VSB — TECHNICAL UNIVERSITY OF OSTRAVA
FACULTY OF ECONOMICS
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Fundamentální analýza společnosti Gree, Inc.

Fundamental Analysis of Gree, Inc. Company

Student: Kemin Wang
Supervisor of the diploma thesis: Ing. Martina Novotná, Ph.D.

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1. Introduction
2. Description of the Fundamental Analysis Methodology
3. Global and Industry Analysis
4. Fundamental Analysis of Gree, Inc. Company
5. Conclusion

Bibliography
List of Abbreviation
Declaration of Utilization of Results from the Diploma Thesis
List of Annexes
Annexes

References:

BODIE, Z., A. KANE and A. J. MARCUS. *Investments and Portfolio Management*. 9th ed. New York: McGraw-Hill, 2011. 1056 p. ISBN 978-007-128914-6.
DAMODARAN, Aswath. *Applied Corporate Finance*. 3rd ed. New Jersey: John Wiley & Sons, 2010. 752 p. ISBN 978-0-470-38464-0.
McMILLAN, M. G., J. E. PINTO, W. L. PIRIE and G. Van de VENTER. *Investments: Principles of Portfolio and Equity Analysis*. New Jersey: John Wiley & Sons, 2011. 620 p. ISBN 978-0-470-91580-6.

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VYSOKÁ ŠKOLA BÁŇSKÁ-TECHNICKÁ UNIVERZITA OSTRAVA Ekonomická fakulta

Ing. Iveta Ratmanová, Ph.D.
Head of Department

prof. Dr. Ing. Dana Dluhošová
Dean of Faculty

The declaration

“Here with I declare that I elaborated the entire thesis, including all annexes, independently.”

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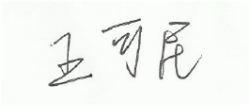

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1 Introduction

Fundamental analysis is a method of evaluating a security that entails attempting to measure its intrinsic value by examining related economic, financial and other qualitative and quantitative factors. Fundamental analysts attempt to study everything that can affect the security's value, including macroeconomic factors, such as the overall economy and industry conditions; company-specific factors, likes financial condition and management.

The objective of the thesis is fundamental analysis of Gree Electric Company. In order to give investors a reasonable and rational recommendation, the Chinese national market and industry which is Gree Company in and financial analysis would be analyzed; intrinsic value of Gree Company would be calculated and compared with market price. The reason of why we choose Gree Electric Company is because Gree Electric Company was founded in Zhuhai in 1991 and which is the largest air conditioner enterprise that integrating R&D, manufacturing, marketing and services globally.

Five chapters are included in this thesis; first chapter is introduction, it includes what the meaning of fundamental analysis is and why we choose Gree Electric Company and the structure of this thesis. Second chapter is description of the fundamental analysis methodology; it includes the methodologies we would use to analysis in this thesis. In this thesis we would analyze the company with financial analysis, and calculate the intrinsic value with DDM and FCF methods. Third chapter is global and industry analysis, in this chapter we will analysis the economic situation of China and air condition market in China. Forth chapter is fundamental analysis of Gree, Inc. Company; it is main part of this thesis. It includes history, product and fundamental analysis of Gree Electric Company. And we will calculate intrinsic value of company on 31st December 2013 with two methods, DDM and FCF; and compare with the market price; it is over value or under value. Fifth chapter is conclusion. In the conclusion, we will summary our work, suggestion for investors to sell, hold or buy the company's stock.

2 Description of the Fundamental Analysis Methodology

The fundamental analysis methodology would be introduced in this chapter. Macroeconomics analysis, industry analysis, financial statement analysis and how to calculate intrinsic value of company would be included in fundamental analysis methodology.

2.1 Macroeconomic Analysis

Macroeconomic analysis analyzed economy-wide phenomena changes in the indicates, such as GDP, inflation, interest rates, price levels, unemployment rate, taxes rate and also includes business cycle, monetary policy, money supply, fiscal policy, central bank policy, labor productivity, budget deficit, debt policy, currency rate, trade balance, sentiment and global economy impacts.

2.1.1 Gross domestic product

GDP measured the economy's total output of goods and services. It includes all of private and public consumption, government outlays, investments and exports less imports that occur within a defined territory. GDP is commonly used as an indicator of the economic health of a country, as well as to gauge a country's standard of living.

GDP has a huge impact in economic. Rapid growth in gross domestic product (GDP) indicates economic expansion and large opportunities for companies to increase sales. When the economy is healthy, low unemployment and wage growth enterprises demand labor to meet the economic growth. The change of the entire economy would be shown by the change of GDP. GDP change significantly, either up or down, there is usually a significant impact on the stock market. But this is not simply the absolute impact on gross domestic product (GDP) growth in the stock price increases, the reality is sometimes different. In both cases described in GDP will change according to the following situations.

When GDP sustained and steady growth of aggregate demand and aggregate supply coordinated growth, the good momentum of economic growth, corporate profits continue to rise, people's living standards improve and increase the intrinsic gold stocks and investors'

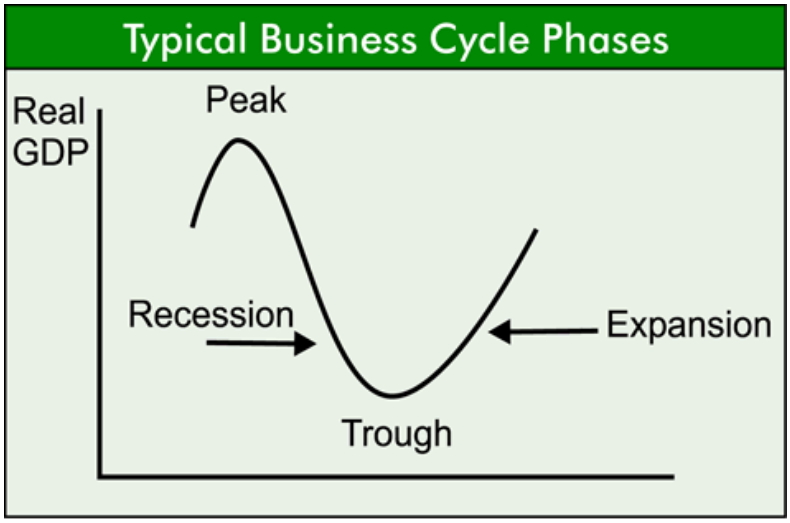
demand for stocks, prompting stock prices, the bullish stock market. The economic structure is irrational, high inflation presents GDP growth, is the performance of the bubble economy, the economic situation is likely to worsen in the intensification of conflicts, rising business costs, duplication and ultimately lead to oversupply, real incomes fall, a variety of factors caused the stock price falls, the stock market go bear.

2.1.2 Business cycle[1]

The term business cycle (or economic cycle or boom-bust cycle) refers to economy-wide fluctuations in production, trade and economic activity in general over several months or years in an economy organized on free-enterprise principles.

Business cycle can predicted long-term pattern changes in gross domestic product. Traditional business cycles undergo four stages: peak, recession, trough, expansion.

Figure 2.1 Typical business cycle phases



Source: http://www.erelscredit.com/wp-content/uploads/2013/08/urlcx.png

Peak[2] is the highest point between the end of an economic expansion and the start of a contraction in a business cycle. The peak of the cycle refers to the last month before several

[1] Source: http://en.wikipedia.org/wiki/Business_cycle

[2] Source: http://www.investopedia.com/terms/p/peak.asp

key economic indicators, such as employment and new housing starts, begin to fall. It is at this point that real GDP spending in an economy is its highest level.

Recession [3] is a signiflcant decline in activity across the economy, Iasting Ionger than a few months. It is visible in industrial production, employment, real income and wholesale-retail trade. The technicaI indicator of a recession is two consecutive quarters of negative economic growth as measured by a country's gross domestic product (GDP); although the National Bureau of Economic Research does not necessarily need to see this occur to call a recession. A recession generally lasts from six to 18 months, and interest rates usually fall in during these months to stimulate the economy by offering cheap rates at which to borrow money.

Trough[4] is the stage of the economy's business cycle that marks the end of a period of declining business activity and the transition to expansion.

Expansion[5] is the phase of the business cycle when the economy moves from a trough to a peak. It is a period when business activity surges and gross domestic product expands until it reaches a peak. An expansion is one of two basic business cycle phases. The other is contraction. The transition from expansion to contraction is termed a "peak" and the changeover from contraction to expansion is a trough. Expansions last on average about three to four years but have been known to last anywhere from 12 months to more than 10 years. Much of the 60s was a time of expansion which lasted almost nine years.

2.1.3 Government policy

Monetary policy [6] is the actions of a central bank, currency board or other regulatory committee that determine the size and rate of growth of the money supply, which in turn affects interest rates. Monetary policy is maintained through actions such as increasing the interest rate, or changing the amount of money banks need to keep in the vault.

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[3] Source: http://www.investopedia.com/terms/r/recession.asp

[4] Source: http://www.investopedia.com/terms/t/trough.asp

[5] Source: http://www.investopedia.com/terms/e/expansion.asp

[6]Source: http://www.investopedia.com/terms/m/monetarypolicy.asp

Interest rate

Interest rate can cause the stock price change, increase of interest rates leads to increase of required interest rates for calculation of net present value; it will decrease of net present value for stockholders, that is will fall of stock price. In another way, interest rate can influence costs of capital for investments.

Inflation rate

Inflation rate is a main macroeconomic factor, it measures the general price level or the rate at which prices rise. Inflation is primarily measured in two ways: through the consumer price index (CPI) and the GDP deflator. The CPI gives the current price of a selected basket of goods and services that is updated periodically.

Generally, when the inflation rate is low, inflation would push stock prices rise, because inflation is mainly due to an increase in the money supply. At the beginning of Money supply increased can stimulate production and increase company's profits, so the dividends would be increased and the demand of stock would be increased. It would push stock prices rise. But in the long run and the inflation rate is high, it would decrease the stock price.

Fiscal policy[7] is the means by which a government adjusts its spending levels and tax rates to monitor and influence a nation's economy. It is the brother strategy to monetary policy through which a central bank influences a nation's money supply. These two policies are used in various combinations to direct a country's economic goals. If the government supported some industries, it would make the stock price of these industry increasing.

[7] Source: http://www.investopedia.com/articles/04/051904.asp

2.2 Industry analysis

2.2.1 Porter five forces analysis [8]

Porter five forces analysis is a framework for industry analysis and business strategy development and it used to analysis of competitive strategy, can effectively analyze customer's competitive environment. Five forces are: Threat of new entrants; Threat of substitute products or services; bargaining power of customers (buyers); bargaining power of suppliers and intensity of competitive rivalry. Five different combinations of power and ultimately affect change in industry profit potential changes.

Threat of new entrants

New entrants to the industry to bring in new production capacity and new resources, but will be hoping to own a place has been carved up in an existing enterprise market, which may compete with the raw materials and the market share of existing enterprises occurred ultimately lead to lower industry profitability of existing enterprises, the worst case there could endanger the survival of these enterprises. The severity of the threat of competitive entry depends on two factors, which is entering a new field with the expected size of the existing barriers to enterprises for entrants' reactions.

The main barriers to entry, including aspects of economies of scale, product differentiation, capital requirements, switching costs, sales channel development, government actions and policies, not the size of the disposal cost disadvantage of natural resources, geo figurey and environment, which is very difficult to help some obstacles to copy or mimic the way to break. Expected existing enterprises into those reactions, mainly the possibility of retaliation size, depend on the vendor's financial situation, revenge records, fixed asset size, industry growth speed. In short, the new enterprise into the possibility of an industry size, depending on subjective estimates entrants can bring into the potential benefits, costs and cost required to bear the risk of the relative size of these three cases.

[8] Source: McMILLAN, M. G., J. E. PINTO, W. L. PIRIE and G. Van de VENTER (2011), p.388

Threat of substitute products or services

Two enterprises are in the same industry or different industries, but the products are substitutes, which between them produce competition behavior, will this originated in the competition of the alternatives in various forms affect the competitive strategy of the existing enterprise in the industry.

First, the existing enterprise product price and profit potential of the increase, due to there are limits can be accepted by users easily substitute.

Second, due to the invasion of the substitute producers, make existing enterprises must improve the quality of our products, or by reducing the cost to reduce the price, or make the product characteristic, otherwise its sales and profit growth is likely to be thwarted a goal.

Third, the intensity of competition from substitute producers influenced by product buyer switching costs high and low. In short, substitute the lower the price, the better the quality, the user conversion cost is lower, it can produce pressure of competition is strong; And the intensity of the competition pressure from substitute producers, concrete by looking at alternatives can be sales growth, alternative manufacturers production capacity expansion and earnings to describe them.

Bargaining power of customers (buyers)

Buyers mainly through require lower prices and higher quality of products or services to influent the existing enterprise profitability in the industry. Generally speaking, buyers satisfy the following conditions may have stronger bargaining power:

1. The total number of buyers is less, and each buyer purchases of large, large proportion of the seller's sales.

2. The seller industry composed of a large number of relatively smaller companies.

3. Buyers purchase is basically a standardized product; the buyer can buy it from multiple sellers at the same time.

4. The buyers can achieve backward Integration, but the sellers cannot achieve forward integration.

Bargaining power of suppliers

Suppliers mainly through raise input prices and lower unit value quality of existing enterprises to influence the industry's profitability and competitiveness. The strength of the supplier power mainly depends on what inputs as they provide to the buyer, when the supplier provided input elements of its value constitute the proportion of the total cost of the product is bigger, buyers is very important for buyers product production process, or seriously affect the buyer the quality of the product, the supplier for the buyer's potential bargaining power is greatly enhanced. In general, meet the following conditions of the supplier group will have a stronger bargaining power:

1. The supplier industry to have some relatively stable market position and is not subject to intense market competition plagued by control of enterprise, its products are a lot of buyers, so that each individual buyer is likely to become the supplier of the important customers.

2. Each enterprise products - the supplier has distinguishing feature each, so that the buyer is difficult to convert or conversion cost is too high, or it is hard to find a substitute for enterprise products compete with suppliers.

3. The supplier can easily implement forward combination or integration, and the buyer after the difficult to joint or integration.

Intensity of competitive rivalry

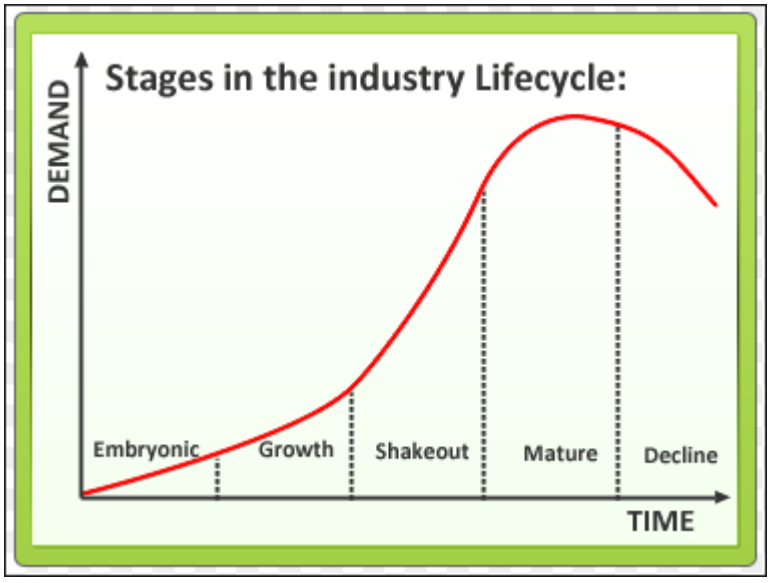
Most of the companies in the industry, mutual interests are closely linked, as part of the enterprise overall strategy of the enterprise competition strategy, the goal is to make my own business relative to the competition advantage, therefore, is the inevitable result in the implementation of the phenomenon of conflict and confrontation, these conflicts and confrontation, make up the existing competition among enterprises. The competition between existing enterprise often in performance: sustainable competitive advantage through

innovation, competition between online and offline companies; level of advertising expense; powerful competitive strategy; firm concentration ratio; degree of transparency.

