

Equity Valuation – CHINA VANKE CO., LTD

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Abstract

CHINA VANKE CO., LTD is a property development company operating in a slowdown in the housing market, the competition is highly intensified. Although Vanke is already a property giant in China, the company does not want to be stagnated and it is trying to enter into other business fields. Based on this, the present valuation raises a high value, which is an important indicator to debt holders and investors.

The present project aims to make a firm valuation analysis of CHINA VANKE CO., LTD, using the Discounted Cash Flow method to reach the fair value for each share on the December 28th of 2018. The main results show that the company's shares are priced below its fair value.

Keywords: Equity Valuation, Discounted Cash Flows

Jel Classification: G30

Resumo

CHINA VANKE CO., LTD é uma empresa de desenvolvimento de propriedades que opera no mercado imobiliário, mercado este em desaceleração e cuja competição se encontra altamente intensificada. Apesar de a VANKE já ser um gigante de propriedade na China, a empresa não quer estagnar e está a tentar entrar noutras áreas de negócio. Desta forma, a presente avaliação acrescenta um elevado valor, o qual é um importante indicador para os detentores de dívida e investidores.

O presente projeto tem como objetivo avaliar a CHINA VANKE CO., LTD, utilizando o modelo Discounted Cash Flow por forma a obter o valor justo para cada ação a 31 de Dezembro de 2018. Os principais resultados mostram que as ações da empresa estão cotadas abaixo do seu justo valor.

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1. Introduction

One of the key topics in finance is Equity Valuation. It is the foundation of many other subjects studied in the finance area. Equity Valuation is very important, because it is helpful for investors (both institutional and individuals) to make investment decisions, and it is also helpful for the managers of the company to make strategies for future development and manage the company based on the valuation.

This project presents an Equity Valuation of China Vanke, a Chinese listed company. The company will be evaluated by discounted cash flow model, with the goal of estimating whether Vanke's shares price is overrated or underrated. The decision will be on the basis of the comparison between each share's market value and its price target: If the price target is higher than what the market value is, the share price will be underrated and the recommendation will be bought, and if it is lower, the share price is overrated and the recommendation will be sold.

Vanke is one of the property giant which has an important impact in China's property development. the top three property developers in China, including Vanke, dominated a market share of 12.6%.

In 2014 the company initiated a strategic plan for diversification, with the purpose of becoming the world's leading residential leasing company within 10 years. In 2018, the advancement of its strategic development plan was reflected in increased number of projects putting into operation, with more rooms opened and acquired. To get funded onshore and offshore the group emphasizes on the net debt ratio remaining in a low level of the industry.

In China's economy, the industry of real estate belongs to one pillar industry. Its development has a great influence on people's well-being. Currently, the growth of the real estate market has been slowed down, which causes people become worried about its future development. In this context, Vanke changed its strategy to adapt to the change

of the operating environment. These are the reasons to develop a project about the company valuation. Although Vanke has already been evaluated by other researches, the value of a company changes overtime, and the valuation needs to be updated..

This paper is divided into the following parts: Background analysis of the company, industry analysis, SWOT, literature review, valuation and conclusion.

To better understanding the analysis in the following parts, we will begin with the introduction of Vanke's profile, in order to give a basic impression on it, including its strategy, the stakeholder structure and its dividend policy. Besides, the analysis extends to the economic framework and the industries in which the company operates- property development and rental residential properties.

The literature review introduces the major models for company valuation, which will later be used in the methodology.

The methodology will be defined by choosing the most appropriate evaluation model regarding the characteristics of the company. After collected the data and set the assumptions, the valuation is operated in the Microsoft Excel and used the model chosen to calculate the price target for each share.

The last part is the conclusions. We will use each share's market value to compare the intrinsic value as of 28th December of 2018, and then made the investment advice of buy or sell.

2. Background Analysis

2.1 Company Presentation

2.1.1 Historical Review

Vanke was founded in 1984. It was listed on SZSE (Shenzhen Stock Exchange) in the year of 1991, which ranked the second in SZSE. Then, the company was listed on SEHK (Hong Kong Stock Exchange) in the year of 2014. The board's Chairman is Yu

Liang, while is the President and Chief Executive Officer is Zhu Jiusheng.

The main core business of this company is property exploitation as well as property services, and other relevant businesses of life services.

The starting point was in 1988, the group ventured into property development, and established property development as the core business in 1992. In 2004, the equity acquisition of several companies of property development gave rise to The Vanke Company, especially the acquisition of Nandu Group Holding Ltd., Vanke's business has expanded to 21 large and medium-sized urban cities, the Group centers in China's Pearl River Delta, the Delta of Changjiang River, the Bohai-Rim Region, and many China's hub cities of the Midwest.

In the year of 2014, Vanke stretched its stats into an "integrated urban services provider" from the company which offers "better houses, better services, and better community" in its 14th ten years development project. With this new strategy, the company directs itself to become the global key residential leasing company within 10 years.

In 2018, Vanke reformed its position into the "provider for urban & countryside development and living services". Moreover, the company refined itself into 4 roles as follows: a supplier for better life solution, a real economy contributor, an future development innovator, and a harmonious ecosystem creator.

For a solution provider for better life means based on enhancing the key business of the property development as well as property services, the group ventured itself into many areas, including commercial exploitation and managements, logistic & warehousing services, rental residential properties, businesses of skiing resort, and elderly-care and education.

In turn, to entry into commercial development and operations, the Group participated in the joint-acquisition platform with several partners. In 2016, the Group as well as its cooperative partners obtained 96.55% equity interest in SCPG through cooperation.

The Group uses SCPG as the management platform on commercial projects. To entry into Logistic and warehousing services, the Group participated in the privatization of the World Logistic Properties Limited in 2017; the feeder fund of the Company possesses roughly 21.4% of the interests, and becomes the largest shareholder of a global leading provider of the modern logistics facilities.

A contributor to real economy means the Group creates real value to customers and shareholders.

An innovator for future development means the Group makes innovation in three segments, technology research & exploitation, blended ownership reform, the mechanism of business partners, and the company management in network times.

A creator of harmonious ecosystem means that the Group conducts an exploration in environment protection as well as recycling industries except the energy saving as well as the environment protection in operating activities.

