

VSB TECHNICAL UNIVERSITY OF OSTRAVA FACULTY OF
ECONOMICS

DEPARTMENT OF FINANCE

Evaluation and comparison of the Effects of Value Creation for
the Selected Czech and Chinese Company

Zhodnocení a komparace vlivů tvorby hodnoty u vybrané české a čínské
společnosti

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OSTRAVA 2018

VŠB - Technical University of Ostrava
Faculty of Economics
Department of Finance

Diploma Thesis Assignment

Student: Bc. Huanyu Li

Study Programme: N6202 Economic Policy and Administration

Study Branch: 6202T010 Finance

Title: Evaluation and Comparison of the Effects of Value Creation for the
Selected Czech and Chinese Company
Zhodnocení a komparace vlivů tvorby hodnoty u vybrané české a čínské
společnosti

The thesis language: English

Description:

1. Introduction
 2. Description of the Valuation Process Methodology
 3. Basic Financial Characteristics of Selected Czech and Chinese Company
 4. Evaluation and Comparison of the Effects of Value Creation for the Selected Companies
 5. Conclusion
- Bibliography
List of Abbreviations
Declaration of Utilisation of Results from the Diploma Thesis
List of Annexes
Annexes

References:

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Extent and terms of a thesis are specified in directions for its elaboration that are opened to the public on the web sites of the faculty.

Supervisor: **Ing. Petr Gurný, Ph.D.**


Date of issue: 24.11.2017

Date of submission: 27.04.2018





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1. Introduction.

This thesis is not only focus on the valuation but also about the drivers or multiples which lead the results, which means we will analyze the value comparison.

For this goal, we selected two companies, one from Czech Republic, another is from China, HONG KONG, but in same industry, electricity (energy), so it is obvious that the external environment will determine the growth different, and we will analyze other factors in detail.

The goal of the thesis is to estimate, analyze and compare the V/EBIT(1-t) multiplier for two companies in energy industry, where one of two companies is from Czech and one from China. The selected Czech company is CEZ,a.s, since employs over 25,000 people and forms the basis of the Czech economy with a high contribution to the state budget in the form of a dividend. And Chinese company, is the China Resources Power Holdings Co., Ltd (CR Power), is also one of the biggest electricity company in China. In fact, A specific list of all the enterprises data can be found in the annexes to the reader.

The work is structured into two basic parts - theoretical and practical. In the theoretical part, the basic assumptions of the evaluation, strategic and financial analysis strategies, and enterprise valuation methods themselves. are gradually defined in detailed, Due to the scope of the work, all methods will not be practical parts used. In the methods, we mainly use the DCF- Entity and key value driver model to valuate and use decomposition to analyze the value creation. And we also analyze the financial characteristics of two companies for the last five years, after that we use the quick test to rate the two companies.

The conclusion of this thesis is devoted a summary of the whole results, include the financial performance and value creation, and give some advice about this two companies, Within the annexes, the reader can find the list of all calculation producer and company data which make up this thesis.

2. Description of the Valuation Process Methodology

Knowing what an asset is worth and what determines that value is a pre-requisite for intelligent decision making -- in choosing investments for a portfolio, in deciding on the appropriate price to pay or receive in a takeover and in making investment, financing and dividend choices when running a business. The premise of valuation is that we can make reasonable estimates of value for most assets, and that the same fundamental principles determine the values of all types of assets, real as well as financial. Some assets are easier to value than others, the details of valuation vary from asset to asset, and the uncertainty associated with value estimates is different for different assets, but the core principles remain the same. This introduction lays out some general insights about the valuation process and outlines the role that valuation plays in portfolio management, acquisition analysis and in corporate finance.

The estimated value of a company is influenced by the amount and quality of inputs, the time horizon and the valuation methodology used. The chosen approaches can be applied only under specific terms and conditions and their violation can lead to misinterpretation of the resulting values. It is important to note that the result of the valuation is not usually a single number, but rather a range of values.

2.1 Business valuation procedure

Business valuation is a process that follows a number of key steps starting with the definition of the task at hand and leading to the business value conclusion. The five steps are:

1. Planning and preparation
2. Adjusting the financial statements
3. Choosing the business valuation methods
4. Applying the selected valuation methods.
5. Reaching the business valuation conclusion.

It is not possible to estimate the reasonable value of the company without sufficient information inputs. We can generally divide these inputs into the following groups: internal corporate information, which incorporates financial plans, financial

statements and in-house economic and technical information ; sector information and projections, which are related to the market analysis, economic development projections and influences of foreign markets; microeconomic information, which involves legislation and rating, and macroeconomic information, which characterize the state and development of the economy and the development of the financial markets.

A good marketing plan provides the essential inputs into the future business earnings projections. And accurate earnings projections are key to establishing the business value based on its income. Some of the information will provide immediate and useful parameters to determine the business value. Other parts of this data, notably the company's historical financial statements, require adjustments to prepare inputs for the business valuation methods. We discuss the financial statements adjustment process in the following sections.

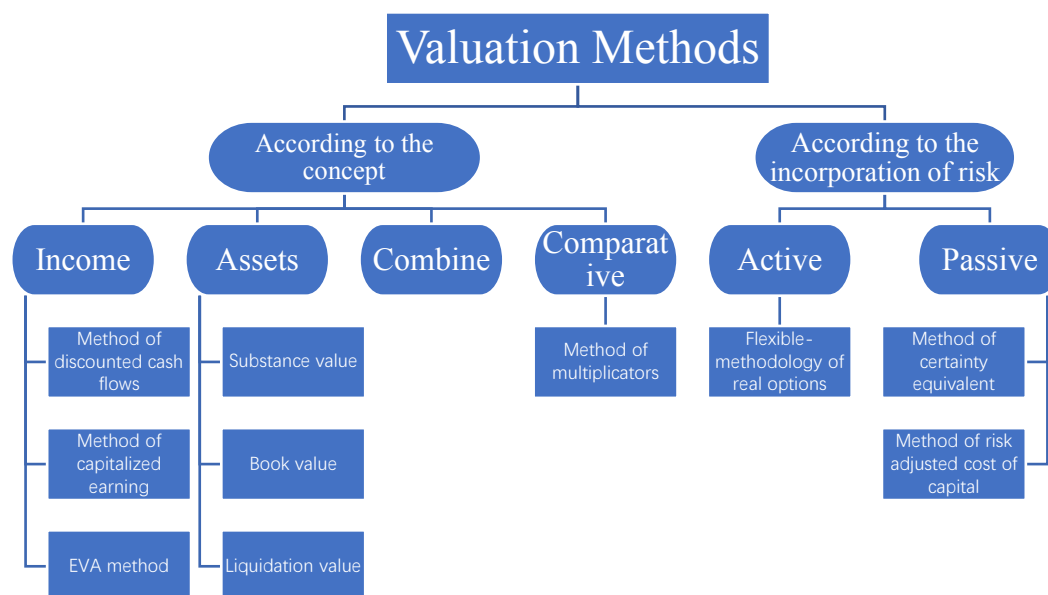
Business valuation is largely an economic analysis exercise. Not surprisingly, the company financial information provides key inputs into the process. The two main financial statements you need for business valuation are the income statement and the balance sheet. To do a proper job of valuing a small business, we should have 3–5 years of historic income statements and balance sheets available.

2.2 Valuation method

We can distinguish several types of value; the most important are the market value, investment value and intrinsic value. The market value is defined as the price at which the property would change hands between a willing buyer and a willing seller, neither being under compulsion to buy or to sell and both having reasonable knowledge of the relevant facts. In other words, it means that the market value is not dependent on the individual opinion of transaction participants. In contrast to the market value, the investment (or subject) value is the value to a particular investor based on individual investment requirements and expectations. The approach of investment value is based on the uniqueness of the company and the key point here is the individual opinion of the transaction participants. The intrinsic or fundamental value is the true or real worth of an item, based on an evaluation of the available facts and on the fundamental analyses of the publicly trade company. The intrinsic value is then used for investment decision.

There are four fundamental ways to measure what a business is worth: the income approach, asset-based approach, market approach and combined approach.

Chart 2.1 Overview of the company valuation methods.



Source: Duna Dluhosova, 2014, p.161

The income approaches are based on the estimation of value of an ownership interest as sum of present value of expected future benefits of owning that interest. The asset-based methods seek to determine the company's value by estimating the fair market value of every single asset. In the market or comparative approaches, the value of the business can be determined by reference to reasonable comparable companies, for which the values are known. The combined approaches estimates the value of company like the weighted average of values obtained by means of the income, assets and market methods.

Valuation models have become more and more complex over the last two decades, as a consequence of two developments. On the one side, computers and calculators have become far more powerful and accessible in the last few decades. With technology as our ally, tasks that would have taken us days in the pre-computer days can be accomplished in minutes. On the other side, information is both more plentiful, and easier to access and use. We can download detailed historical data on thousands of companies and use them as we see fit. The complexity, though, has come at a cost. In this section, we will consider the trade off on complexity and how analysts can decide how much to build into models.

Due to the fact that the future benefits, from which the value is derived, are evidently indeterminate. The valuation process is under risk terms, or we can say uncertainty, firm-specific and macroeconomic uncertainty is that it gives us a window on what we can manage, what we can control and what we should just let pass through into the valuation. The method of risk-adjusted cost of capital(RACC) or the method of certainty equivalent (CE) can be applied.

Then we will describe some methods of valuation companies in detailed.

2.3 Income methods

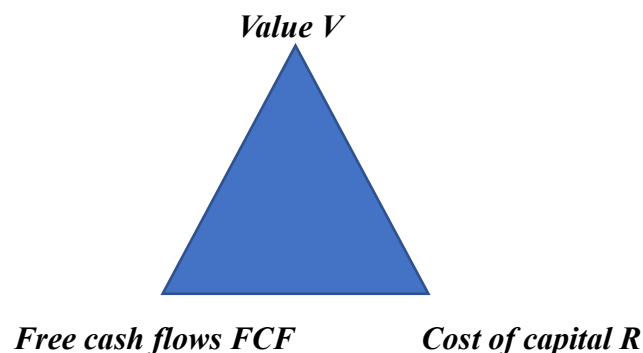
The core concept of these methods is the assumption that the value of assets is determined by the expected utility for the holder of the assets. In the case of a company, we consider these utilities as economic benefits, such as earnings, dividends, cash flows or economic profits. The value is determined within the income methods particularly by the definition of expected benefits, time horizon and estimation of cost of capital. This group of approaches consists of two basic kinds of approaches: the methods of discount cash flows (DCF) and the methods of capitalized earnings. The methods of discount cash flows currently dominate both the theoretical and the practical approaches, because they are more focused on the market procedures and market values. On the other hand, the methods of capitalized earnings are based primarily on accounting data.

2.3.1 Methods of discounted cash flows

These methods are based on projections of future free cash flows that are generated by the business activities. The future free cash flows are one of the key parameters used within business valuation, because the value of company increases with the growing cash flows.

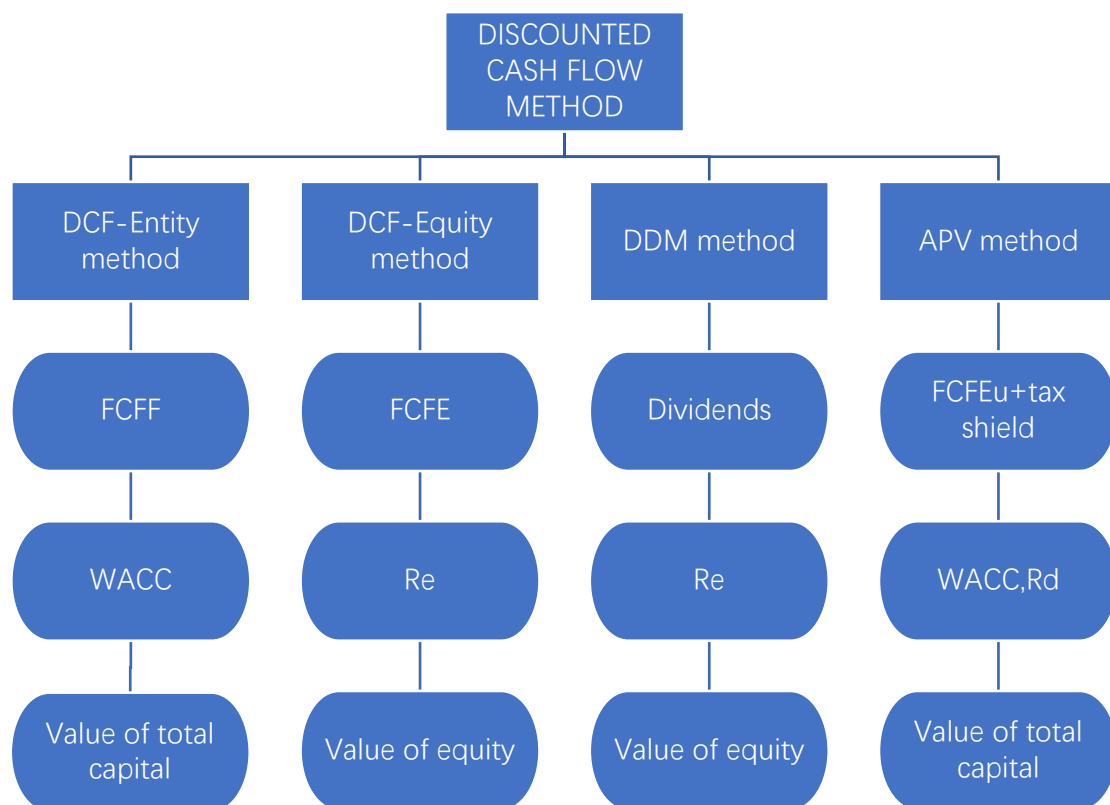
There are some basic tasks in the utilization of these methods. First, it is necessary to define the future cash flows correctly, second, it is important to estimate the costs of capital, which are used for the discounting of the future cash flows, and third, it is necessary to estimate the value of the company by means of chosen method. The relationship among these three factors is schematically shown in figure 2.2.

Figure 2.2 Key components of income methods of valuation.



Depending on the capital that we want to value (Total invested capital or equity). And depending on the definition of future cash flows and cost of capital, we have four different methods for business valuation: the *DCF-Entity* method, *DCF-Equity* method, the *DDM* (dividend discount method) and the *APV* (adjusted present value) method. The *DCF-Entity* and *DCF-Equity* are the most popular used in real life. The *DDM* can be used for valuation of equity in countries with a mature and efficient capital market, The *APV* method is used in the analysis of influence of the leverage on the company's value.

Figure 2.3 Valuation possibilities for a levered company on the basis of DCF methods.

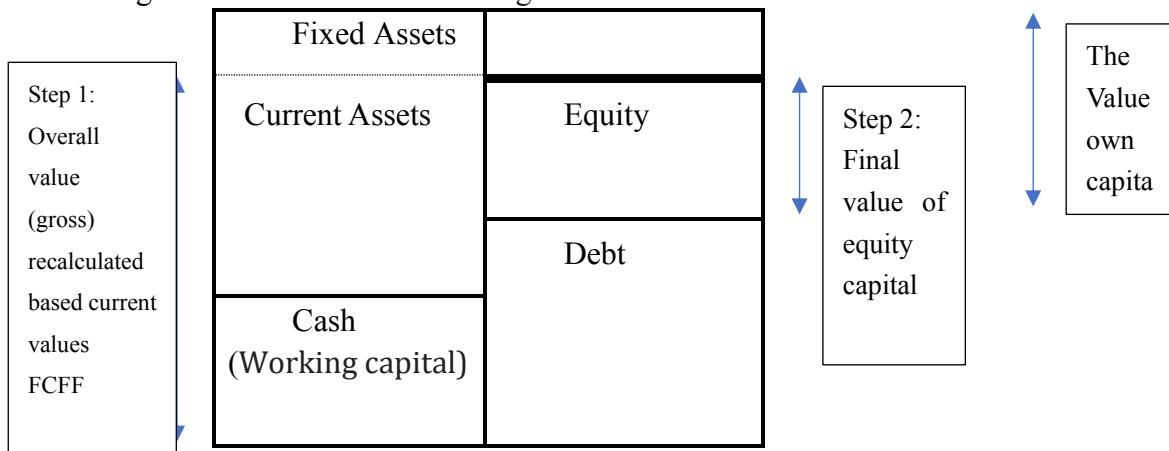


Source: Duna Dluhosova, 2014, p.164

2.3.2 DCF-Entity method

Technique of enterprise value calculation based on the DCF entity method consists of two steps. The first is to determine the total value of the business (gross value) that is earned by discounting the cash flows arising from the main operating activities of the enterprise. Second the step consists in reducing the total value of the company by the value of interest-bearing debts at the valuation date and the addition of non-performing assets. In this way, we calculate the value of equity. The logic of the procedure described is illustrated in Figure 2.4.

Figure 2.4 Method of calculating the value of the business.



Source: Duna Dluhosova, 2014, p.84

In the case of a joint stock company, we will find the intrinsic value of the share in a simple share the resulting value of equity and the number of shares issued. Based on their comparison we can make an investment recommendation.

The first step of the model calculating the gross value is determined by the general mathematical-model:

$$V_t = \sum_{t=1}^n \frac{FCFF_t}{(1+WACC)^t} \cdot \tag{2.1}$$

In this formula:

$FCFF_t$ = Free cash flow of the company in year t

$WACC$ = Weighted assets cost of capital

n = The number of years of the presumed existence of the enterprise

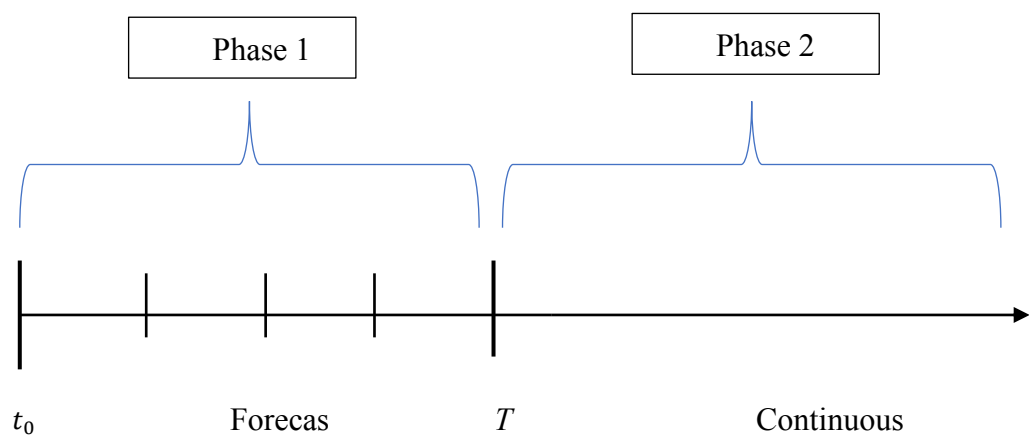
The above formula works with the premise that we know how long the business will exist. It of course, in reality it is not at all easy to determine (unless the enterprise is explicitly based on a certain period) and is therefore mostly working on the assumption of "going concern", that is, the enterprise it will exist in definitely and it works with the so- continuing value. From that reason there are various model modifications. defines two basic:

I. Two-Phase Method

As the title suggests, it is a breakdown of the calculation process into 2 phases. The first phase rests in the prediction of future cash flows - they are discounted to the present, giving a value of the first phase. However, the so-called "gross" continued the value of the business. The continuing value of this company defines "the present value of expected cash flows from the end of the first phase to infinity, this current value being recalculated on the date of completion of the first phase.

Graphically, this method can be illustrated as follows:

Figure 2.5 DCF Two-Phase Method



The mathematical two-phase method is illustrated as follows:

$$V = \sum_{t=1}^n \frac{FCFF_t}{(1+WACC)^t} + \frac{FCFF_{n+1}}{(1+WACC)^n} \cdot \frac{1}{(WACC-g)} \quad (2.2)$$

In this formula:

Terminal Value: value of the company at the end of the forecast period

n : length of the first phase in years

In this method, it is very important to determine the appropriate length of the forecast period. In real business valuation, we always forecast for 3 to 6 years. Forecast for a longer period would be very risky and, ultimately, difficult to estimate - in particular at present, in times of political, social and environmental turbulence. Damodaran (1994) also suggests that less is sometimes more and predictions for a longer period would be highly unnecessary and inaccurate.

The second component of the continuing value calculation is an important component of the calculation, whereas for the projected period of 5 years, it accounts for approximately 80% of the total value. From this point of view, it is necessary to choose the appropriate technique for calculating the continuous value and its parameters.

From this view of this calculation technique, we have two different possibilities:

Gordon's formula: this is used for the assumption of stable and sustained growth of cash flow. The Continued value is calculated as follows:

$$\text{Terminal Value} = \frac{FCFF_{t+1}}{WACC-g} \quad (2.3)$$

In this formula, the growth(g) is the expected growth rate of free cash flow during the second phase. And this is valid only when $WACC > g$.

Parametric formula - this works with the quantity of the corrected operating result (and its rate of growth) and the expected return on new (net) investments. The formula for calculating the continuous value has the following form:

$$\text{Terminal Value} = \frac{FCFF_{t+1} \cdot \left(1 - \frac{g}{r_1}\right)}{WACC-g} \quad (2.4)$$

In this formula:

$FCFF_{t+1}$ = adjusted operating result at phase two.

g = growth rate of adjusted operating cash flow at phase two.

