# The intrinsic value analysis of stock based on dividend discount model - takeing the case of Leche film

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## Abstract

As an important reference model for evaluating the relative investment value and relative investment risk, the dividend discount model provides a valuable reference for investors to make rational investment judgment. Taking Lecai film as an example, based on the data of the company's annual report from 2012 to 2016, the paper makes an empirical analysis of the investment value of the company by using the dividend discount model. The results show that the theoretical value of the company's shares is 3.809 yuan, which does not have the value of investment. Investors should avoid blind investment and realize rational investment and scientific investment.

## Keywords

Dividend discount ;Intrinsic value;Risk;Investment.

## 1. Introduction

After more than ten years of ups and downs, the Chinese stock market is developing in the direction of maturity and standardization, forming two major trading centers of the Shanghai Stock Exchange and the Shenzhen Stock Exchange. The rapid growth of stock trading has attracted a large number of retail and institutional investors, Their purpose of investing in stocks is to expect that they will bring some benefits in the future. It is worth investing only if the present value of the expected return is greater than its price. The valuation of stock value of listed companies is related to the vital interests of investors. A reasonable valuation method of stock value can guide the strategy and direction of investors and promote the rational allocation of all kinds of resources. As an effective method to evaluate the stock value in the capital market, the dividend discount model has attracted wide attention from scholars at home and abroad. This paper selects Lecai film as the object of investment value analysis, analyzes and calculates its investment value by using dividend discount model, and probes into an effective evaluation method of investment value of listed company, which provides scientific and reasonable investment advice for investors. It not only provides important reference for investors, but also urges listed companies to improve financial management, create greater social value and attract more investors.

## 2. Dividend discount model

### 2.1 General form of dividend discount model

Dividend discount model (DDM) is one of the most basic models for evaluating the intrinsic value of stock.Williams1938 put forward the discounted dividend model for stock value evaluation, which lays a theoretical foundation for quantitative analysis of fictitious capital, assets and company value, and provides a strong theoretical basis for the basic analysis of securities investment.

Since the expected price until the end of the period is determined by the future dividend of the stock, the current value of the stock should be equal to the present value of the indefinite dividend. Thus, the general formula of the dividend discount model is as follows.

$$p_0 = \frac{DPS_1}{1+k} + \frac{DPS_2}{(1+k)^2} + \sum_{t=1}^{\infty} \frac{DPS_t}{(1+k)^t}$$

"$P_O$"means stock value per share,"DPSt" means share of expected dividends per share in Year t, "k" means necessary rate of return on stocks. The above expression represents the present value of the price of each share equal to the sum of all expected dividends in the future.

### 2.2 Two-stage dividend discount model

There are two stages in the process of development, namely, the initial stage of extraordinary growth and the subsequent stage of stable growth.The two stage dividend discount model takes into account the two growth stages mentioned above. It considers that the company has a period of extraordinary growth lasting n years and a subsequent period of perpetual stability.Therefore, the sum of the present value of the dividend and the present value of the stock price at the end of the period of extraordinary growth is the price of the stock.The formula is expressed in the following form.

$$p_0 = \sum_{t=1}^{n} \frac{DPS_t}{(1+k)^t} + \frac{P_n}{(1+k)^n}$$

$$P/E = \frac{P_n}{EPS_n} = \frac{P_n}{\left[EPS_n \times (1+g)^n\right]}$$

$$p_0 = \frac{DPS_0(1+g)}{(1+k)} + \frac{DPS_0(1+g)^n}{(1+k)^n} + \frac{EPS_0(1+g)(P/E)}{(1+k)^n}$$

In the above formula,"Pn"means stock Price issue n,"EPSn"means dividend per share,"DPSn "means earnings per share,"g" means capital growth rate, "P/E"means priceearning ratio, "k" means the necessary rate of return on stocks.

$$g = (1-b) \times \left[ROA + D/E \times (ROA - R_D\right]$$

B =Dividend per share/Earnings per share

ROA=Net margin/General assets

D/E=Total indebtedness /Total owner's equity

According to the capital asset pricing model (CAPM), the following equations can be deduced.

$$k = r_f + \beta(r_m - r_f)$$

"$r_f$" means risk-free rate of interest. Risk-free interest rate represents the interest rate that capital can invest in an investment object without any risk."rm" means expected rate of return. The difference between the former and the latter is the risk premium, that is, the difference between the market expected return and the risk-free return, which is the expected return due to the investor taking the non-decentralized risk associated with the stock market.

## 3. Analysis of intrinsic value of Lecai film based on dividend discount model

### 3.1 Brief introduction of Leche film

The China Leche film Group Company is a large state-owned enterprise funded by the State assets Supervision and Administration Commission of the State Council. It is a modern enterprise with the largest scale, the strongest technical force, the largest variety of products, the most extensive market coverage and the cross-regional market in China's video and information recording industry.It is also China's special military photosensitive materials research, development and production base.

The company's products include more than 100 types of image recording materials, printing materials, fine chemicals, membrane materials and coating materials, and four other product systems.The company's shares were listed on the Shanghai stock exchange in January 22, 1998. After issuing, the company's total share capital was 190 million shares.