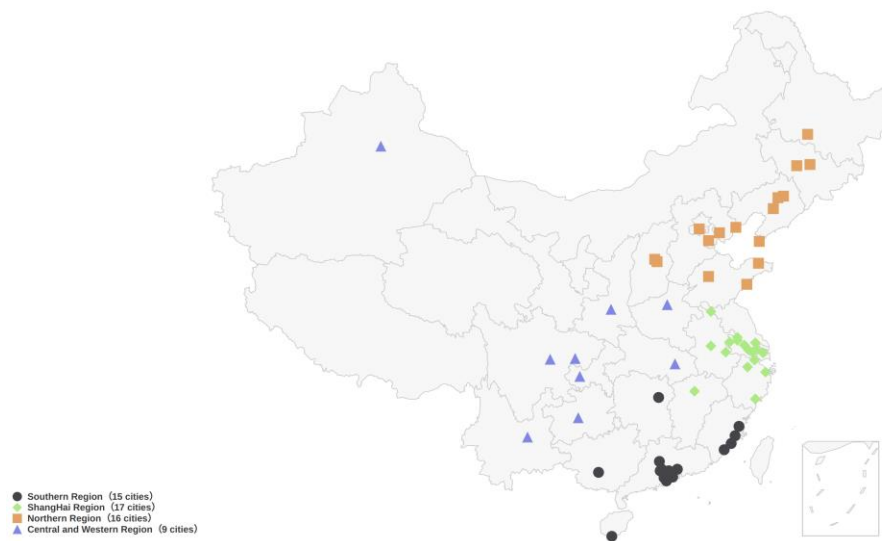
The company has an important impact in the Chinese property development. In 2018, the top three property developers in China, including Vanke, dominated a market share of 12.6%, which is more than one-eighth of the market, also Vanke was ranked 3rd of the property developers in China. Vanke Service won the honor of the “TOP one of China’s Top one hundred Property Service Providers”, which ranked top one hundred for the ninth consecutive year. The Group employs 104,300 workers directly.

Globally, Vanke was ranked 356th in the Fortune Global 500 in 2016, 307th in 2017 and 332nd in 2018.

2.1.2 Main Business Areas

- a) Property development business: It includes the development and sale of residential properties in four regions: Southern Region (15 cities), Shanghai Region (17 cities), Northern Region (16 cities) and Central and Western Region (9 cities)

Figure 1: Vanke's Business Region



Source: Vanke's Annual Report 2019

- b) Property services business: this segment offers property management, the relevant services for purchasers, tenants from the Group's own-developed residential properties, and shopping arcades.
- c) Business expansion: It includes business development & operation, services of logistic & warehousing, rental residential properties, and other businesses (skiing resort projects, elderly care, education).

2.1.3 Products and Services

The Vanke Company is well known by property development and property service. However, the company has other products and services in other industries.

Firstly, the group focuses on Property development business. The product can be separated into three segments, housing, commercial offices and other ancillary facilities. The housing products satisfy the ordinary residents need, including new immigrants and younger generation. Vanke adheres to "constructing housing acceptable for the purpose of occupation". More than 93% products are medium and small housing covering an area of less than 144sq.m. In addition, the company operates in four

geographical regions of China: Southern Region (15 cities), Shanghai Region (17 cities), Northern Region (16 cities) and Central and Western Region (9 cities).

In the Commercial exploitation & operation segment, the Group takes SCPG as the management platform, target at shopping malls and community business in 50 cities, and focus on ordinary consumers and merchants.

In the logistic and warehousing services segment, the Group provides logistics service to over 600 customers, including E-commerce, express delivery, manufacturing, catering, and retailing etc. Also, VX Logistics Properties had entered 42 cities.

In the Rental residential properties segment, the Group created its own brand called “Boyu”, to satisfy the urban youngsters’ needs for long-term or medium-term rental housing, the business covered total of 35 first and second tier cities.

2.1.4 Markets

According to the 2018 annual report, the top three property developers in China, including Vanke, dominated a market share of 12.6%. The Group realized revenue of RMB297.68 billion. Through business segments, it recognized benefit taxes from property exploitation business, which occupied 95.6% of the revenue of the Group.

Through geographical regions, the benefit taxes from the Southern Region, the Shanghai Region, the Northern Region, and the Central & Western Region occupies 26.94%, 29.33%, 24.18%, and 19.55% respectively of the overall accomplished benefit taxes derived from the property development business of the Group. Its sales amount in twenty-four cities ranked first in the whole area. While the sale area from the Southern Region, the Shanghai area, the Northern area and the Central& Western area occupied 20.31%, 21.89%, 30.45%, and 27.35% respectively of the overall sale area derived from the property development business of the Group.

As per the 2018 yearly report, the share of the Group in China’s commodity housing market rose to 4.05% (2017: 3.96%).

Sales amount kept on increasing. The Group accomplished a sales area and sales amount of 40.377 million sq.m. and RMB606.95 billion. Among the sold products, housing, commercial offices, and other ancillary facilities occupied 84.9%, 11.5% and 3.6% respectively. However, housing products centered on the demands of the mainstream customers, 91.4% of the products sold were medium housing and small housing under 144 sq.m.

2.1.5 Competitors

As per the National Bureau of Statistics, there're total of 95897 companies operating the real estate industry. This industry is highly concentrated. In 2018, the top 10 developers' market share was 26.9%, more than one-fourth of the market; the top twenty, top thirty, top fifty and top one hundred developers' market shares were 37.5%, 45.2%, 55.1%, and 66.7% respectively. The top 100 developers dominated two-thirds of the market share. Judging from the situation, competition in property development markets has been increasing, which may have a significant impact in prices and, consequently, in the group's profit.

The most important competitors for Vanke are two enterprises--China Evergrande Group and Country Garden Holdings Company Limited. In 2018, both companies were ranked in the TOP 3 of the property developers in China. Also, both operated in the same business areas as The Vanke Company, namely property development and property service.

China Evergrande Group geographical market coverage extended to 228 cities of Mainland China in 2018, the Group's revenue increased by 49.9% to approximately RMB466.20 billion, which result in winning the biggest share in property development market.

Garden Holdings Company Limited geographical market coverage extended to 269 cities of Mainland China in 2018, the Group's revenue increased by 67.1% to

approximately RMB379.08Billion, which result in winning the second biggest share in property development market.

2.1.6 Strategy

The company mainly operates in property development and property services, taking the place as one of China's largest property developers. The company adopts a strategy of integrating the quality resources in upstream and downstream, by utilizing its professional advantages, to increase the market share of the industry.

The product positioning has a competitive advantage of focusing on selling ordinary housing acceptable for occupation, since the company specializes in decorated housing in the industry and has the ability to customize it to fit the specific needs of different customers segments, which is separated into 4 segments based on the capability of payment.

As for the main business area, Vanke adopts the regional coordinated development strategy as well as the core urban cities groups deployment, which focus on the Bohai-Rim Region, the Yangtze River Delta, and the Pearl River Delta.

The company owns a diversification strategy with three main areas: commercial exploitation & operation, logistic & warehousing services, and the rental residential properties. The development of other businesses will bring scale effect and synergy effects with the main businesses. In order to improve its business layout, Vanke used equity acquisition to acquire the most shares of leading companies within these three main business areas. For both parties, the cooperative effects have been brought by the strategic investment.

2.1.7 Stockholder Structure

Vanke is listed in the Shenzhen Stock Exchange (SZSE), one of the Chinese stock markets. On the 28th of December of 2018, the company shares' closing price was 3.06 euros, and the overall number of shares of the company was 11,039,152,001.

As shown in Table 1, the major stockholders are SZMC, HKSCC NOMINEES LIMITED, Jushenghua, AnBang Life Insurance Co., Ltd, Guosen Securities, together with a share of 60.16% of capital.