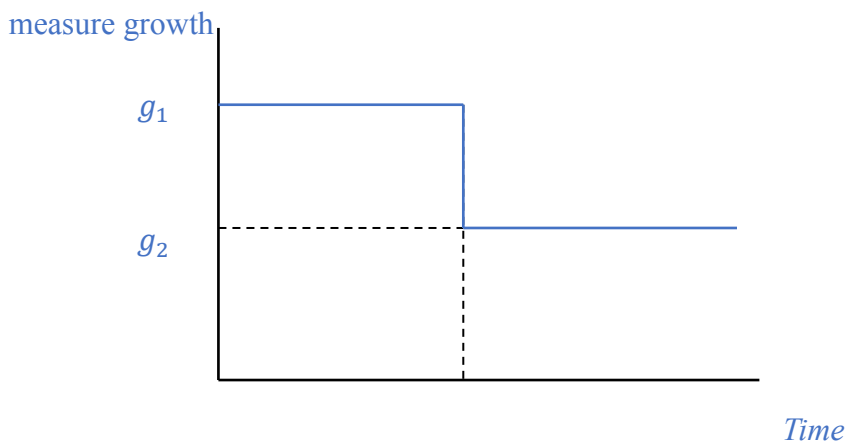
r_1 = Return on the net investment.

II. Methods based on estimation of average growth rates

An alternative, or an addition to the above solution, may be to define future business period with different rates of growth. We have several options to calculate the value of the business and the following could be included among the most important:

Jumping Model: consider several phases for which different growth rates are defined (initially higher and then "normal" growth rates). For 2 periods to illustrate this model as follows:

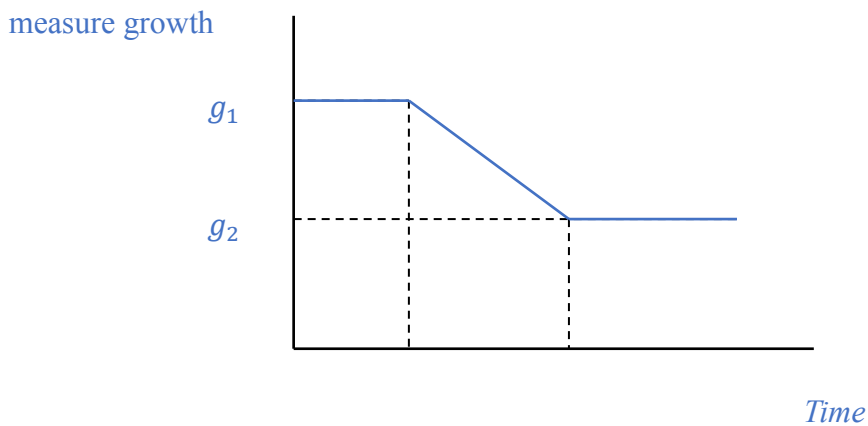
Figure 2.6 Jumping model



Source: Koller, T., M. GOEDHART and D. WESSELS. P79

Linear Model - Consider, like jump models, several different growth templates, but they assume, for example, that the competitive advantage is phasing out rather than jumping.

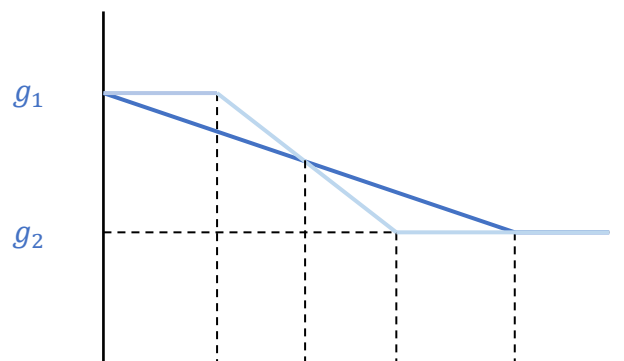
Figure 2.7 Linear model



Koller, T., M. GOEDHART and D. WESSELS. p 79

H model - This model is based on the above two models and hence from two-stage jumper and three-stage linear model. The model still mitigates the change in the transition of each growth temp. Unlike the linear three-stage model calculates an immediate decline in the initial rapid growth rate and the second side extends the period of subsequent adjustment to the normal growth rate.

Figure 2.8 H model
measure growth



Source: Koller, T., M. GOEDHART and D. WESSELS. P80

The value of an enterprise could theoretically be derived from the synthesis described above approaches where the FCFF variable would be directly predicted in the first phase and the subsequent one would continue the value could be determined either on a step, linear, or H model.

2.3.3 DCF-Entity parameters

From last content we mention above, we have known some mathematic expression of the model and we must know the following basic parameters:

The time period of this business
Cash flows in individual years of business life
The discount rate that will transfer the future cash flows to the present value

If the enterprise's continuing value is assumed, it is also appropriate to estimate the average growth rate (g), which may also be zero.

(A) FCFF

The normal method to calculate the FCFF is shown below:

Table 2.1 Calculation of FCFF

Earning before interest & Taxes (EBIT)
-Income Tax
= Earning before interest after taxes(EBIAT)
+ Depreciation & Amortization
- Capital Expenditures (Investment)
- Change in net working capital
= (Unlevered)Free cash flow

Source: Koller, T., M. GOEDHART and D. WESSELS. P159

Earnings before interest and taxes, *EBIT*, is, as it suggests, the earnings from a company's operations before adjusting for interest expense and taxes. *EBIT* can be found on the company's income statement or calculated from the cash flow statement. The free cash flow to firm formula does adjust for taxes by multiplying *EBIT* by one minus the tax rate.

Capital expenditures (*INV*) is the capital used to fund operations in the long run. Capital expenditures can be found on a company's cash flow statement.

Working capital is capital used to fund operations in the short run. Working

capital is current assets minus current liabilities. As opposed to longer term capital expenditures, working capital connotes expenses due within one year or less. The change in working capital can be calculated using a company's balance sheet.

Unlevered means that the cash flow is looked at before you pay interest on the debt. Because you are trying to value the business based on its operations, unaffected by the amount of debt it has.

Another important parameter is investments, which are necessary to future cash flow, we recommend that the size of these investments be determined from the operational size of the necessary capital invested in individual years. Subsequently, the following relationships apply:

$$I_{net} = C_t - C_{t-1} \quad (2.5)$$

$$I_{gross} = C_t - C_{t-1} + dep_t \quad (2.6)$$

In this formula:

$I_{net/gross}$ = investments in operating capital required in year t

C_t = operating capital required end of year t

dep_t = depreciation in year t

(B) WACC

As we all know, One of the DCF's basic parameters is the discount rate for the future enterprise revenue is currently being discounted. In an entity variant, the discount rate is determined at the weighted average cost of capital (WACC) level. As they already include in the WACC name capital costs of creditors, but also equity costs - shareholder capital. General the WACC calculation formula is as follows:

$$WACC = \frac{Debt}{Debt+Equity} \cdot [r_{debt} \cdot (1 - t)] + \frac{Equity}{Debt+Equity} \cdot (r_{equity}) \quad (2.7)$$

So we can abbreviate it as:

$$WACC = r_d \cdot (1 - t) \cdot \frac{D}{C} + r_e \cdot \frac{E}{C} \quad (2.8)$$

In this formula:

r_d = the cost of capital of creditors (cost of debt)

t = Corporate income tax rate

D = market value of debt (interest-bearing)

E = market value of equity

C = the total value of the invested capital (always combine debt and equity)

r_e = the cost of shareholder's equity

when setting the WACC, emphasizes that the share of total capital is more appropriately, based on market values than accounting values. In determining the capital structure based on market value, however, the problem of cyclicity of the problem arises because it is just that the market value of equity is the result of the analysis. The logic behind the determination of the capital structure.

However, based on market value, it is obvious - the return on the investment is calculated from what it actually does they pay and not what is kept in the accounting.

Cost of equity is typically calculated through the CAPM formula (Capital Asset Pricing Model). Model CAPM makes it possible to analyze both the impact of risk and market profitability in determining the expected (from a model of equilibrium) yield on individual securities. The model assumes that investors use it when creating a portfolio, all the traded shares on the market. Explanatory variable for the expected yield the share chosen is the difference between the return on the market portfolio and the risk-free interest rate. "

Let's look at its components. And in the formula above the r_e can be calculated as follows:

$$\text{CAPM} = r_e = r_{free} + \beta \cdot (E_{Rm} - r_{free}) . \quad (2.9)$$

In this formula:

r_{free} = it represents a theoretical rate that you can earn with zero risk of financial loss. People usually use government bonds rates as an estimate of risk free rate.

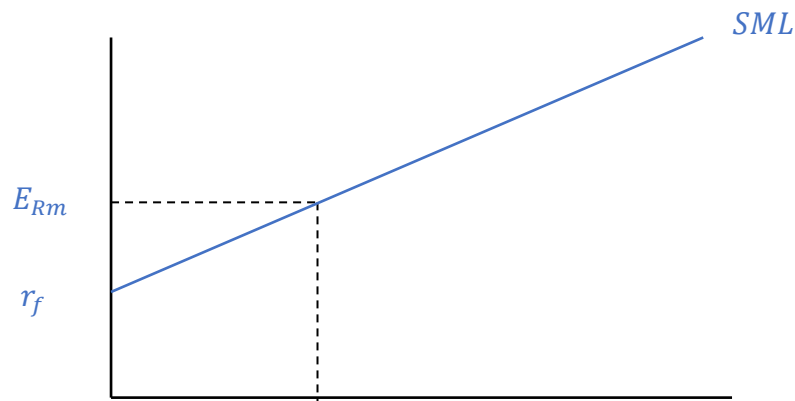
β = Beta is parameter to measure of how risky the particular investment is in comparison to the overall market.

r_{market} = Market rate represents expected return of all companies in the market.

$E_{Rm} - r_{free}$ = risk premium (typically between 5% to 7%)

The square bracket represents the market risk premium. Beta is the only factor that is unique to a particular undertaking and expressing a risk11 of a share, relative to the capital market as a whole. If beta is equal to 1, the premium for the security is equal to the average market premium. Graphically, the model can be expressed using the so- lines of securities (SML).

Figure 2.9 Security market line (SML)



Source: Investopedia

The line begins with the risk-free rate (with zero risk) and moves upward and to the right. As the risk of an investment increases, it is expected that the return on an investment would increase. An investor with a low risk profile would choose an investment at the beginning of the security market line. An investor with a higher risk profile would thus choose an investment higher along the security market line.

For successful implementation of the CAPM model, it is necessary to estimate all the components to they are picking:

We always using the risk-free rate of yield of government bonds with a comparable life time as corporate assets. Therefore, many authors are inclined to believe that it is appropriate to work with the yield of government bonds with a maturity of more than 10 years.

Risk premium - The first step of the calculation process is to establish the long-

term level of stock market shares - a stock index (like the Prague Stock Exchange index

PX). Consequently, it is necessary to calculate the average level of return on government bonds and to determine differential of values found. From a methodological point of view, we always calculate that the average yield be calculated by the geometric mean it takes account for complex interest.

Beta coefficient - As with all parameters, the beta coefficient can be determined by several ways. Probably the easiest way to estimate the beta factor is by using historical data. And analyzing the regression dependence between stock returns and market yields as a whole. The calculation formula would take the following form:

$$\beta_i = \frac{Cov(R_m, R_i)}{Variance(R_m)} . \quad (2.10)$$

In this formula:

R_m = Market return

R_i = Return on equity

$Variance(R_m)$ = the variance of market return

Cost of debt- r_d , is also important parameter in above formula, when determining the cost of foreign capital, we always use two basic ways. The first is to calculate the effective interest that an enterprise applies to different forms of foreign capital. Another alternative way is seen in a market-based process. the capital can be determined as the sum of the risk-free rate of yield and the risk premium:

$$r_d = r_{free} + RP . \quad (2.15)$$

In this formula:

r_{free} = risk-free rate

RP = risk premium

The risk-free rate of return is set at the level of government bond yields with a similar maturity as the debt under consideration. The risk premium will be further determined by the risk class to which the debt falls. The risk class may be determined differently, as an example, describes the interest rate criterion. The higher the interest

rate, the more secure the debt and the associated lower risk premium.

The expert Damodaran has make a data of the risk premium for the market, the below table is the risk premium for different size companies and rating in the market.

Table 2.2 Risk premium of company 2017

<i>If interest coverage ratio is</i>			
<i>Large firms</i>	<i>Small firms</i>	Rating is	<i>Spread is</i>
<0.19	<0.49	D2/D	12.00%
0.2-0.649	0.5-0.799	Caa/CCC	10.00%
0.65-0.799	0.8-1.249	Ca2/CC	8.00%
0.8-1.249	1.25-1.499	C2/C	7.00%
1.25-1.499	1.5-1.999	B3/B-	6.00%
1.5-1.749	2-2.499	B2/B	5.00%
1.75-1.999	2.5-2.999	B1/B+	4.00%
2-2.249	3-3.499	Ba2/BB	3.25%
2.25-2.499	3.5-3.999	Ba1/BB+	2.75%
2.5-2.999	4-4.499	Baa2/BBB	1.75%
3-4.249	4.5-5.999	A3/A-	1.20%
4.25-5.499	6-7.499	A2/A	1.00%
5.5-6.499	7.5-9.499	A1/A+	0.90%
6.5-8.499	9.5-12.499	Aa2/AA	0.70%
>8.5	>12.5	Aaa/AAA	0.40%

Source: www.damodaran.com

2.4 Pyramidal Decomposition of value creation

As we describe the in the previous chapter, if we want to value a company, we separate a company's expected cash flow into two periods and define the company's value as follows:

Value = Present value of cash flow *during* explicit forecast period + Present value of cash flow *after* explicit forecast period

The second term is the continue value: the value of the company's expected cash flow beyond the explicit forecast period. Making simplifying assumptions about the company's performance during this period (e.g., assuming a constant rate of growth and return on capital), we can estimate continuing value by using formulas instead of explicitly forecasting and discounting cash flows over an extended period.

And from the equation, we can know our goal of the thesis is to find why caused the different continue value of these two companies. A thoughtful estimate of continue value is essential to any valuation because continue value often accounts for a large percentage of a company's total value. But these large percentages do not necessarily mean that most of a company's value will be created in the continuing value period, and often the continue value is very large than the previous periods cause the early cash inflows will be offset by the early outflows.

Thinking of the different size of two selected companies, we can use the decomposition to measure how they well use their funds to create the valuation. We all know the value is influenced by many factors based on the equation we mention before, and we can transfer it to the equation below:

$$\text{Continue Value}_t = \frac{EBIT \cdot (1-t) \cdot (1 - \frac{g}{ROIC})}{WACC - g} \quad (2.11)$$

$$\frac{V}{EBIT(1-t)} = \frac{1 - \frac{g}{ROIC}}{WACC - g} \quad (2.12)$$

From this equation we can see the value of company is influenced by EBIT, tax rate, growth rate, WACC. And we need to in-depth analyses of this factors for their influences in value changes. On the basis of results, it is possible to make appropriate decisions for improvement.

Pyramidal decomposition, is exactly mathematically formulated by a set of equations and formulas. The basic idea of pyramidal decomposition is the gradual decomposition of the equations as the product of the component ratios and subsequently the evaluation of how these components affect the final value.

Pyramidal decomposition enables the detection of the relationship existing between the basic and the component factors, moreover, such pyramidal decomposition enables the analysis of past, present and future performance of a company.

From the equations (2.4), we can decomposition the right parts of the equation.

Then we use the pyramidal decomposition to analysis the parameters in detailed; first we look at the denominator $WACC - g$:

$$WACC = r_d \cdot (1 - t) \cdot \frac{D}{C} + r_e \cdot \frac{E}{C}$$

$$g = IR \cdot ROIC$$

So the results of the denominator is the difference of these two parts, and then we to pyramidal the numerator $1 - \frac{g}{ROIC}$, we can see $1 - g$ is a constant, and Return on capital:

$$ROIC = \frac{EBIT}{IC(Invested\ capital)}$$

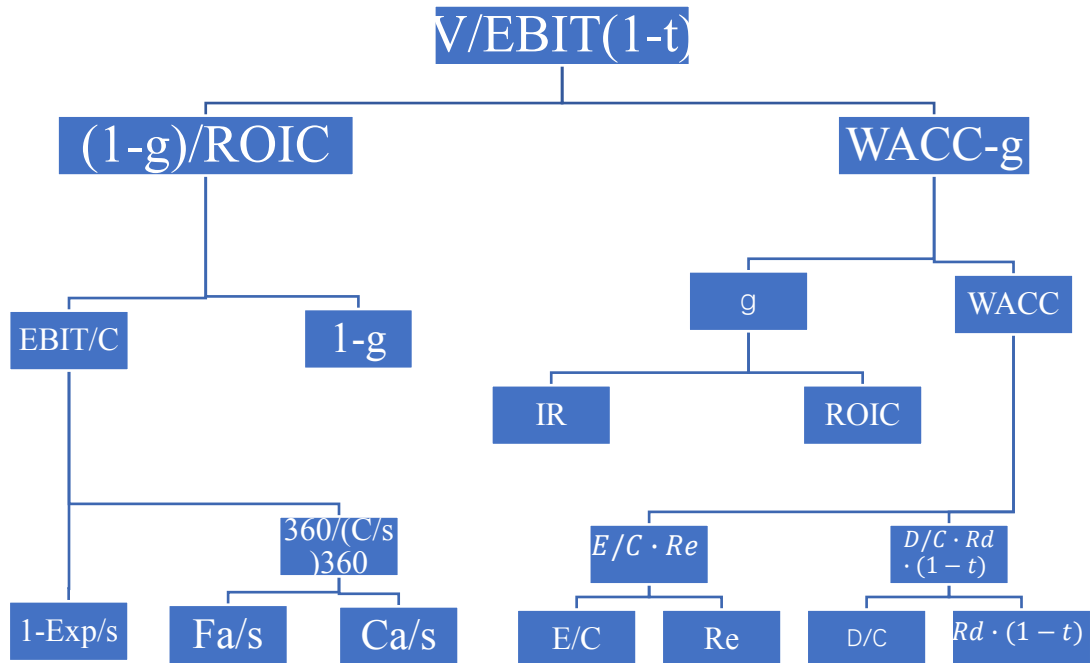
$$ROIC = \frac{EBIT}{IC} = \left(1 - \frac{Exp}{sales}\right) \cdot 360 / \frac{capital}{sales} \cdot 360$$

As for the

$$\frac{\text{capital}}{\text{sales}} \cdot 360 = \left(\frac{FA}{S}\right) \cdot 360 + \left(\frac{CA}{S}\right) \cdot 360$$

The following chart will show the decomposition:

Chart 2.11 Decomposition of value creation.



Source: Our calculation

And when we think about the value create (continue value), keep in mind the following technical considerations:

EBIT: the level of EBIT should be based on the financial plan, the normal level of revenues should reflect the midpoint of its business cycle and cycle average profit margins.

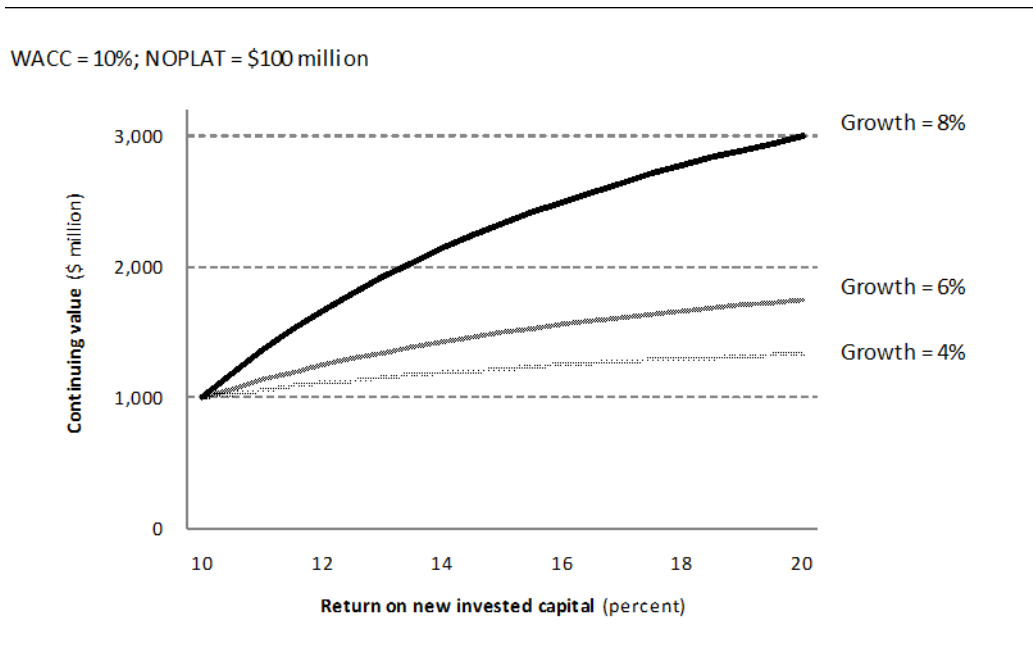
ROC: The expected return on the capital should be consistent with expected competitive conditions. Economic theory suggests that competition will eventually eliminate abnormal returns, so for many companies, set RONIC equal to WACC.

Growth rate: The growth rate of companies should be estimate by the business cycle the companies is, few companies can be expected to grow faster than the economy for long-period. The best estimate is probably the expected long-term rate of consumption plus the inflation rate.

WACC: The weighted average cost of capital should incorporate a sustainable capital structure and an underlying estimate of business risk consistent with expected industry conditions.

Continuing value can be highly sensitive to changes in the continuing-value parameters. Let’s examine how continuing value (calculated using the key value driver formula) is affected by various combinations of growth rate and rate of return on new investment.