2.2.2 Industry life cycle[9]

Industries, like individual companies, tend to evolve over time, and usually experience significant changes in the rate of growth and levels of profitability along the way. Just as an investment in an individual company requires careful monitoring, industry analysis is a continuous process to identify changes that may be occurring or be likely to occur. A useful framework for analyzing the evolution of an industry life-cycle model, which identifies the sequential stages that an industry typically goes through. The five stages of an industry life-cycle model are embryonic, growth, shakeout, mature, and decline. Each stage is characterized by different opportunities and threats.

Figure 2.2 An industry life-cycle model



Source: http://stockshastra.moneyworks4me.com/wp-content/uploads/2011/03/Copy-of-ss_44_table1.png

Embryonic: an embryonic industry is one that is just beginning to develop. Characteristics of the embryonic stage include slow growth and high prices because customers tend to be

[9] Source: McMILLAN, M. G., J. E. PINTO, W. L. PIRIE and G. Van de VENTER (2011), p.397

unfamiliar with the industry's product awareness and developing distribution channels are key strategic initiatives of companies during this stage. Substantial investment is generally required, and the risk of failure is high. A majority of start-up companies do not succeed.

Growth: a growth industry tends to be characterized by rapidly increasing demand, improving profitability, falling prices, and relativity low competition among companies in the industry. Demand is fueled by new customers entering the market, and prices fall as economies of scale are achieved and as distribution channels develop. The threat of new competitors entering the industry is usually highest during the growth stage, when barriers to entry are relatively low. Competition tends to be relatively limited, however, because rapidly expanding demand provides companies with an opportunity to grow without needing to capture market share from competitors. Industry profitability improves as volumes rise and economies of scale are attained.

Shakeout: the shakeout stage is usually characterized by slowing growth, intense competition, and declining profitability. During the shakeout stage, demand approaches market saturation levels because few new customers are left to enter the market. Competition is intense as growth becomes increasingly dependent on market share gains. Excess industry capacity begins to develop as the rate at which companies continue to invest exceeds the overall growth of industry demand. In an effort to boost volumes to fill excess capacity, companies often cut prices, so industry profitability begins to decline. During the shakeout stage, companies increasingly focus on reducing their cost structure and building brand loyalty. Marginal companies may fail or merge with others.

Mature: characteristics of a mature industry include little or no growth, industry consolidation, and relatively high barriers to entry. Industry growth tends to be limited to replacement demand and population expansion because the market at this stage is completely saturated. As a result of the shakeout, mature industries often consolidate and become oligopolies. The surviving companies tend to have brand loyalty and relatively efficient cost structures, both of

which are significant barriers to entry. During periods of stable demand, companies in mature industries tend to recognize their interdependence and try to avoid price wars. Periodic price wars do occur, however, most notably during periods of declining demand (such as during economic downturns). Companies with superior products or services are likely to gain market share and experience above-industry-average growth and profitability.

Decline: during the decline stage, industry growth turns negative, excess capacity develops, and competition increases. Industry demand at this stage may decline for a variety of reasons, including technological substitution, social changes, and global competition. As demand falls, excess capacity in the industry forms and companies respond by cutting prices, which often leads to price wars. At this point, the weaker companies often exit the industry, merge, or redeploy capital into different products and services.

2.3 Company analysis[10]

The financial analysis of a company is process of selecting, evaluating, and interpreting financial data, along with other pertinent information, in order to formulate an assessment of the company's present and future financial condition and performance. We can use financial analysis to evaluate the efficiency of a company's operations, its ability to manage expenses, the effectiveness of its credit policies, and its creditworthiness, among other things. There are two main way to analyze a company, common-size analysis and financial ratio analysis.

2.3.1 Common-size analysis

Common-size analysis is the restatement of financial statement items using a common denominator or reference item that allows us to identify trend and major differences. There are two types of common-size analysis. The most common is vertical common-size analysis, in which we compare the accounts in a given period to a benchmark item in that same year.

[10] Source: CLAYMAN, M. R., FRIDSON, M. S. and TROUGHTON, G. H.(2008). p.311

2.3.2 Financial ratio analysis

Financial ratio analysis is the use of financial accounting and other information to assess a company's financial performance and financial condition. Specifically, financial ratio analysis uses comparisons of financial data in the form ratios to assess a company's financial health and profitability.

We use profitability ratios to analyze a company's ability to manage its expense to generate profits from its sales. We use liquidity ratios to measure a company's ability to meet its short-term, immediate obligations. We look at a company's solvency ratios to gauge its ability to meets its debt obligations.

Profitability ratios

When we want to know the company's profitability, we need to calculate profitability ratios. There are four types' ratios used to measure management's ability to control expenses and to earn a return on the resources committed to the business. They are operating profit margin, net profit margin, return on assets and return on equity. The higher the profitability ratios，the better competitive position of the company.

Operating profit margin is calculated as:

$$\text{Operating profit margin} = \frac{\text{Operating profit}}{\text{Revenues}} \tag{2.1}$$

Operating profit margin is net profit as a percentage of sales revenue, is an indicator of profitability and is often used to compare the profitability of companies and industries of differing sizes.

Net profit margin is calculated as:

$$\text{Net profit margin} = \frac{\text{Net profit}}{\text{Revenues}} \tag{2.2}$$

Profit margin is the percentage of selling price that turned into profit, where as "Profit Percentage" or "Markup" is the percentage of cost price that one gets as profit on top of cost price. The profit margin is mostly used for internal comparison.

Return on assets is calculated as:

$$\text{Return on assets} = \frac{\text{Net profit}}{\text{Total assets}} \tag{2.3}$$

ROA measures the return earned by a company on its assets. The higher the ratio, the more income is generated by a given level of assets.

Return on equity is calculated as:

$$\text{Return on equity} = \frac{\text{Net profit}}{\text{Equity}} \tag{2.4}$$

ROE measures the return earned by a company on its equity capital, including minority equity, preferred equity and common equity. The ROE is useful for comparing the profitability of a company to that of other firms in the same industry.

Leverage ratios

Leverage ratios are used to measure the company's debt levels. The most common leverage ratios are the debt ratio and the debt-to-equity ratio.

Debt ratio is calculated as:

$$\text{Debt ratio} = \frac{\text{Total debt}}{\text{Total assets}} \tag{2.5}$$

The higher the ratio, the greater risk will be associated with the firm's operation. In addition, high debt to assets ratio may indicate low borrowing capacity of a firm, which in turn will lower the firm's financial flexibility.

Debt-to-equity ratio is calculated as:

$$\text{Debt to equity} = \frac{\text{Total debt}}{\text{Total equity}} \tag{2.6}$$

A high debt to equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Turnover ratios

Turnover Ratios can be separate several types: inventory turnover ratio, receivables turnover ratio, asset turnover ratio and so on.

Inventory turnover ratio is calculated as:

$$\text{Inventory turnover ratio} = \frac{\text{Sales}}{\text{Inventory}} \tag{2.7}$$

Inventory turnover ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying.

Receivables Turnover Ratio is calculated as:

$$\text{Receivables Turnover Ratio} = \frac{\text{Net credit sales}}{\text{Average accounts recevable}} \tag{2.8}$$

An accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. The receivables turnover ratio is an activity ratio, measuring how efficiently a firm uses its assets. A low ratio implies the company should re-assess its credit policies in order to ensure the timely collection of imparted credit that is not earning interest for the firm.

Asset turnover ratio is calculated as:

$$\text{Asset turnover ratio} = \frac{\text{Sales or revenue}}{\text{Total asset}} \tag{2.9}$$

Generally speaking, the higher the ratio, the better it is, since it implies the company is generating more revenues per monetary unit of assets. But since this ratio varies widely from one industry to the next, comparisons are only meaningful when they are made for different companies in the same sector.

Liquidity ratios

There are three types of liquidity ratios were used measure a firm’s ability to meet its current obligations.

Current ratio is calculated as:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Short} - \text{term liabilities}} \tag{2.10}$$

Current ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations.

Quick ratio is calculated as:

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Short} - \text{term liabilities}} \tag{2.11}$$

Quick ratio is an indicator of a company's short-term liquidity. The quick ratio measures a company's ability to meet its short-term obligations with its most liquid assets. For this reason, the ratio excludes inventories from current assets,

Cash ratio is calculated as:

$$\text{Cash ratios} = \frac{\text{Monetary fund}}{\text{Short} - \text{term liabilities}} \tag{2.12}$$

The cash ratio of a company is total cash and cash equivalents to its current liabilities. The cash ratio is most commonly used as a measure of company liquidity. It can therefore determine if, and how quickly, the company can repay its short-term debt.

2.4 Calculation of Intrinsic Value

Intrinsic value[11] is the actual value of a company or an asset based on an underlying perception of its true value including all aspects of the business, in terms of both tangible and intangible factors. This value may or may not be the same as the current market value. Value investors use a variety of analytical techniques in order to estimate the intrinsic value of securities in hopes of finding investments where the true value of the investment exceeds its current market value.

We have many methods to calculate intrinsic value, but in our thesis we would use DDM and DCF.

[11] source: http://www.investopedia.com/terms/i/intrinsicvalue.asp

2.4.1 Dividend Discount Model[12]

The dividend discount model (DDM) is a method of valuing a company's stock price based on the theory that its stock is worth the sum of all of its future dividend payments, discounted back to their present value. In other words, it is used to value stocks based on the net present value of the future dividends. The equation most widely used is called the Gordon growth model.

To value a company using the DDM, you calculate the value of dividend payments that you think a stock will throw-off in the years ahead. There are several versions of DDM:

- You receive dividends (e.g. for 3 years) and finally you will sell the stock
- You hold the stock and dividends are all the time same
- You hold the stock and dividends can change

Stock Valuation:

$$\text{Value per share of stock} = \sum_{t=1}^{t=\infty} \frac{\text{Expected dividends in period t}}{(1 + \text{cost of equity})^{\text{t}}} \qquad (2.13)$$

"t" is the time period.

If we assumed the dividend would growth at a same growth rate, we can use Gordon growth model.

Gordon growth model[13]

The formula in Gordon growth model is as follow:

$$\text{P} = \frac{D_1}{r-g} \qquad (2.14)$$

"P" is the current stock price.

"g" is the constant growth rate in perpetuity expected for the dividends.

"r" is the constant cost of equity capital for that company.

[12]Source: McMILLAN, M. G., J. E. PINTO, W. L. PIRIE and G. Van de VENTER.(2011). p.430

[13] Source: McMILLAN, M. G., J. E. PINTO, W. L. PIRIE and G. Van de VENTER.(2011). p.436

"D_1" is the value of the next year's dividends.

Multistage dividend discount models[14]

Multistage growth models are often used to model rapidly growing companies. The two-stage DDM assumes that at some point the company will begin to pay dividends that grow at a constant rate, but prior to that time the company will pay dividends that are growing at a higher rate than can be sustainable in the long run. Two-stage DDM thus makes use of two growth rates: a high growth rate for an initial, finite period followed by a lower, sustainable growth rate into perpetuity.

Two-stage DDM's formula is:

$$\text{Value per share of stock} = \sum_{t=1}^{n} \frac{D_n}{(1+r)^t} + \frac{D_{T+1}}{r-g}(1+\text{r})^{-T} \qquad (2.15)$$

Before these models, we need to calculate discount rate or cost of equity capital for company. So we need CAPM model.

Capital Asset Pricing Model[15]

CAPM is capital asset pricing model, a model that describes the relationship between risk and expected return and that is used in the pricing of risky securities; is used to determine a theoretically appropriate required rate of return of an asset, if that asset is to be added to an already well-diversified portfolio, given that asset's non-diversifiable risk. The model takes into account the asset's sensitivity to non-diversifiable risk (also known as systematic risk or market risk), often represented by the quantity beta (β) in the financial industry, as well as the expected return of the market and the expected return of a theoretical risk-free asset. CAPM "suggests that an investor's cost of equity capital is determined by beta."

[14] Source: McMILLAN, M. G., J. E. PINTO, W. L. PIRIE and G. Van de VENTER.(2011). p.441

[15] Source: DAMODARAN, Aswath. (2010). p.122.

The formula is calculated as:

$$E(r_i) = r_f + \beta_i(E(r_m) - r_f) \quad (2.16)$$

"$E(r_i)$" is the expected return on the capital assets.

" r_f" is the risk-free rate.

"β_i" (The beta) is the sensitivity of the expected excess asset returns to the expected excess market returns.

"$E(r_m)$" is the expected return of the market.

For estimating beta, we can make a regression between market return and return of an asset. Using a different time period for the regression or different return intervals (weekly or daily) for the same period can result in a different beta.

For DDM method to calculate intrinsic value of company is based on the dividend payment, dividend growth rate and required return rate. After this way, we have another way to calculate the intrinsic value based on the free cash flow, named discount cash flow model.

2.4.2 Discount cash flow model[16]

Discounted cash flow (DCF) model is a method of valuing a project, company, or asset using the concepts of the time value of money. All future cash flows are estimated and discounted to give their present values (PVs), which is taken as the value or price of the cash flows in question. Present value may also be expressed as a number of years' purchase of the future undiscounted annual cash flows expected to arise.

Using DCF model to compute the PV takes as input cash flows and a discount rate and gives as output a price; the opposite process—taking cash flows and a price and inferring a discount rate—is called the yield.

Discounted cash flow analysis is widely used in investment finance, real estate development, corporate financial management and patent valuation.

[16] Source: DAMODARAN, Aswath. (2010). p.597

The discounted cash flow formula is calculated as:

$$\mathrm{DCF} = \frac{\mathrm{CF}_1}{(1+\mathrm{r})^1} + \frac{\mathrm{CF}_2}{(1+\mathrm{r})^2} + \cdots + \frac{\mathrm{CF}_\mathrm{n}}{(1+\mathrm{r})^\mathrm{n}} \tag{2.17}$$

"DCF" is discount cash flow.

"CF_n" is the cash flow in nth period.

"r" is discount rate.

In this thesis, we will calculate FCFE with two-stage DCF method. So there is a little bit different on the formula.

Two stage DCF with FCFE method's formula is:

$$V = \sum_{t=1}^{T} \frac{FCFE_t}{(1+r_1)^t} + \frac{FCFE_{T+1}}{r_2 - g}(1+r_1)^{-T} \tag{2.18}$$

V is the intrinsic value of the company.

$FCFE_t$ is free cash flow to equity in t period.

r_1 is the discount rate or expected return rate in the first stage.

r_2 is the discount rate or expected return rate in the second stage.

g is growth rate of FCFE in a long term.

After a short introduction about DCF method, we can know that if we want to use this method we need to calculate free cash flow to equity first. The FCFE formula is showed as follow:

$$\begin{aligned}\mathrm{FCFE} = {} & \text{net income} - (\text{capital expenditure} - \text{depreciation} + \text{change in working capital}) \\ & - \text{principal payment} + \text{new debt issued}\end{aligned} \tag{2.19}$$

We can find the data from company's financial statement, and for some data we couldn't find from statement, we can find it from annual report.

2.5 SWOT[17] Analysis method

A SWOT analysis (alternatively SWOT matrix) is a structured planning method used to evaluate the strengths, weaknesses, opportunities, and threats involved in a project or in a business venture. A SWOT analysis can be carried out for a product, place, industry or person. It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favorable and unfavorable to achieve that objective.

Strengths: characteristics of the business or project that give it an advantage over others.

Weaknesses: characteristics that place the business or project at a disadvantage relative to others.

Opportunities: elements that the project could exploit to its advantage.

Threats: elements in the environment that could cause trouble for the business or project.

[17] Source: http://www.investopedia.com/terms/s/swot.asp

3 Global and Industry Analysis

The macroeconomic in China and air conditioner industry in China would be analyzed in this chapter.