Table 1: Vanke's Top 5 Shareholders

	N. of Shares held	% of total issued share capital
SZMC	32.43	29.38%
HKSCC NOMINEES LIMITED	13.15	11.91%
Jushenghua	9.26	8.39%
AnBang Life Insurance Co., Ltd.	7.00	6.34%
Guosen Securities	4.57	4.14%

Source: Vanke's annual reports

2.1.8 Dividend payout policy

The dividend payout policy of the company is on the basis of its profit as well as its reserves. The table below shows the dividends per share paid in the last four years until 2018, as shown in the table below:

Table 2: Vanke's Paid Dividend

	2015	2016	2017	2018
Dividend	0.72	0.79	0.90	1.05
Dividend Payment Rate	43.90%	41.58%	35.43%	34.15%

Source: Vanke's Annual Reports

2.2 Industry Analysis

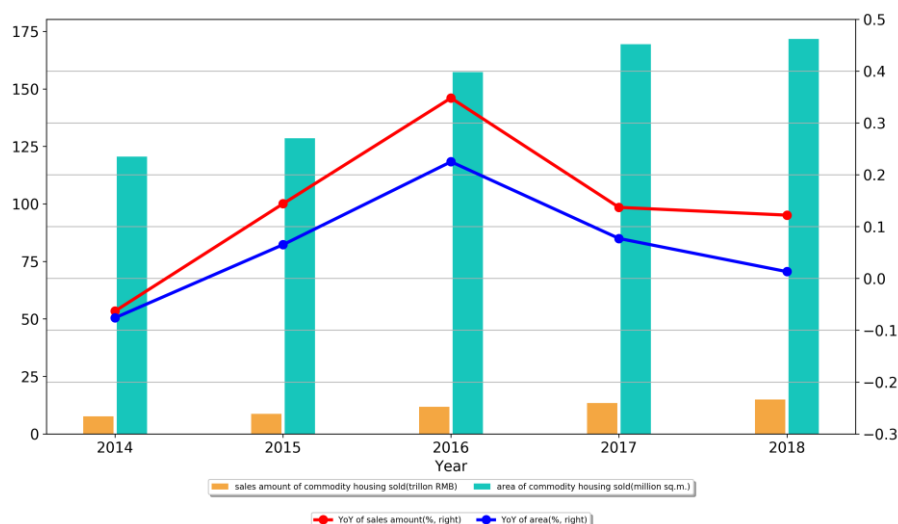
2.2.1 Property development business

The main activity of Vanke is Property development, the real estate industry is heavily influenced by the policy direction, in 2018, the regulation continued to be tightened and the real estate market experienced a cooldown.

Recent data shows that the increase of China's commodity housing' sales continued to

slow down. As per the data from the National Bureau of Statistics, in 2018, China's commodity housing sales amount increased by 12.2% year-on-year to RMB15.0 trillion; the increasing rate was 1.5% lower than that of 2017. Moreover, China's area of the commodity housing increased by 1.3% year-on-year to 1,717 million sq.m.; the increasing rate was 6.3% lower than that of 2017, as shown in the figure below:

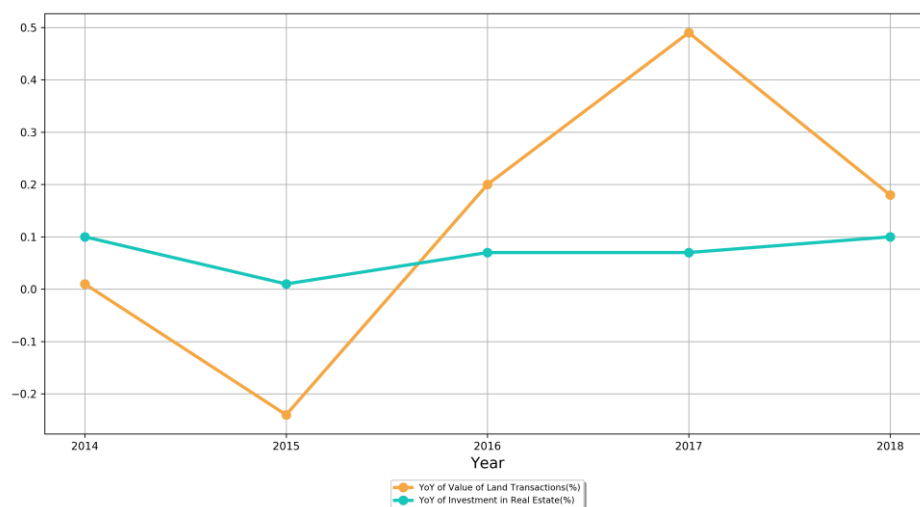
Figure 2: Sales amount and area of Commodity Housing Sold



Source: National Bureau of Statistics

Obvious cooldown in land market. The Value of Land Transactions in China increased by 18% year-on-year to RMB 1.6 trillion, the growth rate was 31.4% lower than that of 2017, as shown in the figure below:

Figure 3: YoY of Value of Land Transaction and Investment in Real Estate

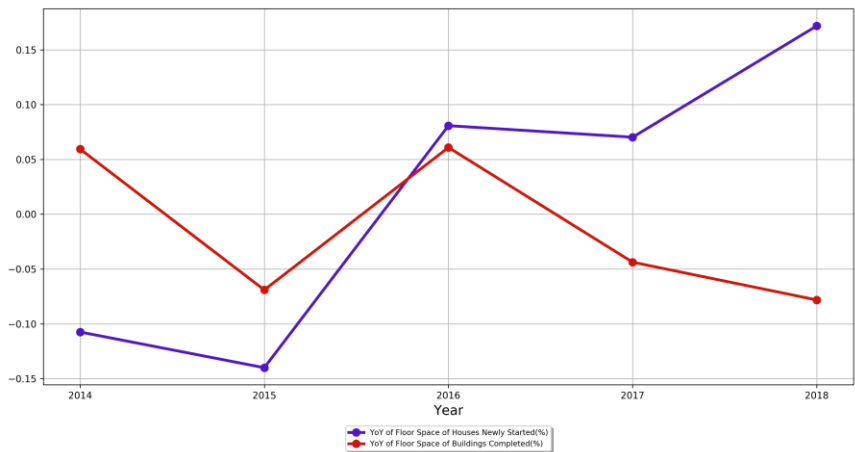


Source: The National Bureau of Statistics

Real estate exploitation & investment has increased steadily. The Investment in Real Estate increased by 9.5% year-on-year to RMB12.0 trillion, the growth rate was 2.5% larger than that of 2017.

