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Dynamics of the Fundamental Valuation Models in US housing construction companies during the Financial Crisis

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Dynamics of the Fundamental Valuation Models in US housing construction companies during the Financial Crisis

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Description

Fundamental equity valuation has been prevalent in today's financial world, especially when stock investment is heavily noticed. Nonetheless, it is not suggested to apply fundamental valuation during unstable periods since the accounting data of firms are negatively fluctuating. It is nearly infeasible to capture relevant value estimates when the historical performance is erratic. The aim of this methodology-based study was to examine four models: Dividend Discount Model (DDM), Discounted Cash Flows (DCF), Residual Income Valuation (RIV) and Abnormal Earnings Growth Model (AEG) regarding their accuracy in explaining the market price. The methods assembled historical data of US house builders around the time frame of the 2008 Financial Crisis, divided into three investigation sub-periods: pre-crisis, crisis and post-crisis to clarify how the selected time frames impact valuation results.

The initial data set obtained was the pricing error (PE) of each stock. Subsequently, the one-way ANOVA test was conducted to examine the similarities among models in terms of statistical analysis and conclude whether the variations are statistically significant. Regarding the accuracy and reliability of valuation, the mean, median, standard deviation and coefficient of PE values were attained and compared among models.

The results indicated that most of the observations were overvalued with very inconsistent PE value distribution. Especially during the crisis period, the stocks delivered poorer performance in explaining trading price compared to the pre and post-crisis. The ANOVA test failed to reject the null hypothesis, which meant there were no statistically significant differences in means among models. RIV was considered to be the most reflective valuation method to the market, AEG came in second, DDM third, and DCF showed the poorest market explanatory power.

Keywords (subjects)

Dividend Discount Model, Discounted Cash Flows, Residual Income Valuation, Abnormal Earning Growth Model, valuation, valuation methods, Financial Crisis, House Builders

Miscellaneous

Attached 120 pages of Appendices

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Abbreviations

AEG	Abnormal Earnings Growth Model
B	Book value of Equity
BVPS	Book Value of Equity per share
CAPEX	Capital Expenditure
CAPM	Capital Asset Pricing Model
CF	Cash Flows
CVA	Cash Value Added
D	Dividends
D&A	Depreciation and Amortization
DCF	Discounted Cash Flows
DDM	Dividend Discount Model
DPS	Dividends per share
E	Equity
EBIT	Earnings before Interests and Taxes
EP	Economic Profit
EVA	Economic Value Added
FCF	Free Cash Flows
g	Growth rate
GAAP	Generally Accepted Accounting Principles
IFRS	International Financial Reporting Standard
IR	Investor Relations
NI	Net Income
NOPAT	Net Operating Profit after Taxes
NSE	Nairobi Securities Exchange
NZSE	New Zealand Stock Exchange
NYSE	New York Stock Exchange
p	Net Debt
PP&E	Property, Plant and Equipment
r_d	Cost of Debt
r_e	Cost of Equity
R_f	Risk-free rate
R_m	Market Rate of Return
$R_m - R_f$	Market Risk Premium
RIV	Residual Income Valuation
ROA	Return on Assets
ROCE	Return on Capital Employed
ROE	Return on Equity
SGR	Sustainable growth rate
SGR	Sustainable Growth Rate
T	Corporate tax rate
V	Intrinsic value of equity
VR	Residual Values
WACC	Weighted Average Cost of Capital
β	Beta

1 Introduction

1.1 Research Background

In the financial world, the 2008 crisis initiated from the US has been a hot topic that a tremendous number of articles had brought up the investigation of its causes and impacts. Amadeo (2017) stated that the crisis made the housing price to fall by more than 30%, even greater than the 1931 Depression. Furthermore, even two years after the recession, the unemployment rate was still more than 9%. When the dust settled from the collapse, 5 trillion dollars in pension money, real estate values, savings and bonds had disappeared. The story about how the housing bubble began an unexpected panic has been exposed by numerous practitioners that several economics and finance textbooks have condensed the period into a case study or chapter. (Murphy 2008.)