3.1 Chinese macroeconomic analysis

China is the biggest developing country with the largest population (1.4 billion). In the past 30 years, Chinese economic grew rapidly. We collected a 35 years data about Chinese GDP from 1978 to 2012 from government website. These data would show us the economic trend in China.

Table 3.1 GDP from 1978 to 2012

Time	GDP(100mil)	Time	GDP(100mil)	Time	GDP(100mil)
1978	3,645.22	1990	18,667.82	2002	120,332.69
1979	4,062.58	1991	21,781.50	2003	135,822.76
1980	4,545.62	1992	26,923.48	2004	159,878.34
1981	4,891.56	1993	35,333.92	2005	184,937.37
1982	5,323.35	1994	48,197.86	2006	216,314.43
1983	5,962.65	1995	60,793.73	2007	265,810.31
1984	7,208.05	1996	71,176.59	2008	314,045.43
1985	9,016.04	1997	78,973.03	2009	340,902.81
1986	10,275.18	1998	84,402.28	2010	401,512.80
1987	12,058.62	1999	89,677.05	2011	473,104.05
1988	15,042.82	2000	99,214.55	2012	519,470.10
1989	16,992.32	2001	109,655.17	2013	568,845.00

Source: National Bureau of Statistics of China; http://data.stats.gov.cn/workspace/index?m=hgnd

Figure3.1 GDP growth rate from 1978 to 2012

Source: National Bureau of Statistics of China; http://data.stats.gov.cn/workspace/index?m=hgnd data; author

From table 3.1, we can know that Chinese economic grew rapidly in the past 35years. Chinese economic is in an expansion period. From the figure 3.1, we can know the GPD growth rates were around 10%. This situation is good for company's development. In the last six years (2008 to 2012) the GDP grew from 314,045 (100 million CNY) to 519,470.10 (100 million CNY).

Table 3.2 GNI, the secondary industry output and GDP per capita and index

Time	2008	2009	2010	2011	2012
Gross National Income (100 million)	316,030	340,320	399,760	468,562	516,810
The secondary industry (100million)	149,003	157,639	187,383	220,413	235,162
GDP per capita (yuan)	23,708	25,608	30,015	35,198	38,459
GNI index	100	108.3	110.2	108.7	108.1
Secondary industry index	100	109.9	112.3	110.3	107.9
Per capita GDP index	100	108.7	109.9	108.8	107.1

Source: National Bureau of Statistics of China; http://data.stats.gov.cn/workspace/index?m=hgnd

From 2008 to 2012, the GNI grew from 316,030 (100 million CNY) to 516,810 (100 million CNY); the secondary industry output also increased year by year. From table 3.2, we can know that Chinese economic situation is good, all projects are growing steadily. The GNI growth rate is around 9%.

These data are about production power; now let's move to consumption level.

There is a big gap between Chinese urban and rural, so we have to analysis the consumption level of urban and rural areas separately.

Table 3.3 Consumption level in China[18]

Time (yuan)	2008	2009	2010	2011	2012
Average Consumer level	8,430	9,283	10,522	12,570	14,098
Consumption level of rural residents	3,901	4,163	4,700	5,870	6,515
Consumption level of urban residents	13,653	14,904	16,546	19,108	21,120
per capita disposable income	15,781	17,175	19,109	21,810	24,565

Source: National Bureau of Statistics of China; http://data.stats.gov.cn/workspace/index?m=hgnd

From the table 3.3, we can know that the consumption level of rural residents was 3,901CNY in 2008 and 6,515CNY in 2012. The consumption level of urban residents was more than three times than consumption level of rural residents. Because of that the rural residents had lower income and low price level. It means that the main market of air conditioner is urban market. But the government in order to improve rural residents' life level formulated two fiscal policies: Energy Efficient Appliances and Home appliances to the countryside policy.

From the fiscal policy side; two fiscal policies were implemented by the Chinese government for supporting Chinese air condition industry. The two fiscal policies were called Energy Efficient Appliances and Home appliances to the countryside policy.

Energy Efficient Appliances: from 2007, the government wants to through fiscal subsidies to promote the products which are rating by 1 or 2 more energy efficient products. The amount

[18] Source: http://data.stats.gov.cn/workspace/index?m=hgnd

of fiscal subsidies is determined based on a certain percentage of energy efficient products and general product spreads. For energy efficiency rating 2 room air conditioner to give 300-650 yuan/unit of subsidies, energy efficiency rating of Class 1 to give 500-850 yuan/unit of subsidies.

Home appliances to the countryside policy: in 2008, the government announced bailout plan, in order to combat the global financial crisis began in the United States. The rural will get 13% of the product price subsidies when they buy home appliances.

After all the macroeconomic data, we have a summary, China's economy is raising trend now. And from the government plan, this growing situation will last at least 20 years.

3.2 Chinese air conditioner industry analysis[19]

Air conditioners are used to adjust temperature of the air for making people feel comfortable. In 3600 years ago, our ancestry had already used nature cold (ice). But the first modern electrical air conditioning unit was invented by Willis Carrier in Buffalo, New York. In 1965 Shanghai refrigerator factory successfully developed China's first three-phase power window air conditioner. In 1968 the first air condition company Midea established. Then other air conditioning companies have appeared; in 1991 Gree air-conditioning company was founded. After twenty years of development under the support of national policy (home appliance going rural and Energy saving policy), China's air-conditioning companies greatly increased production capacity, air conditioning production has maintained rapid growth, from 960 million units in 1999 soared to 48.3 million units in 2004, with an average growth rate of 80.6%. 2005 annual production is 50.6 million air-conditioning units, although the total amount increased than 2004, but the growth rate is only about 4.5%; air conditioning production in 2006 is the first decline, for 48.8 million units, compared to the same period last year decreased 3.6%. After a round of rapid development China's air-conditioning industry

[19] Chinese air condition industry annual meeting report (2013); author

entered a relatively stable period.

Market share of inverter air conditioner products in China market has grown from 17.37% in 2009, and rapid rise to 38.68% in 2011, and exceed 40% in 2012. Inverter air conditioner sales in the Chinese market were nearly 7 million units in the first half of 2011, this number was near 40% market share. Inverter air conditioner has accounted for a dominant position in the first and second tier cities' market. 33% of consumers prefer to 2000-3000 yuan price of air conditioning.

But the high speed of expansion and the several countries promoting policies have been end or near the end, the inventory of air condition made people worried. In august 2011, the inventory of air conditions were 10miliion units, and in November the inventory increased to 25million units.

In the next few years, air-conditioning market would continue to develop, but the speed would be slow down.

3.2.1 Threat of new entrants' analysis

The threat of potential entrants mainly depends on the high and low barriers to entry. From the aspects of scale economy, air conditioning industry as manufacturing industry required a higher investment in the fixed cost.

From the degree of product differentiation side, in recent years, domestic air conditioning market competition gradually from the low level of price competition into in order to meet the different needs of differentiation competition. As to the air conditioning market segmentation, the different needs of customers have been satisfied, and produce spell differentiation degree unceasing enhancement, industry barriers to entry will continue to increase.

Technical barriers: technology is the source of the air conditioning industry core competitiveness. Product quality and high energy consumption index requirements. The whole industry increased the investment in technology research and development, and the industry technology updates faster and faster. At the same time, the state encouraged and

support enterprise independent innovation, technology innovation for industrial transformation and upgrading. The potential entrants required of high enterprise technology innovation ability.

The degree of brand concentration and the effect of famous brand are higher and higher. Domestic market has basically been shared by Gree, Haier, Midea and other several big brands. As the leader of the industry, they are in product research and development, sales, after-sales service have already formed a relatively complete industrial chain, at the same time as domestic for the air conditioning industry product quality, energy consumption index enhances unceasingly. These are obstacles for new entrants who want to join the air conditioning industry. Therefore, a little chance for new entrants enters the industry.

3.2.2 Threat of substitute products or services analysis

Substitute products are mainly the upgrading of products in the industry. The upgrading mainly present on energy saving products, such as solar energy air conditioning, geothermal air conditioning and gas central air conditioning, but now is not the mainstream.

3.2.3 Bargaining power of customers analysis

From the consumer's point of view, an adequate supply of household appliances market, appliance sales have entered a buyer's market; consumers have a lot of options and the ability to bargain. To attract customers, household appliances enterprises to reduce prices competitive. Managers use to measure the sales performance service levels, these levels are usually used to determine the distribution of opportunities permit, get standard advertising revenue and other economic benefits.

In addition, the Chinese electrical appliances market has developed from a single model into the diversity of the marketing network of today's retail chain business model. So, the seller must consider the bargaining power of chain retail enterprises. Supermarkets such as gome, suning, yongle (three retail companies) can rely on their agglomeration effects, such as home

appliances manufacturer will be asked to pay the goods shelves, even celebrate their fees, festival fee cost is high. Thus, the buyer's bargaining power is very strong.

3.2.4 Bargaining power of suppliers analysis

First look at parts suppliers, dispersed more than domestic suppliers, bargaining power is low. But in the past two years, the raw material is raw material market supply and price fluctuation, the raw material, cause the global imbalance between supply and demand, steel, copper, aluminum, energy supply, demand prices rose sharply increase, the influence of the compressor industry, both production and marketing, surging across the board. Raw materials and key components of the upstream supply lead supply enterprises are competition. In order to obtain competitive advantage and air conditioning enterprise need to strengthen the integration of upstream resources. Overall, the supplier's bargaining power is not strong.

3.2.5 Intensity of competitive rivalry analysis

Gree's biggest rival is Midea, the Media of "power" strategy of diversifying began to appear, in recent years, obtained the remarkable achievements of Midea is a threat to the status of Gree. After these years of rapid development of the Chinese electrical appliances industry, home appliance enterprises continuously raise, the constant improvement of the technology. Home appliance enterprises generally a vanguard of industrial upgrading. Due to the policy of "home appliances to the countryside ", the speed of the growth rate of industry increased in order to have a bitter competition for industry.

Due to the increasing of RMB exchange rate, Labor costs have risen sharply, the overall factors rising costs, inevitably lead to rising household appliances industry, the fixed costs of enterprises, in order to reduce the unit fixed costs, improve yield and lower prices lead to the risk of price wars and home appliance industry competition.

It can be seen from the above, the air conditioning industry competition is intense, the air conditioning industry after 20 years of development, and has changed from the original profiteering era of meager profit era.

Comparing with Midea, Chuanlan and Emicon Company [20]

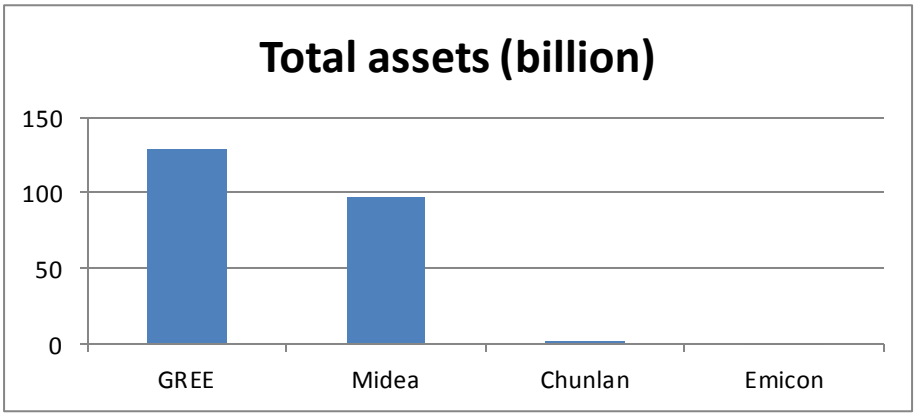
In Chinese air condition market, there are four main companies. They are Gree, Midea, Chuanlan and Emicon. We will compare some financial data about these four companies.

Table 3.4 Total assets of Gree, Midea, Chuanlan and Emicon company

Company	GREE	Midea	Chunlan	Emicon
Total assets (billion)	129.486	97.593	2.566	0.695

Source: http://stockpage.10jqka.com.cn/000651/field/

Figure3.2 Total assets of these four companies



Source: http://stockpage.10jqka.com.cn/000651/field/ (data), author

From the total assets side, we can estimate the company size. From table 3.4 and figure 3.2, we can know that the Gree Company had absolute advantage. The only competitor is Midea Company, but it was still 30 billion gaps.

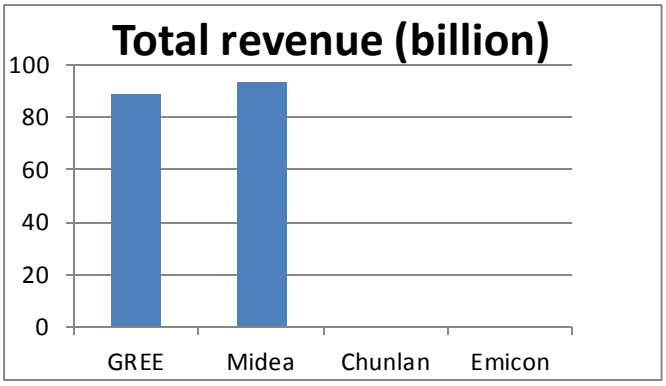
Table 3.5 Total revenue of Gree, Midea, Chuanlan and Emicon company

Company	GREE	Midea	Chunlan	Emicon
Total revenue (billion)	88.759	93.779	0.775	0.262

Source: http://stockpage.10jqka.com.cn/000651/field/

[20] All the industry data are available on source: http://stockpage.10jqka.com.cn/000651/field/

Figure3.3 Total revenue of Gree, Midea, Chuanlan and Emicon company



Source: http://stockpage.10jqka.com.cn/000651/field/ (data), author

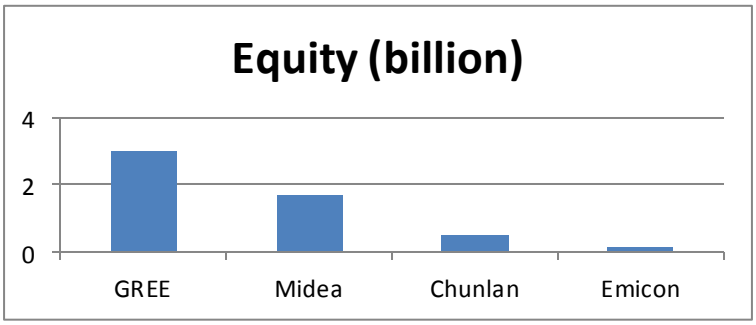
From total revenue side, we can estimate how many market share the company owned. The total assets of Gree are higher than Midea, but the total revenue of Gree is lower than Midea. The reason is in the low-priced market, the people prefer Midea, and the Midea has more diverse products, not only air conditioner.

Table 3.6 Total equity of Gree, Midea, Chuanlan and Emicon company

Company	GREE	Midea	Chunlan	Emicon
Equity (billion)	3.008	1.686	0.519	0.157

Source: Stock analysis http://stockpage.10jqka.com.cn/000651/field/

Figure3.4 Total equity of Gree, Midea, Chuanlan and Emicon company



Source: http://stockpage.10jqka.com.cn/000651/field/ (data), author

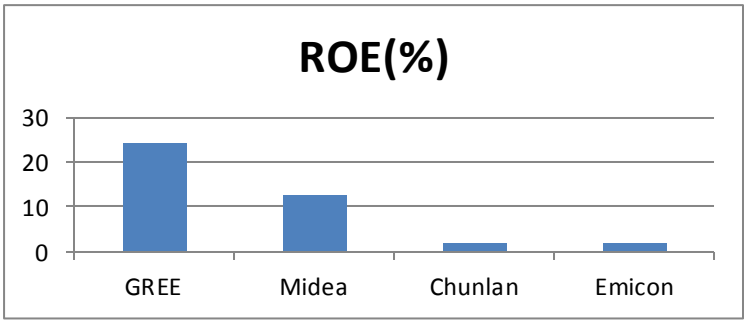
Gree also had the highest equity in these four companies. It means the most people choose Gree Company. Why most people choose hold Gree Company's stock? Because people can get more profit from Gree Company.