The sales area from new housing units is further declined. The Floor Space of Buildings Completed decreased by 7.8% year-on-year to 936 million sq.m, the growth rate was 3.4% lower than that of 2017. The Floor Space of Houses Newly Started increased by 17,2% year-on-year to 2,093 million sq.m, whose growth rate was 10.2% higher than that of 2017,as shown in the figure below:

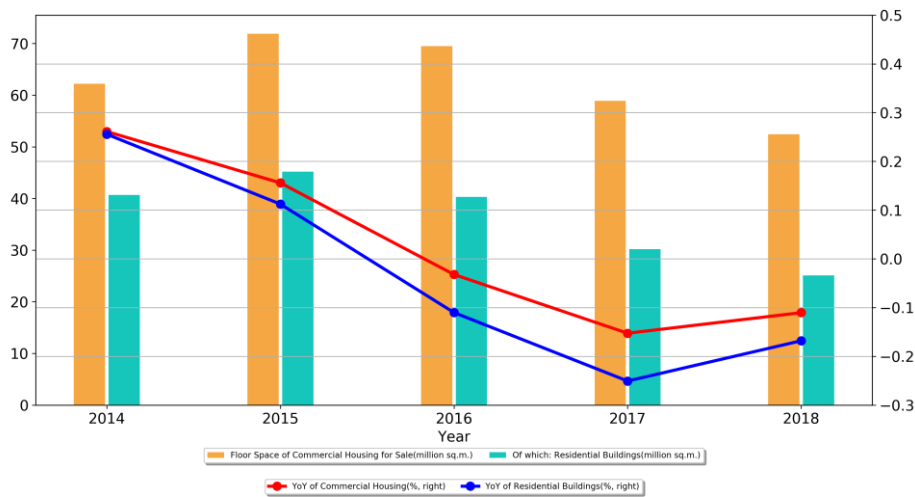
Figure 4: YoY of Floor Space of Newly-Started Houses and Building Completed



Source: The National Bureau of Statistics

There was an obvious cooldown in the Floor Space. The floor space of the commercial housing for sale in China decreased by 11% year-on-year to 524 million sq.m, and the floor space of the residential buildings decreased by 16.8% year-on-year to two hundred fifty one million sq.m., as shown in the figure below:

Figure 5: Floor Space of Commercial Housing and Residential Building for Sale

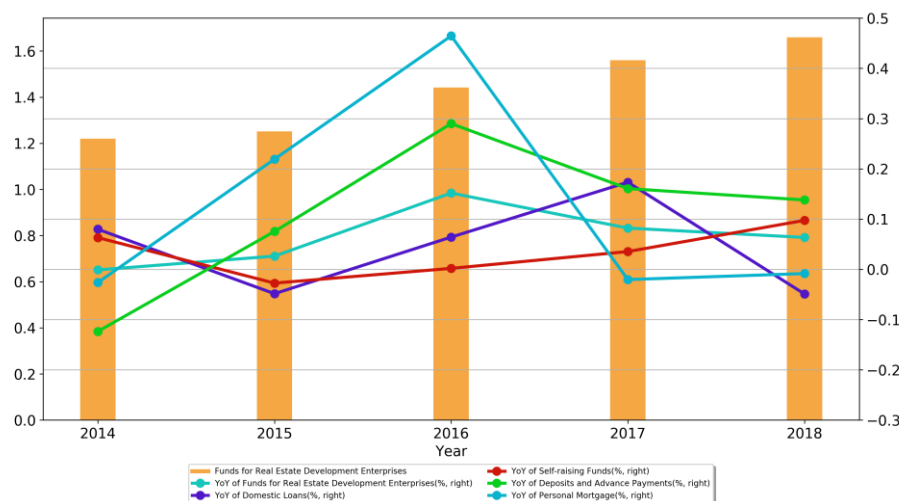


Source: The National Bureau of Statistics

The financing channels of the real estate market were tightened step by step. Moreover, the funds for China's real estate exploitation enterprises were increased by 6.4% year-on-year to RMB 16.6 trillion, the growth rate was 1.9% lower than that of 2017. The

Domestic Loans for Real Estate Development Enterprises Accounted for 14.5%, which was 1.7% lower than that of 2017. The Self-raising Funds, Deposits and Advance Payments for Real Estate Development Enterprises in total Accounted for 67.0%, which was 3.2% higher than that of 2017, as shown in the figure below:

Figure 6: Funds for Enterprises of Real Estate Development



Source: The National Bureau of Statistics

As per Vanke's 2018 annual report, the floor area of new construction projects developed by Vanke increase of 36.7% year-on-year to 49.928 million sq.m.,

In the rapid changes in the operating environment, Vanke manages to ensure a healthy resource. In 227 new projects acquired by the Group with a planned Gross Floor Area ("GFA") of 46.814 million sq.m., 72.1% were located in the first or the second tier cities. To continue on expanding the business, the total GFA from the Group's schemes under the construction was roughly 90.127 million sq.m..

2.2.2 Rental Apartment business

In 2018, Vanke reformed its strategy, and emphasize on developing the rental apartment business, which is also related to the policy direction.

According to *the Report on the Development of China's Migrant Population* issued by National Health and Family Planning Commission at the end of 2018, the overall

migrant populations from China in 2016 and 2017 were 245 million and 241 million, respectively.

Given this situation, the migrant population's proportion from the "post-1980s and post-1990s" grew stably to 65.1% (2016: 64.7%) in 2017. By geographical distribution, the Top 10 immigrant cities are Shanghai, Guangzhou, Shenzhen, Beijing, Suzhou, Tianjin, Hangzhou, Chengdu, Ningbo and Dongguan. In the future, the demand for rental apartment in the youths will be huge.

The housing prices in China remain at a high level. The population mobility has a positive influence on the rental housing market. Post-1980s and post-1990s people are the main customers in the field.

As for the government policy, according to the Government Work Report of NPC and CPPCC published in 2018.2.6, to support residents to purchase housing, cultivate housing rental market and develop the housing with the common property right. In June 2018, insurance capital are allowed to enter into rental housing, after that, there are more and more policy bonus on encouraging housing rental consumption,

As per the yearly report of the company in 2018, the rental business maintained a positive performance and continued to increase rental housing services in core cities. The cause lies at that, at the end of 2018, in 35 cities from the whole country, Vanke owns more than 60,000 rooms opened.

2.3 SWOT

Based on the company presentation and industry analysis made before, it will be performed by SWOT analysis. This analysis aims better understand the operating environment of Vanke.

2.3.1 Strengths

- Vanke utilize its professional advantages of property development and rich

customer volume to develop other business, which bring scale effect and synergy effects with the main businesses.

- Cost leadership and Product differentiation. Housing products focused on medium and small housing to meet the demand for self-occupation, which is in line with the market trend.
- Healthy balance sheet and high liquidity, the net debt ratio remaining at a low level in this industry. Vanke is at a good position to get funded onshore and offshore.

2.3.2 Weakness

- Dependence on the certain regional as main sales destination, in which fell in the loss of the revenue from some cities.
- The Floor Space for sale is limited.

2.3.3 Opportunities

- The population mobility in China remains at a high level, which is favorable to develop other business, such as rental housing.
- China's urbanization process is still in progress, and people's demand for occupation remains enormous,

2.3.4 Threats

- The strengthened financial regulation and unfavorable government policies.
- The regional layout of Vanke's competitors is more extensive, competition is highly intensified difficult to be among the top developers

3. Literature Review

3.1 Introduction

To start, it is important for us to be clear that a company's value is not the same as its price. Fernandez, (2002, pp.2)stated the price as a "quantity which is an agreement

between the seller and the buyer in a company's sale". While Koller et al.(2010, pp.3) defined the value "is the defining size of the measurement in the market economy".

"Valuation is the estimation of an asset's value on the basis of either on variables perceived to be relevant to the future investment returns or on contrasts with the similar assets. Moreover, skills in valuation is one very significant factor for succeeding in the investment", as stated in (Stowe, 2002, pp.20). It is an important tool in the portfolio management, the corporate finance, and acquisitions analysis (Damodaran, 2002); Fernandez, (2002) states that the valuation of the listed companies is used for the following aspects: i) comparing the intrinsic value using market price, and making a suggest for buying, selling, or holding the shares; ii) deciding in which securities the portfolio should focus on – the ones undervalued by the market; iii) comparing companies.