Ever since the imposition of Mortgage-Backed Securities in the late 1970s, big banks recorded huge profit since the rate of mortgage default was 1%, which make the investments low-risked. However, with beyond-imagination greed, they took advantage of those securities by collecting the junk mortgage bonds, piled it up into a low-risk bond and sold it to the open market. In 2006, the rate of mortgage default was 4%, and 8% in 2008, which made the bonds became completely worthless. As houses were also a type of mortgage, their value dropped down severely, but people were still unable to afford. (The Enterprise 2016.)

Before the event, the housing market in the US had the reputation of being solid for decades. Securities in this industry was believed to be low-risked, even when there were signals of financial market imbalances. Investors acted irrationally towards the potential threat via excessive trading due to the positive extrinsic figures. As these securities were inflated by hundreds of percent (Murphy 2008, 3), investors suffered severely from continuous devaluation of stocks and bonds during the crisis.

From such panics, the need of “proper valuation” were brought into line, along with rational and risk-adverse investment. Too much divergence between “market” value

and “real” value can lead to irrational behavior of investors. Detecting mispriced securities for trading was regarded as the key of success for every individual investor or fund. Apart from relative models such as P/E, P/B ratios utilized by major stock investors, absolute valuation methods were taken into practice to estimate the corporate’s intrinsic value. (Damodaran 2008.) Two most common approaches are Dividend Discount Model (DDM) and Discounted Cash Flows (DCF). Nonetheless, empiricists like Charlton (2012) emphasized the lack of explanatory power of these methods during erratic period such as the housing crisis. Since the models heavily rely on the forecast of cash flows and income, analysts coped with uncertain expectation. The misleading historical performance of firms made it unable to anticipate future stock movement, especially for long-term investment. Hence, it is my interest and curiosity to examine these valuation models regarding how accurate and stable in valuing the investigated companies along the crisis time window.

1.2 Relevance of the topic

The 2008 Financial Crisis is considered a global crisis because its ultimate consequences were far from only a national level. According to Mir (2013), the economic slowdown also took place in other developed countries in Europe and, to a lesser extent, Asia. Additionally, Otker-Robe and Podpiera (2013) claimed that the youth is the most impacted age group by the crisis. They estimated a total of nearly 75 million young people who were unemployed in 2012. Therefore, I believe that this topic is relevant, concretely for the future generation since valuation has always been an essential process to find the intrinsic value of any securities. Subsequently, one can seek overvalued or undervalued stock and implement appropriate investment approaches.

The direct impacts of the crisis to the housing market can be interpreted based on recorded figures. Wearden and Kollewe (2008) stated that up to July 2008, about 5,000 US building workers were laid off by the construction companies to minimize the recession effect. Being the primary subjects of this research, certainly the relevance of the topic to the house builders is self-explanatory. I hope the results will be a minor contribution to the companies in terms of hedging and risk management.

Furthermore, the study might devote to the acknowledgement of publicly-traded companies in conducting Investor Relations (IR) activities. The need to focus more on IR as a separate department has become undeniable (Johnson 2010).

The Financial Crisis of 2008 has always been my favorite topic for financial analysis, thanks to The Big Short (2015). Even though the root causes and long-term impacts can only be explained by high practitioners through intensive valuations (Murphy 2008), I shared deep interest in researching the same field with an objective attitude. Based on other academic documents, I may competently apply the knowledge of 2008 crisis and valuation methods into each case. The topic itself might not directly associate to me, but I believe conducting this research is a huge personal milestone in terms of enhancing financial skills and acknowledging the severity of every economic downfall.