Chart 2.12 Impact of continue value assumptions



Source: Koller, T., M. GOEDHART and D. WESSELS. P159

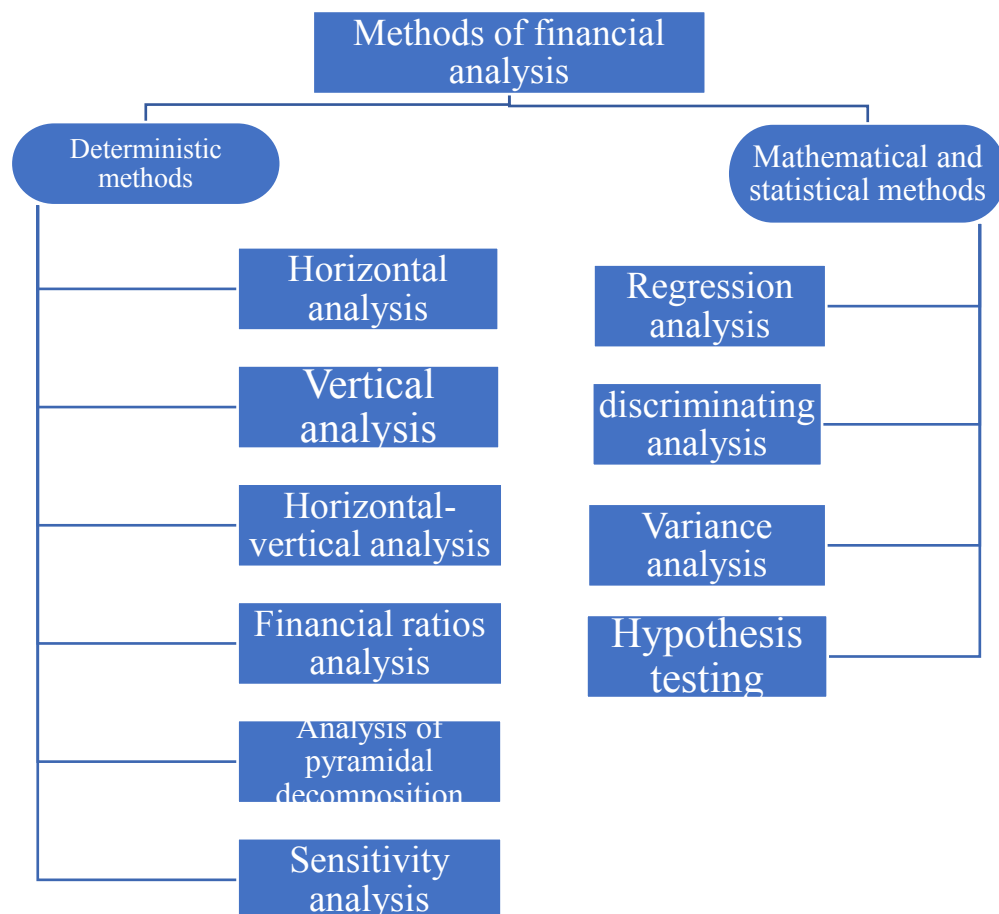
2.5 Financial analysis

In this work, financial analysis will be understood as an analysis based on quantitative data - the sources of which are the Company's basic accounting statements and annual reports. The goal is a comprehensive assessment of the company's financial health and the identification of risks in relation to the future development.

The scope and structure of financial analysis remains the responsibility of a particular analyst. The should structure the structure to match the purpose of the analysis and the specific conditions, in which the analysis is performed.

The tools and techniques used for the evaluation of a company's performance can be classified in many ways. The methods of classification are shown in the below figure.

Chart 2.13 Various techniques of financial analysis.



Source: Duna Dluhosova, 2014, p.73

Horizontal analysis can refer either to an analysis comparing the specific financial statements items and their values with prior or future time periods or to a cross-sectional analysis of one company with another. Horizontal analysis is based on the computing the increase or decrease (in absolute or percentage terms) of each item from the prior period:

$$\text{absolute change} = U_t - U_{t-1} = \Delta U_t . \quad (2.13)$$

$$\text{Percentage change} = \frac{U_t - U_{t-1}}{U_{t-1}} = \frac{\Delta U_t}{\Delta U_{t-1}} . \quad (2.14)$$

Where:

U_t is the value, t is the current period and $t - 1$ is the prior period.

In case of horizontal analysis, it is necessary to take into account possible changes in the evolution of the specific economic conditions, for example changes in taxation, changes in capital markets, changes in the prices of production inputs.

The other way is vertical analysis, which is used to analyze the composition of a given financial statement item. The composition is expressed as a percentage proportion for a given item or base, the general formula is as follow:

$$\text{proportion} = \frac{U_i}{\sum U_i} . \quad (2.5)$$

where U_i is the value of a given item and $\sum U_i$ is the base.

Vertical analysis is used to analyze the composition (mix) of assets, equity and liabilities. Vertical common-size analysis of the income statement divides each income statement item by the revenues or sometimes by the total assets (especially in the case of financial institutions).

2.5.1 Basic Financial ratios

There are many relationships between financial accounts and between expected relationships from one point in time and another. Ratios are very efficient way of expressing these relationship; they express one quantity in relation to another.

Several aspects of ratios analysis are important. First, the ratio is an indicator of a particular aspect of a company's performance, reporting what happened but not why it happened. The second aspect of ratio analysis is that difference in accounting policies (across companies and across time) can distort ratios, and a meaningful comparison may involve making adjustments to the financial data. Third, not all the financial ratios are necessarily relevant to a particular analysis. Finally, financial ratio analysis does not stop with computation.

Profitability indicators are among the most important because of they express how an enterprise can use available resources. Profitability reflects a company's competitive position in the market and the quality of its management. The way in which profit is expressed the analyst works, depends on what we want to express and for whom the conclusions of the analysis are determined. The most important indicators are:

$$\text{Return on assets (ROA)} = \frac{EBIT}{\text{Average total assets}} \quad (2.16)$$

$$\text{Return on equity (ROE)} = \frac{EAT}{\text{Average total equity}} \quad (2.17)$$

$$\text{Return on sales(ROS)} = \frac{\text{Net income(before interest and tax)}}{\text{Sales}} \quad (2.18)$$

$$\text{Operating profit margin} = \frac{EBIT}{\text{Revenues}} \quad (2.19)$$

$$\text{Net profit margin} = \frac{EAT}{\text{Revenues}} \quad (2.20)$$

$$\text{Return on invested capital(ROIC)} = \frac{EBIT*(1-t)}{\text{Invested capital}} \quad (2.21)$$

As described above, profits may take a different form. In practice, the most used categories we shown below.

Table 2.3 Profit categories.

EARNINGS
Economic outturn for the accounting period (EAT)
+ income tax on extraordinary activity
+ Income tax on ordinary activities
= Profit before tax (EBT)
+ interest expense
= Profit before interest and taxes (EBIT)
+ depreciation
= Profit on Interest, Depreciation and Tax (EBITDA)

Source: Koller, T., M. GOEDHART and D. WESSELS. P75

Another group is liquidity indicators. An enterprise must be sufficiently liquid to cover its liabilities. Therefore, they must hold part of their assets in liquid assets, which is in direct conflict with profitability. Liquidity itself defines as "The ability of an enterprise to convert its assets into cash and to cover them in a timely manner, to the extent required place for all due liabilities ". Basic liquidity indicators include:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} \quad (2.22)$$

$$\text{Net working capital} = \text{Current assets} - \text{Current liabilities}$$

or

$$\text{Net working capital} = \text{Long - term sources} - \text{Long - term assets} \quad (2.23)$$

$$\text{Liquidity ratio} = \frac{\text{Current assets} - \text{current liabilities}}{\text{Current assets}} \quad (2.24)$$

Another type of ratios are activity ratios, these ratios are known as a assets utilization ratios or operating efficiency ratios. These financial indicators add to each other the ratio of sales and assets expressed in a certain form. Among the basic ones are:

$$\text{Total assets turnover} = \frac{\text{Revenues}}{\text{Average total assets}} \quad (2.25)$$

$$\text{Fixed assets turnover} = \frac{\text{Net sales}}{\text{Net property, plant and equipment}} \quad (2.26)$$

$$\text{Receivable turnover} = \frac{\text{Revenues}}{\text{Average receivables}} \quad (2.27)$$

$$\text{Payable turnover} = \frac{\text{Purchases}}{\text{Average payables}} \quad (2.28)$$

Leverage refers to a company's ability to fulfil its long-term debt obligations. The assessment of a company's ability to pay its long-term obligations generally includes an in-depth analysis of components of its financial structure. Leverages ratios provide information regarding the relative amount of liabilities (debt) in the company's capital structure and the adequacy of earnings and cash flow to cover interest expenses and other fixed charges as they become due. Some important indicators are shown below:

$$\text{Debt ratio} = \frac{\text{Total debt (liabilities)}}{\text{Total assets}} \quad (2.29)$$

$$\text{Debt to equity ratio} = \frac{\text{Total debt}}{\text{equity}} \quad (2.30)$$

$$\text{Financial leverage} = \frac{\text{Total assets}}{\text{Total equity}} \quad (2.31)$$

$$\text{Interest coverage} = \frac{\text{EBIT}}{I} \quad (2.32)$$

For listed companies there is a group of ratios of capital the market is very important (and unavoidable in the financial analysis), as it shows how the market evaluates past business activity and its future outlook. Significant indicators include:

$$\text{Earning per share (EPS)} = \frac{\text{EAT}}{\text{Number of common shares outstanding}}. \quad (2.33)$$

$$\text{Pricing – earning ratio}(P/E) = \frac{\text{Market price per share}}{\text{EPS}}. \quad (2.34)$$

$$\text{Book value per share} = \frac{\text{Equity}}{\text{Number of shares outstanding}}. \quad (2.35)$$

$$\text{Dividend growth rate}(g) = \text{ROE} * \left(1 - \frac{\text{dividend}}{\text{earning per share}}\right). \quad (2.36)$$

2.6 Prediction model

Prediction model has two types, one is bankruptcy model, another is rating model. Here we will introduce the rating model. Kralick's Quicktest originated in 1990, which may evoke the impression of a rather outdated model, but compared to other similar models among the newer ones. this model can also be used to compare companies from different industries. However, it is primarily intended for the assessment of non-financial corporations.

In this quick test, a score between zero and four points is assigned for given financial ratios and the intervals of their values. The final value of the quick test is then given as a weighted average.

Table 2.4 Quick test (1990)

Item	Equation	Score	Level
R1	Equity/Total assets	0.3 and more	4
		0.2 to 0.3	3
		0.1 to 0.2	2
		0.0 to 0.1	1
		0.0 and less	0
R2	(Total debt)/ Operating CF	3 and less	4
		3 to 5	3
		5 to 12	2
		12 to 30	1
		30 and more	0
R3	EBIT/Total assets	0.15 and more	4
		0.12 to 0.15	3
		0.08 to 0.12	2
		0.00 to 0.08	1
		0.0 and less	0
R4	Operating CF/Operating revenues	0.1 and more	4
		0.08 to 0.1	3
		0.05 to 0.08	2
		0.00 to 0.05	1
		0.0 and less	0

Source: Duna Dluhosova, 2014, p.95

3. Basic financial characteristics of Selected Czech and Chinese Company

In this part, we will evaluate our selected companies (one is ČEZ, České Energetické Závody; the other is CR power, China Resource Power), one from Czech Republic, another is from China, by the methods we mention in previous chapters.

3.1 Introduction of ČEZ

ČEZ Group (Czech: 'Skupina ČEZ' České Energetické Závody) is a conglomerate of 96 companies (including the parent company ČEZ, a.s.), 72 of them in the Czech Republic. Its core business is the generation, distribution, trade in, and sales of electricity and heat, trade in and sales of natural gas, and coal extraction. ČEZ Group operates also in Bulgaria, Germany, Hungary, Poland, Romania, Slovakia and Turkey. ČEZ, a.s. is listed on Prague Stock Exchange and Warsaw Stock Exchange.

Basic data from home page:

Company name: ČEZ, a.s.

Trade as: PSE: CZE

WSE: CZE

Industry: Energy

Founded: 1992

Headquarters: Prague, Czech Republic

Products: Electricity, generation and distribution, nature gas and cellphone operator

Owner: Ministry of finance (69.78%)

ČEZ is a company traded on the capital market and is therefore in the search engine many institutional as well as individual investors. Its creditworthiness is regularly rated by the most important credit rating agencies. As of 30/11/2017, the rating of the company is as follows (Bloomberg):

Moody's

Baa1 Standard & Poor's

A-



3.2 Introduction of CR Power

Founded in August 2001, China Resources Power Holdings Co., Ltd. (“CR Power”) is a flagship Hong Kong-listed company of China Resources (Holdings) Co., Ltd. (“CR”) and one of the comprehensive energy companies with the highest efficiency and best benefits in China. Its businesses cover thermal power, coal, wind power, hydropower, distributed energy, nuclear power, photovoltaic power and other fields.

CR Power was listed on the Main Board of the Hong Kong Stock Exchange on November 12, 2003 (stock number: 0836.HK). In March 2004, CR Power was added to Hang Seng Composite Industry Indexes (Utilities) and Hang Seng China-Affiliated Corporations Index. In May 2005, CR Power was incorporated into Morgan Stanley Capital International China Index. On 8 June 2009, the company formally became a constituent stock of the Hang Seng Index, making it the only Chinese invested power company that has been admitted to the Hang Seng Index. As of June 2017, CR Power’s total assets amounted to HK\$210.475 billion and operational installed capacity amounted to 42,600MW, covering 27 provinces, municipalities and autonomous regions. For ten consecutive years, CR Power has been listed in the Platts Top 250 Global Energy Companies and the Forbes Global 2,000, ranking 71th and 775th respectively.

Basic data from home page:

Company name: China Resources Power Holdings Co., Ltd. (“CR Power”)

Trade as: HKEx, 0836

Industry: Energy

Founded: 2001

Headquarters: HONGKONG, CHINA

Products: Electricity, nature gas, new energy



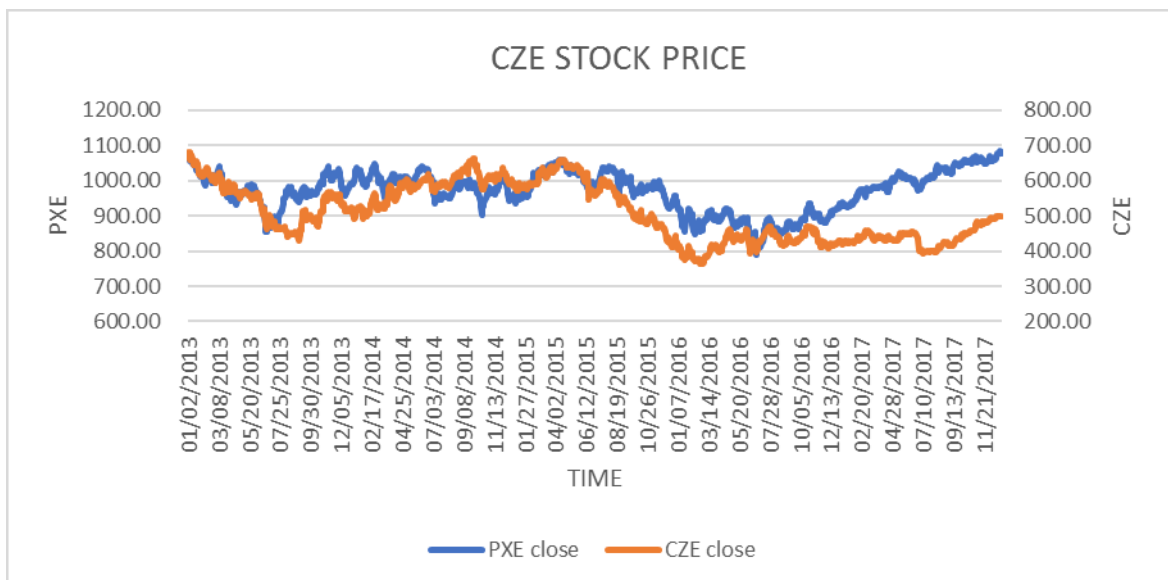
3.3 Financial performance

3.3.1 Stock information of two selected company

Before we do some calculations, the stock price can directly mirror the company's operating performance, cause high profit can lead to the high dividend (sometimes depend on the dividend policy), so we can see the equity conditions first.

CEZ's shares are among the most traded shares in the Czech Republic. They are listed on the Prague Stock Exchange, but also on the RM-system. Abroad, ČEZ shares are traded in Poland (the Warsaw Stock Exchange) and Germany (the Frankfurt Stock Exchange and the local exchanges in Berlin, Munich and Stuttgart).

Figure 3.1 CEZ stock price comparing with the PXE index



Source: Prague stock exchange data and our calculation.

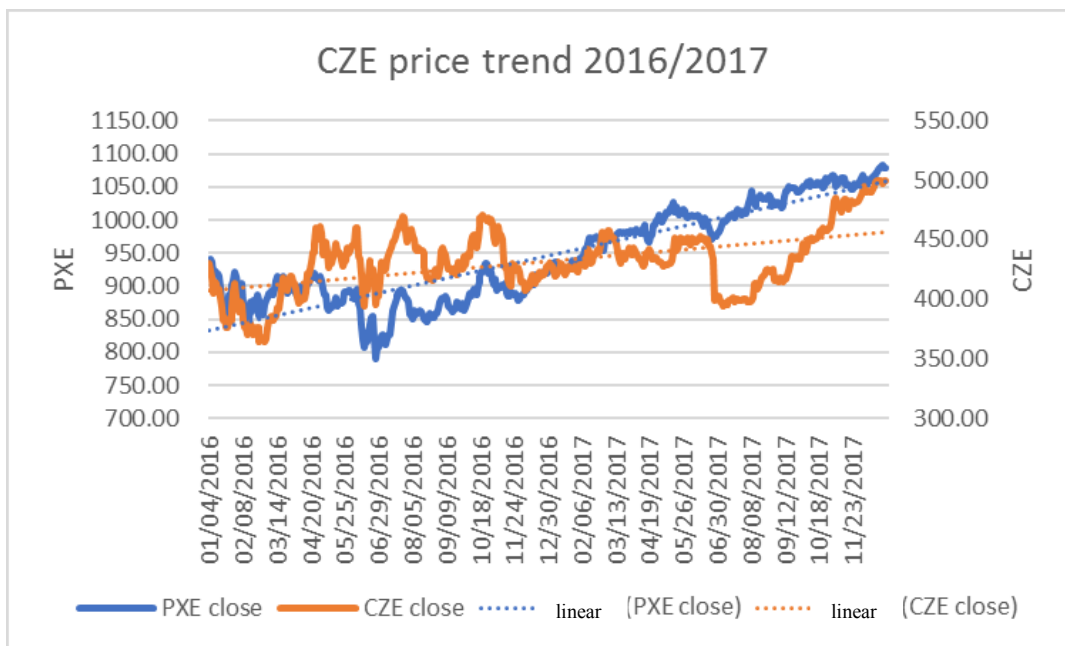
The long-term view of CEZ's share price trend shows a clear downward trend. The biggest the fall of ČEZ shares (but also the PX index of which ČEZ is part) is at the end of the year 2008, the fall of the Lehman Brothers investment bank and the start of the global financial crisis (not shown in the figure)

The highest value was ČEZ's share on 1st Jan 2013. The course reached the level of CZK 680.20. Vice versa the lowest value (in the last 5 years) reached the rate on February 24, 2016, when the price fell to CZK 364.10 per share.

The PX index was roughly the same as ČEZ's share, with a clear downward trend, which has been relatively stable in recent years. The highest value of the index reached at 9st Jan 2013 at 1066.14. The lowest value in the period under review was reached on 24th Feb 2016 which is the same day of the CEZ lowest, with a result of 364.10.

And when we focus on the recent 2 years data, we can see the market and CEZ resuscitate slowly, we can see the results in the below figure 4.2.

Figure 3.2 CEZ stock price comparing with the PXE index last two years.

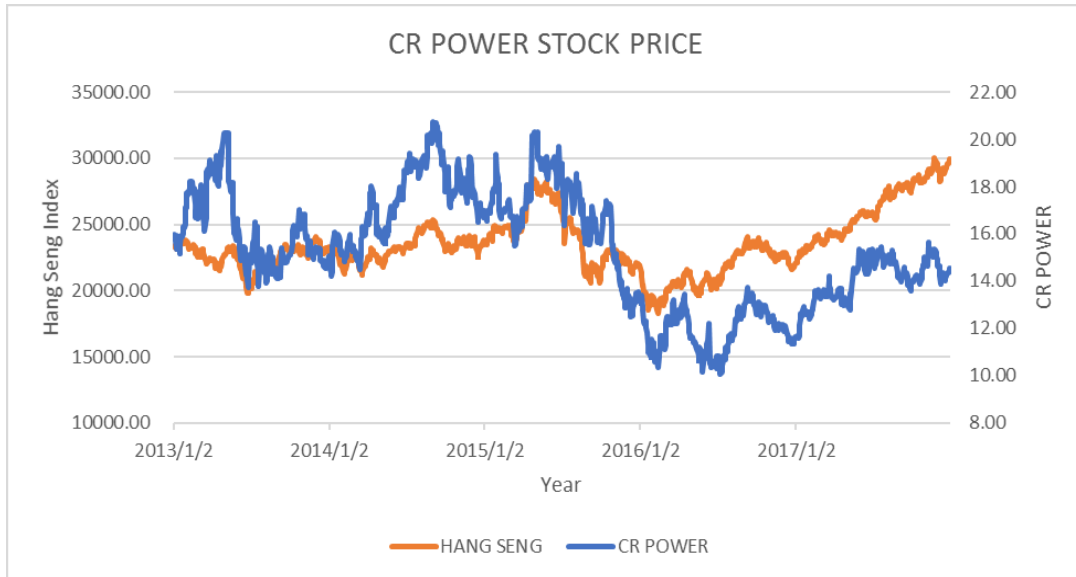


Source: Data base and linear model calculation.

From this chart we can see the CEZ stock price is volatility and oscillation in the last years, but also show the upward in generally. From 2016 to June 2017, the stock price keep stable. The average stock price is 450 CZK. And we make a linear model for the trend, from the dashed line we can see the future trend is close to the market trend, moving slowly but also upward trend.

CR Power is listed in the Hong Kong Hang Seng Stock Exchange(HK.0836), as one important component of the index in Hang Seng market. Below figure shows the last five years data of the CR Power and Market Index.

Figure 3.3 Hong Kong Hang Seng Index and CR Power.