Damodaran, (2002) stated that the valuation is not an objective and static process. As company valuation is a subjective process which depends on company's product and the characteristic of operating environment, the value will change overtime and has to be updated based on the new information.

Analysts apply various models to evaluate assets in reality, which ranges from the easy to the complicated. However, there is no agreement on the existence of a single ideal model of valuation,

Damodaran, (2002) states that there are three main methods used in the valuation of companies, which will be presented as follows: 1) Discounted Cash Flow; 2) Related Valuation; 3) Contingent Claim Valuation.

3.2 The Discounted Cash Flow Valuation

The Discounted Cash Flow Valuation views the intrinsic asset value as the current value of its expected future cash flows, and the discounted rate reflects the risk of the expected cash flows (Damodaran, 2002; Luehrman,1997).

$$Value = \sum_{t=1}^{t=n} \frac{CF_t}{(1+r)^t} \quad (1)$$

In the two elements of discounted cash flow, CF refers to the expected cash flow at time t ; r stands for the discount rate or required rate of return.

This valuation method was first introduced in the 1970's (Luehrman, 1997), it has been evolved through the years, and is the most accepted valuation method and widely used in companies.

Imam et al. (2008) interviews with 42 sellers' securities analysts, suggest that various analysts have various preferences for valuating models for the same industry. Moreover, most analysts like the complicated valuation models, such as DCF. Their findings also reveal that the cash-flow-based valuation models are the original models applied by analysts. Demirakos et al., (2010) applied descriptive and univariate evidence to suggest that analysts apply DCF models significantly more frequently than PE models. Imam et al. (2008) hold that DCF the estimation mode can better show the value of high-tech industries.

Damodaran (2002) and Fernandez (2007) categorize the discounted cash flow in two approaches as follows: the equity valuation and the firm valuation. Damodaran (2002) states that for firm valuation, there are two paths as follows: FCFF (the Free Cash Flow to the Firm) and APV (the Adjusted Present Value). About equity valuation, the author considers FCFE (the Free Cash Flow to Equity) as well as DDM (the Dividend Discount Model).

3.2.1 Firm Valuation

a) FCFF

FCFF (The Free cash flow to the firm) refers to the cash flow, which can be obtained from suppliers of capital from the company after taxes, deducting expenses, and changes in working capital.

$$FCFF = EBIT(1 - \text{tax rate}) + \text{Depreciation} - \text{Capital Expenditure} - \Delta \text{Working Capital} \quad (2)$$

The firm's value is the current value of the future expected cash flows to the firm (FCFF) discounted at a weighted average cost of capital.

$$\text{Value of firm} = \sum_{t=1}^{t=n} \frac{CF \text{ of firm}_t}{(1 + WACC)^t} \quad (3)$$

Here, $CF \text{ of firm}$ refers to the expected cash flow to firm at time t . It corresponds to the residual expected cash flows to the firm after deducting expenses, taxes and investments. If the firm reaches a stable state after n years and increases at a steady rate g_n , the firm's value can be expressed as follows:

$$\text{Value of Firm} = \sum_{t=1}^{t=n} \frac{FCFF_t}{(1 + WACC)^t} + \frac{[FCFF_{n+1} / (WACC - g_n)]}{(1 + WACC)^n} \quad (4)$$

WACC refers to the minimum rate of return needed by investors. It stands for the cost of various categories of financing applied by the firm (including equity and debt), proportionately weighted. However, this is only suitable when there is a stable capital structure. The formula to compute WACC is the following:

$$WACC = \frac{E}{D + E} \times R_d + (1 - t) \times \frac{D}{D + E} \times R_e \quad (5)$$

Here, D refers to the firm's debt's market value, and E stands for the market value of firm's equity; R_d stands for debt cost, and R_e is the equity cost.

b) Adjusted Present Value (APV)

APV values the company's each claim separately. In this valuation method, the firm is valued first assuming no use of debt. Then, the effect of debt is added through summing the Present Value (PV) of tax benefits as well as the expected bankruptcy costs (Damodaran, 2002).

$$\begin{aligned} \text{Value of firm} = & \text{Value of all-equity-financed} + \text{PV of tax benefits} \\ & + \text{Expected bankruptcy costs} \end{aligned} \quad (6)$$

Damodaran (2002) demonstrates a three-step formula to compute the APV. It begins with the estimation of the firm's a non-debt scenario. In this approach, the firm value is calculated by the expected free cash flow to the firm discounted at the unlevered equity cost.

$$\text{Value of Unlevered Firm} = \frac{FCFF_0(1+g)}{(r_u - g)} \quad (7)$$

Here, $FCFF_0$ stands for the firm's free cash flow (assuming no debt), and r_u refers to the unlevered equity cost (assuming no debt).

In order to value the unlevered equity cost, we need to compute the firm's unlevered beta as follows:

$$\beta_U = \frac{\beta_L}{1 + (1-t)\frac{D}{E}} \quad (8)$$

Here, β_U is the firm's unlevered beta; β_L the levered the firm's equity beta; t refers to the firm's tax rate, and $\frac{D}{E}$ stands for the debt of the equity ratio.

In the second step in this approach, the effect of debt will be added by summing the estimation of the expected tax benefit of debts at a certain level. The tax profit depends on the firm's tax rate, which is discounted at the debt cost.

The last step requires to calculate the risk costs as well as the company's bankruptcy costs, taking a certain level of debt into consideration. According to Damodaran, it is necessary to estimate the probability of bankruptcy and its indirect costs.

In comparison with WACC, the advantage of APV is that it is useful to understand the impact of the changing capital structure. However, its flaw is that managers may ignore the expected bankruptcy costs, which leads to the increase of the firm's value as

companies borrow money.

3.2.2 Equity Valuation

a) Dividend Discounted Model (DDM)

The DDM is a means to estimate stock price of a company on the basis of the theory which its stock is worthy of the sum of all future dividend payments, which is discounted back to their current value. The mentality is as follows: the stock will be undervalued if the value obtained from the DDM is higher than what the shares of the current trading is.

DDM is the oldest and simplest DCF valuation method. It was first presented by John Burr Williams (1938) and later exploited by Gordon and Shapiro (1956) as well as Gordon (1962), which is mostly famous for the Gordon Model. This model holds that the equity value is corresponding to the discounted expected dividends. The relevant expression is as follows:

$$\text{Value of equity} = \sum_{t=1}^{t=n} \frac{E(DPS_t)}{(1+k_e)^t} \quad (9)$$

Here, $E(DPS_t)$ refers to the expected dividend in period t , and k_e stands for the cost of equity.

Regarding the difficulty of predicting future dividends, the Gordon Model supposes that the dividends increase at a steady rate. The following formula computes the value of stock:

$$\text{Value of stock} = \frac{DPS_t}{k_e - g} \quad (10)$$

Here, g refers to the constant growth rate.