Table 3.7 ROE of Gree, Midea, Chuanlan and Emicon company

Company	GREE	Midea	Chunlan	Emicon
ROE (%)	24.21	12.58	1.77	1.7

Source: Stock analysis; http://stockpage.10jqka.com.cn/000651/field/

Figure3.5 ROE of Gree, Midea, Chuanlan and Emicon company



Source: Stock analysis http://stockpage.10jqka.com.cn/000651/field/ (data), author

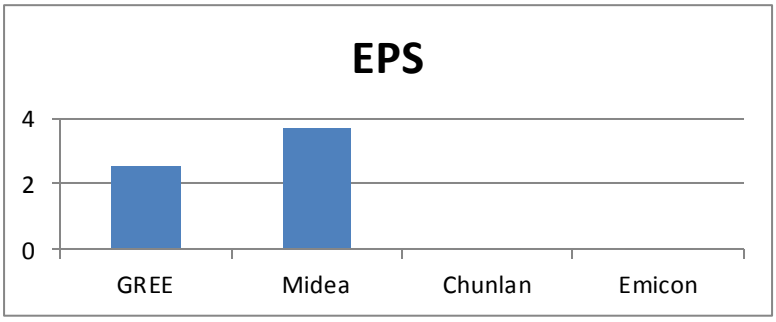
Gree had a highest ROE ratio, which meant the investors who invested in air condition industry can get the highest return from Gree Company. High return rate will attract more money; more money will do more business. This became a virtuous circle

Table 3.8 EPS of Gree, Midea, Chuanlan and Emicon company

Company	GREE	Midea	Chunlan	Emicon
EPS	2.52	3.73	0.07	0.05

Source: Stock analysis; http://stockpage.10jqka.com.cn/000651/field/

Figure3.6 EPS of Gree, Midea, Chuanlan and Emicon company



Source: Stock analysis; http://stockpage.10jqka.com.cn/000651/field/ (data), author

Compared with Midea Company, the Gree Company's EPS is lower than Midea Company's, but the price of Gree stock in 2013 increased from 25.50 to 32.66; EPS for Gree Company is

2.52, which means the return of this stock is nearly 10%. And the stock price of Midea Company is around 50; EPS for Midea Company is 3.73, the return rate is 7.5%. That means investing on Gree Company stock is better.

Now we will compare some ratios between Gree Company and industry in China.

Table 3.9 Profitability ratios from Gree and Industry in 2013

Profitability ratios	Operating profit margin	Net profit margin	ROA
Gree	29.95%	8.77%	7.49%
Industry	25.31%	6.53%	5.44%

Source: Stock analysis; http://stockpage.10jqka.com.cn/000651/field/

Profitability ratio is used to evaluate company's profitability. From Table 3.9, we can know that the profitability of Gree Company is better than average level of this industry.

Table 3.10 Turnover ratios from Gree and Industry in 2013

Turnover Ratios	Inventory turnover Ratio	Receivables Turnover Ratio	Asset turnover Ratio
Gree	4.64	49.33	0.74
Industry	4.29	9.23	0.75

Source: Stock analysis; http://stockpage.10jqka.com.cn/000651/field/

Turnover ratios are used to evaluate company's turnover ability. For inventory turnover ratio and asset turnover ratio, Gree Company's is near the average level of industry. But the receivables turnover ratio is much higher than industry level. Because the domestic market sales policy of Gree is payment before shipment, dealers in the form of bank acceptance bill payment in advance, advance payments surge. This policy made the Gree had a lot of receivables; and more receivables need more time to receive.

Table 3.11 Liquidity ratios from Gree and Industry

Liquidity ratios	Current ratio	Quick ratio	Cash ratio
Gree	1.05	0.95	20.5
Industry	2.33	1.87	20.53

Source: Stock analysis; http://stockpage.10jqka.com.cn/000651/field/

Gree Company prefer short term debt than long term debt, this make the company had a high current liability, that is the reason why current ratio and quick ratio is lower than industry level.

According financial statement analysis, we can know that Gree Company had a good profitability; solvency ability is also not bad and increased year by year. For the investors, invest on Gree Company is the best choice in air conditioner industry.

4 Fundamental analysis of Gree, Inc. Company

In this chapter, we will introduce the characteristics of Gree Company first; secondly is financial analysis; and we will calculate intrinsic value at last.

4.1 Characteristics of Gree, Inc. Company

Gree Electric Company was founded in Zhuhai in 1991, which is the largest air conditioner enterprise that integrating R&D, manufacturing, marketing and services globally. Gree Company go public in Shenzhen stock exchange in 1996. Total revenue of company is over 100.11 billion yuan; tax paid more than 7.4 billion yuan.

Gree air-condition is the only one world famous brand in Chinese air-condition industry, trade more than 100 countries. Gree has 9 production bases in the world (Zhuhai, Chongqing, Hefei, Zhengzhou, Wuhan, Shijiazhuang, Brazil, Pakistan and Vietnam) with an annual production capacity of 60 million residential air-conditions and 5.5 million commercial air-conditions.

Main products[21]

The main products can be divided by two ways: Residential Air Conditioner and Commercial Air Conditioner. For residential air conditioner, there are six kinds of types, they are Wall-mounted, Floor Standing, Window, Portable, Dehumidifier and Air Purifier. For commercial air conditioner, there are Unitary, Free Match, GMV, and Air to Water, Chiller, Terminals and Specialized Air Conditioner.

Wall-mounted air conditioner usually called split air-conditioning, free installation location restrictions, easier and decorated with the city. Function of this air conditioner is less noise and some have multiple split air purification function, can purify the indoor air, but also have split air ventilation functions in order to maintain health.

Floor-standing air conditioner is bigger than Wall-mounted air conditioner, suit for living room, best squire suggestion 90~140M^2 and cool down fast.

[21] Source: http://www.gree.com.cn/english/products/housepro_jsp_catid_628.shtml

Window air conditioner: it is a small air conditioner can be installed on windows; window air conditioners have cold type, electric type and heat pump three.

Portable air conditioner: Adopt effective evaporative cooling technology, as well as soothing effect of humidification and ergonomic design. Only need to add water to activate the cooling function.

Dehumidifier: Moist air from the fan will be pumped into the machine, through the heat exchanger, when moisture in the air condenses into water droplets, after handling dry air from the plane, and so reduce indoor humidity.

Air Purifier: Gree air purifier has a multiple purifying system comprised of cold catalyst & high voltage ionization technology which can purify 90% of the indoor air and provide a healthier environment to your family.

Commercial Air Conditioner part

Free Match: It's a kind of DC inverter multi-split air conditioner that consisted with one outdoor unit and up to five indoor units.

GMV: The GMV series is the VRF system that adopts variable capacity compressor and multiple indoor units to realize independent cooling or heating in different rooms.

Air to Water able to absorb the low-temperature heat in the air, after the compressor compresses into a high-temperature thermal energy, heating water temperature

Chiller is a machine that removes heat from a liquid via a vapor-compression or absorption refrigeration cycle.

4.2 Gree Company financial analysis

4.2.1 Common-size analysis of Gree Company

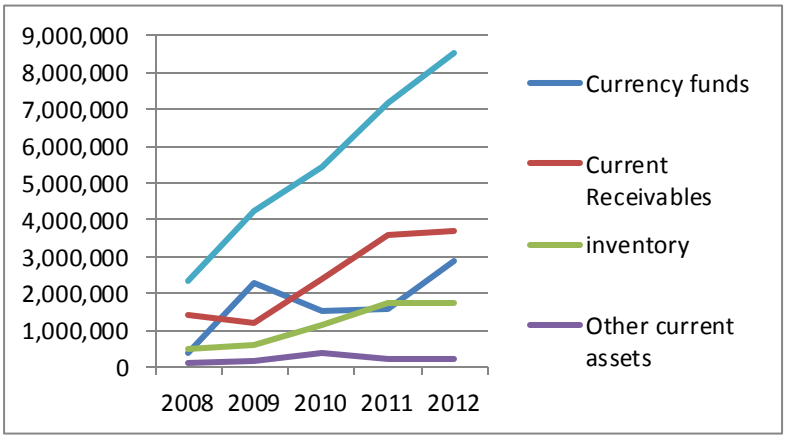
In financial analysis part, we will analyze current asset first.

Table 4.1 Current asset (10thound CNY)

Report date	2008	2009	2010	2011	2012
Currency funds	366,630	2,290,480	1,516,610	1,604,080	2,894,390
Current Receivables	1,392,404	1,199,043	2,374,757	3,576,911	3,676,829
Inventory	478,988	582,364	1,155,920	1,750,310	1,723,500
Other current assets	89,688	189,193	405,983	244,259	214,041
Total current assets	2,327,710	4,261,080	5,453,270	7,175,560	8,508,760

Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012

Figure 4.1 Current assets



Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012; author

From 2009 to 2010 and 2010 to 2011 the current receivable increased 98.05% and 50.62%, mainly because the domestic market sales continue to execute sales policy payment before shipment, dealers in the form of bank acceptance bill payment in advance, advance payments surge.

The inventory increased 98.49% and 51.42% from 2009 to 2011. Mainly in order to deal with material price fluctuations, the company active adjusts the production plan, raw materials and finished goods inventory.

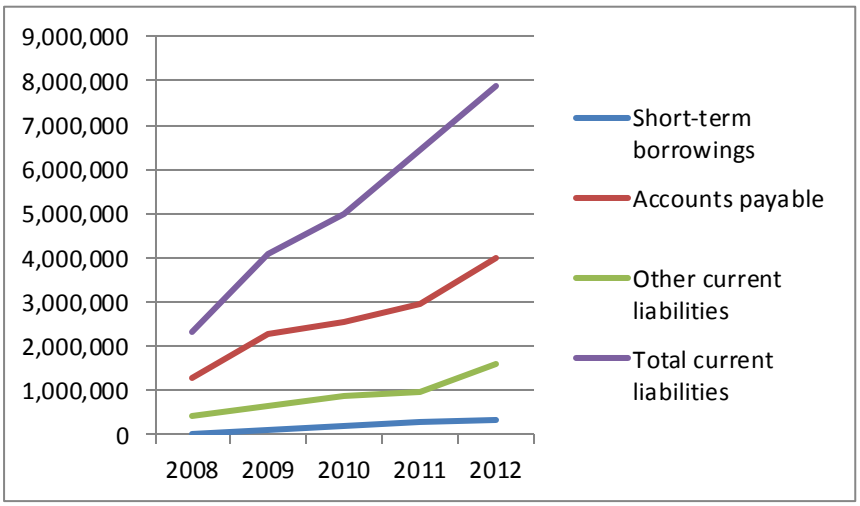
For the current liabilities, every item increased stably and continually.

Table 4.2 Current liabilities (10thound CNY)

Report date	2008	2009	2010	2011	2012
Short-term borrowings	840	96,163	190,038	273,929	352,064
Accounts payable	1,276,157	2,270,124	2,537,848	2,968,410	3,999,087
Other current liabilities	419,614	624,736	893,165	958,900	1,574,390
Total current liabilities	2,306,920	4,083,920	4,967,490	6,419,300	7,883,040

Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012

Figure 4.2 Current liabilities



Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012; author

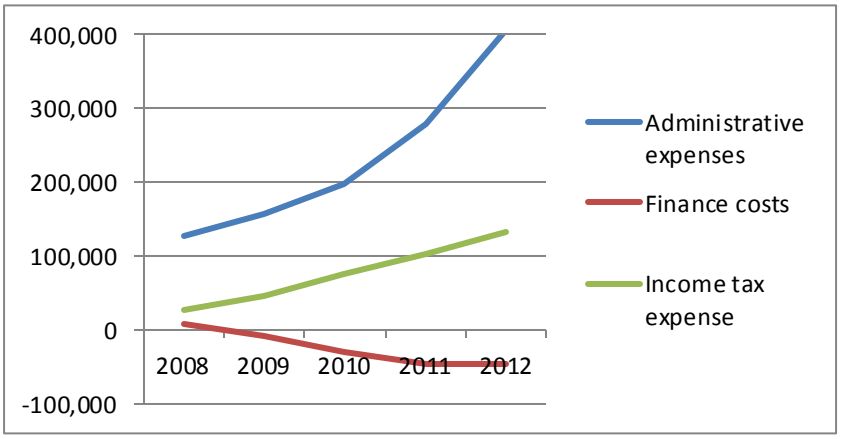
Now we will analysis Gree Company's expenses. Company's expense is important for a company's development.

Table 4.3 Gree Company's expense (10thound CNY)

Report date	2008	2009	2010	2011	2012
Administrative expenses	127,136	156,660	197,805	278,327	405,581
Finance costs	8,500	-9,702	-30,897	-45,271	-46,135
Income tax expense	27,818	44,861	75,312	103,122	131,678

Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012

Figure 4.3 Gree Company's expenses



Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012 data; author

The administrative expense increased year by year, the reason is the company expansion, the administrative expense increased. From the speed of administrative expense increase, we can know that the company expanse fast.

Finance costs decrease rapidly in 2009, it because the interest rate rise up, company's interest income increased. And at the time, BRC (crozier) appreciated from 1 BRC: 2.9 CNY to 1 BRC: 3.9 CNY; the registered capital in Brazil is 40 million BRC (crozier) in 1999; the revenue is 572 million BRC (crozier) in 2009. From this side, we need to realize holding foreign currency is risk. In this case, BRC appreciated, so we can get a profit, but if BRC depreciated, we would lose a lot. We need to consider this risk, and buy some forwards or options to hedging.

The income tax expense increased because of the profit increased. That also means the company expanse fast because of fast increasing income.

4.2.2 Financial ratios analysis of Gree Company

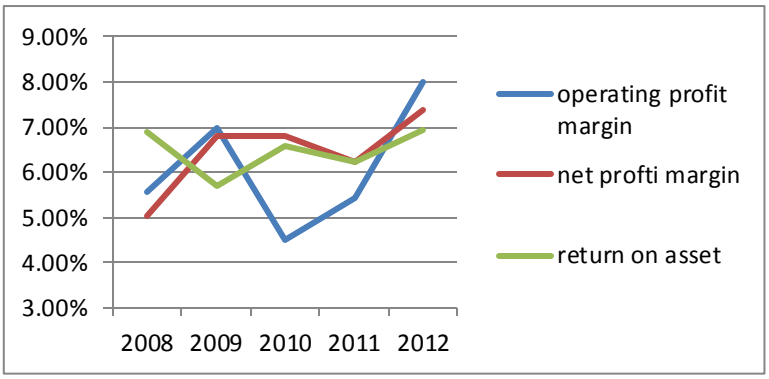
Profitability is also important for a company. The main goal of a company is get profit, lower profitability means lower profit.

Table 4.4 Profitability ratios

Profitability ratios	2008	2009	2010	2011	2012
Operating profit margin	5.54%	6.98%	4.52%	5.44%	8.02%
Net profit margin	5.03%	6.81%	6.81%	6.21%	7.38%
Return on asset	6.91%	5.69%	6.56%	6.22%	6.92%
Return on equity	27.54%	27.52%	30.71%	28.83%	27.00%

Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012 data; author.

Figure 4.4 Profitability ratios



Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012 data; author.

Net profit margin is not stable, but the trend is positive and we can assume it will increase in the future.

There is a big change in operating profit margin from 2009 to 2010; it decreased 2.5 percentage points, because operating income increasing is lower than operating cost increasing in 2010, it means operating profit decreased.

Compared net profit margin and operating profit margin, operating profit margin decreased in 2010, but net profit margin is constant, that means non-operating profit increased a lot.