1.3 Research Problem, Objectives and Questions

There is always a possibility that any company's financial performance was not parallel with the trading price in a specific time during the investigation period. That is why there might be such differences between the intrinsic and extrinsic value, since the cost of every types of risk would be considered. Nonetheless, each valuation approach consists of distinct assumptions, formula and interpretations. Hence, it is paramount that the methods conducted can reflect the trading value to a certain degree. Regarding publicly-traded firms in an industry, the market risks are major factors in determining future stock movement (Lofthouse 2001, 65). The investigated home construction companies, which are considered the largest in the US, is expected to witness such correlations with the housing market. Still, the result might be surprising as financial crisis is the period of extreme fluctuation in all financial data. It is likely that each valuation method may reveal opposite results concerning the intrinsic value of equity. While one concludes the result to be undervalued, the other might indicate overpriced securities. The current financial sector experiences different portfolio management strategies based on valuation results, which leads to several trading plans. Even for a common approach such as P/E multiple, individual investors may come up with divergent intrinsic values.

(Villiger & Bordan 2005.) Although there is no ideal method that can be implemented in any case in any specific period, this can be utilized as an empirical research to assess the accuracy and credibility of each valuation model. Since there is only one author in this study, the assumptions and calculations are unified among models. I would like to examine whether disparate valuation methods obtain similar results, as well as how reflective they are in explaining the stock market values. Following are the research questions addressed in the current study:

1. **DO THE VARIOUS VALUATION METHODS PROVIDE SIMILAR CORPORATE VALUES DURING THE INVESTIGATION PERIODS?**
2. **WHAT IS THE EXTENT OF DISCREPANCIES IN THE CORPORATE VALUATION PROVIDED BY DIFFERENT METHODS?**

In order to solve the research questions, I have chosen 10 companies as the representatives of US Housing Giants. They were in the top 20 largest house builders in 2017: DR. Horton Inc., Lennar Corp., Pulte Group, NVR Inc., Toll Brothers, KB Home, Meritage Home Corp., Hovnanian Enterprises Inc., M.D.C Holdings Inc. and Beazer Homes USA. According to Pro Builder (2017), here is their ranking in the US Housing Giants with the 2016 revenue:

Table 1. Selected US House Builders for valuation (adapted from Pro Builder 2017)

Ranking	Company	Code (NYSE)	Starting Year	2016 Revenue ($)
1	DR. Horton Inc.	DHI	2002	12.3 billion
2	Lennar Corp.	LEN	1954	9.5 billion
3	Pulte Group	PHM	1950	7.4 billion
5	NVR Inc.	NVR	1980	5.7 billion
6	Toll Brothers	TOL	1967	5.2 billion
7	KB Home	KBH	1957	3.5 billion
9	Meritage Home Corp.	MTH	1985	3 billion
10	Hovnanian Enterprises	HOV	1959	2.7 billion
12	M.D.C Holdings Inc.	MDC	1972	2.2 billion
15	Beazer Homes USA	BZH	1985	1.7 billion

There are some companies belonging to this ranking but forcefully eliminated from the selected cases such as:

- CalAtlantic Homes (#4 ranking): it was established in October 2015 by merging Standard Pacific Homes and Ryland Homes.
- Taylor Morrison (#8 ranking): its annual report of 2008 is unreadable (have another format rather than pdf).
- Shea Homes (#12 ranking): it is not a publicly traded company hence its financial data is unreachable.

The company cases are parts of New York Stock Exchange (NYSE). The states in the US which recorded the majority of construction units were Texas, Ohio, Florida, etc.

This will be a quantitative study using numerical data from various internet sources such as Yahoo Finance, Stockrow, Reuters… containing the historical share prices of the publicly traded companies in the States. These websites provided all the essential market data that can be conducted during this research. Furthermore, the obtained figures should be double-checked with the financial statements of each firm, especially when the intermediary web pages enclose differently.

The investigation time scale will be divided into three main periods: Pre-crisis from 2003 to 2007, During crisis from 2008 to 2012 and Post-crisis from 2013 to 2017. Even though the housing bubble initiated in early 2006, the boundary between Pre-crisis and During crisis is chosen to be 2008 since the securities collapse only began from 2008. The four absolute valuation methods implemented in this research are The Dividend Discount Model (DDM), The Discounted Cash Flows Model (DCF), The Residual Income Valuation (RIV) and The Abnormal Earnings Growth Model (AEG). All of them are addressed as fundamental, which have been generated in several empirical studies. Therefore, each method has been practically proven in terms of validity and credibility to a certain extent.