In comparison with earnings as well as many other return concepts, the advantage of this model is its related stability of dividends, which may have DDM values insensitive

to short-run fluctuations in the underlying value. The main limitation of this model is the dividends distribution is related with the company's dividend payout policy and with its earnings, thus wouldn't be realistic assuming a constant growth in every case. According to Damodaran (2002), this model is only fit for mature companies with steady increase rates and well defined payout policies.

b) FCFE

Similarly to DDM, the FCFE estimates the company based on the dividends. However, in comparison with DDM, The FCFE estimates the company based on the potential dividends that could be paid, instead of the actual paid dividends.

The FCFE represents the cash flow obtained after meeting the financial obligations and making the necessary investments with a view to continuation of the company's operating cycle:

$$FCFE = \text{Net Income} + \text{Depreciation} - \text{Capital Expenditures} - \text{Change in non-cash Working Capital} - (\text{New Debt Issue} - \text{Debt repayments}) \quad (11)$$

The value of equity can be determined by future expected cash flows to shareholders (after debt payments), discounted at a required rate of return by investors (See the following formula).

$$\text{Value of equity} = \sum_{t=1}^{t=n} \frac{CF \text{ to equity}_t}{(1 + k_e)^t} \quad (12)$$

Here, $CF \text{ to equity}_t$ is the expected cash flow to the equity in period t and k_e is the equity cost.

The discount rate applied is the required rate of return on equity. What the adopted model adopted to estimate the equity cost is CAPM (the Capital Asset Pricing Model):

$$k_e = r_f + \beta[E(r_m) - r_f] \quad (13)$$

Here, r_f stands for the risk-free rate, and β stands for the coefficient of systematic risk; $E(r_m)$ refers to the market's expected return.

3.3 Relative Valuation

A relative valuation is a means of computing the company's value by using multiples of comparable companies and of the industry. Damodaran (2002, pp.18) states that "the asset value originates from the pricing of the comparable assets, which are standardized by means of the application of common variables, including earnings, cash flow, book value, revenues, etc".

The P/E's comparison value is likely to be P/E's mean or median value from a group of assets. Damodaran (2002) claims that when a large number of assets are being traded, and the market has priced them properly, this approach is particularly applicable.

The advantage of relative valuation is easier to be presented than DCF. However, it is difficult for us to find two similar firms with the identical business. Moreover, the choosing of comparable companies will influence the valuation result. Fernandez (2002), claims that a relative valuation should be used by combining with another methodology. Asquith et al. (2005) discover that nearly 99% of reports claim that analysts apply various earnings multiples (For instance, EBITDA multiples, P/E).

Fernandez (2002) mentions a research by Morgan Stanley, which reports that Tax, Depreciation, the Price to Earnings Ratio (PER) & the Enterprise Value to Earnings Before Interest, and Amortization (EV / EBITDA) ratios are the most popular aspects to evaluate companies. The ratios will be explained as following:

a) PER

This is a measure that relates the stock price of a company with its expected future earnings per-share. Due to its simplicity, it is one of the most used ratios to evaluate companies on relative valuation. This multiple is determined by:

$$PER = \frac{\text{Market Value per share}}{\text{Earnings per share}} = \frac{\text{Payout ratio} \times (1 + g_n)}{k_e - g_n} \quad (14)$$

Here, g_n refers to the future expected growth rate.

Koller et al. (2005) claims that PER can be manipulated by managers, result in biased valuation.

Demirakos et al.(2010)analyze 104 listed companies' research reports of three industries, suggest that the PS valuation method as well as the PE valuation method is widely applied in food, beverage industry and Electrical Manufacturing Industry. Because the growth rate of this industry is not high in the future, and the financial indicators are relatively steady. Therefore, on the basis of the present financial data indicators, we can estimate the intrinsic value in a better way. Imam et al.(2008) hold that PB valuation method is better for the listed companies in finance industry, since most of the assets owned by the listed companies in finance industry are highly liquid assets. Except that, generally speaking, the book value of finance companies is in the compliance with the value of the market.

b) EV / EBITDA

This ratio is a measure which relates the company's overall market value with its incomes before tax, interest, amortization, and depreciation. It is expressed as follows:

$$\frac{EV}{EBITDA} = \frac{(1-t) + t \times \frac{\text{Depreciation and Amortization}}{EBITDA} - \frac{\text{Reinvestment}}{EBITDA}}{WACC - g_n} \quad (15)$$

Koller et al. (2005) suggests that EV/EBITDA is likely to be more reliable than PER in comparison with different financial debts, while Stowe(2002) claims that the drawback of EV/EBITDA, with the growing of working capital, EBITDA will overestimate cash flow from operations.

Pinto (2010) holds that EV/EBITDA is more applicable for the industry of

manufacturing since the manufacturing industry owns enormous fixed assets as well as the accumulated amortization and depreciation. It can eliminate the influence of the amortization and the depreciation on valuation in an efficient way.

Therefore, this method will be used in the project as a complement of Discounted Cash-Flow.

3.4 Contingent Claim Valuation

Damodaran (2002, pp.22) stated that “an option or a contingent claim is a claim, which pays off only in certain contingencies, if the value of the underlying asset exceeds a pre-specified value for a call option, or if it is lower than a specified value for a put option”.

This model originates from the Black Scholes Model, which was released in 1973 by Myron Scholes and Fischer Black. It is significant to evaluate undeveloped assets with uncertain cash flow, such as patents or natural reserves. However, it has two main limitations: i) When dealing with long-term options it is difficult to make assumptions about constant variance; and dividend yield and ii) the values won't be directly extracted from the markets when the underlying asset is not traded. Moreover, the inputs will have to be estimated. Damodaran (2002)

Banerjee (2003) suggest that option model is more suit for biotechnology companies, because a lot of projects of biotechnology enterprises is still in the research and under experiments.

Thus, when the underlying assets, which are not traded the value, has more estimation error due to the assumptions on variables, it is likely to lead to a highly complex process and to an unreliable final value. In this project, this methodology will not be used.

4. Valuation

4.1 WACC

In order to calculate WACC (the Weight Average Cost of Capital):

$$WACC = \frac{E}{D+E} \times R_e + (1-t) \times \frac{D}{D+E} \times R_d \quad (16)$$

It is necessary to compute: Equity, Debt, debt cost, and equity cost. It is important for us to understand that the values of Equity and Debt applied in WACC are the intentional target of the capital structure that the company pretends to attain in the near future. In reality, the assumptions adopted in the Income Statement and Balance Sheet result in small changes in the structure of capital. The equity value in 2018 is computed by multiplying share price as well as the issued shares number. The value of debt is from the balance sheet.

Next, the pre-tax cost of debt can be broken into two parts: $R_d = R_f + \text{credit spread}$.