Source: Hong Kong Stock Exchange

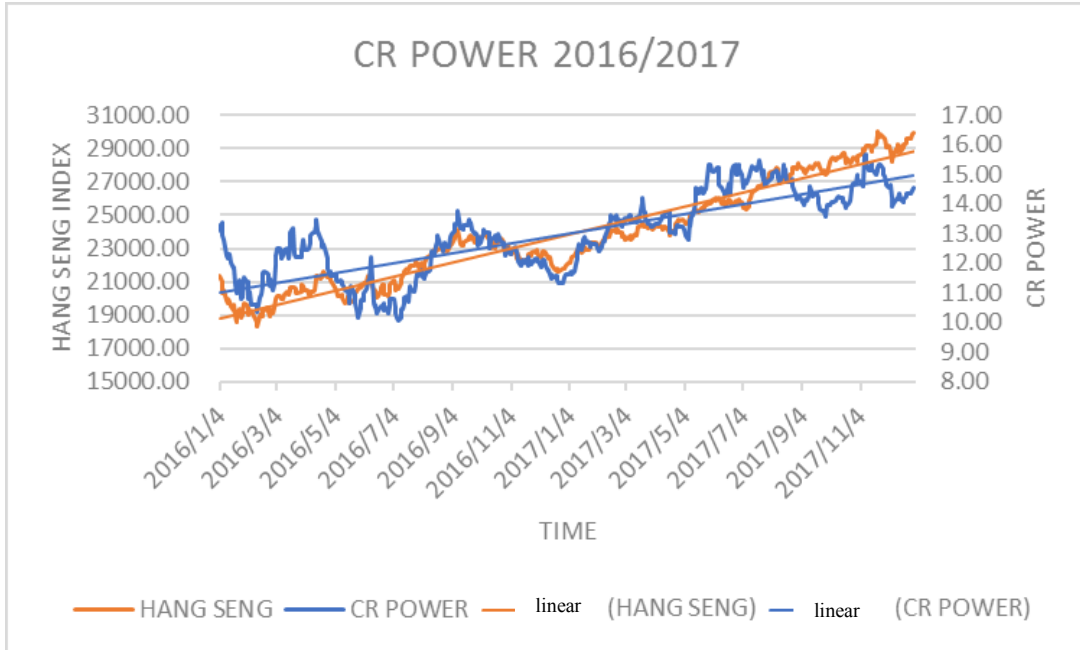
From the long-term trend, we can see these two line has high relationship, and we can see in the last 5 years, the market is volatility. From 1st Jan 2013 to half of year 2015, we can see the market keep stable, the Hang Seng Index fluctuate between 20000 to 27000, and among these days, the highest index reached at 28133 at 4th May 2015, and after that, the whole market went down.

Comparing with the Hang Seng Index, The CR Power has the similar trend at the first period, we can see the stock price show a fluctuate, but also is a upward trend, the highest stock price is 20.28 at 27th Aug 2014.

And we can see after Feb 2015, the market and stock price went down as well. The Hang Seng Index from 28133 to 18319 at 12th Feb 2016, and at the same time, the CR Power went down from 20.28 to 10.33 HKD per share at 12th Feb 2016. After this day we can see the market and this stock went up in the following days.

And then we focus the CR Power last two years' performance, we can see the price is increased in generally, and it has strong relationship with the market index. And we make a linear model for the last year trend, the figure is shown below:

Figure 3.4 CR Power stock price and expected linear



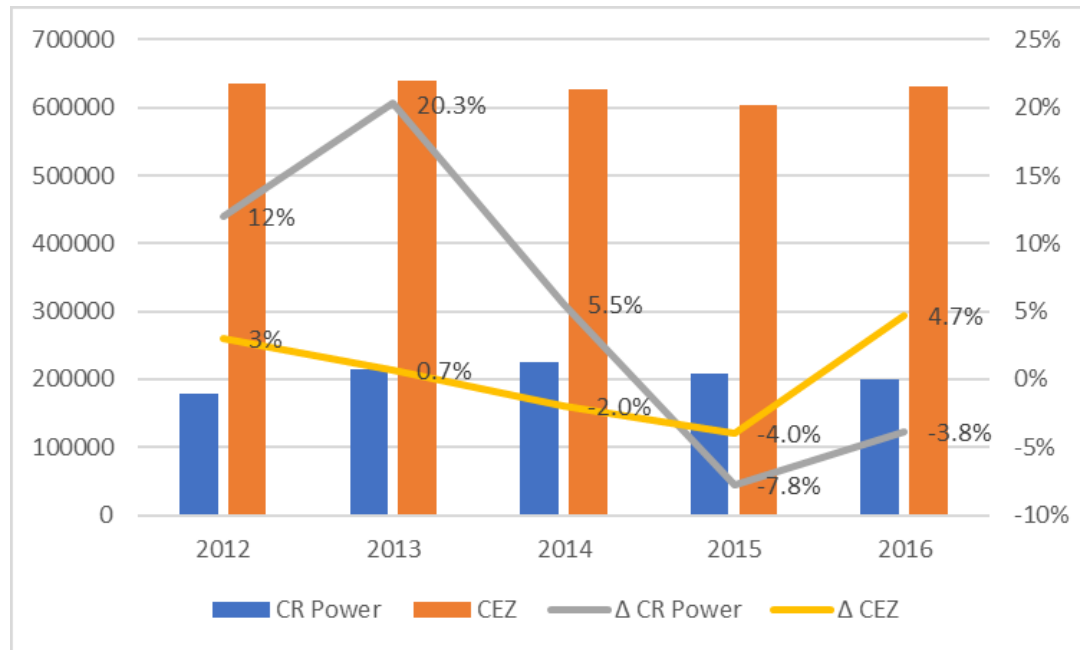
Source: Data base and linear model calculation.

From this figure, we can see in the last two years, the whole market shown a great revive trend, the Hang Seng index increase from 19000 to 30000, and the stock price also increased from 10 HKD per share to near 16 HKD per share. So we can have a positive expected for the future trend.

3.3.3 Financial Characteristics of Two Company

In this part, we will compare two company financial characteristics by the methods we mentioned in the chapter two, and to demonstrate the results by the chart or table.

Figure 3.5 Total business revenue of CEZ and CR Power and year on year change.



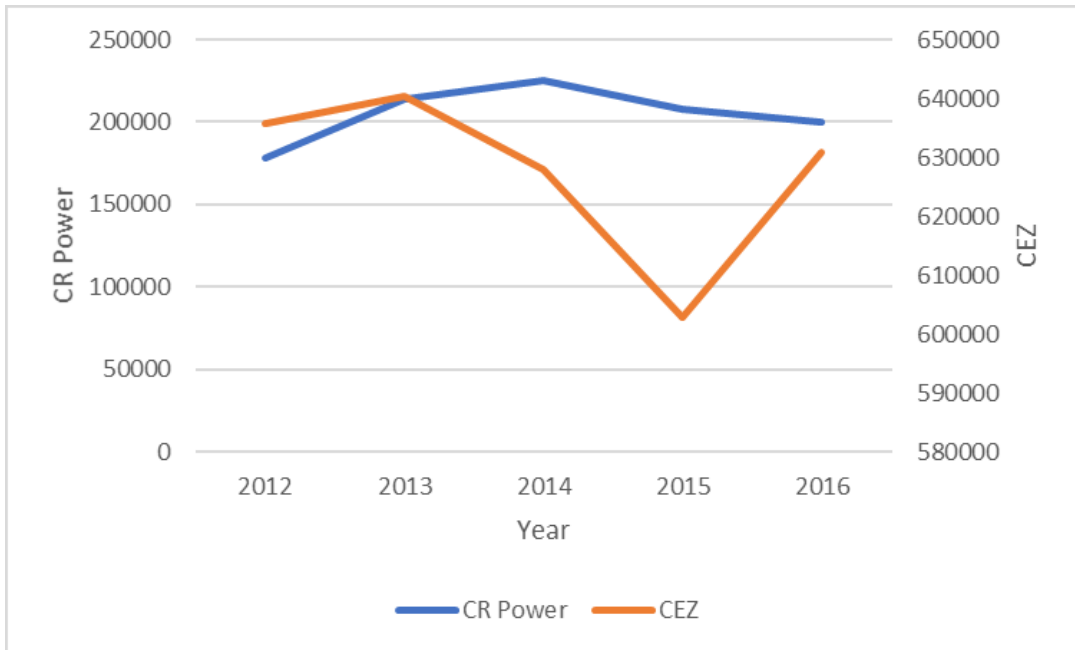
Source: Our calculation based on the data base.

From these two lines, we can see the two companies' revenues has shown fluctuated during these years, we can clearly see in 2013, the revenues of CR Power is dramatic increased and reached 20.3%, compared with CR Power strong increased, CEZ has a slight increased, just 0.7% at that year.

And then in the next three years, we can see both companies has different down in the revenues, until 2015, the CR Power decreased 7.8% at that year, and CEZ has 4% decreased.

At 2016, the CR Power still decreased, but not too much compared with CEZ, reached 3.8%, and CEZ is increased.

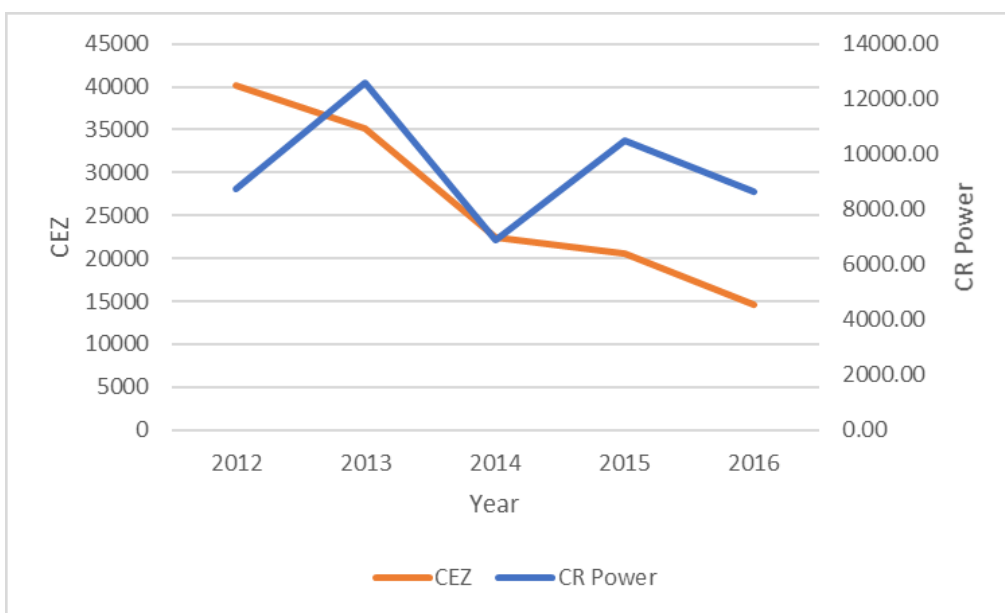
Figure 3.6 Total Assets of CR Power.



Source: Our calculation based on data base.

From these two lines we can see, in the recently years, the two companies' assets have a drop though a various degrees, the CEZ got a bottom at 2015 but in the 2016, it has a dramatic increased, but in CR Power, we can see from 2014, the company has decreased, and compare to 2014, CR Power decreased 11.31% in 2016.

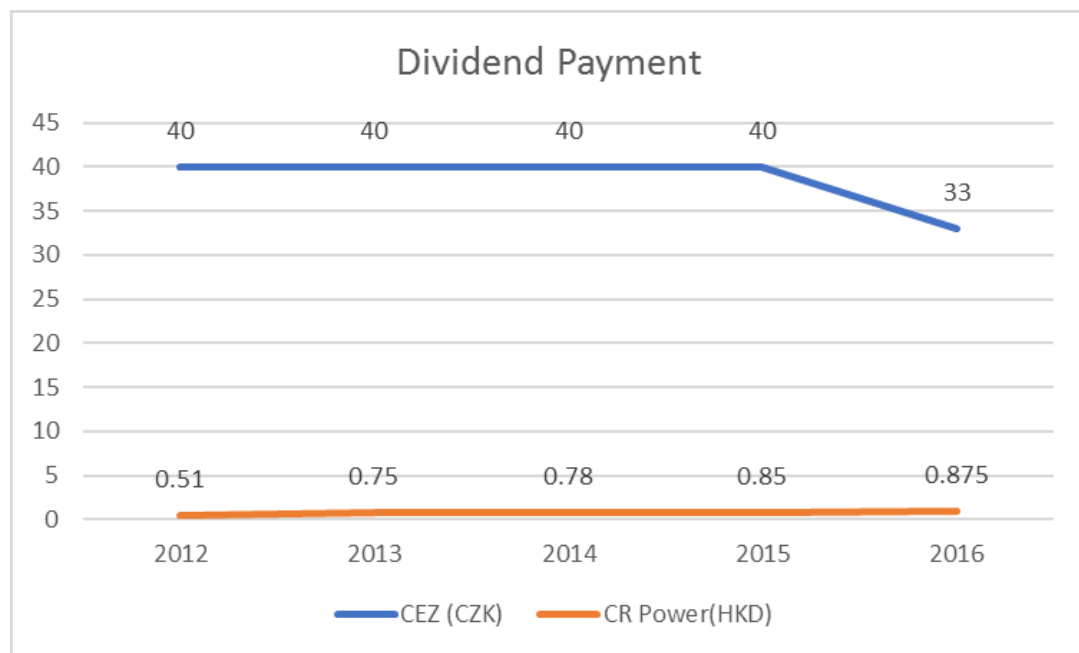
Figure 3.7 Net income of CEZ company



Source: Our calculation based on data base.

From these two lines, we can see these two companies' net income show a sharp decreased in the last five years, some reasons are the coal price fluctuates and electricity Change, we can see the CEZ net income decreased from 40153 million CZK to 14575 million CZK at 2016, and in CR Power, the peek income appeared at 2013, it reached 12500 million HKD, but until 2014 it got a sharp decreased to 7000 million HKD.

Figure 3.8 Dividend payment of two companies.



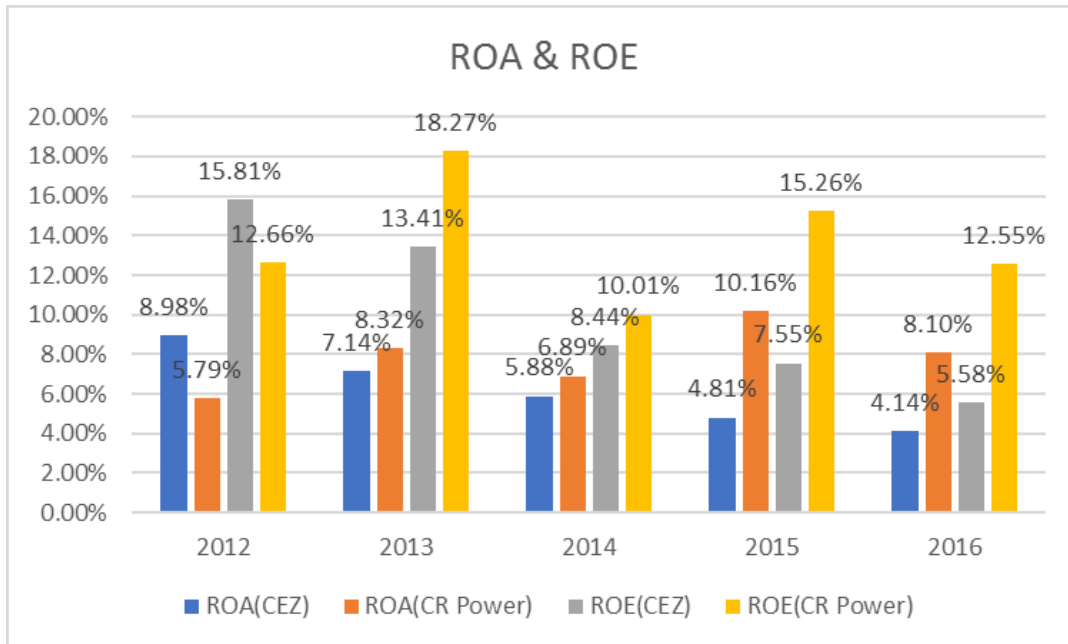
Source: Our calculation based on data base.

From this figure, we can see in the last five years, the CEZ keep the high dividend payment policy, from 2012 to 2015, CEZ give 40 CZK dividend per share, until 2016, it decreased to 33 CZK, one hand is caused by the net income decreased in the recent years, another reason is company need more cash to support the future development.

For the CR Power, we can see the dividend payment is increased, from 2012, is 0.51 HKD per share to 2016, 0.875 HKD per share, even though the net income show negative performance recent years, but the whole company keep high dividend policy always.

And we back to see the return on assets (ROA) and return on equity (ROE) ratio, it shows the company's ability to generate the profit by the company's overall assets and the securities which it is issued in the market.

Figure 3.9 ROA and ROE ratios of two companies.



Source: Our calculation based on data base.

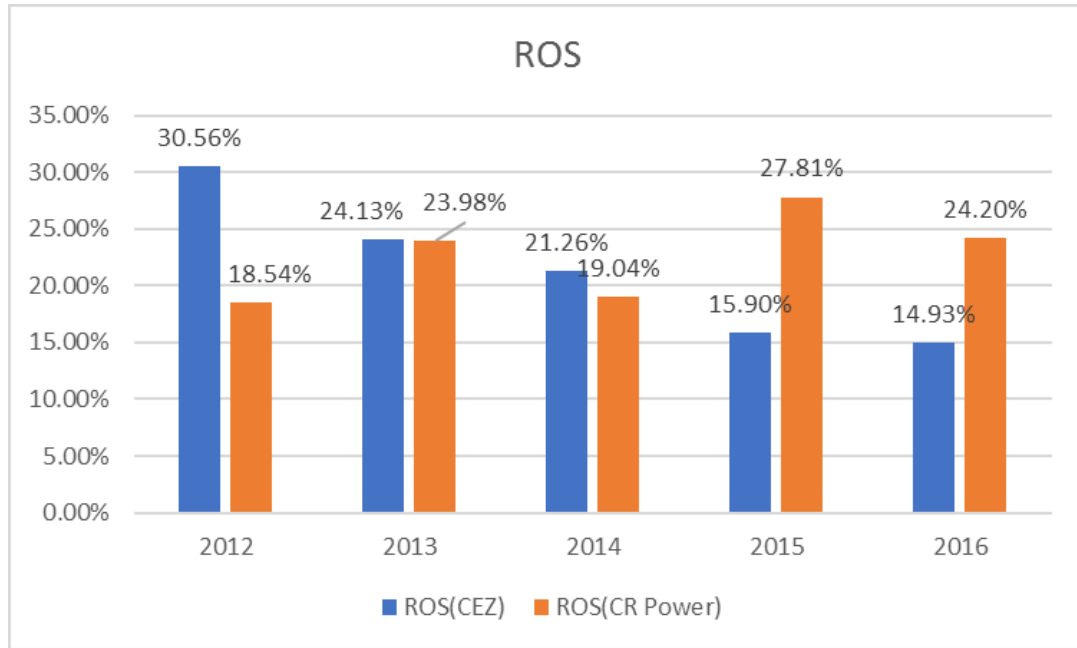
From this chart, we can see the overall trend of return on assets (ROA) and return on equity (ROE) ratio change in the last five years, and when we see the ROA of CEZ in the recent years, it is clear show that the return on assets appear a down trend from 8,98% to 4.41% at 2016, and also at the 2016, it get the bottom in the history. It is very similar condition to CEZ's ROE (Return on equity), we can see the ROE has a sharp decreased in the last five years, from 15.81% to 5.58%, it get the bottom at the same year, one important reason is the revenues decreased in the 2016.

Comparing to the CEZ's performance in the last five years, we can see the CR power does better in the last five years, the return on equity remains stable in this period, it nearly fluctuate over 12%, and it get the peek at 2013, reach at 18.27%, also it thanks to the strong performance of income that year, and at 2016 it back at 12.55%. And for the return on assets, we can see the ROA is increased at 2016 compare to the staring year, and in this five years, the ROA is keep stable, it reached the highest point at 2015, reach 10.16%.

To sum up the above analysis, we can see not only return on assets but also return on equity, the CR power show better performance in the last five years.

When we concentrate on the return on sales, this ratio shows the company's operational efficiency, tell us how much profit it generates per dollar of sales.

Figure 3.10 Return on sales of two companies.

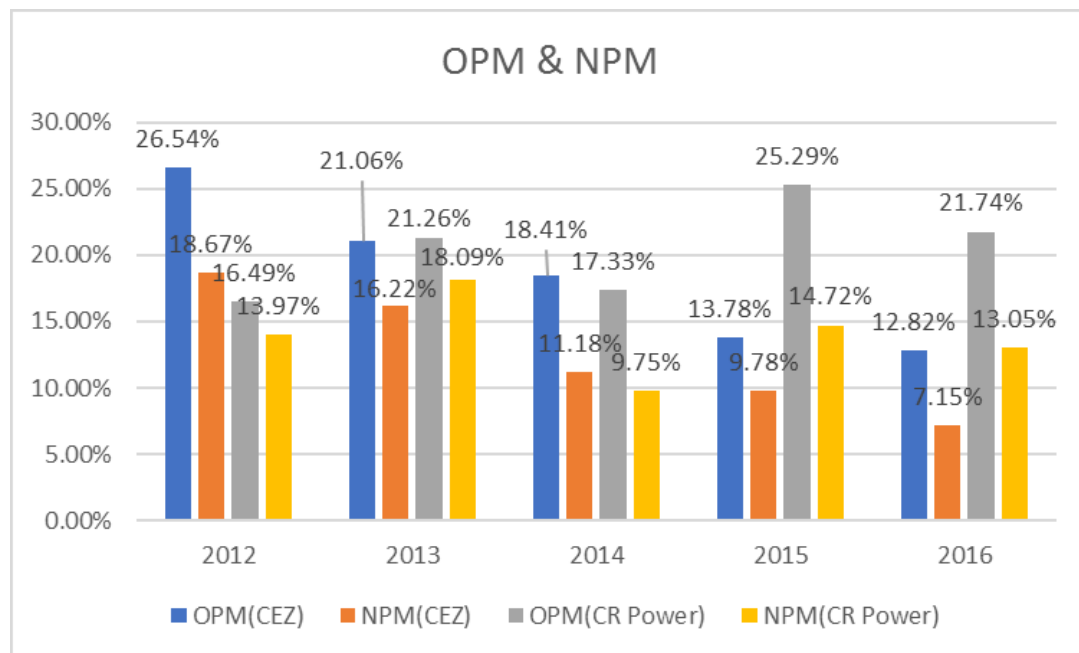


Source: Our calculation based on data base.