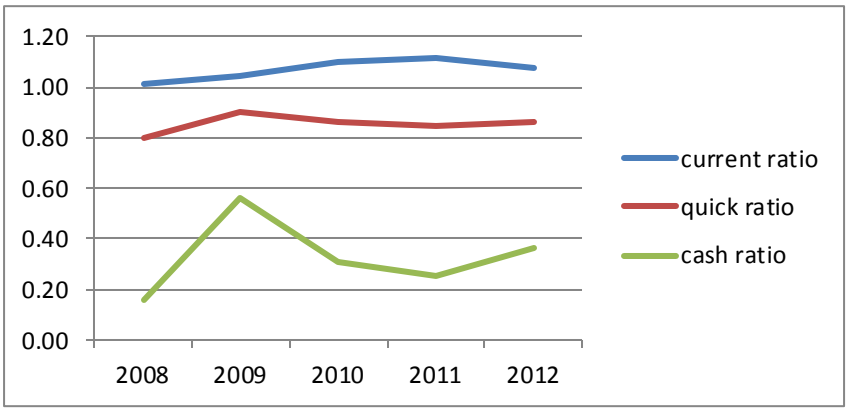
For a company, solvency ability is also important; we will analyze short term solvency ability with liquidity ratios.

Table 4.5 Liquidity ratios

Liquidity ratios	2008	2009	2010	2011	2012
Current ratio	1.01	1.04	1.10	1.12	1.08
Quick ratio	0.80	0.90	0.87	0.85	0.86
Cash ratio	0.16	0.56	0.31	0.25	0.37

Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012 data; author.

Figure 4.5 Liquidity ratios



Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012 data; author.

According table 4.5 and figure 4.5, we can find the current ratio almost constant. But we can sure the current asset and current liability increased every year.

From the quick ratio, Gree Company's short-term debt paying ability is poor. But after 2009, Gree short-term solvency in enhanced, in the case of make full use of the funds, can raise the short-term debt paying ability.

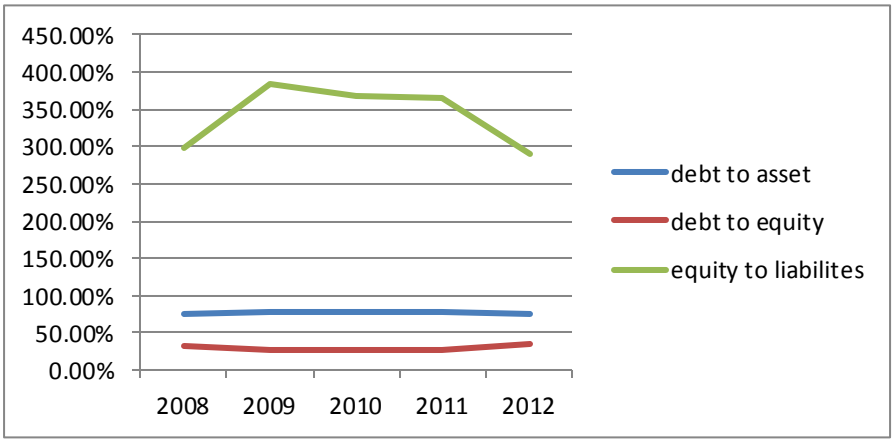
We also need to analysis Gree Company's long term solvency ability.

Table 4.6 Solvency ratios

Solvency ratios	2008	2009	2010	2011	2012
Debt to asset	74.91%	79.33%	78.64%	78.43%	74.36%
Debt to equity	33.49%	26.06%	27.16%	27.50%	34.48%
Equity to liabilities	299%	384%	368%	364%	290%
Interest coverage	197.26	214.42	78.00	354.19	37.99

Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012 data; author.

Figure 4.6 Solvency ratios



Source: Gree Company annual report 2008, 2009, 2010, 2011, 2012 data; author.

The debt to asset ratio is 74.91% in 2008. Debt to asset ratio in 2009 increased by 4% than 2008, this is mainly due to increase of current liabilities. Enterprise scale has increased the demand for inventory, accounts payable and notes payable, and advance payments and debt scale. From 2009 to 2011, debt to asset ratio continuously reduce, full solvency also increased year by year.

In general, equity to liabilities is lower, the company's long-term debt paying ability stronger; from 2009 to 2012, equity to liabilities decreased year by year, the company's long-term ability increased year by year.

4.3 SWOT analysis

Strengths: Gree air conditioning were first consecutive 11 years on annual sales in the country, not only benefit from the Gree air-conditioning excellent qualities and the strength of the brand, but also benefit from the Gree's unique regional agency system and a Gree brand stores channel mode. Products - brand - brand stores composed a perfect brand image. Gree air conditioning has done eleven years of stores, and going to the store to continue work. Gree air conditioning has leading technology advantage, good brand image and reputation. Gree Company's assets strong, adequate cash flow is located in the industry first. And the sales grow fast.

Weakness: Although the current Gree is still on the market in a leading position, but it is still worth of enlightenment, the advent of destroyed an air-conditioning frequency turning point, the Gree facing the market pressure also increased gradually. At the same time, Guangzhou group purchase site is facing Midea, Haier, the strong competitors, and each other's market share is gradually narrowing, Gree also had to adjust strategy, to seek is space in the air conditioning in the operation of the break. Gree had no good way to deal with a growing tide of heat shock online shopping. Turn online sales will hurt the operator and join the fierce price war, but if not it would be easy to miss the opportunity to join the layout of the Internet.

Opportunities: China's economic growth momentum immeasurable, but also further promote the development of the central air-conditioning industry. These aim to bring economic development opportunities in recent years, Gree, Midea, Haier central air-conditioning have entered the rail transportation, real estate, telecommunications, health and other projects in the commercial air conditioning market has much to offer. Strong demand in the Chinese market and overseas market to be further developed. Achieve higher capital efficiency by improving the management of funds.

Threats: Foreign brands on the threat of local enterprises in China's central air-conditioning market performance significantly. Like the threat of Haier, Midea, Toshiba, etc. These external air-conditioning business, China Gree enterprises are facing enormous challenges, although domestic enterprises have certain local advantages, but foreign brands in the central air-conditioning industry started early, the technology is mature, rich market accumulation. China Gree air-conditioning business to narrow the gap with other brands of air conditioning, but also need long way to go! Competition from the industry, such as the Midea, also has a very high technical level, and the prices are generally lower than Gree. Midea spend on marketing investment is also great.

4.4 Calculation of intrinsic value

In this chapter, we will calculate intrinsic value of Gree Company on 31st December 2013 by two methods, one is discount dividend model, and another one is discount cash flow method. We suppose we will receive dividend for three years, then we will sell the stock.

4.4.1 Dividend discount model calculation

The way to calculate the intrinsic value of company by DDM method was described in chapter 2, formula (2.13). We can know that if we want to use this model, we need to forecast dividend from 2014 to 2016 and the stock price in 2016; when we discount dividend we need to know expected return rate and growth rate.

We collected the data from annual reports from 2008 to 2013; we found the dividend data are in the table.

Table 4.7 Dividend per share of Gree Company from 2008 to 2013

Time	DPS(unit: CNY)	Shares	Dividend(unit: CNY)
2008	1.68	1,252,395,000	2,104,023,600
2009	1.55	1,878,592,500	2,911,818,375
2010	1.52	2,817,888,750	4,283,190,900
2011	1.86	2,817,888,750	5,241,273,075
2012	2.47	3,007,865,439	7,429,427,634
2013	3.61	3,007,865,439	10,858,394,235

Source: Gree Company's annual reports from 2008 to 2013

We calculate the annual percentage change of DPS and dividends; the annual percentages change of DPS are -7.74%, -1.94%, 22.37%, 32.80% and the annual percentage changes of dividends 38.39%, 47.10%, 22.37%, 41.75%, 46.15%. We can find the annual percentage changes are not stable. That is the reason why we do not use percentage change to be growth rate. So we would calculate payout ratio (dividend/net income), and through forecasting net income to forecast dividend.

We collected net income data from annual report from 2008 to 2013, and calculated payout ratio as follow:

Table 4.8 Net income and payout ratio of Gree Company from 2008 to 2013

Time	Dividend	Net income	Payout ratio	Average payout ratio
2008	2,104,023,600	2,128,075,053	98.87%	
2009	2,911,818,375	2,931,663,385	99.32%	
2010	4,283,190,900	4,303,205,496	99.53%	99.29%
2011	5,241,273,075	5,297,340,543	98.94%	
2012	7,429,427,634	7,445,927,983	99.78%	
2013	10,858,394,235	10,935,755,177	99.29%	

Source: Gree Company's annual reports from 2008 to 2013; author

From table 4.8 we can find that Gree Company almost payout all the net income, the average payout ratio is 99.29%; and the payout ratio was quite stable.

For forecasting net income, we assumed that there is a regression relationship between GDP and total income. We can through forecasting GDP to forecast total income; after that we can know net income by profit margin.

Table 4.9 GDP and total income of Gree Company from 2008 to 2013

Time	GDP	Total income
2008	314,045.43	42,282,835,300
2009	340,902.81	43,054,845,000
2010	401,512.80	63,160,520,000
2011	473,104.05	85,363,090,000
2012	519,470.10	100,870,383,000
2013	568,845.00	120,727,200,000

Source: http://data.stats.gov.cn/workspace/index?m=hgnd; Gree Company annual report 2008 to 2013

For testing the relationship between total income and GDP, we used t-test method.

H0: there is no relationship between total income and GDP.

H1: there is a relationship between total income and GDP.

We used command "ls total income c GDP" with EViews7; and the output of this command can be found in annex 6. Here we have a part of the output as follow:

Figure 4.7 Simplified output of output regression between total income and GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.12E+10	7.00E+09	-8.734407	0.0009
GDP	314168.5	15702.76	20.00722	0.0000
R-squared	0.990106	Mean dependent var		7.59E+10

Source: http://data.stats.gov.cn/workspace/index?m=hgnd; Gree Company annual report 2008 to 2013; author

From figure 4.7, we can know that the R-squared is 0.99 and P-value is 0.0009. It means that under a 1% significance level, P-value is 0.0009 very strong against null hypothesis. We rejected H0.

We had a formula between total income and GDP:

$$\text{Total income} = -61{,}166{,}115{,}131.80 + 314{,}168.53 * \text{GDP} \qquad (4.1)$$

Now we need to forecast GDP from 2014 to 2017. We collected forecasting GDP growth rate from World Bank website.

Table 4.10 Forecasting GDP growth rate in China (%) from 2014

Time	2014	2015	2016	future
GDP growth rate	7.6	7.5	7.4	5.0

Source: http://www.worldbank.org/en/publication/global-economic-prospects/regional-outlooks/eap; http://www.tradingeconomics.com/forecast/gdp-annual-growth-rate

For two stage method, we assumed from 2014 to 2016 is first stage and the GDP growth rate are 7.6%, 7.5% and 7.4%; after 2016 is second stage and the GDP growth rate is 5%. Chinese GDP can be forecasted by these growth rates.

Table 4.11 Chinese GDP forecasting from 2014 to 2017 (unit 100 million)

Time	2014	2015	2016	2017
GDP	612,077.22	657,983.01	706,673.75	742,007.44

Source: author

Based on the formula (4.1) the total income from 2014 to 2017 can be calculated.

Table 4.12 Total income forecasting of Gree Company from 2014 to 2017

Time	2014	2015	2016	2017
Total income	131,129,283,700	145,551,438,612	160,848,537,590	171,949,270,226

Source: author

The net income can be calculated through net profit margin. The net profit margin from 2008 to 2013 was:

Table 4.13 Net profit margin of Gree Company from 2008 to 2013

Time	2008	2009	2010	2011	2012	2013	Geometric average growth rate
Net profit margin	5.03%	6.81%	6.81%	6.21%	7.38%	9.06%	
Annual change %		35.3%	0.0%	-8.9%	19.0%	22.7%	12.5%

Source: Gree Company's annual reports from 2008 to 2013; total income and net income data; author.

We assumed the net profit margin would increase every year with average change. So we can get the result of net profit margin and net income from 2014 to 2017 as follow.

Table 4.14 Forecasting net profit margin, total income and net income from 2014 to 2017.

Time	2014	2015	2016	2017
Net profit margin	10.19%	11.46%	12.89%	14.50%
Total income	131,129,283,700	145,551,438,612	160,848,537,590	176,389,563,280
Net income	13,359,476,367	16,678,253,320	20,729,818,360	24,924,303,639

Source: author

The dividend can be calculated through payout ratio, and the average payout ratio was 99.29%. We assumed Gree Company would still payout with this number 99.29% in the future.

Table 4.15 Forecasting dividend from 2014 to 2017

Time	2014	2015	2016	2017	Payout
Net income	13,359,476,367	16,678,253,320	20,729,818,360	24,924,303,639	ratio
Dividend	13,264,631,890	16,559,847,466	20,582,648,762	24,747,355,645	99.29%

Source: author.

For forecasting dividends per share we need to know the number of shares, the number of shares can be forecast with weighted average growth rate.

Table 4.16 Number of shares and growth rate from 2008 to 2013

Unit: thousand	2008	2009	2010	2011	2012	2013
Number of shares	1,252,395	1,878,593	2,817,889	2,817,889	3,007,865	3,007,865
Growth rate		50.0%	50.0%	0.0%	6.7%	0.0%
Weights		0.1	0.1	0.2	0.2	0.4

Source: Gree Company's annual reports from 2008 to 2013; author

The weights were set based on the time. We assumed the weights of growth rate in 2009 and 2010 were 0.1; the weight of growth rate in 2011 and 2012 were 0.2; the weight of growth rate in 2013 was 0.4. So the weighted average growth rate is 11.35%. The number of shares would increase with 11.35%.

Table 4.17 Forecasting number of shares

	2013	2014	2015	2016	2017
Growth rate		11.35%	11.35%	11.35%	11.35%
Number of shares	3,007,865,439	3,349,208,894	3,729,289,239	4,152,502,478	4,623,743,486

Source: author

After forecasting dividends and number of shares, the dividend per share can be calculated.

Table 4.18 Forecasting dividend per share from 2014 to 2017

	2014	2015	2016	2017
Dividends	13,264,631,890	16,559,847,466	20,582,648,762	24,747,355,645
Number of shares	3,349,208,894	3,729,289,239	4,152,502,478	4,623,743,486
DPS	3.96	4.44	4.96	5.35

Source: author

After forecasting dividend per share, we need to calculate cost of equity with CAPM method. The formula of CAPM had been described in chapter 2, formula (2.16).

We collected the data from websites by Damodaran[22] and the World Bank website, risk free rate and risk premium can be found, but Beta need to be estimated.

Table 4.19 CAPM Parameter

Risk free rate[23]	4.18%
Beta	?
Risk premium	6.31%
E(r)	?

Source: author.

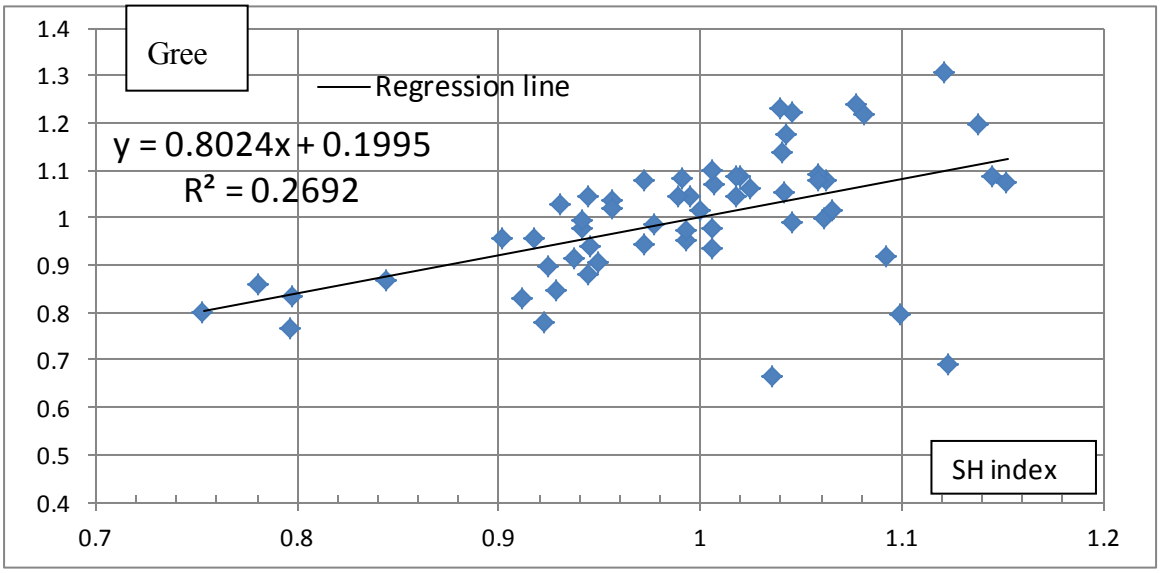
If we want to know expected return rate, we need to know Beta first. We select 5 years monthly data about Gree Company's stock price and Shanghai composite index[24]. We calculate return on Gree and return on Shanghai composite index first, then we used equation "=SLPOE (return on Shanghai composite index, return on Gree)", the result is 0.8. This is the Beta of Gree Company. We can found the data in annex 4.