The risk-free rate corresponds to the rate on a 10-year treasury bond from China in 2018, Vanke is rated AAA by China Chengxin Securities Rating Co., Ltd. According to Damodaran's website of applying the typical default spreads for AAA rated firms, the pre-tax cost for Vanke is obtained by adding the credit spread of 0.75% to 3.27% riskless rate:

$$\text{Pre-tax cost of debt} = 0.75\% + 3.27\% = 4.02\%$$

Vanke owns 35% effective tax rate. However, using the marginal tax rate is more accurate (Damodaran 2002), which is 25% given by the Chinese government, the debt after-tax cost for Vanke:

$$\text{After-tax cost of debt} = 4.02\%(1-0.25) = 3.02\%$$

With the aim to estimate the cost of capital, CAPM (the Capital Asset Pricing Model) is applied as follows:

$$k_e = r_f + \beta[E(r_m) - r_f] \quad (17)$$

By applying a nominal risk free rate of 10.50% as well as an 8.28% risk premium (average of market premium from 2009-2018). The beta is from a published source (guorn.com/stock/history), which is 1.42. Subsequently, the equity cost can be valued as follows:

$$\text{Cost of Equity} = 3.27\% + 1.42 (8.28 - 3.27\%) = 10.40\%$$

Table 3: WACC

	2019E	2020E	2021E	2022E	2023E
WACC	4.15%	4.15%	4.15%	4.15%	4.15%

4.2 FCFF

The firm's cash flow is the cash obtained to pay to the investors after the company's paying its costs for the business.

Table 4: FCFF Forecast

FCFF Forecast					
	2019E	2020E	2021E	2022E	2023E
EBIT	81225339731.2	98814119163.8	120211625810.71	146242612921.54	177910428295.82
t	25.00%	25.00%	25.00%	25.00%	25.00%
Depreciation	3,309,413,055.80	2,343,666,453.13	3,575,769,847.06	5,455,609,940.59	8,323,712,402.33
NWC	203,432,860,371.05	251,559,988,774.26	276,483,015,718.88	212,024,384,668.02	-99,308,948,442.02
CAPX	48,379,019,903.74	71,193,639,356.77	104,850,697,140.61	154,536,426,371.49	227,932,615,992.42
FCFF Forecast	-187,583,462,420.57	-246,299,372,305.05	-287,599,223,654.40	-251,423,241,407.76	13,132,866,073.80

From the table, the FCFF stays in negative for four years, the reasons can be as follows: Based on the research by JIA(2019), the study shows the cyclical fluctuations of the market of China's real estate, according to the pattern before, the market of real estate will reach the bottom and begin to rise around 2019, and 36 months is a full circle in average. In addition, Chairman Yu Liang said in the meeting in September 2018, quote "survival was the ultimate goal for its next three-year strategic plan, as the turning point has really arrived for the industry." After 2021, the cash flow will start to recover from the recession of the real estate market.

We assume that the firm is in steady businesses with the expectation to grow only 3.27%

yearly. Then, the firm's expected free cash flow to the firm of the next 5 years can be estimated as follows:

$$\text{Value of Firm} = \sum_{t=1}^{t=n} \frac{FCFF_t}{(1+WACC)^t} + \frac{[FCFF_{n+1} / (WACC - g_n)]}{(1+WACC)^n} \quad (18)$$

Table 5: PV of FCFF

	2019E	2020E	2021E	2022E	2023E
WACC	4.15%	4.15%	4.15%	4.15%	4.15%
FCFF	-187,583,462,420.57	-246,299,372,305.05	-287,599,223,654.40	-251,423,241,407.76	13,132,866,073.80
PV	-180,108,941,354.37	-236,485,235,050.46	-276,139,437,018.15	-241,404,936,541.30	12,609,568,961.88

$$PV \text{ of } FCFF = -921,528,981,002.39$$

$$\begin{aligned} TV &= FCFF \times \frac{(1+g)}{(wacc-g)} \\ &= 13,132,866,073.80 \times \frac{1+3.27\%}{4.15\%-3.27\%} = 1,541,171,681,183.03 \end{aligned}$$

$$PV \text{ of } TV = \frac{TV}{(1+WACC)^5} = 1,257,635,097,325.71$$

$$EV = PV \text{ of } FCFF + PV \text{ of } TV = 336,106,116,323.32$$

$$\frac{EV}{Shares} = \frac{336,106,116,323.32}{11,039,152,000.00} = 30.45$$

The fair value is 30.45 (based upon the 11,039,152,000 shares outstanding). The stock was trading at 27.80 at the time of this valuation, which is below its fair value. Thus, based on the forecast, it appears that the company is undervalued and the recommendation given to the shareholders is to buy Vanke's shares.

4.3 PER

The multiples valuation is used to support the Discounted Cash Flows method. We

selected China Merchants Shekou Industrial Zone Holdings CO., Ltd, China Fortune Land Development Co., Ltd, and Poly Developments and Holdings Group Co., Ltd as Vanke's competitors.

Table 6: Multiples

Company	P/E	Eps	Price
CHINA VANKE CO., LTD	8.50	3.06	24.74
China Merchants Shekou Industrial Zone Holdings CO., Ltd.	8.27	1.59	12.85
Poly Developments and Holdings Group Co., Ltd.	8.24	1.93	15.59
China Fortune Land Development Co., Ltd	7.33	3.91	31.62
Industry	8.09		

Vanke's PER ratio is in comparison with its peers in the industry. A high P/E ratio suggests that the market has a higher expectation of earnings for the company. Vanke had a higher PER than the average in the sector, the recommendation is to sell.

In conclusion, the valuation results in different recommendation. As mentioned before, the using of valuation method varies from industry. Since Vanke is a property development company, PER might not be the best choice to evaluate the company.

5. Conclusion

CHINA VANKE CO., LTD is one of China's most well-known property developers, which is a key position at the property development market. In order to react to a cooldown of the industry, threatened by the unfriendly policies, Vanke introduced a new strategic plan, which is to enter in new businesses fields and regions.

The main aim of this project is to estimate the fair value of CHINA VANKE CO., LTD, so as to give the shareholders a suggestion of buying or selling the company's shares.

Although there is no agreement on a single model for valuation, many scholars find out DCF models id significantly used, based on the characteristic of Vanke, the valuation

of the company used Discounted Cash Flows model, together with the Multiples methodology.

According to the Discounted Cash Flows methodology, Vanke's shares are priced below its fair value, which means that the company is underestimated and the recommendation is to buy. The multiples methodology shows that the company is in line with its competitors, also the recommendation is to buy.

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7. Appendix

7.1 Appendix 1 - Income statements

Income Statements (RMB'000)				
Years	2015	2016	2017	2018
Revenue	184,317,543	228,916,100	237,344,688	297,083,058
Cost of sales	-138,625,598	-170,602,315	-160,621,229	-187,130,999
Gross profit	45,691,945	58,313,785	76,723,459	109,952,059
Other net income	3,431,620	1,388,918	4,537,623	3,585,145
Selling and marketing expenses	-4,138,274	-5,160,716	-6,261,981	-7,868,076
Administrative expenses	-4,853,224	-7,174,595	-9,632,693	-14,590,133
Other operating expenses	-229,477	-519,023	-1,193,097	-2,112,602
Profit from operations	39,902,590	46,848,369	64,173,311	88,966,393
Finance costs	-1,778,974	-2,310,339	-4,060,732	-8,181,336
Share of profits less losses of associates joint ventures	2,393,092	4,930,716	4,569,160	6,279,911
Profit before taxation	40,516,708	49,468,746	64,681,739	87,064,968
Income tax	-14,567,270	-21,118,491	-27,473,352	-37,792,673
Profit for the year	25,949,438	28,350,255	37,208,387	49,272,295
Attributable to:				
Equity shareholders	18,119,406	21,022,606	28,051,815	33,772,652
Non-controlling interests	7,830,032	7,327,649	9,156,572	15,499,643
Profit for the year	25,949,438	28,350,255	37,208,387	49,272,295
Earnings per share (RMB)	1.64	1.9	2.54	3.06