### 3.2 Leche film related financial data

Table 1 Related data from 2102 to 2016

| Year | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| Dividend per share | 0.025 | 0.022 | 0.025 | 0.03 | 0.034 |
| Earnings per share | 0.08 | 0.07 | 0.08 | 0.10 | 0.11 |
| Priceearning ratio | 79 | 113.3 | 135 | 213.4 | 124.4 |

Table 2 Key financial data of Lucky film 2016

| Index name | General assets | Total indebtedness | Net asset | Net margin | Cash liabilities |
|---|---|---|---|---|---|
| Numerical value | 20.58 | 4.01 | 16.57 | 0.411 | 3.93 |
| Index name | Non-current liability | Accounts receivable | Advances received | Earnings per share | Total owner's equity |
| Numerical value | 0.0823 | 1.22 | 0.427 | 0.11（yuan） | 16.57 |

Unit: 100 million yuan

### 3.3 Capital growth rate

$$g=(1-b)\times\left[ROA+{}^{D}\!/_{E}\times(ROA-R_D\right]$$

Core competence is the skill of integration within the organization, especially how to coordinate multiple production skills and integrate different technologies.It should be a kind of ability which is difficult to imitate by competitors, that is, the unique resources and ability of enterprises.The talent itself is a vague concept. It has no definite measurement standard. It can only be judged by experience whether a person is a talented person, but experience is not reliable in many cases.The characteristics of talents are manifested in the following aspects.

Dividend payment rate

When calculating the dividend payout ratio, we first calculate two financial indicators of dividend per share and earnings per share. The dividend payment rate is determined by the quotient of dividends per share and earnings per share. The dividend payout rates for each year from 2012 to 2016 are calculated first, and then the payout rate of Lokai film is determined by calculating the average of the arithmetic. In the end, the value of the dividend payment rate is calculated to be 0.31.

Value of earnings per share and dividend per share in 2016

According to the report data, the value of earnings per share in 2016 was 0.11, and the value of dividend per share was 0.034.

The value of the rate of return on assets and the ratio of equity to liability

ROA=Net/General assets =0.411/20.58=2.00%

D/E=Total indebtedness/Total owner's equity =4.01/16.57 =24.20%

Calculation of debt interest rate

Interest rate on debt is interest on long-term debt.From the data on the 2016 annual financial report of Lucan film, you can see that the total liabilities of the film in 2016 were 401 million yuan, and the value of the non current liabilities in 2016 was 8 million 230 thousand yuan.It can be seen that

non-current liabilities account for 2.05% of total liabilities, with a small proportion.So when we calculate the rate of capital growth, it's zero.

Combined with the data calculated above, the capital growth rate of Lucky film is calculated as follows.

$$g = (1-b)\times\left[ROA+\left(D/E\right)\times\left(ROA-R_D\right)\right]$$

=(1-0.31)*[2.00%+24.2%*(2.00%-0)]

=0.017

### 3.4 Average price-earnings ratio in the industry five years later

As an important indicator to measure and evaluate the profitability of listed companies, the price-earnings(P/E) ratio is the price that investors in stocks are willing to pay for their profits of one dollar.The price-earnings ratio of the general situation is the common expectation of the market to the listed company.Industry average price-earnings ratio is an important indicator to evaluate whether the industry has vitality.Since the average expected rate of return is 5% to 10%, the normal price-earnings ratio is generally considered to be 5-20 times.In 2016, the average price-earnings ratio of the manufacturing industry was 42.36 times, and the price-earnings ratio of leche film was 124.4 times.

### 3.5 The necessary rate of return and the value of "β"

$$k = r_f + \beta(r_m - r_f)$$

From the Csmar website , the "β" value of Lokai film is 1.4304.The short-term time deposit rate is chosen as the risk-free interest rate, because in the stock market of our country, quite a large number of investors mainly invest in savings and stocks.The savings account for a large proportion in the investment activities, so the short-term time deposit interest rate is chosen as the risk-free interest rate.

k =One-year deposit rate ＋β×8%

=1.50%+1.4034*8%

=12.72%

### 3.6 he intrinsic value of Leche film

Based on the above data, the discounted dividend model with two-stage growth is calculated, and the intrinsic value of Lucky film is calculated as follows.

$$p_0 = \frac{DPS_0(1+g)}{(1+k)} + \frac{DPS_0(1+g)^n}{(1+k)^n} + \frac{EPS_0(1+g)(P/E)}{(1+k)^n}$$

=0.031+0.028+0.025+0.023+0.013+3.689

=3.809（元）

## 4. Conclusion

By using "DDM" to analyze the equity capital value of Lecai film, we find that the intrinsic value of Lecai film per share is 3.809 yuan, but the market price is about 11 yuan, which is much higher than the intrinsic value.This shows that the value of Lecai film is overestimated and Lecai film has no significant investment value. From the analysis of the intrinsic value of Lecai film stock, investors should evaluate the intrinsic value of Lecai film stock by discount.The market value of the stock will eventually tend to the intrinsic value of the stock, rather than other factors.If the intrinsic value of the stock is higher than the market value, the value of the stock is undervalued, and the stock has the investment value. conversely, the value of the stock is overvalued and does not have the investment value.

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