From this column chart, we can see the return on sales ratio of CEZ is decreased in the last five years, from 30.56% to 14.93% at 2016, and on the contrast, we can see the CR power's return on sales, it seek improvement in stability in the last five years, from 2012 to 2016, it increased from 18.54% to 24.20%, and it got the peak at 2015, it reached 27.81%. Two reasons lead to this situation, first is compare to Europe coal material, China can have cheaper material price, and second Europe have high rules of the scrap material, it has higher environmental management rules, so it will cut down the profit per unit currency earn in the real business.

When we see the operating profit margin and net profit margin, the operating profit margin indicates the percentage of revenue available to cover operating and other expenditures, and the net profit margin measures how profitable a company's production and sales are after all the expenses (operating, interest and taxes) have been deducted.

Figure 3.11 Operating profit margin and Net profit margin



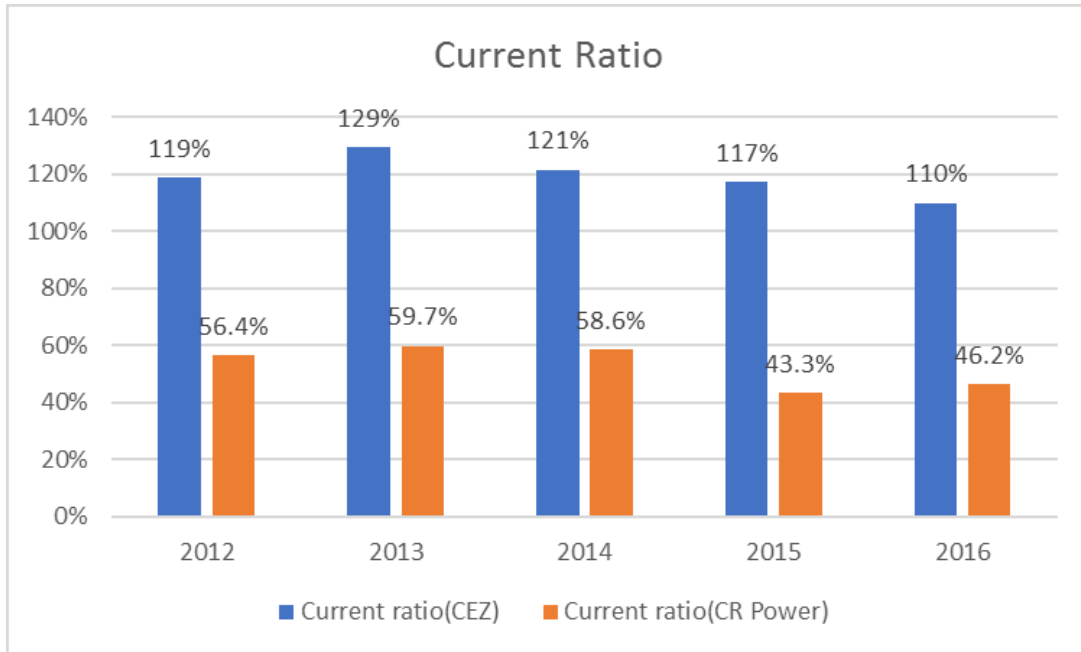
Source: Our calculation based on data base.

As is shown in the column chart, we can see the operating profit margin of CEZ is decreased year by year, from 26.34% to 12.82% in the five years, and reached the bottom at 2016, and compare to the 2012 the operating profit margin nearly decreased 50%, and same conditions to the net profit margin of CEZ, in the five years, we can see the ratio decreased from 18.67% to 7.15%.

In the contrast, we look the CR Power performance in the past five years, we can see the operating profit margin show the stable with a slight improvement in the five years, from the 2012 to 2016, it increased from 16.49% to 21.74%, compare to the starting year, we can see the ratio increased 31% in the five years, however the net profit margin seems keep stable in the five years, fluctuate at 13%, and reached the peak at 2013, is 18.09%, get the bottom at 2014, not reach 10%.

When we want to compare the liquidity ratio, we will see the current ratio of these two companies, it measures the company's ability to pay its current or short term liabilities.

Figure 3.12 Current ratio of two companies.



Source: Our calculation based on data base.

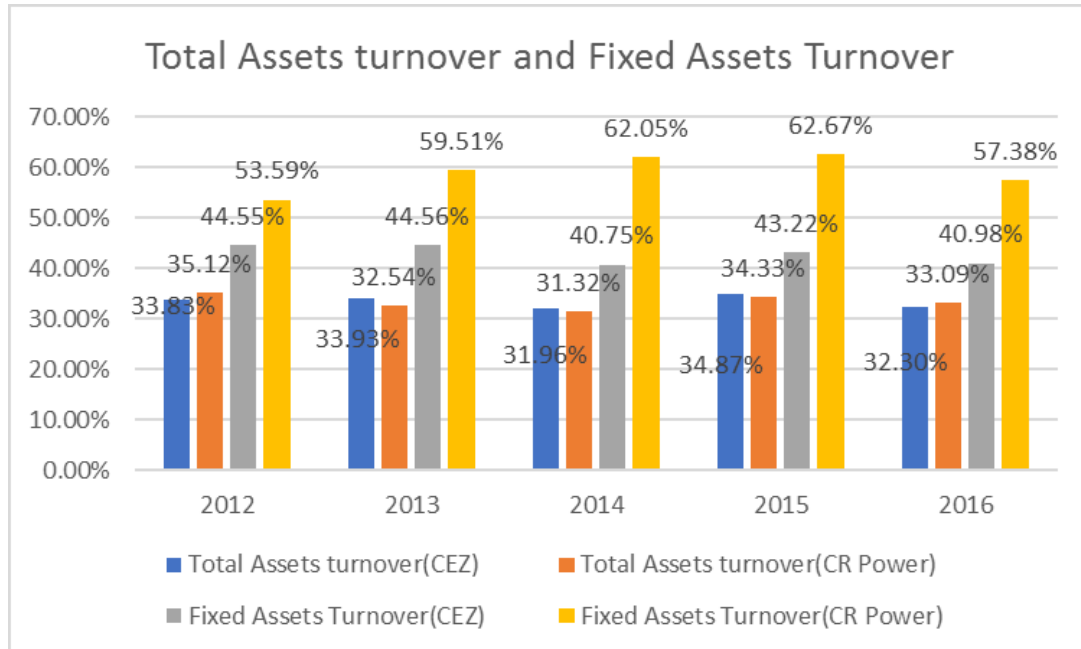
As the column chart shows, we can see the structure difference of this two company, the CEZ current ratio is higher than 100%, however the CR Power current ratio is below the 100%.

A higher current ratio means the company has a higher level of liquidity, we can see the CEZ always keep high liquidity, to cover the current liabilities, when we take the industry to account, the electricity company not only has enough cash and current assets, but also has the equipment, these non-current assets, so the CEZ does better in liquidity.

When we look the CR Power, the current ratio keep stable in the last five years, and get the bottom at 2015, is 43.3%. Last but not least, the current ratio does not reflect the structure of current assets and short-term liabilities.

When we think of the activity ratios, it shows the assets utilization ratios or operating efficiency ratios. It measures how well a company manages various activities and particularly how efficiently it manages its various assets.

Figure 3.13 Total Assets turnover and Fixed Assets Turnover of two companies.



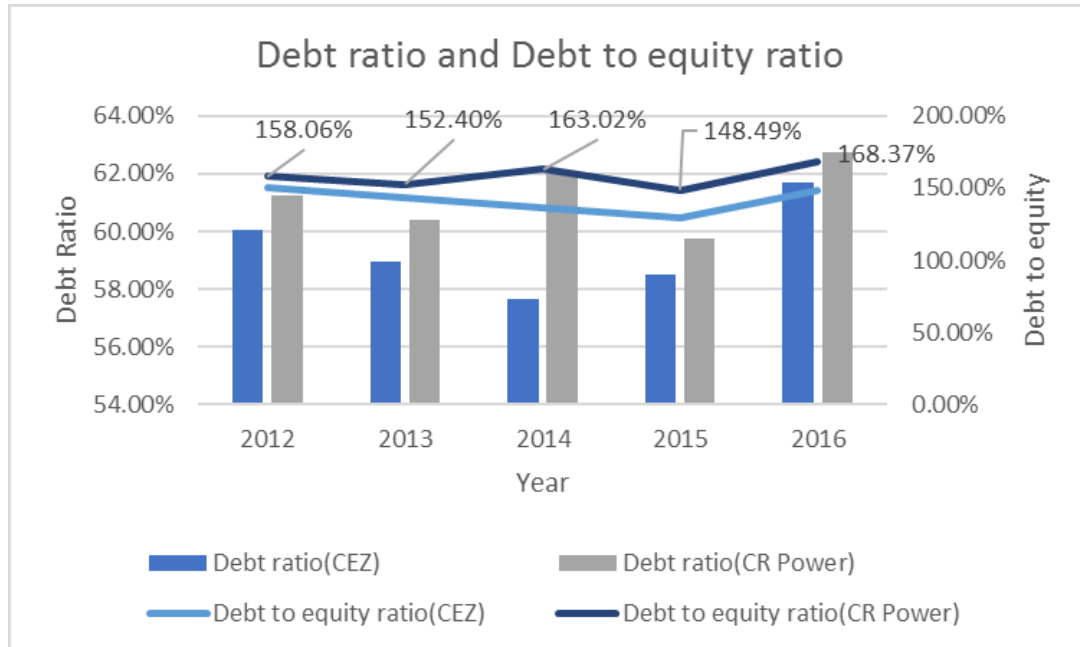
Source: Our calculation based on data base.

From this column chart, we can see the total assets turnover of two companies nearly keep similar percentage in the last five years, the total assets turnover of CEZ is keep over 30% in the last 5 years, and get the bottom at 2014, is 31.96%, it is very similar, the total assets turnover of CR Power is keep over 30% in the last five years, we can see the ratio get the bottom at 2014, is 31.32%, a slight difference of CEZ, and get the peek at the starting year, is 35.12%.

Cause these two companies are electricity companies, has high level of fixed assets, so we take the fixed assets turnover into account, we can see the fixed assets turnover of CEZ is fluctuate at 40% in the last five years, but compare to the starting year, the ratio is decreased 8% at 2016. However, the fixed assets turnover of CR Power is keep higher level at these period, it always above 50%, and get the peek at 2015, it reached 62.67% and the bottom is the starting year, is 53.59%.

Another important financial characteristic is leverage ratio or solvency ratio. So here we will analyze these two companies' leverage ratio.

Figure 3.14 Debt ratio and Debt to equity ratio of two company



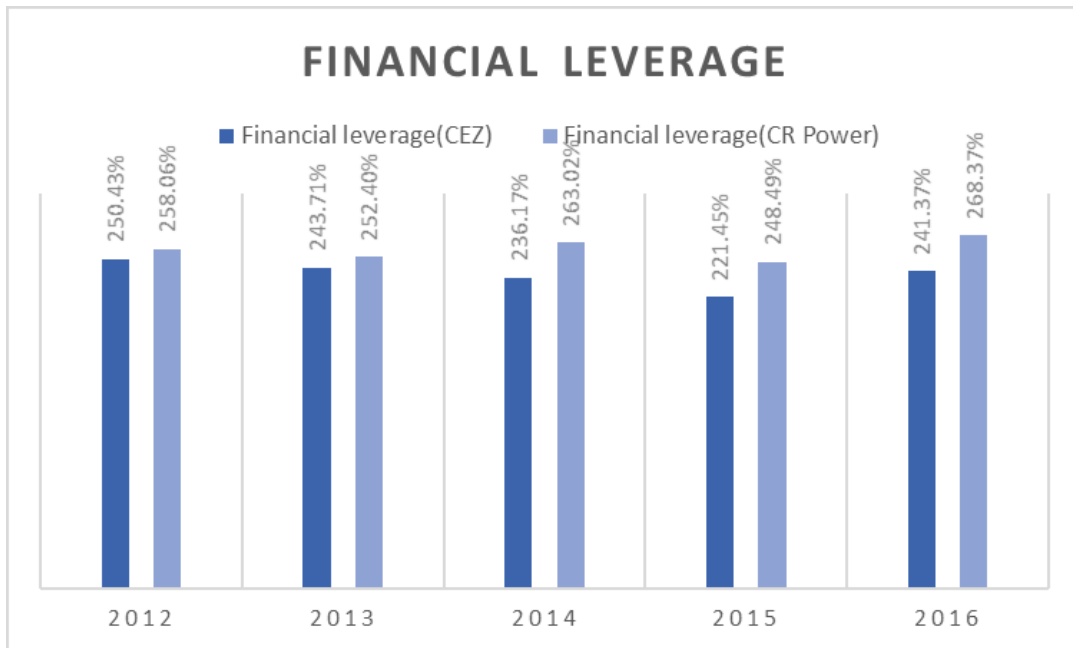
Source: Our calculation based on data base.

As this mixed chart show, we can see the debt ratio of two companies seems similar in the last five years, and debt ratio focus on the balance sheet and measure the amount of debt capital relative to equity capital. Compare to CR Power, CEZ debt ratio is more healthy, it always keep low and stable in these period, we can see the debt ratio get bottom at 2014, it not reach 58%, and the highest point at 2016, is not reach 62%, and CR Power's debt ratio see a increased year by year, we can see the ratio get the peek at 2016, above 62%, and the bottom is at 2015, is 59.76% but still higher than the CEZ debt ratio.

The debt to equity ratio measures the amount of debt capital relative to equity capital. We can see the CR Power debt to equity ratio is higher than CEZ in the five years, it means it has weaker solvency and vice versa, the peek point CR Power got at 2016, is 168.37%, and the bottom is 148.49% at 2015, in the contrast, we can see the CEZ keep stable in this period, the highest point is 150.43% at the starting year, and keep stable with a slight decline in these five years.

When we see the financial leverage, the ratio measures the amount of assets supported for each one money unit of equity. The higher the financial ratio leverage, the more levered the company the company is in the sense of using debt and other liabilities to finance assets.

Figure 3.15 Financial leverage of two selected companies.



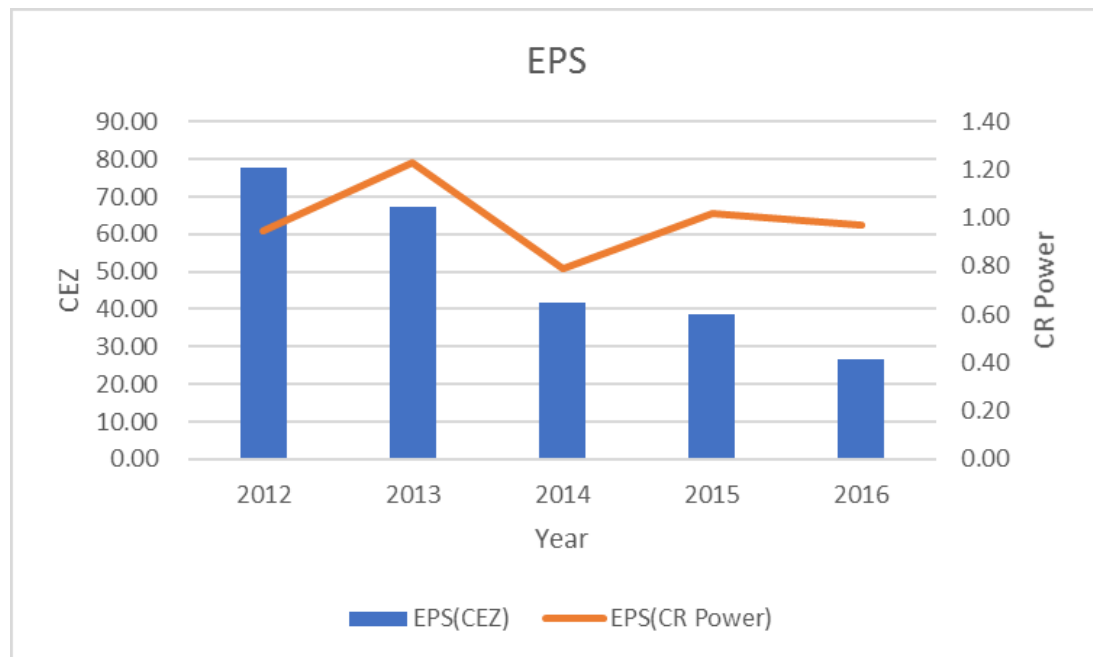
Source: Our calculation based on data base.

This is the column chart showing that the financial leverage of two companies is above 200% in the last five years, and compare with the CEZ, the CR Power financial leverage is higher, but it is very good for these two companies to keep the financial leverage stable in these years.

The financial leverage of CEZ get the peek at 2012, is 250.43%, and after that year, it declined slowly and reach the bottom at 2015, is 221.45%. In the contrast, the CR Power keep stable and high financial leverage in the past five years, we can see the peek appears at 2016, it reached the 268.3%, and the bottom is at the 2015, is 248.49%.

Market based ratio is also very important in the financial analysis, we can see the earning per share is the amount of earning attributed to each common share outstanding. But the earning per share provides neither adequate information for the comparison of one company with another nor information on how high the dividend per share is.

Figure 3.16 Earning per share (EPS) of two companies.



Source: Our calculation based on data base.

As can be seen from this chart, the earning per share of CEZ is show a sharply decreased in the last five years, it decreased from 77.6 CZK to 26.7 CZK per share but it still very high in Czech market, compare to CEZ we can see the CR Power, the highest point appear at 2013, is 1.23 HKD, but after that, it decreased to 0.97 at 2016, the bottom appears at 2014, is 0.79 HKD.

In the quantities, the common stock outstanding of CR Power is more than CEZ issued in the market, so it is one main reason lead to the low earning per share of CR Power.

3.4 Quick test of Two companies

The chart below shows the results of two companies based on the quick test.

Table 3.1 Quick test results of CEZ.

Quick test					
Year	2012	2013	2014	2015	2016
R1	0.4	0.39	0.41	0.42	0.44
	4	4	4	4	4
R2	2.11	2.2	2.08	2.1	1.96
	4	4	4	4	4
R3	10.77%	9.25%	7.16%	5.83%	4.71%
	2	2	1	1	1
R4	0.35	0.36	0.39	0.4	0.37
	4	4	4	4	4
Average	3.5	3.5	3.25	3.25	3.25
Rating	very good	very good	very good	very good	very good

Source: Our calculation.

Table 3.2 Quick test results of CR Power.

Quick test					
Year	2012	2013	2014	2015	2016
R1	0.39	0.40	0.38	0.40	0.37
	4	4	4	4	4
R2	5.7	4.8	4.7	3.5	4.4
	2	3	3	3	3
R3	5.79%	6.92%	5.43%	8.68%	7.19%
	1	1	1	2	1
R4	0.31	0.39	0.42	0.49	0.43
	4	4	4	4	4
Average	2.75	3	3	3.25	3
Rating	good	very good	very good	very good	very good

Source: Our calculation.

From the quick test result we can clearly see that, the CEZ is better than CR Power, especially in R3 rating, the CR Power is lower than the CEZ in the last five years.

4. Evaluation and comparison of the Effects of value Creation for the Selected Companies

In this chapter we will calculate the enterprise value of two selected company, and then we will use decomposition to analyze the value create parameters, how to lead this result, which item they perform better.

4.1 Pyramidal decomposition of valuation creation (Continue value)

From previous calculation, we can see the terminal value or continue value has a large part of the whole entity, so if we want to compare the size of two companies is unrealized, we could use the pyramidal decomposition to analyze the results, before we do it, we should estimate the parameters in the formula (2.16) and (2.17)

4.1.1 Estimation of EBIT

For the EBIT estimate itself, the underlying data is for the individual forecast years estimated sales and development of the operating profit margin, also we need to estimate the expense, from the table 2.3, we know how to calculate the EBIT:

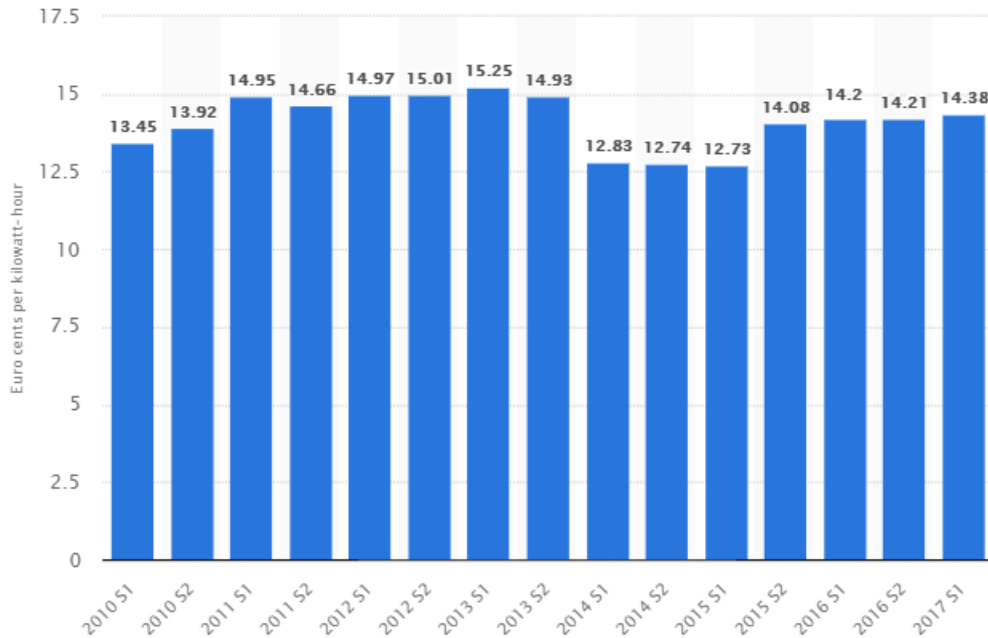
$$\text{EBIT} = \text{Revenue} - \text{Operating expense}$$

4.1.1.1 EBIT estimate of CEZ

Before we estimate the EBIT, we need to make a detailed financial plan for the future (here we choose five years), now we will consider the related information to make the financial plan.