[22] Source: http://pages.stern.nyu.edu/~adamodar/

[23] Source: http://www.tradingeconomics.com/china/government-bond-yield

[24] It was prepared by the Shanghai Stock Exchange. The calculation of ranges included all of the shares which listed in Shanghai Stock Exchange.

Figure 4.8 Monthly returns on Gree against returns on Shangzheng index from 2008 to 2012



The regression statistics for Gree are as follow:

Slope of the regression = 0.8. This is Gree's beta, based on return from 2008 to 2012.

Now we can calculate expected return rate:

$$E(r) = 4.18\% + 0.8 \times 6.31\% = 9.24\%$$

After this all preparations have been completed, we will calculate the intrinsic value of Gree Company.

Table 4.20 Data for calculating intrinsic value

	First stage			Second stage
Time	2014	2015	2016	2017
dividends	3.96	4.44	4.96	5.35
r	9.24%			g=5%

Source: author

With the formula (2.15), we can calculate the value of per share.

First stage:

$$\text{Value1} = \frac{3.96}{(1+9.24\%)} + \frac{4.44}{(1+9.24\%)^2} + \frac{4.96}{(1+9.24\%)^3} = 11.15$$

Second stage:

$$\text{Terminal value} = \frac{5.35}{9.24\% - 5\%} = 126.23$$

$$\text{Value 2} = \frac{126.23}{(1 + 9.24\%)^3} = 96.83$$

$$\text{Total value} = 11.15 + 96.83 = 108\,\text{CNY}$$

The stock intrinsic value of Gree Company is 108 CNY on 31December 2013. The market stock price (31 December 2013) is 29 CNY and on that day the number of shares is 3,007,865,439. Thus, the intrinsic value of Gree Company from DDM is 324,795,494,591 CNY. The market value of the company is 78,204,501,414 CNY. Based on the results above, we can easily say the intrinsic value is higher, and the stock is undervalued.

4.4.2 Free cash flow method calculation

We will use free cash flow to equity to calculate intrinsic value of Gree Company on 31 December 2013. First of all, we need to estimate FCFE from 2014 to 2017. From the formula (2.19), we know that we need to estimate net income, capital expenditure, depreciation, changed in working capital, principle payment and new debt issued. These data can be estimated by regression model.

Due to the net income have already estimated in DDM, we would estimate depreciation first. We supposed there is some relationship between GDP and depreciation. We collected data about GDP and depreciation from 1989 to 2012, and used EViews7 to regress.

Table 4.18 GDP and depreciation of Gree Company from 1998 to 2013

Time	GDP	Depreciation
1998	84,402.28	143,709,529.19
1999	89,677.05	195,698,260.59
2000	99,214.55	226,803,278.48
2001	109,655.17	281,555,050.88
2002	120,332.69	323,890,605.94
2003	135,822.76	390,682,572.93
2004	159,878.34	867,761,481.39
2005	184,937.37	1,059,648,186.29
2006	216,314.43	1,254,271,759.35
2007	265,810.31	1,518,813,144.22
2008	314,045.43	1,810,731,522.37
2009	340,902.81	2,181,364,218.76
2010	401,512.80	2,553,544,563.49
2011	473,104.05	2,985,379,723.06
2012	519,470.10	3,725,006,521.01
2013	568,845.00	4,443,120,241.25

Source: GDP: http://data.stats.gov.cn/workspace/index?m=hgnd; Depreciation: Gree Company annual report from 1998 to 2013.

The simplified output of this regression show as follow, and we can find detail output in annex 6.

Figure 4.9 Simplified output of regression between depreciation and GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.06E+08	76332135	-7.941227	0.0000
GDP	8242.245	254.3977	32.39906	0.0000
R-squared	0.986838	Mean dependent var		1.50E+09

This means depreciation = -606170792.822+8242.24543556 × (GDP), and R-Squared is 98.7%; significant level is 99%. So we can use GDP to forecast depreciation.

Thirdly, we supposed there is some relationship between GDP and current asset. We collected data about GDP and current asset from 1989 to 2012, and used EViews7 to regress.

Table 4.19 GDP and current asset of Gree Company from 1998 to 2013

Time	GDP	Current asset
1998	84,402.28	2,345,291,858.82
1999	89,677.05	2,769,926,363.94
2000	99,214.55	5,096,116,870.01
2001	109,655.17	6,144,822,677.27
2002	120,332.69	6,144,722,508.35
2003	135,822.76	6,889,460,564.45
2004	159,878.34	10,366,414,711.27
2005	184,937.37	9,848,182,694.65
2006	216,314.43	12,738,627,705.21
2007	265,810.31	21,009,792,889.29
2008	314,045.43	23,277,074,455.53
2009	340,902.81	42,610,815,546.19
2010	401,512.80	54,532,718,614.97
2011	473,104.05	71,755,610,465.43
2012	519,470.10	85,087,645,122.13
2013	568,845.00	103,732,522,181.91

Source: GDP: http://data.stats.gov.cn/workspace/index?m=hgnd; Current asset: Gree Company annual report from 1998 to 2013.

The simplified output of this regression show as follow, and we can find detail output in annex 6.

Figure 4.10 Simplified output of regression between current asset and GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.07E+10	3.80E+09	-5.441037	0.0001
GDP	194644.9	12654.98	15.38089	0.0000
R-squared	0.944128	Mean dependent var		2.90E+10

This means current asset= -20660336459.5+194644.882394 × (GDP), R-squared is 94.4%, significant level is 99%. So we can use GDP to forecast current asset.

After that, we supposed there is some relationship between GDP and current liabilities. We collected data about GDP and current asset from 1989 to 2012, and used EViews7 to regress.

Table 4.20 GDP and current liabilities of Gree Company from 1998 to 2013

Time	GDP	Current liabilities
1998	84,402.28	1,928,120,577.58
1999	89,677.05	2,337,525,913.10
2000	99,214.55	4,133,641,106.51
2001	109,655.17	5,164,208,189.07
2002	120,332.69	5,279,840,006.20
2003	135,822.76	6,092,331,469.44
2004	159,878.34	10,206,268,777.16
2005	184,937.37	9,866,203,541.34
2006	216,314.43	12,835,022,868.96
2007	265,810.31	19,685,178,634.83
2008	314,045.43	23,069,221,911.24
2009	340,902.81	40,839,243,955.87
2010	401,512.80	49,674,947,491.47
2011	473,104.05	64,193,015,605.56
2012	519,470.10	78,830,359,476.58
2013	568,845.00	96,491,213,574.31

Source: GDP: http://data.stats.gov.cn/workspace/index?m=hgnd; Current liabilities: Gree Company annual report from 1998 to 2013

The simplified output of this regression show as follow, and we can find detail output in annex 6.

Figure 4.11 Simplified output of regression between current liabilities and GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.90E+10	3.33E+09	-5.717036	0.0001
GDP	180069.1	11103.92	16.21672	0.0000
R-squared	0.949455	Mean dependent var		2.69E+10

This means current liabilities = -19047654933.2+180069.123899 × (GDP), R-squared is 94.9%, significant level is 99%. So we can use GDP to forecast current liabilities.

Now we can forecast GDP from 2014 to 2017 for forecasting net income, depreciation, current asset and current liabilities.

Table 4.20 Forecasting GDP in China (%) from 2014

Time	2013	2014	2015	2016	Future
GDP growth rate		7.6	7.5	7.4	5.0
Forecasting GDP	568,845.00	612,077.22	657,983.01	706,673.75	742,007.44

Source: http://www.worldbank.org/en/publication/global-economic-prospects/regional-outlooks/eap; author

Table 4.21 Regression formulas base on GDP

Depreciation = -606170792.822+8242.24543556 × (GDP)
Current asset= -20660336459.5+194644.882394× (GDP)
Current liabilities = -19047654933.2+180069.123899 × (GDP)

Source: author

Based on the forecasting GDP from 2014 and the formulas, we can forecast net income, depreciation, current asset and current liabilities. The result would be showed as follow.

Table 4.22 Result of forecasting net income, depreciation, current asset and current liabilities

Time	2014	2015	2016	Future
Net income	13,359,476,367	16,678,253,320	20,729,818,360	24,924,303,639
Depreciation	4,438,719,880	4,817,086,680	5,218,407,733	5,509,636,660
Current asset	98,477,362,043	107,412,689,431	116,890,093,347	123,767,614,837
Current liabilities	91,168,553,831	99,434,769,488	108,202,468,895	114,564,975,087

Source: author

After forecasting net income, depreciation, current asset and current liabilities, we also need forecasting capital expenditure, principle payment and new debt.

Table 4.23 Capital expenditure, principle payment and long term debt from 1998 to 2013

Time	Capital expenditure	Long term debt	Net debt issued
1998		0	
1999	141,182,604.13	0	0
2000	281,203,403.67	0	0
2001	134,300,285.80	0	0
2002	108,330,149.65	0	0
2003	433,477,246.57	0	0
2004	554,650,550.29	33,000,000	33,000,000
2005	676,273,727.14	0	-33,000,000
2006	554,241,407.48	0	0
2007	1,136,140,702.31	0	0.00
2008	942,341,952.70	0	0.00
2009	3,092,961,803.60	0	0.00
2010	1,887,059,863.78	1,853,826,967	1,853,826,967
2011	2,767,272,507.87	2,582,204,889	728,377,922
2012	4,212,523,966.37	984,463,173	-1,597,741,716
2013	2,185,987,355.41	1,375,348,442	390,885,269

Source: Gree Company annual report 1998 to 2013

We collected the historical data of capital expenditure, long term debt and net debt issued (table 4.23); the net debt issued is the difference between principle repayment and new debt issued. We found net debt issued was not stable and no trend. But we assume that net debt issued will be kept the average level from 2009 to 2013, it was 275,069,689. For capital expenditure we assumed it would be kept the average level from 2009 to 2013 in the future, it was 2,829,161,099 CNY.

Now we can calculate free cash flow from 2013 to 2016 with the formula had been described in chapter 2, formula (2.18).

Table 4.24 Estimating FCFE from 2014 to 2017

	2014	2015	2016	2017
Net income	13,359,476,367	16,678,253,320	20,729,818,360	24,924,303,639
Capital expenditure	2,829,161,099	2,829,161,099	2,829,161,099	2,829,161,099
Depreciation	4,438,719,880	4,817,086,680	5,218,407,733	5,509,636,660
Current asset	98,477,362,043	107,412,689,431	116,890,093,347	123,767,614,837
Current liabilities	91,168,553,831	99,434,769,488	108,202,468,895	114,564,975,087
Working capital	7,308,808,213	7,977,919,943	8,687,624,452	9,202,639,751
∆working capital	67,499,605	669,111,730	709,704,509	515,015,299
Net debt issued	275,069,689	275,069,689	275,069,689	275,069,689
FCFE	15,176,605,231	18,272,136,859	22,684,430,174	27,364,833,589

Source: author

At last we will calculate intrinsic value of Gree Company with the expected return rate and growth rate we have already known them in DDM method, r is 9.24%% and growth rate is 5%.

Table 4.25 Data for calculating intrinsic value

	First stage			Second stage
Time	2014	2015	2016	2017
FCFE	15,176,605,231	18,272,136,859	22,684,430,174	27,364,833,589
r	9.24%			g=5%

Source: author

With the formula (2.18), we can calculate the present value of FCFE.

First stage:

$$\text{Value1} = \frac{15{,}176{,}605{,}231}{(1+9.24)^1} + \frac{18{,}272{,}136{,}859}{(1+9.24)^2} + \frac{22{,}684{,}430{,}174}{(1+9.24)^3} = 46{,}606{,}035{,}195$$

Second stage:

$$\text{Terminal value} = \frac{27{,}364{,}833{,}589}{9.24\% - 5\%} = \quad 645{,}397{,}018{,}608$$

$$\text{Value2} = \frac{645{,}397{,}018{,}608}{(1+9.24)^3} = \quad 495{,}087{,}407{,}756$$

$$\text{Total value} = \text{value1} + \text{value2} = 46{,}606{,}035{,}195 + \ 495{,}087{,}407{,}756 \ =$$

$541{,}693{,}442{,}951$ CNY

The intrinsic value of Gree Company is 541,693,442,951 CNY on 31 December 2013. The market value of the company is 78,204,501,414 CNY and on that day the number of shares is 3,007,865,439. Thus, the intrinsic stock value is 180 CNY. The stock market price is 29 CNY. Based on the results above, we can easily say the intrinsic value is higher, and the stock is undervalued.

According the big difference between two results, we would give a weight to each result. For the result from DDM, we gave the weight 0.7; for the result from FCF, we gave the weight 0.3. So the final result after added weighted average is 129.6 CNY. We gave 0.7 to DDM because the forecasting dividends in the future are more rational. For the DCF method, we used several times regression; it would cause the result deviate from the truth.

5 Conclusion

This thesis is focused on fundamental analysis of Gree Company. It included macroeconomic environment analysis, industry analysis, financial analysis and intrinsic value estimation. Gree Company is the best company in Chinese air conditioner industry. Gree Company was founded in 1991 and went public in 1996.

Macroeconomic environment in China is positive for company's development. The economic in china developed continually and stably; the GDP growth rate were over than 7% in the past 20years and the government will control this develop speed 20 more years. And the government also implemented encourages policies to push industry's development, such as Energy Efficient Appliances policy and Home appliances to the countryside policy.

Air conditioner industry is a high barrier industry. For entry air conditioner industry, it requires a huge capital to invest; and technical requirements are very high. In Chinese air conditioner market, there are four main companies; Gree Company is the biggest one. Base on the financial ratio analysis, the profitability, liquidity ability and solvency ability of Gree Company were over the industry average level. The profitability ratios and liquidity ratios were stable. All the signs showed the Gree Company was in a stable period.

We estimated the stock's intrinsic value of Gree Company with two methods DDM and DCF on 31st December 2013. In dividend discount model, we estimated total income base on regression with GDP, then we through forecasted net profit margin to estimate net income, at last we calculated dividend according net income with payout ratio. And we estimated the intrinsic value with two stage method; the result of this model is 108 CNY. With discount cash flow method, we estimated net income, capital expenditure, depreciation, net working capital, principle repayment and new debt issued to calculate FCFE, then we also used two-stage method to estimate intrinsic value, and the result of FCF method is 180 CNY. Both of the result are much higher than market price (31 December 2013) 29 CNY. In order to reduce errors, we gave weights to the result. For the DDM, the weight is 0.7; for the DCF method,

the weight is 0.3. The final result after added weighted average is 129.6 CNY. It was over value.

In this thesis, we collect data; analyzed data and estimated value, calculated with CAPM model, DDM model and DCF model, this process make us understanding of the knowledge more clearly.

