-17	-3.529%	-0.00969937	-0.013798393	-2.1494%	-4.61%	-1.738503884
2012/1/4	-18	-3.771%	-0.013747667	-0.019041436	-1.8664%	-2.46%	-0.927121387
2011/12/30	-19	1.180%	0.011827313	0.014081309	-0.2279%	-0.59%	-0.222555164
2011/12/29	-20	-0.274%	0.0016346	0.000880493	-0.3616%	-0.36%	-0.136520559

2. Event b:

time		Rit	Rmt	normal return	AR	CAR	θ
2010/12/28	20	-1.500%	-0.01755815	-0.007996734	-0.700%	-0.11805921	-2.002176728
2010/12/27	19	-4.048%	-0.019143975	-0.00895436	-3.152%	-0.11105445	-1.883382419
2010/12/24	18	-0.827%	-0.007050525	-0.001651533	-0.662%	-0.0795327	-1.348802162
2010/12/23	17	-0.911%	-0.007911964	-0.002171727	-0.694%	-0.07291592	-1.236587709
2010/12/22	16	-2.286%	-0.009066114	-0.002868679	-1.999%	-0.06598012	-1.118962778
2010/12/21	15	-1.626%	0.017783944	0.013345166	-2.961%	-0.04599322	-0.780003173
2010/12/20	14	-3.638%	-0.014206752	-0.005972937	-3.041%	-0.01638753	-0.277917655
2010/12/17	13	-0.084%	-0.001519369	0.001688546	-0.253%	0.014022742	0.237812944
2010/12/16	12	0.547%	-0.004568348	-0.00015263	0.563%	0.016551624	0.280700484
2010/12/15	11	1.962%	-0.005367839	-0.000635416	2.025%	0.010924144	0.185263536
2010/12/14	10	-0.858%	0.001411959	0.003458676	-1.204%	-0.00932811	-0.158196189
2010/12/13	9	2.551%	0.028423198	0.019769853	0.575%	0.002706952	0.045907442
2010/12/10	8	-1.262%	0.010647678	0.009035816	-2.166%	-0.00303809	-0.051523279
2010/12/9	7	-2.478%	-0.013287588	-0.005417886	-1.936%	0.018620307	0.31578346
2010/12/8	6	-1.798%	-0.009541667	-0.00315585	-1.482%	0.037979425	0.644096501
2010/12/7	5	2.179%	0.006516636	0.006541218	1.524%	0.052804407	0.895514703
2010/12/6	4	-5.721%	0.005175804	0.005731535	-6.294%	0.037560097	0.63698507
2010/12/3	3	-1.035%	-0.000415052	0.002355406	-1.270%	0.100497106	1.704339485
2010/12/2	2	0.000%	0.00711483	0.006902448	-0.690%	0.113198804	1.919748726
2010/12/1	1	-1.727%	0.001158829	0.003305819	-2.057%	0.120101252	2.036807963
2010/11/30	0	7.639%	-0.016242219	-0.007202088	8.359%	0.140675946	2.385736057
2010/11/29	-1	0.717%	-0.001861257	0.001482091	0.568%	0.057088527	0.968169479
2010/11/26	-2	-2.712%	-0.009206368	-0.002953374	-2.417%	0.05140515	0.871784582
2010/11/25	-3	-1.593%	0.013309911	0.010643449	-2.657%	0.075576327	1.281705743
2010/11/24	-4	3.967%	0.011131893	0.009328217	3.035%	0.102148232	1.732341072
2010/11/23	-5	-0.672%	-0.019637752	-0.009252536	0.253%	0.071801823	1.217693596
2010/11/22	-6	0.799%	-0.001455065	0.001727377	0.626%	0.069272002	1.174790131
2010/11/19	-7	5.912%	0.008036164	0.00745881	5.166%	0.063011109	1.068611075
2010/11/18	-8	-0.803%	0.009322843	0.008235792	-1.626%	0.011347967	0.192451192
2010/11/17	-9	-5.992%	-0.019423641	-0.009123241	-5.080%	0.027612348	0.468280303
2010/11/16	-10	-3.414%	-0.040577919	-0.021897597	-1.224%	0.078407911	1.32972684
2010/11/15	-11	7.994%	0.009656983	0.008437568	7.150%	0.090648937	1.537323497
2010/11/12	-12	-6.075%	-0.052937595	-0.029361189	-3.139%	0.019144884	0.324679821
2010/11/11	-13	3.140%	0.01034002	0.008850031	2.255%	0.050537138	0.857063883
2010/11/10	-14	1.716%	-0.006284459	-0.001188931	1.835%	0.027984128	0.474585356
2010/11/9	-15	2.719%	-0.007787778	-0.002096735	2.929%	0.009634759	0.163396741
2010/11/8	-16	-0.355%	0.009543705	0.008369164	-1.192%	-0.01965664	-0.333358646
2010/11/5	-17	-1.408%	0.013692938	0.010874746	-2.495%	-0.00773665	-0.131206488
2010/11/4	-18	2.343%	0.01829101	0.013651367	0.978%	0.017216642	0.29197859
2010/11/3	-19	0.944%	-0.004752807	-0.000264019	0.970%	0.007441523	0.126201463
2010/11/2	-20	-0.135%	-0.002816649	0.000905162	-0.226%	-0.00225865	-0.038304605