First, we think the electricity is a very important factor. Electricity prices in the Central European market were also significantly affected by developments in 2018 commodity prices that determine the variable cost of electricity generation. The most significant impact on the price electricity has the price of coal and the price of emission allowances, and to a limited extent also the gas price. Prices are also affected by the continued growth of installed capacity of renewable sources.

Chart 4.1 Electricity prices for households in Czech Republic (semi-annually) in Eurocents per Kilowatt-hour.



Source: www.statista.com

From the last 7 years electricity price we can see the energy price is fluctuated with the 14, and get the bottom at 2014, nearly to 12.83.

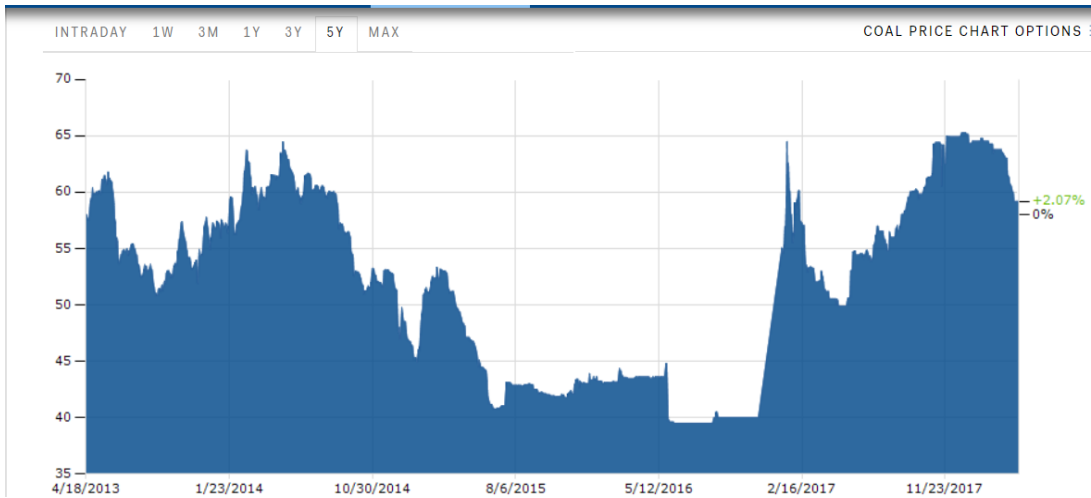
Then we can make an estimation of the electricity price of Czech Republic in the next years.

2017	➔	28.9 Kwh
2018	➔	29.0 Kwh
2019	➔	29.2 Kwh
2020	➔	28.8 Kwh
2021	➔	28.9 Kwh

Another important factor influenced the electricity price is the coal price in European union, if the coal price increased, there is no doubt that the costs of the electricity will increased too.

The following chart show the coal price in the last five years.

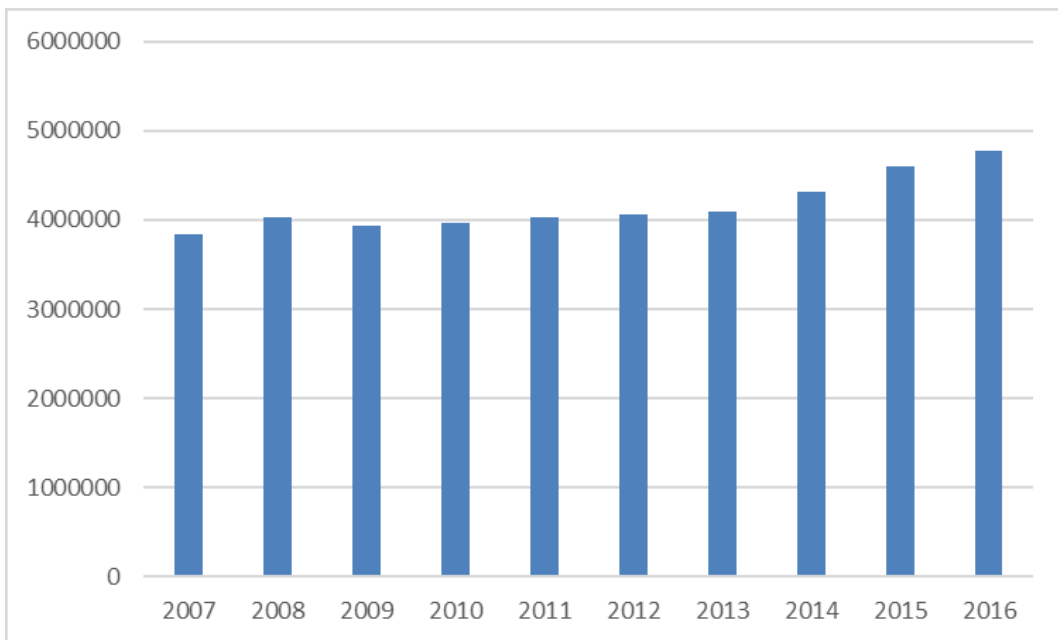
Chart 4.2 Coal price in Global.



Source: www.statista.com

Then we choose the GDP as other factors affects the Revenues, the chart below shows the history GDP of Czech Republic.

Chart 4.3 History GDP of the Czech Republic (mil CZK)



Source: Trading Economic

Then we make a regress model between the Revenues and the three factors, the model is:

$$\ln(\text{Revenue}) = a \cdot \ln(X) + b$$

And then we use the statistic to test the three indicators (GDP, COAL PRICE, ELECTRICITY PRICE), but we find the R-square is so low and the P value is so great, the result we show in the below (just show the GDP, the others are similar)

Chart 4.4 Regression statistic between the GDP and Revenue.

<i>Regression statistics</i>						
Multiple R	0.407879					
R Square	0.166365					
Adjusted R Squ	0.062161					
Standard error	0.064774					
Observed value	10					
Analysis						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression Ana	1	0.006698	0.006698	1.596528	0.241972	
Residuals	8	0.033565	0.004196			
Total	9	0.040264				
	<i>Coefficient</i>	<i>sd</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	6.329882	4.653879	1.36013	0.210875	-4.40198	17.06175
ln(GDP)	0.385859	0.30538	1.263538	0.241972	-0.31835	1.090066

Source: Our calculation

Then we can make a financial plan for sales according to the previous information (CAGR), all in all, the sales in the future will increased slightly.

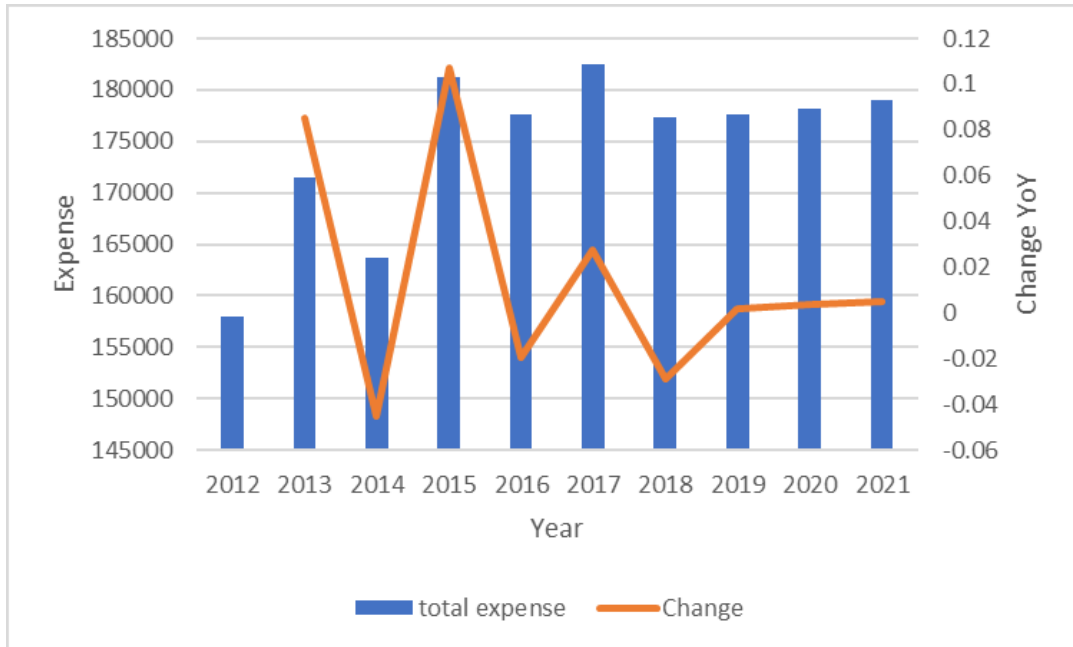
Table 4.1 Financial plan of revenue

	2016	2017	2018	2019	2020	2021
Sales of electricity	174,944	177,835	180,775	183,762	186,800	189,887
Gain and losses from electricity	1,735	1,680	1,627	1,576	1,526	1,478
Sales of gas, coal	27,065	27,336	27,609	27,885	28,164	28,446
Total revenues	203,744	206,851	210,011	213,223	216,490	219,810

Source: Our calculation.

The total expense was estimated based on linear regression analysis, which based on the coal price changes, emission price change, then we will adjust the results.

Chart 4.5 Expense expected for next five years.



Source: Our calculation.

Then we will plan the depreciation and amortization, we account it as percentage of the sales, and find an average percentage.

Table 4.2 Average depreciation and amortization rate from 2012 to 2016

	2012	2013	2014	2015	2016	Average
Sales	215095	217273	200657	210167	203744	
Depreciation & Amortization:	34391	41864	40721	40923	36655	
% sales	16.0%	19.3%	20.3%	19.5%	18.0%	19.3%

Source: Our calculation

After we do all the previous expected, we can make a financial plan of the CEZ, the results show below:

Table 4.3 EBIT ESTIMATION OF CEZ

Million CZK	Forecast period				
	2017	2018	2019	2020	2021
Sales	206,851	210,011	213,223	216,490	219,810
<i>growth</i>	1.0%	1.0%	1.0%	1.0%	1.0%
Total costs	- 132,385	- 134,407	- 136,463	- 138,553	- 140,679
EBITDA	74,466	75,604	76,760	77,936	79,132
Dep& Amo	-39831	-40440	-41058	-41687	-42327
EBIT	34,635	35,164	35,702	36,249	36,805

Source: Our calculation

4.1.1.2 EBIT of CR-Power

When we consider the electricity price, we must consider two components, first one is costs of material, other is market. And in the start of 2018, Hong Kong's two power companies announced that electricity bills are to rise by 1.9 per cent this year, HK Electric amid a government veto on its proposed double-digit increase to a key component of its tariff.

And in Hong Kong, the price of electricity is similar to tax, use the step wise quotation, if you use different quantity of electricity, you must pay different price for higher parts. So it is difficult to predict the price of electricity per unit. But we can focus on the electricity consumption per year.

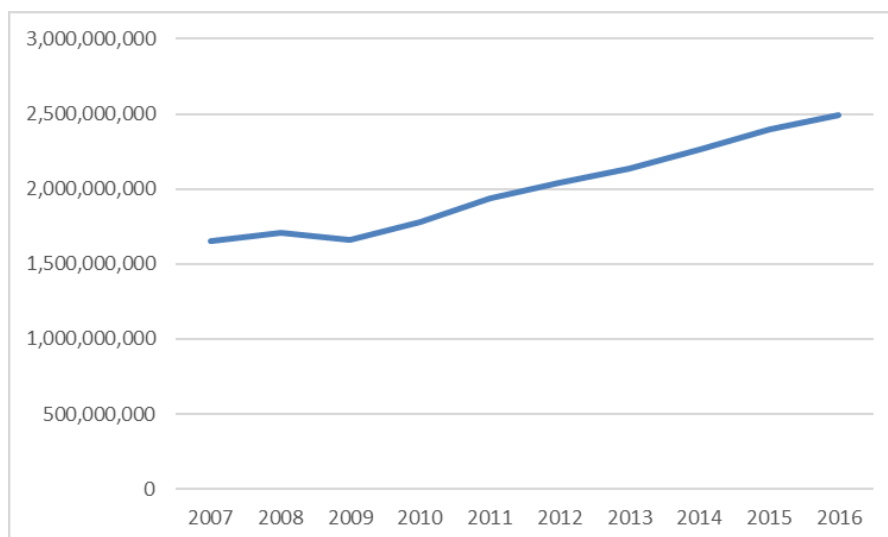
Chart 4.6 Electricity consumption in Hong Kong.

Year	Month	Domestic	Commercial	Industrial	Street lighting	Exports to the mainland of China	All groups
2015		42 368	103 893	11 436	386	4 273	162 356
2016		43 120	103 739	11 252	390	4 338	162 838
2017		42 127	103 893	11 196	389	4 828	162 432
2016	Dec	2 131	7 681	875	35	274	10 996
2017	Jan	2 455	7 211	843	34	209	10 751
	Feb	2 205	6 555	764	36	184	9 743
	Mar	2 531	7 492	861	33	234	11 150
	Apr	2 614	7 939	868	29	324	11 773
	May	3 128	9 336	1 021	32	335	13 853
	Jun	4 685	10 183	1 073	28	454	16 423
	Jul	4 847	10 447	1 024	31	616	16 965
	Aug	5 574	10 423	1 055	31	677	17 760
	Sep	5 244	9 953	1 031	31	612	16 871
	Oct	3 884	9 256	910	36	436	14 522
	Nov	2 731	7 665	840	34	252	11 522
	Dec	2 230	7 432	906	33	497	11 098
2018	Jan	2 592	7 503	821	38	306	11 260
	Feb	2 615	6 372	769	32	191	9 978

Source: Census and Statistic department

From this chart we can see that the consumption of electricity is stable in the last three years, so the electricity is the main factors influenced the revenues.

Chart 4.7 GDP OF HONG KONG.



Source: Census and Statistic department

Then we like the CEZ, we use the regression model:

$$\ln(\text{Revenue}) = a \cdot \ln(X) + b$$

After we calculate, we find the GDP has high relative with the Revenues than the electricity consumption, the results we show below:

Chart 4.8 regression statistic of the GDP and Revenue

<i>regression statistic</i>						
Multiple R	0.829141859					
R Square	0.687476222					
Adjusted R Square	0.64841075					
Standard error	0.296369992					
Observed values	10					
Analysis						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
regression analysis	1	1.545728	1.545728	17.59805	0.003017	
Residuals	8	0.702681	0.087835			
Total	9	2.248409				
	<i>Coefficients</i>	<i>sd</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-40.10483532	13.7763	-2.91115	0.019555	-71.873	-8.33664
ln(GDP)	2.69942226	0.643485	4.195003	0.003017	1.215543	4.1833017

Source: Our calculation

So we can get the formula:

$$\ln(\text{Revenue}) = 2.7 \cdot \ln(\text{GDP}) - 40.1$$

So we can get the future sales of the CR Power, the results show below:

Table 4.4 Revenue expected based on the regression model.

Year	forecast GDP	ln (forecast GDP)	forecast ln(revenue)	forecast revenue
2017	2,053,355,472	21.44274111	17.77817733	66,874,716
2018	2,065,675,605	21.44872318	17.79432547	67,543,463
2019	2,082,201,010	21.45669135	17.81583492	68,218,898
2020	2,103,023,020	21.46664168	17.84269507	68,901,087
2021	2,119,847,204	21.47460985	17.86420452	69,590,098

Source: Our calculation

Then we also need to get the ratio of depreciation and amortization, we account it as

percentage of the total sales:

Table 4.5 Depreciation and Amortization average percentage.

	2012	2013	2014	2015	2016	Average
Sales	62,435,520	69,581,526	70,680,628	71,435,875	66,212,590	
Dep & Amor	8937089	12018308	17459561	17135019	14228143	
%sales	14.31%	17.27%	24.70%	23.99%	21.49%	21.86%

Source: Our calculation

So we can get the financial plan for the CR Power.

Table 4.6 Financial plan for CR Power

In mil HKD	Forecast period				
	2017	2018	2019	2020	2021
Sales	66,874,716	67,543,463	68,218,898	68,901,087	69,590,098
Total costs	39,605,848	40,001,907	40,401,926	40,805,945	41,214,004
EBITDA	27,268,868	27,541,556	27,816,972	28,095,142	28,376,093
Depreciation & Amortization:	-14620395	-14766599	-14914265	-15063408	-15214042
EBIT	12,648,473	12,774,957	12,902,707	13,031,734	13,162,051

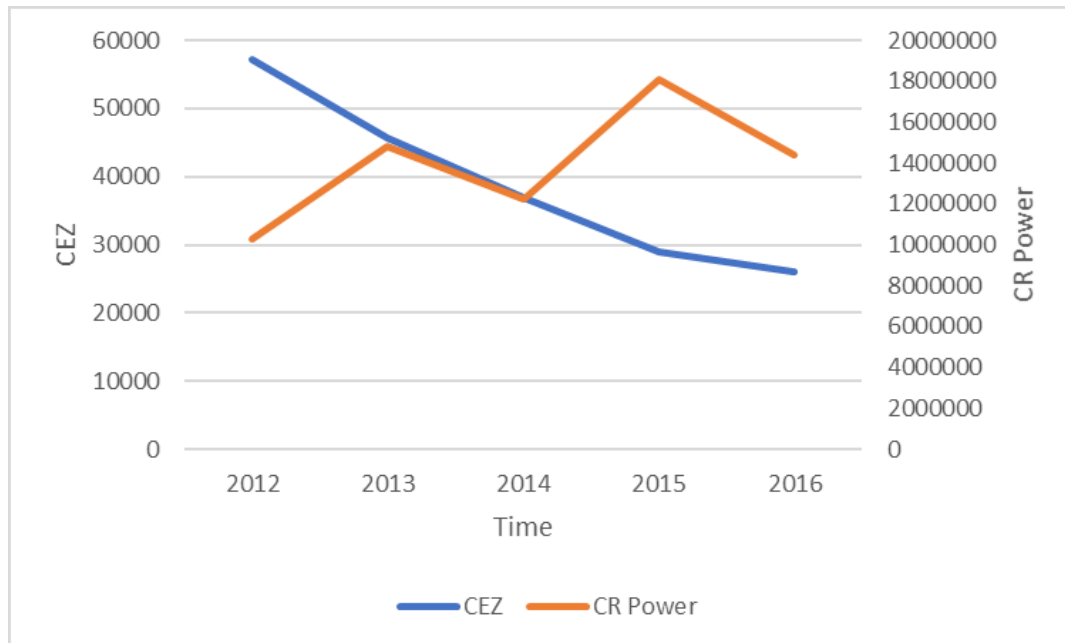
Source: Our calculation

For the depreciation and Amortization estimate, we find the main equipment has long life, so here we assumption the depreciation and Amortization will keep stable, and take a stable proportion of sales (Consider the more electricity we make, the

equipment will break sooner)

4.1.1.3 Comparison of EBIT of two companies

Chart 4.9 Comparison of EBIT of two companies.



Source: Our calculation

From this chart we can clearly see the EBIT of two companies is fluctuated in the last five years, the CEZ is keep the down trend in the last five years, on the other we can see the CR Power is keep uptrend but has big wave during this period.

4.1.2 WACC of two companies

WACC is also the main parameter in our key driver formula, and the formula we show below:

$$WACC = r_d \cdot (1 - t) \cdot \frac{D}{C} + r_e \cdot \frac{E}{C}$$

So if we want to get the WACC, we must to find the proportion of a company's capital structure and to find the cost of them. The cost of equity, we always use the stock market yield rate, and the cost of debt we use the industry indicator in Prof. Damodaran website.

4.1.2.1 WACC to CEZ

For WACC calculations, it is necessary to determine the total capital, but also the capital divided into equity and liabilities. One method is to use the market value of capital, which seems to be logical, but model-inappropriate, as market value is the very purpose of valuation. The calculation will not be based on any estimated optimal structure but on the real data accounting data for the last known year - 2016. The amount of invested capital and its historical development is shown in Table below.

Table 4.7 The debt and equity of CEZ.

	2017	2018	2019	2020	2021
Equity	253,893	262,766	265,851	272,155	261,360
Liabilities	381,930	377,628	362,019	352,584	389,124

Source: Our calculation

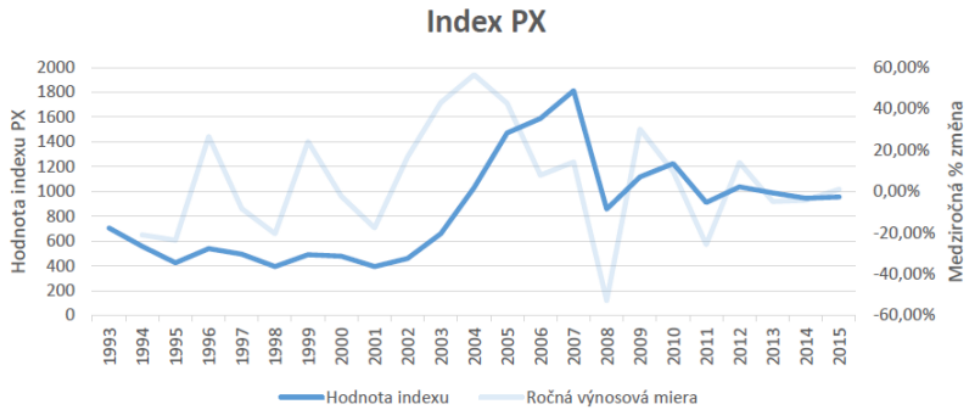
And we can calculate the proportion of the equity and capital the CEZ use in the history, and the cost of debt is 4.41%, we search on the market statistic, from the Damodaran website.