7.2 Appendix 2 – Balanced Sheets

Balance Sheets (RMB'000)					
	Years	2015	2016	2017	2018
Assets					
Non-current assets					
Property, plant and equipment		6,373,913	9,105,632	10,734,770	22,645,383
Investment properties		7,609,532	12,096,846	17,046,197	25,897,948
Intangible assets		836,490	892,754	1,096,273	1,015,426
Interest in associates and joint ventures		33,503,424	61,701,988	81,224,305	129,527,656
Other financial assets		1,138,813	1,328,014	1,340,749	2,688,915
Other non-current assets		9,642,481	17,055,019	26,700,789	35,982,967
Deferred tax assets		5,166,541	7,198,533	9,651,002	15,749,205
Total Non-current assets		64,271,194	109,378,786	147,794,085	233,507,500
Current assets					
Inventories		367,507,209	466,225,274	597,487,304	754,310,077
Contract assets		-	-	-	1,364,127
Trade and other receivables		118,576,603	159,542,743	238,404,911	331,838,827
Other current assets		7,956,600	8,670,500	721,893	12,600,806
Pledged and restricted deposits		1,432,760	7,542,103	9,795,002	12,749,283
Cash and cash equivalents		51,747,621	79,490,015	164,326,007	175,668,164
Assets held for sale		-	-	6,910,171	6,624,631
Total current assets		547,220,793	721,470,635	1,017,645,288	1,295,155,915
Total assets		611,491,987	830,849,421	1,165,439,373	1,528,663,415
OWNERS EQUITY AND LIABILITIES					
Equity					
Total equity attributable to equity shareholders of the Company		100,183,518	113,444,766	132,675,315	155,764,132
Non-controlling interests		36,126,099	48,231,805	53,998,624	79,856,598
TOTAL EQUITY		136,309,617	161,676,571	186,673,939	235,620,730
Liabilities					
Current liabilities					
Bank loans and borrowings from financial institutions		25,648,370	40,881,705	56,109,320	69,136,923
Bonds payable		998,122	2,468,181	6,163,376	24,046,473
Trade and other payables		380,825,800	519,643,307	760,383,146	486,726,148
Contract liabilities		-	-	-	504,711,414
Current taxation		12,589,535	17,005,293	24,699,588	37,292,979
Total current liabilities		420,061,827	579,998,486	847,355,430	1,121,913,937
Non-current liabilities					
Bank loans and borrowings from financial institutions		33,828,585	56,406,061	96,029,045	120,929,055
Bonds payable		19,015,812	29,108,376	32,322,672	47,095,146
Deferred tax liabilities		754,849	679,255	357,755	622,971
Provisions		143,221	118,672	159,866	143,528
Other non-current liabilities		1,378,076	2,862,000	2,540,666	2,338,048
Total Non-current liabilities		55,120,543	89,174,364	131,410,004	171,128,748
Total liabilities		475,182,370	669,172,850	978,765,434	1,293,042,685
Total Sources of Funds		611,491,987	830,849,421	1,165,439,373	1,528,663,415

7.3 Appendix 3 – WACC

	2019E	2020E	2021E	2022E	2023E
WACC	4.15%	4.15%	4.15%	4.15%	4.15%
FCFF Forecast	-187,583,462,420.57	-246,299,372,305.05	-287,599,223,654.40	-251,423,241,407.76	13,132,866,073.80
PV	-180,108,941,354.37	-236,485,235,050.46	-276,139,437,018.15	-241,404,936,541.30	12,609,568,961.88

7.4 Appendix 4 – FCFF

EBIT Forecast					
	2019E	2020E	2021E	2022E	2023E
EBIT	81,225,339,731.22	98,814,119,163.80	120,211,625,810.71	146,242,612,921.54	177,910,428,295.82
Depreciation Forecast					
	2019E	2020E	2021E	2022E	2023E
Depreciation and Amortization	4,458,045,055.80	6,801,711,508.93	10,377,481,355.99	15,833,091,296.57	24,156,803,698.90
Change in non-cash Working Capital Forecast					
	2019E	2020E	2021E	2022E	2023E
Inventories	939,036,063,532.08	1,169,000,329,573.77	1,455,281,456,820.12	1,811,671,104,777.77	2,255,338,427,150.99
Trade and other receivables	469,130,695,994.28	663,224,409,011.28	937,620,625,689.64	1,325,542,947,113.80	1,873,960,593,977.74
Pledged and restricted deposits	40,248,211,502.70	127,059,578,892.87	401,114,384,606.91	1,266,278,000,765.56	3,997,513,020,616.80
Trade and other payables	569,573,330,844.24	666,522,192,288.30	779,973,023,235.34	912,734,675,624.63	1,068,094,104,885.76
Bonds payable	71,109,170,774.46	210,280,907,650.42	621,833,437,806.96	1,838,858,452,226.44	5,437,791,218,255.99
Current taxation	53,467,022,039.30	76,655,781,393.89	109,901,554,210.17	157,566,088,273.84	225,902,830,513.59
Change in non-cash Working Capital	203,432,860,371.05	251,559,988,774.26	276,483,015,718.88	212,024,384,668.02	-99,308,948,442.02
Capital Expenditures Forecast					
	2019E	2020E	2021E	2022E	2023E
Property, plant and equipment	34,217,872,098.51	51,704,260,022.89	78,126,731,458.30	118,051,900,668.44	178,380,062,640.53
Investment properties	38,965,547,302.10	58,626,802,268.36	88,208,742,907.30	132,717,153,660.72	199,683,640,138.86
Intangible assets	1,098,248,471.15	1,187,826,295.94	1,284,710,469.80	1,389,496,929.69	1,502,830,219.74
Other financial assets and Deferred tax assets	26,912,427,745.09	39,281,595,256.72	57,335,731,303.32	83,687,692,992.15	122,151,227,500.67
Other non-current assets	51,164,768,286.89	72,752,019,416.60	103,447,284,262.39	147,093,382,521.60	209,154,482,265.23
Capital Expenditures	48,379,019,903.74	71,193,639,356.77	104,850,697,140.61	154,536,426,371.49	227,932,615,992.42

FCFF Forecast					
	2019E	2020E	2021E	2022E	2023E
EBIT	81225339731.2	98814119163.8	120211625810.71	146242612921.54	177910428295.82
t	25.00%	25.00%	25.00%	25.00%	25.00%
Depreciation	3,309,413,055.80	2,343,666,453.13	3,575,769,847.06	5,455,609,940.59	8,323,712,402.33
NWC	203,432,860,371.05	251,559,988,774.26	276,483,015,718.88	212,024,384,668.02	-99,308,948,442.02
CAPX	48,379,019,903.74	71,193,639,356.77	104,850,697,140.61	154,536,426,371.49	227,932,615,992.42
FCFF Forecast	-187,583,462,420.57	-246,299,372,305.05	-287,599,223,654.40	-251,423,241,407.76	13,132,866,073.80