3. Event c:

time		Rit	Rmt	normal return	AR	CAR	θ
2008/7/30	20	-0.278%	-0.4797%	-0.663%	0.386%	13.876%	2.355291794
2008/7/29	19	-0.966%	-1.8320%	-2.148%	1.181%	13.490%	2.289832676
2008/7/28	18	1.105%	1.3145%	1.306%	-0.201%	12.309%	2.089293606
2008/7/25	17	-1.926%	-1.5649%	-1.855%	-0.071%	12.510%	2.123367972
2008/7/24	16	1.787%	2.5206%	2.629%	-0.842%	12.581%	2.135463091
2008/7/23	15	2.528%	-0.2910%	-0.456%	2.985%	13.423%	2.278463636
2008/7/22	14	0.428%	-0.5361%	-0.725%	1.153%	10.439%	1.771875101
2008/7/21	13	3.637%	2.9454%	3.096%	0.541%	9.286%	1.576163383
2008/7/18	12	0.445%	3.4266%	3.624%	-3.178%	8.745%	1.484317013
2008/7/17	11	1.953%	-0.7825%	-0.996%	2.949%	11.923%	2.023801314
2008/7/16	10	-6.036%	-2.6830%	-3.082%	-2.954%	8.974%	1.523210662
2008/7/15	9	-3.371%	-3.4933%	-3.971%	0.600%	11.928%	2.024632519
2008/7/14	8	1.671%	0.7543%	0.691%	0.980%	11.328%	1.922820707
2008/7/11	7	-2.907%	-0.6567%	-0.858%	-2.049%	10.348%	1.756410609
2008/7/10	6	-4.011%	-1.5563%	-1.845%	-2.166%	12.397%	2.104223299
2008/7/9	5	1.852%	3.6827%	3.905%	-2.053%	14.563%	2.471911852
2008/7/8	4	1.615%	0.8043%	0.746%	0.869%	16.616%	2.820390564
2008/7/7	3	3.873%	4.4864%	4.787%	-0.914%	15.747%	2.67283565
2008/7/4	2	-1.122%	-1.2521%	-1.511%	0.389%	16.661%	2.827936163
2008/7/3	1	6.185%	1.9346%	1.986%	4.198%	16.272%	2.761884828
2008/7/2	0	3.472%	0.0049%	-0.132%	3.604%	12.073%	2.04928765
2008/7/1	-1	-3.324%	-3.1370%	-3.580%	0.256%	8.470%	1.437620377
2008/6/30	-2	-5.774%	-0.4496%	-0.630%	-5.143%	8.213%	1.394106987
2008/6/27	-3	0.000%	-5.4319%	-6.099%	6.099%	13.357%	2.26709415
2008/6/26	-4	3.569%	-0.1088%	-0.256%	3.826%	7.258%	1.231942659
2008/6/25	-5	4.763%	3.5739%	3.786%	0.977%	3.432%	0.582586432
2008/6/24	-6	1.536%	1.5315%	1.544%	-0.008%	2.455%	0.416708839
2008/6/23	-7	-3.049%	-2.5509%	-2.937%	-0.112%	2.463%	0.41802128
2008/6/20	-8	4.452%	2.9701%	3.123%	1.329%	2.575%	0.437106073
2008/6/19	-9	-10.567%	-6.7597%	-7.556%	-3.012%	1.246%	0.211501345
2008/6/18	-10	7.020%	5.1044%	5.465%	1.555%	4.258%	0.7226691
2008/6/17	-11	-0.151%	-2.7997%	-3.210%	3.058%	2.702%	0.458707351
2008/6/16	-12	1.218%	0.1846%	0.066%	1.152%	-0.356%	-0.060397035
2008/6/13	-13	-4.930%	-3.0461%	-3.480%	-1.450%	-1.508%	-0.255941977
2008/6/12	-14	1.616%	-2.2305%	-2.585%	4.202%	-0.058%	-0.009829652
2008/6/11	-15	-4.632%	-1.5776%	-1.868%	-2.763%	-4.259%	-0.722982436
2008/6/10	-16	-10.593%	-8.0437%	-8.965%	-1.627%	-1.496%	-0.253941062
2008/6/6	-17	-2.264%	-0.6580%	-0.859%	-1.405%	0.131%	0.022304741
2008/6/5	-18	-1.359%	-0.5433%	-0.733%	-0.626%	1.537%	0.260814186
2008/6/4	-19	-3.140%	-1.9538%	-2.281%	-0.859%	2.162%	0.367004274
2008/6/3	-20	2.164%	-0.6567%	-0.858%	3.021%	3.021%	0.51281081

4. FCFF of Shanghai Pharmaceutical Co, Ltd.

ten-thousand yuan	historical				planning horizon		continuing
	-3	-2	-1	0	1	2	3
by Discounted Cash Flow (FCFF)	2006	2007	2008	2009	2010	2011	2012
Sales and Other Operating Revenues	1,263,920.00	1,391,980.00	1,654,780.00	1,956,810.00	2,263,732.03	2,618,794.22	2,749,733.94
Growth Rate					15.68%	15.68%	5%
ROS	-0.11%	0.69%	0.78%	1.35%	1.50%	1.50%	1.50%
INCOME TAX	3,671.41	5,107.37	5,727.29	9,147.50			
NOPLAT= EBIT (1 - t)	-5068.0416	4440.22082	7216.39916	17200.94665	25466.98539	29461.43502	30934.50678
Net Working Capital	-37,902.00	-34,586.00	-5,903.00	24,388.00	33,955.98	39,281.91	41,246.01
NWC/Sales					1.50%	1.50%	1.50%
△NWCN		3,316.00	28,683.00	30,291.00	9,567.98	5,325.93	1,964.10
Fixed Assets	130,158.00	105,195.00	84,776.70	85,531.40	90549.2814	104751.769	109989.3574
Fixed Assets/Sales					4.00%	4.00%	4.00%
△Fixed Assets		-24,963.00	-20,418.30	754.70	5,017.88	14,202.49	5,237.59
FCFF = Free Cash Flow for the Firm		26,087.22	-1,048.30	-13,844.75	10,881.12	9,933.01	23,732.82