The cost of equity is determined by the CAPM. Model template can be found in the theoretical part of the thesis. The following are parameters we use in this model:

The risk-free rate of return is set at 1 %, which corresponds to the average yield on 10-year government bonds of the Czech Republic.

Market yield rate - calculated as the average annual yield of PX last 15 years. The value of this yield is then 7.69%. Stock development index PX is represented by the following graph:

Chart 4.10 Prague stock market yield rate.



Source: Home page of Prague stock exchange.

Then we find some inner industry companies to calculate the beta leverage, and the results showed below.

Table 4.8 Inner industry beta leverage.

Company	Comparable Companies Unlevered Beta						
	Levered Beta (1)	Market Value of Debt (2)	Market Value of Equity (3)	Debt/Equity	Equity/Total Assets	Marginal Tax Rate	unlevered Beta (4)
MGE ENERGY INC	1.02	426.61	2330	18.3%	84.5%	30%	0.90
ROMANDE ENERGIE HOLDING-REG	1.09	354.3	1867	19.0%	84.0%	8.5%	0.93
IREN SPA	0.9	500	1262	39.6%	71.6%	28%	0.70
EVERSOURCE ENERGY	1.12	13330	22669	58.8%	63.0%	30%	0.79
CONSOLIDATED EDISON INC	1.25	16569.6	20000	82.8%	54.7%	30%	0.79
Median	1.09			39.6%	71.6%		0.79
Mean	1.08			43.7%	71.6%		0.82

Source: www.bloomberg.com

The beta coefficient, we use the comparable method, we find five inner industry companies in the Europe and American, find the proportion of their capital structures and then we choose the mean value of the five companies as our beta coefficient.

For the risk free rate, we always choose the ten years government bond rate, we show in the below:

Chart 4.12 Czech Republic Government ten year bond rate



Source: Trading Economic

We calculate the average rate of the ten year bond rate is 1%.

Then we list the all indicator we need in the following table and to calculate the WACC of CEZ.

Table 4.8 Basic indicator of CEZ

CEZ	
Tax rate	19.00%
β^U	0.63
$R_m - R_f$	6.69%
β^L	1.08
R_f	1.00%
Re	8.29%

Source: Market data and our calculation.

Then we calculate the average of WACC in the expected period is equal to 5.83%.

4.1.2.2 WACC of CR-Power

For WACC calculations, it is similar to the producer of CEZ, we must to determine the total capital, but also the capital divided into equity and liabilities. The calculation will be based on our estimation of the balance sheet. The part of the expected balance sheet shown in Table below.

Table 4.9 Expected data of CR Power

	2017	2018	2019	2020	2021
Equity	68,896,001	84,732,881	85,792,368	83,739,343	74,564,863
Liabilities	108,893,717	129,132,022	139,855,713	124,346,536	125,546,606

Source: Our expectation

And we can calculate the proportion of the equity and capital the CR Power use the expected balance sheet, and the cost of debt is 6.08%, we search on the market statistic, from the Hong Kong market for the electricity industry.

Then we will select five inner industry power company to compare with CR Power, in order to find the close beta coefficient.

Table 4.10 Comparable company beta coefficient.

Company	Comparable Companies Unlevered Beta						
	Levered Beta (1)	Market Value of Debt (2)	Market Value of Equity (3)	Debt/Equity	Equity/Total Assets	Marginal Tax Rate	unlevered Beta (4)
Huaneng Power International Inc	1.66	28.9	83	34.8%	74.2%	25%	1.32
Datang	1.65	31	89	34.8%	74.2%	25.0%	1.31
HUA DIAN	1.67	24	54	44.1%	69.4%	25%	1.25
GD Power	1.66	26	57	45.8%	68.6%	25%	1.24
SDIC	1.64	19	46	41.3%	70.8%	25%	1.25
Median	1.66			41.3%	70.8%		1.25
Mean	1.66			40.2%	71.4%		1.27

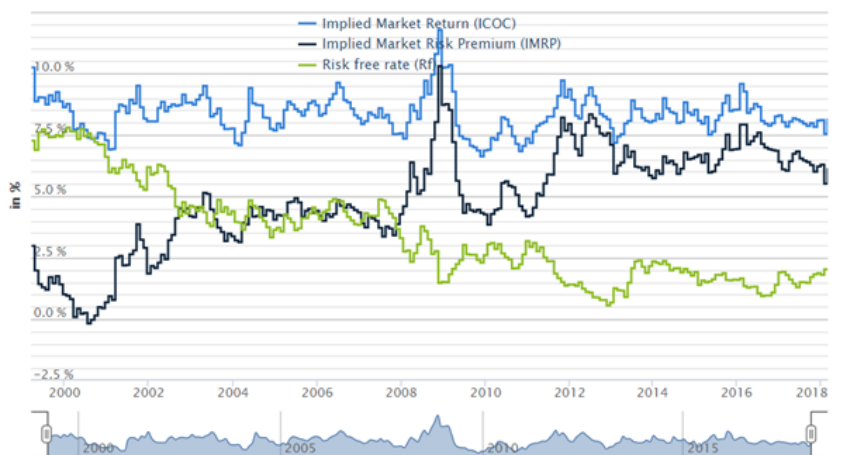
Source: Bloomberg

The cost of equity is determined by the CAPM. Model template can be found in the theoretical part of the thesis. The following are parameters we use in this model:

The risk-free rate of return is set at 3.50%, which corresponds to the yield on 10-year government bonds of the HONG KONG, China.

Market yield rate - calculated as the average annual yield of Hang Seng last 15 years. The value of this yield is then 7.69%. Stock development index PX is represented by the following graph:

Chart 4.13 Market return rate of Hang Seng Index.



Source: HONG KONG statistic.

From this table we can calculate the average market risk premium is 6.25%.

Table 4.11 Basic indicator of CR Power

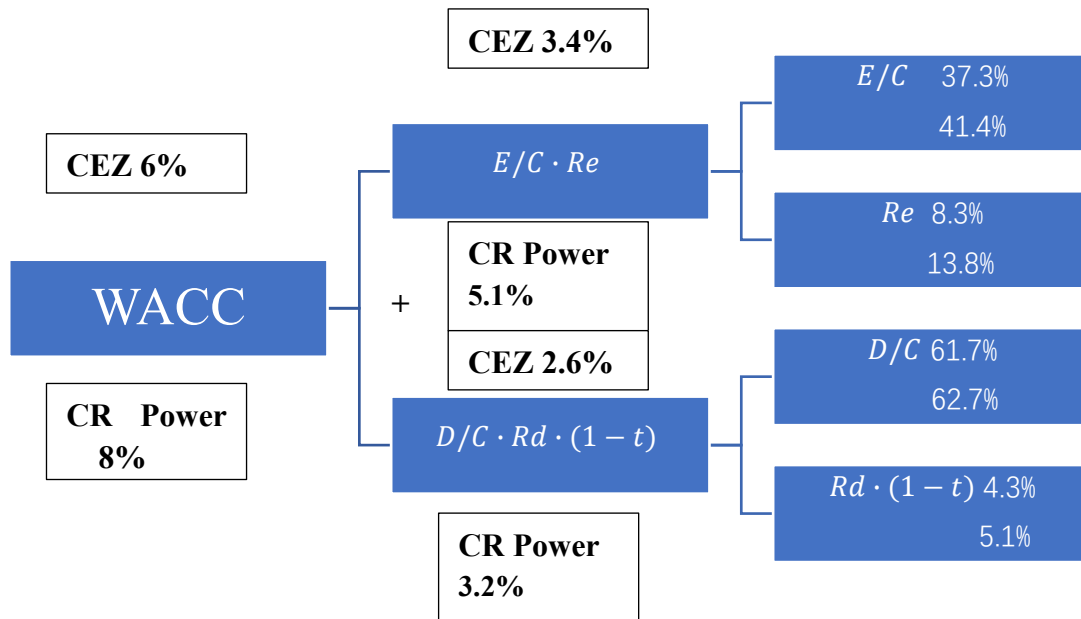
CR Power	
<i>Tax rate</i>	16.50%
β^U	1.27
$R_m - R_f$	6.25%
β^L	1.65
R_f	3.50%
R_e	13.813%

Source: Market data and our calculation.

We put the parameters in the formula and get the WACC is 8%.

4.1.2.3 Comparison of WACC of two companies

Chart 4.13 comparison of two companies' WACC



Source: Our calculation

From this chart we can see the WACC of CEZ is 6%, lower than the CR Power, cause both the cost of equity and the cost of debt, the CEZ is lower than CR Power. And from the capital structure we can see the debt to capital ratio, these two companies is nearly same and the equity to capital ratio, CEZ is obviously lower than CR Power. And in the other hand, we can see in the cost of equity, these two companies are different, but the cost of debt they are close, one is 4.3%, the other is 5.1%.

4.1.3 ROIC of two companies

Return on invested Capital (ROIC) is a measure of financial performance expressed as a percentage that is a very useful metric for assessing how much profit a company is generating for every dollar that is invested in it.

The general formula for calculating ROIC is:

$$\text{ROIC} = \text{Net Income after Tax} / \text{Invested Capital}$$

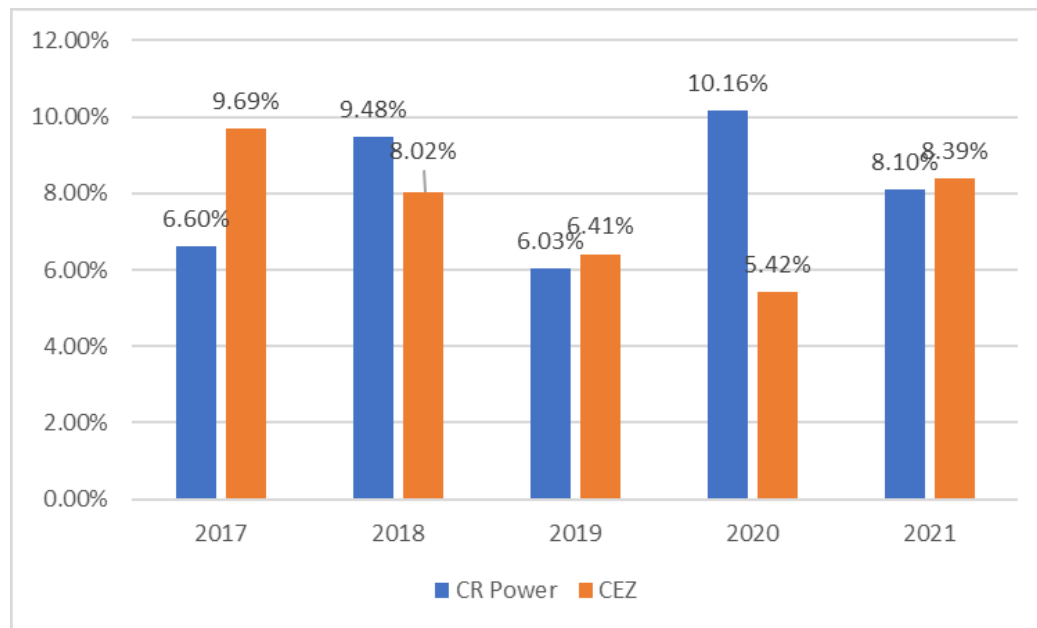
Invested Capital represents the investment in the company, be it funded through debt or equity, that has is being used to generate income. The basic method for arriving at Invested Capital is:

Invested Capital = Total Equity + Total Long-Term Debt

Then we estimate the ROIC on data base of two companies and calculate the average ROIC.

we calculate the history ROIC of two companies, the results show the following chart:

Chart 4.14 ROIC of two companies.



Source: Our calculation

From the chart we can see the ROIC of CEZ is decreased year by year, and the ROIC of CR Power is fluctuated in the expected five years, we know from the previous chapter, if the ROIC is greater than the WACC, the company is creating value. And we calculate the average ROIC of CEZ is 8.39%, and the ROIC of CR Power is 8.07%.

4.1.4 Growth rate of two companies

When we estimate the growth rate in long term, we must consider the two companies business cycle, they have established for a long time and now are maturity, so we can use the GDP growth as their growth rate.

$$g = IR \cdot ROC \text{ or } g = \Delta GDP + \text{inflation}$$

4.1.4.1 Growth rate to CEZ

In order to use the key driver formula (2.16), we must to estimate the growth rate of the industry, here we consider with the GDP growth rate and CEZ history growth rate.

From this chart, we can see the growth rate change sharply, but we still have a positive expectation of the future development, so let we see the CZECH REPUBLIC GDP growth rate to expect the future growth.

Chart 4.15 Czech Republic GDP growth rate.



Source : Trading Economics

Then we will look the calculate expected growth rate of the CEZ, the results showed below..

Table 4.12 Expected growth of CEZ

	IR	ROIC	g
2017	19%	10%	1.8%
2018	46%	8%	3.7%
2019	58%	6%	3.7%
2020	34%	5%	1.8%
2021	40%	8%	3.4%

Source: Our calculation.

Then we calculate the average GDP. growth rate for the data, is 2%. The forecast counts on a slight halt in the rate of decline in the operating margin, even in 2017 it

is expected to increase slightly. At the end of the forecast period, we assumed the sales growth rate is 3.4 %. Then we use this growth rate in our model

4.1.4.2 Growth rate to CR Power

The last but not least, the significant variable entering the model is the expected growth rate. The calculation of the growth rate was determined on the basis of the following assumptions:

Average annual growth in electricity consumption at 0.6% (assumption assumed from World Energy Outlook 2016).

Chart 4.16 HONG KONG GDP growth rate.



Source: Trading Economics

From this chart, we can see the Hong Kong GDP growth rate is nearly to 1% percent.

After set the sales growth rate, we calculation the future expected.

Table 4.13 Expected growth of CR Power

	IR	ROIC	g
2017	72.80%	9.48%	6.90%
2018	41.14%	6.03%	2.48%
2019	30.16%	10.16%	3.07%
2020	17.27%	8.10%	1.40%
2021	22.78%	8.07%	1.84%

Source: Our calculation

Then we calculate the expected average growth by formula, and consider about the HONG KONG GDP growth, we will set the growth rate is 1.84 %

4.2 comparison of value creation

we will make one parameter change and keep other three constant, to find the impact on the enterprise value.

First, we will test how the one parameter change affect the value create:

Table 4.14 The impact of different growth rate.

	-50%	g	+50%
ΔV CR Power	+5.75%	-	- 6.82%
ΔV CEZ	+10%	-	-15.59%

Source: Our calculation.

Table 4.15 The impact of different ROC.

	-50%	ROC	+50%
ΔV CR Power	+14.75%	-	- 14.75%
ΔV CEZ	+34.03%	-	-34.03%

Source: Our calculation.

Table 4.16 The impact of different WACC.

	-50%	WACC	+50%
ΔV CR Power	+141.03%	-	- 36.91%
ΔV CEZ	+255.15%	-	-41.48%

Source: Our calculation.

Only from table, we can just know the growth rate has smallest influenced on the value change, the second is the ROIC, and the biggest influenced indicator is the WACC, but we cannot calculate the precise number or when two or three variables change, we don't know how the value will change, and actually, the structure of assets

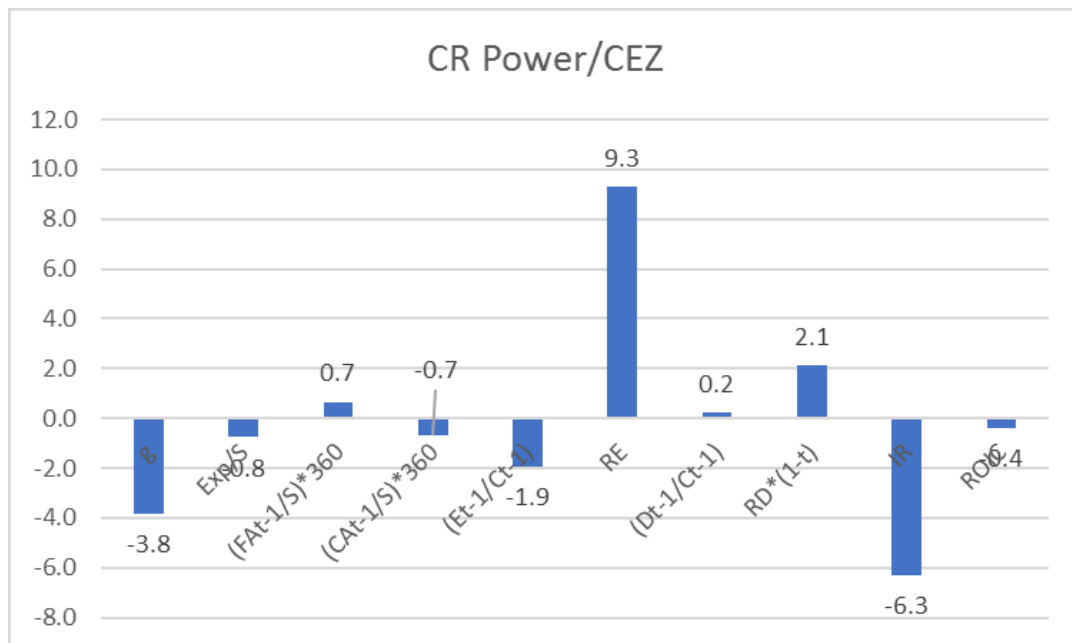
and return on the equity and debt will change the WACC.

Then we use the key value driver model (2.17) to calculate the continue value of two companies at same year, then we use decomposition model (which we mention in the chapter 2) to analyze these two companies, to compare the results.

V/EBIT(1-T) CEZ		V/EBIT(1-t) CR Power
24.41	>	12.17

Then we can see the main parameters in this formula, growth rate(g), return on invested capital(ROIC), weighted average cost of capital (WACC), the value create is very close to these parameters, and then we use the decomposition method, the results show below:

Chart 4.17 Two companies' comparison in value creation by decomposition.



Source: Our calculation based on data base.

After we do the pyramidal decomposition for the value creation of CEZ and CR Power, we can clearly see that CEZ is higher than the CR Power, so what caused the results.

We can see the CR Power positive position in these items: cost of equity, Fixed

assets on sales, $r_d * (1 - t)$, Invest rate (IR) and debt to capital ratio.

In the contrast, we can see the CEZ has positive position in these items: growth rate, expense on sales, current assets on sales, equity to capital ratio, and return on the invested capital.

In the grow rate, we can see the CEZ has positive position, and the growth rate of CEZ is truly higher than the CR Power, and CEZ's value creation is driver by the growth rate is more than CR Power.

And when we see the expense on sales, we can see CEZ is higher than the CR Power, it means during the value creation, the CEZ cost more than CR Power, it takes higher percentage of its revenue.

In the sale to assets ratio, we can see the CR Power has positive in the sales on current assets, in the contrast, CEZ has higher in the sales to fixed assets ratio. It measures the company's efficiency in managing its assets in relation to the revenue generated, we can see the CEZ can generated more value from the fixed assets, and CR Power is from the current assets.

In the capital structure, we can see the CEZ use more equity however the CR Power use more debt, and from previous we know the CR Power has higher cost of equity and cost of debt, so we get the higher WACC of CR Power than CEZ.

As for the investment rate, we can see the CR Power is lower than the CEZ, it means CEZ has higher portion of NOPAT invested back to the business, and because of this CEZ keep higher growth rate in the future.

And for the return on invested capital, we can see the CEZ has higher return on the invested capital, and we know the CEZ has lower WACC, from the chapter, we know when the ROIC is greater than WACC, the value is created.

5. Conclusion

In this thesis, we primary objective is to evaluate and comparison the value creation between these two companies, and then give a valuation of these two companies, before that we also analyze the financial performance of the last five years.

We still analyze the value creation of two companies, from decomposition of value creation, we can clearly see that the growth rate of CEZ is a slight higher than the CR Power, one main reason is recently year, Czech Republic GDP growth keeps stable and growth, however, CR Power growth rate is low. And another important factor is the return on equity, we can see the CR Power is absolutely higher than CEZ, so it caused the WACC is higher, but on the other hand, the ROIC of CEZ is higher than CR Power. For keep the high growth rate. CEZ must reinvest more money into business.

And in chapter three, we analyze the financial performance for two companies and introduce two companies in briefly.

Both two companies' assets are decreased in 2015, especially the CEZ, and for net income, we can see the two companies are decreased year by year. In the profitability ratios, we can see CR Power is higher than CEZ, both in ROA and ROE, but in operating profit margin, the condition is opposite. The assets turnover, the CR Power has advantage compared with CEZ, In capital structure, we can see clearly the CR Power use more debt, the results also can be mirrored in the current ratio.

The biggest disadvantage of the CEZ Group is its size in the world of changing energy and the commitment to not very perspective sources of production, whether it be black and brown coal. If there were a similar situation in the Czech Republic as in Germany - and therefore a complete stop nuclear power generation – cause the Plans for new nuclear capacity are stalled by pricing uncertainty, but policy calls for a substantial increase by 2040. But for the CR Power, the government has more budget and support for the new energy, include the nuclear power.

The energy sector is increasingly affecting legislative requirements to reduce impacts on the environment and in the future we can expect only a further

strengthening of these tendencies. From the opinion of mine, we expected these two companies can make decision on the new energy as soon as possible, in order to solve the depletion of energy source.