From these situations: good macroeconomic environment in China, Chinese government's encourage policies, the best company in the industry, the industry is in the shakeout stage and intrinsic value are higher than market price, the stock is undervalued; we suggest investor to buy the Gree Company's stock.

Bibliography

a) Publications

BODIE, Z., A. KANE and A. J. MARCUS. *Investments and Portfolio Management*. 9th ed. New York: McGraw-Hill, 2011. 1056 p. ISBN 978-007-128914-6.

CLAYMAN, M. R., FRIDSON, M. S. and TROUGHTON, G. H. *Corporate Finance: A Practical Approach*. New Jersey: John Wiley & Sons, 2008.451p. IBSN 978-0-470-19768-4

DAMODARAN, Aswath. *Applied Corporate Finance*. 3rd ed. New Jersey: John Wiley & Sons, 2010. 752 p. ISBN 978-0-470-38464-0.

McMILLAN, M. G., J. E. PINTO, W. L. PIRIE and G. Van de VENTER. *Investments: Principles of Portfolio and Equity Analysis*. New Jersey: John Wiley & Sons, 2011. 620 p. ISBN 978-0-470-91580-6.

b) Electronic documents

National Bureau of Statistics of China: *Annual Data* [online]. [01.05.2013].
Available on: http://data.stats.gov.cn/workspace/index?m=hgnd

Gree: *Download Center* [online]. [01.05.2013].
Available on: http://www.gree.com.cn/english/products/housepro_jsp_catid_628.shtml

Damodaran Online: *The Data Page* [online]. [02.05.2013].
Available on: http://pages.stern.nyu.edu/~adamodar/

International Monetary Fund: *Report for Selected Countries and Subject* [online]. [02.05.2013]. Available on:
http://www.imf.org/external/pubs/ft/weo/2013/02/weodata/weorept.aspx?sy=2011&ey=2018&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=46&pr1.y=11&c=924&s=NGDP&grp=0&a=

The World Bank: *East Asia and the Pacific regional forecast* [online]. [02.05.2013]. Available on:
http://www.worldbank.org/en/publication/global-economic-prospects/regional-outlooks/eap

Trading Economics: *GDP Annual Growth Rate | Forecast* [online]. [02.05.2013].
Available on: http://www.tradingeconomics.com/forecast/gdp-annual-growth-rate

List of Abbreviation

CNY	Chinese Yuan
CPI	Consumer Price Index
DCF	Discount Cash Flow
DDM	Discount Dividend Model
FCFE	Free Cash Flow to Equity
GDP	Gross Domestic Product
GNI	Gross National Income
NPV	Net Present Value
PV	Present Value
R&D	Research and Develop
ROA	Return on Asset
ROE	Return On equity
SH	Shanghai composite index
SWOT	Strengths, Weaknesses, Opportunities, and Threats

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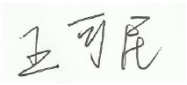


List of annex

Annex 1 Balance sheet statement

Report date	2008-12-31	2009-12-31	2010-12-31	2011-12-31	2012-12-31	2013-12-31
unti (10 thousand CNY)						
Current assets						
Currency funds	366,630	2,290,480	1,516,610	1,604,080	2,894,390	3,854,170.00
Current assets Receivables	1,392,404	1,199,043	2,374,757	3,576,911	3,676,829	5,072,111.00
Trading financial assets	0	35,290	141,867	0	0	124,611.00
inventory	478,988	582,364	1,155,920	1,750,310	1,723,500	1,312,270.00
Other current assets	89,688	189,193	405,983	244,259	214,041	10,085.40
Total current assets	2,327,710	4,261,080	5,453,270	7,175,560	8,508,760	10,373,300.00
Non-current assets						
Loans and advances	145,020	166,610	156,154	0	208,890	456,546.00
Available-for-sale financial assets	0	75,740	109,394	0	55,491	80,593.30
Long-term equity investments	105	702	2,179	1,688	2,816	9,756.85
Investment property	8,003	11,413	17,147	19,763	20,801	50,305.60
Net fixed assets	430,378	460,844	552,798	770,914	1,270,040	1,403,410.00
Construction in progress	26,840	21,112	10,052	217,166	230,432	186,168.00
Disposal of fixed assets	118	100	6	62	11	629.43
Intangible assets	44,957	50,486	104,949	162,216	163,527	237,018.00
Long-term prepaid expenses	868	328	1,608	4,816	4,809	4,266.53
Deferred tax assets	96,000	104,609	152,880	168,973	291,109	568,261.00
Total non-current assets	752,289	891,944	1,107,170	1,345,600	2,247,930	2996960
Total assets	3,080,000	5,153,030	6,560,440	8,521,160	10,756,700	13,370,200.00
Current liabilities						
Short-term borrowings	840	96,163	190,038	273,929	352,064	331,697.00
Deposits and deposits by banks	27,400	140,704	44,020	5,134	8,108	3,741.40
Borrowing funds	--	40,000	--	20,000	--	54,226.50
Advances from customers	582,911	887,195	1,200,620	1,975,270	1,663,010	30,000
Financial assets sold under repurchase agreements	--	25,000	101,800	--	35,000	18,600
Accounts payable	1,276,157	2,270,124	2,537,848	2,968,410	3,999,087	6,026,873
Non-current liabilities due within one year	--	--	--	217,662	251,376	92,345
Other current liabilities	419,614	624,736	893,165	958,900	1,574,390	3,091,640
Total current liabilities	2,306,920	4,083,920	4,967,490	6,419,300	7,883,040	9,649,120
Non-current liabilities						
Long-term borrowings	--	--	185,383	258,220	98,446	137,535
Deferred income tax liabilities	347	2,962	5,383	4,317	16,041	32,894
Other non-current liabilities	--	870	1,007	1,605	1,147	3,992
Total non-current liabilities	347	3,832	191,772	264,142	115,634	174,421
Total Liabilities	2,307,270	4,087,760	5,159,270	6,683,440	7,998,670	9,823,540
Owner's equity						
Paid-up capital (or equity)	125,240	187,859	281,789	281,789	300,787	300,787
Capital reserve	77,933	18,347	19,083	11,017	318,718	317,611
Surplus	172,856	196,791	223,601	250,108	295,809	295,809
General risk provisions	292	340	416	565	759	4,711
Undistributed profit	374,054	590,222	803,048	1,215,550	1,757,230	2,539,560
Currency translation differences	-2,620	3,431	2,318	1,658	1,013	-194
Total equity attributable to shareholders of the parent	747,754	996,990	1,330,260	1,760,690	2,674,310	3,458,280
Minority interests	24,973	68,279	70,915	77,029	83,707	88,387
Total equity	772,727	1,065,270	1,401,170	1,837,720	2,758,020	3,546,670
Liabilities and owners 'equity	3,080,000	5,153,030	6,560,440	8,521,160	10,756,700	13,370,200

Annex 2 Profit and loss statements

Report date	2008-12-31	2009-12-31	2010-12-31	2011-12-31	2012-12-31	2013-12-31
unti (10 thousand CNY)						
I. Total operating income	4,219,970	4,263,730	6,080,720	8,351,730	10,011,000	12,004,300
Operating income	4,203,240	4,245,780	6,043,160	8,315,550	9,931,620	11,862,800
Interest Income	16,724	17,777	37,293	36,175	79,375	141,477
Fee and commission income	9	175	268	3	17	36
Total operating costs	3,986,980	3,967,180	5,819,180	7,900,850	9,231,020	10,948,800
Operating costs	3,373,320	3,195,600	4,740,920	6,813,210	7,320,310	8,038,590
Interest expense	1,220	1,576	6,482	1,787	23,066	49,196
Fee and commission expense	10.58	19.81	16.70	21.26	27.38	26.39
Business tax and surcharges	36,264	40,337	53,882	49,791	58,995	95,617
Selling expenses	440,262	579,786	841,014	805,041	1,462,620	2,250,890
Administrative expenses	127,136	156,660	197,805	278,327	405,581	508,957
Finance costs	8,500	-9,702	-30,897	-45,271	-46,135	-13,731
Impairment losses on assets	273	2,909	9,960	-2,059	6,554	19,239
Fair value gain	--	231	6,919	-5,751	24,689	99,056
Investment income	942	677	6,220	9,109	-2,049	71,734
Including: Investment income from associates and joint ventures	-324	-208	-809	-491	873	286
Exchange gains	-11	0	-4	-6	0	-3
Operating profit	233,919	297,453	274,678	454,231	802,631	1,226,300
NON-Operating income	8,314	41,755	235,332	184,579	76,038	68,420
NON-Operating expenses	1,607	1,179	4,378	5,953	2,398	5,529
Losses on disposal of non-current assets	83	255	416	702	1,429	378
Total profit	240,625	338,028	505,632	632,856	876,271	1,289,190
Income tax expense	27,818	44,861	75,312	103,122	131,678	195,617
Fourth, the net profit	212,808	293,166	430,321	529,734	744,593	1,093,580
Net profit attributable to owners of the parent company	210,274	291,345	427,572	523,694	737,967	1,087,070
Minority interests	2,533	1,821	2,748	6,040	6,626	6,508
Basic earnings per share	1.68	1.55	1.52	1.86	2.47	3.61
Diluted earnings per share	1.68	1.55	1.52	1.86	2.47	3.61
Other comprehensive income	--	9,143	-412	-8,679	5,218	-4,135
Seven Total comprehensive income	--	302,310	429,909	521,055	749,810	1,089,440
Total comprehensive income attributable to owners of the parent	--	300,426	427,272	514,968	743,133	1,083,230
Total comprehensive income attributable to minority shareholders	--	1,883	2,637	6,088	6,678	6,207

Annex 3 Cash flow statements

Reporting period	2008-12-31	2009-12-31	2010-12-31	2011-12-31	2012-12-31	2013-12-31
unti (10 thousand CNY)						
I. Cash flows from operating activities						
Sales of goods or services received in cash	2,052,750.00	4,205,130.00	3,593,150.00	5,275,460.00	7,007,710.00	7,021,140.00
Customer deposits and interbank deposits from Net increase	--	113,303.00	-96,683.60	-38,885.70	2,973.52	46,118.70
Net increase of capital borrowed from other financial institutions	--	65,000.00	36,800.00	-81,800.00	15,000.00	3,741.40
Cash interest , fees and commissions charged	--	12,448.30	37,466.60	39,389.60	76,558.90	128,448.00
Tax Refunds	40,652.50	26,909.10	53,527.20	95,697.10	132,256.00	46,852.50
Other cash received relating to operating activities	-15,606.70	95,738.30	689,846.00	385,183.00	320,668.00	303,246.00
Sub-total of cash inflows from operating activities	2,077,790.00	4,518,530.00	4,314,110.00	5,675,050.00	7,555,170.00	7,563,150.00
For goods and services paid for in cash	1,307,620.00	1,819,470.00	3,411,980.00	4,371,700.00	4,044,620.00	3,858,870.00
Net increase in loans and advances to customers	--	55,820.20	91,865.10	-293,663.00	215,359.00	256,208.00
Central banks and the net increase in interbank payments	--	504,267.00	-230,215.00	-159,583.00	2,486.68	149,189.00
Cash paid for interest , fees and commissions	--	1,006.53	6,691.08	2,212.57	19,850.90	49,002.50
Payments to employees and cash payments for employees	136,649.00	162,807.00	231,977.00	384,559.00	448,636.00	496,395.00
Taxes paid	214,749.00	240,663.00	331,558.00	419,453.00	516,252.00	817,129.00
Other cash paid relating to operating activities	381,919.00	789,540.00	408,651.00	614,750.00	467,093.00	639,367.00
Sub-total of cash outflows from operating activities	2,040,940.00	3,573,570.00	4,252,510.00	5,339,430.00	5,714,290.00	6,266,160.00
Net cash flow from operating activities	36,854.40	944,960.00	61,599.50	335,616.00	1,840,870.00	1,296,980.00
Second, cash flows from investing activities :						
Cash received from disposal of investments	--	137.66	7,030.49	132,337.00	100,557.00	32,751.50
Cash received from investment income	--	62.91	3,654.07	22,022.20	4,729.29	24,135.20
Net cash received from long-term assets	2,542.81	6.97	79.46	618.57	46.92	120.98
Other cash received relating to investing activities	6,808.00	4,039.18	97,970.30	77,113.00	690.25	43439.7
Sub-total of cash inflows from investing activities	9,350.82	4,246.72	108,734.00	232,091.00	106,023.00	100,447.00
Cash paid to long-term assets to pay	102,177.00	71,617.80	248,222.00	477,774.00	360,241.00	246,147.00
Cash paid for investment	214.35	75,947.30	48,551.40	24,910.00	155,836.00	70,406.80
Other business units , net of cash paid to acquire subsidiaries and	43	--	--	--	--	--
Other cash paid relating to investing activities	1,151.05	165,978.00	667.12	6,133.53	11,199.00	2,492.67
Sub-total of cash outflows from investing activities	103,585.00	313,543.00	297,440.00	508,818.00	527,276.00	319,046.00
Net cash flows from investing activities	-94,234.20	-309,296.00	-188,706.00	-276,727.00	-421,252.00	-218,599.00
III Cash flows from financing activities :						
Cash received from investors	50	46,604.60	--	26.39	319,787.00	--
Including: Cash received from minority shareholders of	--	46,604.60	--	--	--	--
Cash received from borrowings	37,928.30	102,296.00	357,868.00	491,049.00	376,302.00	498,791.00
Other cash received relating to financing activities	0.2	0.74	--	--	112,792.00	--
Sub-total of cash inflows from financing activities	37,978.50	148,901.00	357,868.00	491,075.00	808,881.00	199,670.00
Cash repayments of borrowings of	37,155.10	6,723.68	136,184.00	161,461.00	559,719.00	698,461.00
Cash dividends, profits distribution or interest payment	30,346.00	38,915.10	96,426.00	97,691.20	167,382.00	623,384.00
Other cash paid relating to financing activities	104.76	111,323.00	266,778.00	311,383.00	258.3	317474
Sub-total of cash outflows from financing activities	67,605.80	156,962.00	499,388.00	570,535.00	727,359.00	940,858.00
Net cash flow from financing activities	-29,627.40	-8,060.68	-141,520.00	-79,460.10	81,521.60	-242,398.00
Notes						
Effect of exchange rate changes on cash and cash equivalents	-2,233.98	1,494.68	-7,659.19	-16,597.40	2,022.02	-47,117.60
Cash and cash equivalents	-89,241.10	629,097.00	-276,286.00	-37,168.70	1,503,170.00	788,870.00
Cash and cash equivalents at beginning of period	407,481.00	318,240.00	947,337.00	671,052.00	633,883.00	2,137,050.00
Cash and cash equivalents at end of period	318,240.00	947,337.00	671,052.00	633,883.00	2,137,050.00	2,925,920.00
Net profit	212,808.00	293,166.00	430,321.00	529,734.00	744,593.00	1,093,580.00
Impairment of assets	273.03	1,056.32	9,959.67	-2,059.47	6,553.71	19,239.30
Depreciation of fixed assets	32,568.70	41,012.30	42,877.20	58,313.30	88,280.00	114,576.00
Amortization of intangible assets	1,039.63	1,118.81	1,488.65	3,073.22	6,857.15	4,910.78
Amortization of long-term prepaid expenses	888.9	931.19	521.29	1,879.49	2,700.42	3,529.74
Loss on disposal long-term assets	115.72	-51.19	416.14	701.51	1,233.30	176.03
Changes in fair value losses	--	-230.7	-6,919.25	5,750.87	-24,688.50	-99,056.40
Finance costs	6,519.85	314.4	4,268.83	-1,612.66	15,448.60	62,193.40
Investment losses	-941.74	-677.02	-6,219.77	-9,109.41	2,049.44	-71,733.70
Decrease in deferred income tax assets	-42,738.30	-32,133.50	-48,271.40	-15,493.30	-122,881.00	-276,282.00
Increase in deferred income tax liabilities	99.9	2,616.00	2,420.62	315.3	11,361.10	16,988.40
Decrease in inventories	235,025.00	-95,511.00	-573,552.00	-591,673.00	23,484.80	404,769.00
Decrease in operating receivables	-632,396.00	95,203.50	-1,292,820.00	-139,296.00	-248,948.00	-1,518,180.00
Increase in operating payables	261,396.00	1,661,830.00	605,056.00	532,308.00	1,238,030.00	1,912,860.00
Other	-37,841.60	-1,023,810.00	892,050.00	-37,215.40	96,804.50	-370,577.00
Net cash flow from operating activities	36,854.40	944,960.00	61,599.50	335,616.00	1,840,870.00	1,296,980.00
Closing balance of cash	318,240.00	947,337.00	671,052.00	633,883.00	2,137,050.00	2,925,920.00
Opening balance of cash	407,481.00	318,240.00	947,337.00	671,052.00	633,883.00	2,137,050.00
Net increase in cash and cash equivalents	-89,241.10	629,097.00	-276,286.00	-37,168.70	1,503,170.00	788,870.00