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List of Abbreviations

ROA return on assets

ROE return on equity

ROIC return on the invest capital

C capital

ROS return on sales

OPM operating profit margin

NPM Net profit margin

$FCFF_t$ Free cash flow of the company in year t

WACC Weighted assets cost of capital

r_d the cost of capital of creditors (cost of debt)

t Corporate income tax rate

D market value of debt (interest-bearing)

E market value of equity

C the total value of the invested capital (always combine debt and equity)

r_e the cost of shareholder's equity

Dep depreciation

Cap exp capital expense

NWC Net working capita

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Annexes List

Annex 1 Shareholders Structure

Annex 2 Decomposition of CEZ

Annex 3 Decomposition of CR Power

Annex 4 Value created comparison

Annex 5 Balance sheet of CEZ

Annex 6 Income statement of CEZ

Annex 7 Balance sheet of CR Power

Annex 8 Income statement of CR Power

Annex 1

Shareholders Structure of CZE

	At 31.12.2015	At 31.12.2016	At 14.6.2017
Legal entities, total	91.22%	90.23%	89.83%
Czech Republic	69.78%	69.78%	69.78%
CZE, a.s.	0.70%	0.7%	0.7%
Other legal entities	20.74%	19.75%	19.35%
Private individuals,	8.78	9.77%	10.17%

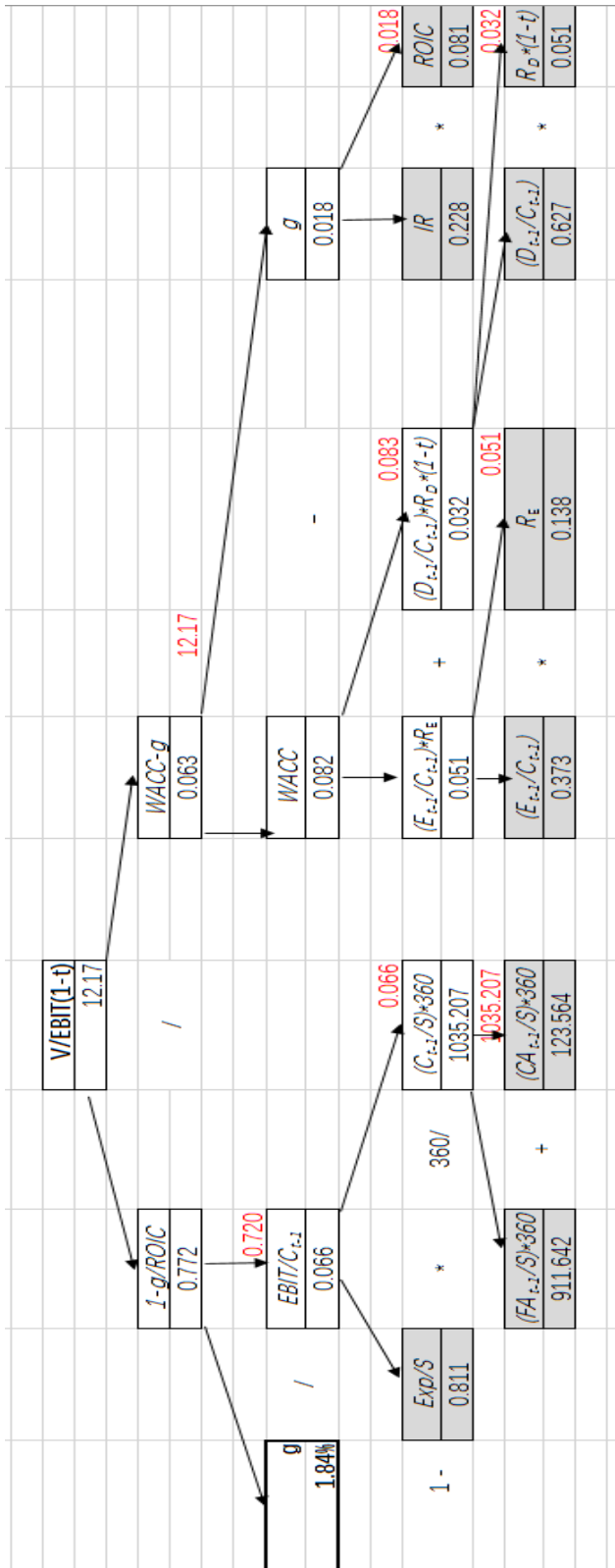
Source: Home page of CZE Company

Shareholders Structure of CR Power

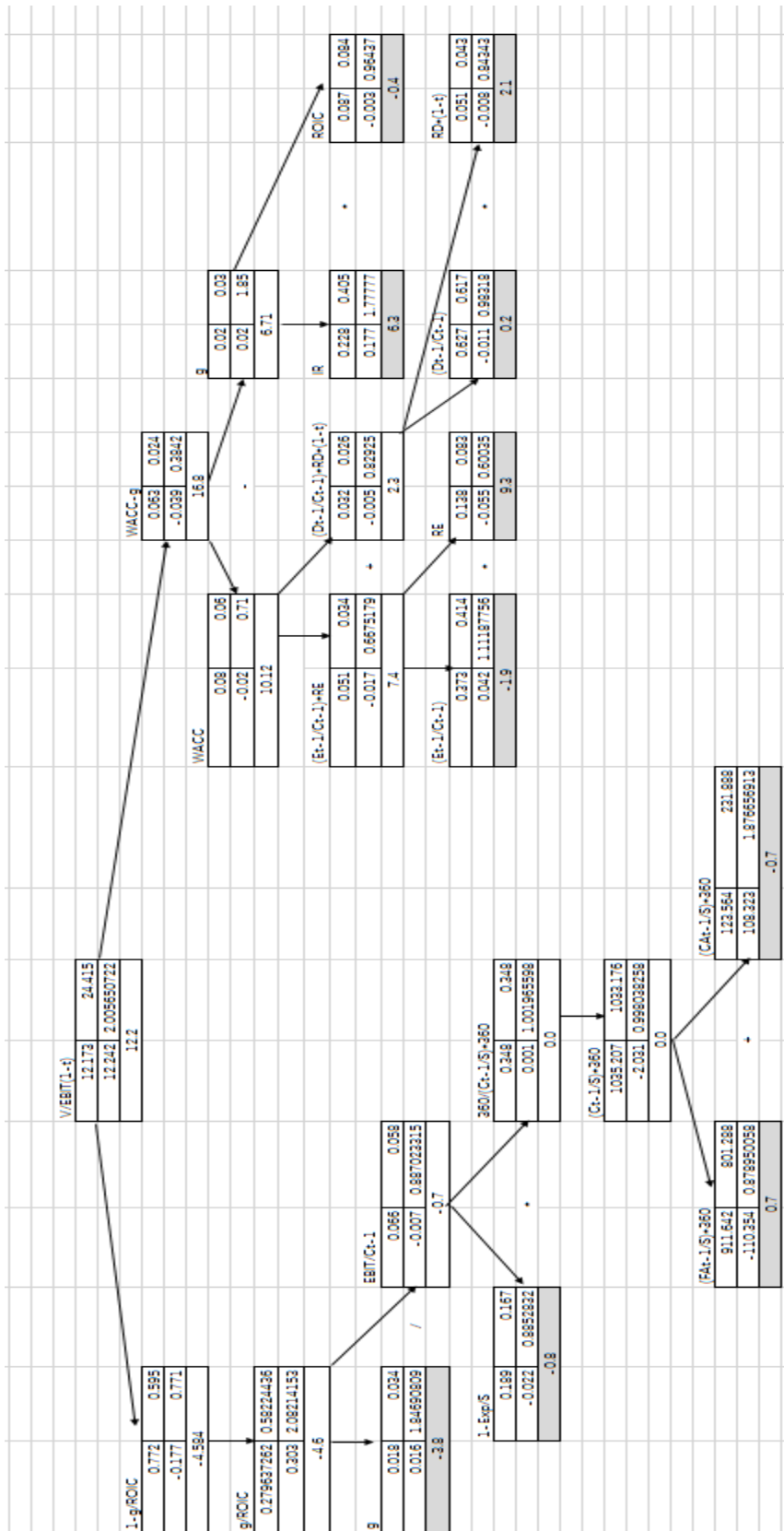
Name	Equities	%
China State-Owned Assets Supervision & Admn Commission	3,027,905,337	62.9%
The Vanguard Group, Inc.	65,966,101	1.37%
JPMorgan Asset Management (UK) Ltd.	49,670,202	1.03%
BlackRock Fund Advisors	39,955,199	0.83%
Value Partners Ltd.	38,587,963	0.80%
JPMorgan Investment Management, Inc.	35,266,000	0.73%
FIL Investment Management (Hong Kong) Ltd.	34,406,448	0.72%
State Street Global Advisors Asia Ltd.	20,048,831	0.42%
Invesco Asset Management Ltd.	17,366,000	0.36%
Fidelity Management & Research Co.	16,954,865	0.35%

Source: Home page of CR Power Company.

Annex 3 Decomposition of CR Power



Annex 4 Value created comparison



Annex 5 Balance sheet of CEZ

Asset(czk millions)	2012	2013	2014	2015	2016
Property, plant and equipment					
Plant in service	656,386	665,354	701,316	719,633	775,181
Less accumulated provision for depreciation	-320,537	-340,888	-371,515	-399,608	-418,981
Net plant in service	335,849	324,466	329,801	320,025	356,200
Nuclear fuel, at amortized cost	9,702	10,688	10,953	12,997	14,892
Construction work in progress	73,738	90,508	85,788	88,342	55,803
Total property, plant and equipment	419,289	425,662	426,542	421,364	426,895
Other non-current assets					
Investment in associates and joint-ventures	14,807	12,999	12,277	9,239	5,309
Investments and other financial assets, net	38,374	25,746	36,348	40,657	33,471
Intangible assets, net	21,507	20,701	20,611	20,164	21,983
Deferred tax assets	750	824	1,738	1,631	1,596
Total other non-current assets	75,438	60,270	70,974	71,691	62,359
Total non-current assets	494,727	485,932	497,516	493,055	489,254
Current assets					
Cash and cash equivalents	17,955	25,003	20,095	13,482	11,226
Receivables, net	54,692	67,485	50,864	46,003	56,331
Income tax receivable	1,798	1,065	1,618	436	1,181
Materials and supplies, net	7,670	8,054	8,462	8,577	7,520
Fossil fuel stocks	4,031	2,552	1,481	1,554	996
Emission rights	12,153	8,505	5,097	3,456	3,958
Other financial assets, net	39,476	38,400	39,438	32,728	56,501
Other current assets	3,321	3,398	3,299	3,395	3,227
Assets classified as held for sale	0	0	0	0	647
Total current assets	141,096	154,462	130,354	109,631	141,587
TOTAL ASSETS	635,823	640,394	627,870	602,686	630,841
EQUITY AND LIABILITIES					
Equity					
Equity attributable to equity holders of the parent					
Stated capital	53,799	53,799	53,799	53,799	53,799
Treasury shares	-4,382	-4,382	-4,382	-4,246	-4,246
Retained earnings and other reserves	200,818	208,659	211,891	218,340	207,259
Total equity attributable to equity holders of the parent	250,235	258,076	261,308	267,893	256,812
Non-controlling interests	3,658	4,690	4,543	4,262	4,548
Total equity	253,893	262,766	265,851	272,155	261,360
Long-term liabilities					
Long-term debt, net of current portion	176,106	168,196	160,852	145,575	142,265
Accumulated provision for nuclear decommissioning and fuel storage	42,415	43,827	47,302	82,578	86,573
Other long-term liabilities	22,542	26,840	25,917	8,679	11,203
Total long-term liabilities	241,063	238,863	234,071	236,832	240,041
Deferred tax liability	21,810	19,201	20,609	22,053	20,213
Current liabilities					
Short-term loans	4,784	2,716	7,608	223	8,343
Current portion of long-term debt	12,005	28,104	15,674	11,696	17,208
Trade and other payables	73,383	63,297	60,331	58,010	80,516
Income tax payable	1,613	1,719	830	1,606	392
Accrued liabilities	27,272	23,728	22,896	22,164	22,411
Total current liabilities	119,057	119,564	107,339	93,699	128,870
Total Liability	381,930	377,628	362,019	352,584	389,124
TOTAL EQUITY AND LIABILITIES	635,823	640,394	627,870	602,686	630,271

Annex 6 Income statement of CEZ

	2012	2013	2014	2015	2016
Revenues					
Sales of electricity and related services	186,797	189,657	173,819	182,105	174,944
Gains and losses from electricity, coal and gas derivative trading, net	4,588	1,579	2,861	3,493	1,735
Sales of gas, coal, heat and other revenues	23,710	26,037	23,977	24,569	27,065
Total revenues	215,095	217,273	200,657	210,167	203,744
Operating expenses					
Gains and losses from commodity derivative trading, net	0	0	0	-540	-368
Fuel	-15,841	-14,089	-12,686	-13,053	-13,150
Purchased power and related services	-71,656	-78,878	-76,005	-90,905	-88,294
Repairs and maintenance	-5,511	-5,498	-4,991	-4,619	-4,563
Depreciation and amortization	-27,696	-27,944	-27,705	-28,619	-28,978
Impairment of property, plant and equipment and intangible assets including goodwill	-1,184	-8,422	-8,025	-7,685	-3,114
Salaries and wages	-18,707	-18,730	-18,852	-17,758	-19,158
Materials and supplies	-5,098	-5,614	-4,334	-4,062	-4,362
Emission rights, net	476	-76	-1,959	-1,711	-520
Other operating expenses	-12,795	-12,267	-9,154	-12,254	-15,123
Total expenses	-158,012	-171,518	-163,711	-181,206	-177,630
Income before other income (expenses) and income taxes	57,083	45,755	36,946	28,961	26,114
Other income (expenses)					
Interest on debt, net of capitalized interest	-4,318	-4,569	-3,650	-2,853	-2,762
Interest on nuclear and other provisions	-2,051	-1,802	-1,834	-1,681	-1,494
Interest income	1,745	1,439	608	388	303
Foreign exchange rate gains	763	1,070	-297	-811	-339
Gain on sale and loss of control of subsidiaries, associates and joint-ventures	0	4,750	73	0	161
Other income (expenses), net	-2,716	-1,222	-1,967	4,546	78
Share of profit (loss) from associates and joint-ventures	451	-981	-1,223	-1,655	-2,733
Total other income(expenses)	-6,126	-1,315	-8,290	-2,066	-6,786
Income before income taxes	50,957	44,440	28,656	26,895	19,328
Income taxes	-10,804	-9,206	-6,224	-6,348	-4,753
Net Income	40,153	35,234	22,432	20,547	14,575
Net income attributable to					
Equity holders of the parent	41,429	35,885	22,403	20,739	14,281
Non-controlling interests	-1,276	-651	29	-192	294
Net income per share attributable to equity holders of the parent (CZK per share)					
Basic	77.6	67.2	42	38.8	26.7
Diluted	77.6	67.2	42	38.8	26.7

Annex 7 Balance sheet of CR Power

	2012	2013	2014	2015	2016
Asset(HK\$'000)					
Non-current assets					
Property, plant and equipment	103,660,633	131,579,042	146,907,932	142,845,210	138,275,197
Prepaid lease payments	2,372,579	2,747,683	3,218,044	3,344,056	3,344,692
Mining rights	14,051,781	21,381,263	18,138,478	15,815,897	14,902,898
Exploration and resources rights	0	172,565	171,989	161,947	151,677
Prepayments for non-current assets	4,447,854	7,066,387	3,579,037	2,789,219	2,784,169
Investments in subsidiaries	0	0	11,222,297	9,484,351	8,459,278
Loans to subsidiaries	0	0	809,229	0	508,923
Investments in associates	19,060,119	12,995,773	0	0	0
Investments in joint ventures	1,728,980	1,873,202	2,472,578	3,694,388	3,610,368
Goodwill	3,914,280	3,126,941	3,123,668	1,760,924	1,567,684
Deferred income tax assets	264,296	494,493	739,113	556,150	725,131
Available-for-sale investments	1,319,116	1,375,876	1,656,455	1,497,284	1,471,665
Loan to an available-for-sale investee company	176,772	0	181,698	303,214	424,099
Loan to a non-controlling shareholder of a subsidiary	0	17,171	17,113	0	0
Derivative financial instruments	0	0	575,898	0	0
Total non-current assets	150,996,410	182,830,396	192,813,529	182,252,640	176,225,781
Current assets					
Inventories	3,258,710	3,481,838	3,308,874	2,306,640	3,124,403
Trade receivables, other receivables and prepayments	14,758,931	18,344,979	19,684,542	14,587,390	14,765,870
receivables and prepayments	3,454,804	839,447	0	23,395	21,911
Loans to joint ventures	0	369,903	371,575	170,528	192,535
Loan to an available-for-sale investee company	0	277,860	95,233	89,673	0
Loan to a non-controlling shareholder of a subsidiary	0	0	0	16,114	32,979
Amounts due from associates	592,171	264,727	106,025	465,471	162,862
Amounts due from joint ventures	0	778,419	120,181	137,249	143,821
Amounts due from joint ventures related companies	77,730	41,329	85,337	39,430	2,171
Financial assets at fair value Financial assets at fair value	3,687	2,956	5,217	0	0
Pledged bank deposits	249,986	598,003	772,433	723,404	1,092,114
Cash and cash equivalents	4,397,289	6,035,046	8,285,135	7,273,945	4,347,022
Total current assets	26,793,308	31,034,507	32,834,552	25,833,239	23,885,688
Total assets	177,789,718	213,864,903	225,648,081	208,085,879	200,111,469
EQUITY AND LIABILITIES					
Equity attributable to owners of the Company					
Share capital	4,762,863	4,791,457	22,102,792	22,252,458	22,257,732
– Proposed final dividend	2,147,390	3,184,988	14,710,033	10,408,713	6,746,795
– Others	47,132,730	57,008,616	33,981,578	38,256,404	40,016,379
	54,042,983	64,985,061	70,794,403	70,917,575	69,020,906
Non-controlling interests					
– Perpetual capital securities	5,897,056	5,897,006	5,897,106	5,897,219	0
– Others	8,955,962	13,850,814	9,100,859	6,924,549	5,543,957
	14,853,018	19,747,820	14,997,965	12,821,768	5,543,957
Total equity	68,896,001	84,732,881	85,792,368	83,739,343	74,564,863
LIABILITIES					
Non-current liabilities					
Borrowings	59,876,386	73,438,346	79,535,707	61,113,715	70,166,815
Derivative financial instruments	320,851	173,652	72,276	0	0
Deferred income tax liabilities	573,881	2,569,573	2,635,041	2,459,682	2,590,741
Deferred income	487,547	607,513	930,275	958,222	955,922
Retirement and other long-term employee benefits obligations	136,481	386,797	626,397	149,764	171,642
Total non-current liabilities	61,395,146	77,175,881	83,799,696	64,681,383	73,885,120
Current liabilities					
Trade payables, other payables and accruals	23,022,262	29,956,821	31,960,657	28,622,007	28,337,920
Loan from a subsidiary	0	0	0	0	0
Amounts due to associates	600,557	969,497	730,760	796,493	253,426
Amounts due to joint ventures	0	397,203	1,881	908,628	653,476
Amounts due to other related companies	2,977,131	4,997,201	959,233	577,667	544,165
Current income tax liabilities	506,479	1,322,159	1,486,367	1,330,166	575,912
Borrowings	20,390,649	14,313,260	20,897,153	27,403,621	21,296,587
Derivative financial instruments	1,493	0	19,966	26,571	0
Total current liabilities	47,498,571	51,956,141	56,056,017	59,665,153	51,661,486
Total liabilities	108,893,717	129,132,022	139,855,713	124,346,536	125,546,606
Total equity and liabilities	177,789,718	213,864,903	225,648,081	208,085,879	200,111,469
Net current (liabilities)/assets	-20,705,263	-20,921,634	-23,221,465	-33,831,914	-27,775,798
Total assets less current liabilities	130,291,147	161,908,762	169,592,064	148,420,726	148,449,983

Annex 8 Income statement of CR Power

Revenues(HK\$'000)	2012	2013	2014	2015	2016
Sales of electricity	55,547,575	61,685,099	64,319,193	64,961,164	59,484,597
Heat supply	2,344,618	2,507,712	2,861,134	3,182,704	3,128,114
Sales of coal	4,543,327	5,388,715	3,500,301	3,292,007	3,599,879
Total revenues	62,435,520	69,581,526	70,680,628	71,435,875	66,212,590
Operating expenses					
Fuels	-35,589,027	-33,067,387	-31,044,413	-25,954,316	-27,199,184
Repairs and maintenance	-1,145,345	-1,579,675	-1,762,055	-1,982,380	-2,142,577
Depreciation and amortisation	-6,183,139	-7,371,469	-8,599,543	-9,787,203	-9,882,488
Employee benefit expenses	-3,762,080	-4,784,336	-5,214,157	-5,250,986	-5,530,489
Consumables	-928,894	-1,070,107	-1,003,571	-992,543	-920,790
Impairment charges	-679,711	-1,997,057	-6,094,392	-4,372,893	-1,282,288
Tax and surcharge	-499,995	-659,993	-799,563	-1,003,681	-1,124,157
Others	-3,348,608	-4,256,991	-3,913,569	-4,028,491	-3,734,114
Total expenses	-52,136,799	-54,787,015	-58,431,263	-53,372,493	-51,816,087
Other income	1,306,198	1,848,651	2,057,888	2,088,708	1,923,016
Other gains/(losses) – net	400,938	861,339	912,943	-143,988	35,262
Operating profit	12,005,857	17,504,501	15,220,196	20,008,102	16,354,781
Finance costs	-3,835,796	-3,328,216	-3,325,487	-3,216,382	-3,557,220
Share of results of associates	1,643,372	1,205,388	-1,177,765	-717,586	288,995
Share of results of joint ventures	90,328	755,556	467,461	247,113	-44,968
Profit before income tax	9,903,761	16,137,229	11,184,405	16,321,247	13,041,588
Income tax expense	-1,179,214	-3,551,936	-4,290,788	-5,808,868	-4,398,440
Profit for the year	8,724,547	12,585,293	6,893,617	10,512,379	8,643,148
Profit attributable to:					
Owners of the Company	7,478,916	11,015,526	9,214,858	10,025,241	7,708,373
Non-controlling interests					
– Perpetual capital securities	418,344	421,835	421,709	421,534	150,164
– Others	827,287	1,147,932	-2,742,950	65,604	784,611