Annex 4 Current price of Gree stock and Shanghai composite index

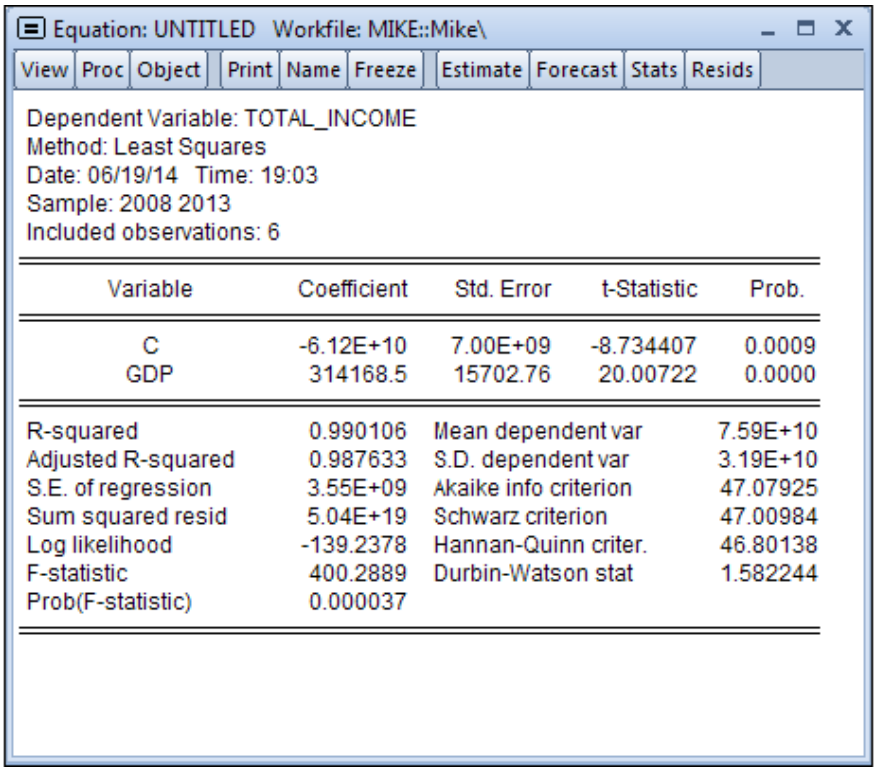
Time	Gree	Shanghai composite index	Time	Gree	Shanghai composite index
2008-01	55.30	4320.77	2010-06	18.80	2398.37
2008-02	53.90	4348.54	2010-07	14.95	2637.50
2008-03	44.89	3472.71	2010-08	15.19	2638.80
2008-04	48.41	3693.11	2010-09	14.18	2655.66
2008-05	40.89	3433.35	2010-10	18.50	2978.84
2008-06	31.30	2736.10	2010-11	17.37	2820.18
2008-07	20.76	2836.67	2010-12	18.13	2808.08
2008-08	18.00	2397.37	2011-02	21.21	2905.05
2008-09	18.60	2293.78	2011-03	22.66	2928.11
2008-10	14.85	1728.79	2011-04	21.98	2911.51
2008-11	18.05	1871.16	2011-05	21.43	2743.47
2008-12	19.44	1820.81	2011-06	23.50	2762.08
2009-01	17.82	1990.66	2011-07	23.17	2701.73
2009-02	21.78	2082.85	2011-08	20.93	2567.34
2009-03	26.01	2373.21	2011-09	19.99	2359.22
2009-04	30.50	2477.57	2011-10	19.75	2468.25
2009-05	30.40	2632.93	2011-11	17.40	2333.41
2009-06	20.90	2959.36	2011-12	17.29	2199.42
2009-07	22.40	3412.06	2012-02	19.85	2428.49
2009-08	19.18	2667.74	2012-03	20.35	2262.79
2009-09	21.80	2779.43	2012-04	21.89	2396.32
2009-10	27.00	2995.85	2012-05	22.80	2372.23
2009-11	27.33	3195.30	2012-06	20.85	2225.43
2009-12	28.94	3277.14	2012-07	21.74	2103.63
2010-01	23.94	2989.29	2012-08	20.47	2047.52
2010-02	25.98	3051.94	2012-09	21.38	2086.17
2010-03	28.20	3109.11	2012-10	23.09	2068.88
2010-04	21.97	2870.61	2012-11	23.47	1980.12
2010-05	21.00	2592.15	2012-12	25.50	2269.13

Annex 5 GDP growth rate

Time	GDP growth rate (%)
1989	4.2
1990	4.1
1991	9.1
1992	14.1
1993	13.7
1994	13.1
1995	9.3
1996	10.2
1997	9.6
1998	7.3
1999	7.9
2000	8.6
2001	8.1
2002	9.5
2003	10.5
2004	10.5
2005	10.8
2006	13.3
2007	14.6
2008	10.1
2009	8.3
2010	10.2
2011	8.7
2012	8.1

Annex 6 Regression output

GDP and total income



Equation: UNTITLED Workfile: MIKE::Mike\

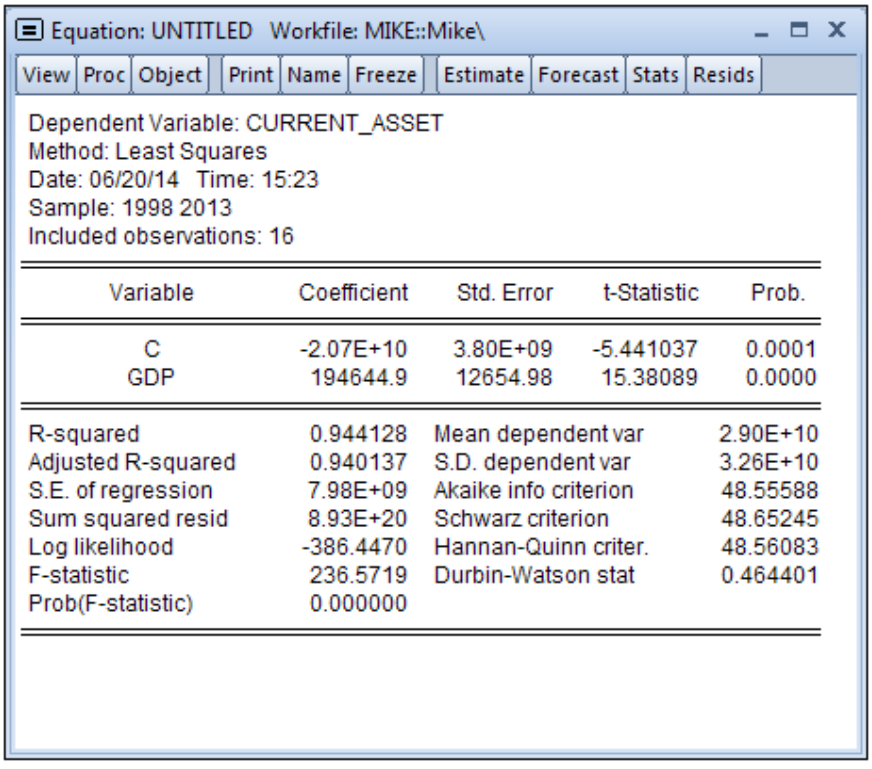
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: TOTAL_INCOME
Method: Least Squares
Date: 06/19/14 Time: 19:03
Sample: 2008 2013
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.12E+10	7.00E+09	-8.734407	0.0009
GDP	314168.5	15702.76	20.00722	0.0000

R-squared	0.990106	Mean dependent var	7.59E+10
Adjusted R-squared	0.987633	S.D. dependent var	3.19E+10
S.E. of regression	3.55E+09	Akaike info criterion	47.07925
Sum squared resid	5.04E+19	Schwarz criterion	47.00984
Log likelihood	-139.2378	Hannan-Quinn criter.	46.80138
F-statistic	400.2889	Durbin-Watson stat	1.582244
Prob(F-statistic)	0.000037		

GDP and current asset



Equation: UNTITLED Workfile: MIKE::Mike\

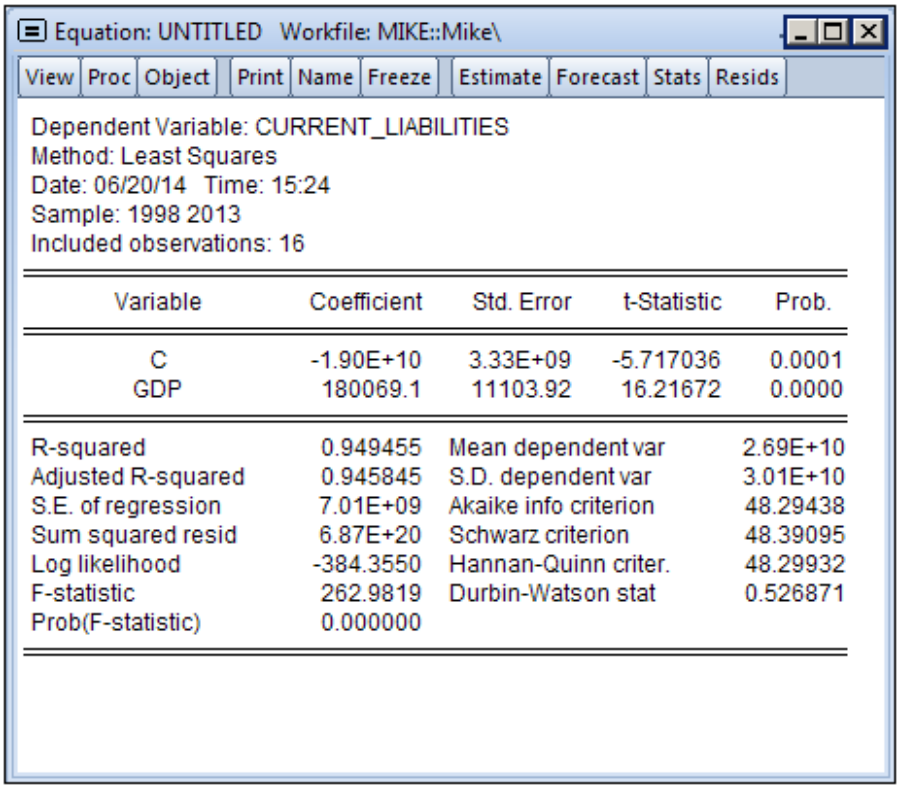
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: CURRENT_ASSET
Method: Least Squares
Date: 06/20/14 Time: 15:23
Sample: 1998 2013
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.07E+10	3.80E+09	-5.441037	0.0001
GDP	194644.9	12654.98	15.38089	0.0000

R-squared	0.944128	Mean dependent var	2.90E+10
Adjusted R-squared	0.940137	S.D. dependent var	3.26E+10
S.E. of regression	7.98E+09	Akaike info criterion	48.55588
Sum squared resid	8.93E+20	Schwarz criterion	48.65245
Log likelihood	-386.4470	Hannan-Quinn criter.	48.56083
F-statistic	236.5719	Durbin-Watson stat	0.464401
Prob(F-statistic)	0.000000		

GDP and current liability



Equation: UNTITLED Workfile: MIKE::Mike\

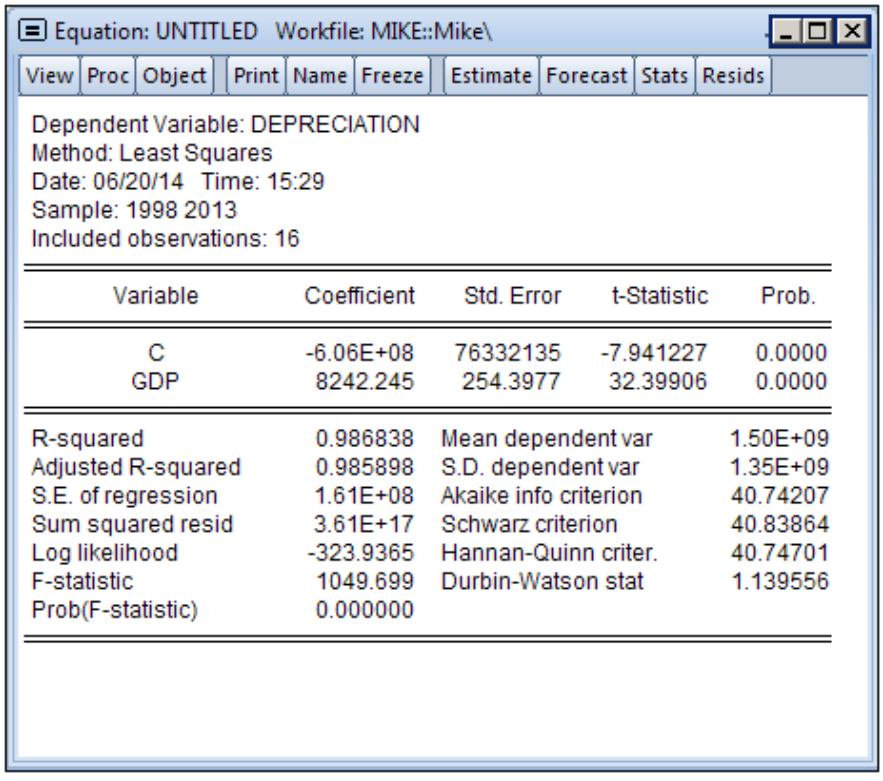
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: CURRENT_LIABILITIES
Method: Least Squares
Date: 06/20/14 Time: 15:24
Sample: 1998 2013
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.90E+10	3.33E+09	-5.717036	0.0001
GDP	180069.1	11103.92	16.21672	0.0000

R-squared	0.949455	Mean dependent var	2.69E+10
Adjusted R-squared	0.945845	S.D. dependent var	3.01E+10
S.E. of regression	7.01E+09	Akaike info criterion	48.29438
Sum squared resid	6.87E+20	Schwarz criterion	48.39095
Log likelihood	-384.3550	Hannan-Quinn criter.	48.29932
F-statistic	262.9819	Durbin-Watson stat	0.526871
Prob(F-statistic)	0.000000		

GDP and depreciation



Equation: UNTITLED Workfile: MIKE::Mike\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: DEPRECIATION
Method: Least Squares
Date: 06/20/14 Time: 15:29
Sample: 1998 2013
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.06E+08	76332135	-7.941227	0.0000
GDP	8242.245	254.3977	32.39906	0.0000

R-squared	0.986838	Mean dependent var	1.50E+09
Adjusted R-squared	0.985898	S.D. dependent var	1.35E+09
S.E. of regression	1.61E+08	Akaike info criterion	40.74207
Sum squared resid	3.61E+17	Schwarz criterion	40.83864
Log likelihood	-323.9365	Hannan-Quinn criter.	40.74701
F-statistic	1049.699	Durbin-Watson stat	1.139556
Prob(F-statistic)	0.000000		