The input will be processed through Microsoft Excel in order to evaluate the equity value in comparison to the trading price. The spreadsheets' functions and format has been fixed among models as well as investigation periods to assure the integrity of

calculation progress. In addition, the “Data Analysis” package from Excel will be utilized as an alternative to SPSS. The test of statistics hypothesis will be described in the upcoming chapters.

Regarding the outcome of the thesis, the two research questions was answered thoroughly. The statistical test failed to conclude any tendency of difference among intrinsic values across models are significant. After considering the accuracy and reliability factors measured by pricing errors (PE), RIV was disclosed to be the most reflective valuation methods to the US housing market. AEG came in second, DDM third, and DCF showed the poorest market explanatory power.

1.4 Thesis structure

This thesis is structured into five chapters. The *Introduction* chapter gives an overview of the research background as well as some current knowledge about the research context for the readers regarding this subject. The *Literature Review* chapter consists of three main part. The *Theoretical Literature Review* introduces all the key definitions and notions associated with valuation methods in theoretical perspectives to analyze and interpret the collected data. The *Empirical Literature Review* offers the practical valuation findings from prior researchers based on the theoretical framework. Therefore, the observations depend on experience and expertise in securities valuation rather than analytical logic. The *Hypothesis* is the part where the author gives some initial assumption based on subjective thoughts and experience. Subsequently, the *Methodology* chapter suggests the most suitable research design and analysis approach for answering the research questions. Additionally, it also covers the method of collecting data from various sources (what? how? where?). The step-by-step process of valuation using Microsoft Excel must be revealed in this chapter. Thereafter, based on the numerical calculation, the researcher needs to be able to answer the research questions in the *Result* chapter. Furthermore, the eventual outcome of each case, in each period, using each method are presented in detail. To sum up the whole thesis, the *Conclusion* chapter indicates some interpretations regarding the results, strengths and limitations of each model, as well as some recommendations contributive to future studies.

2 Literature Review of Valuation

Reviewing of literature is often considered to be a critical process, as it not only refines the research ideas, but also shows your acknowledgement in this research field (Sharp, Peters, & Howard 2002). Therefore, the criticality of reviewing literature will influence others' judgement in terms of their identical approaches (Tranfield & Denyer 2003, 208).

Schreiner (2007, 13) emphasized the significance of both standard literature and empirical studies in conducting a corporate valuation research, especially when applying various methods. All matters related to valuation as well as methodology should be intensively discussed during this chapter.

According to Abend (2008), theoretical framework is the guide leading the researcher to the right directions. It is infeasible to implement any knowledge into the research without relevant theories successfully brought into practice. By doing so, the researcher can form a hypothesis based on the fundamental framework and select the most appropriate method in such circumstances (Asher 1984). Furthermore, it enables the reader to evaluate with a critical mindset, since the literature review needs to be rationally reflected in the research approach.

Going deeper into valuation-related topics, Schreiner (2007, 13) emphasized the necessity of limited theories despite the numerous usages of fundamental methods. Although several approaches have been applied with different variations and techniques, all can be explained thoroughly within a few concepts and equations.

2.1 Risk and Return

In investment, these two factors always go hand-in-hand with increasing correlation. The more potential return an investment could get, the more risks it may capture during the period (Campbell & Viceira 2005, 14). As simple as it may seem, this opposing relationship cannot be applied arbitrarily to any investment or project. The concept of risk and return has become a core principle in valuation as well as other financial issues.

2.1.1 Return

The definition of return was created alongside within “the very first page” of economic histories, as it originates from the core value of economics: profit. If an investment gains profit over a specific period, the representative return is positive, and vice versa (Oxford Dictionary). Nevertheless, the concept can be expressed in different forms and various situations, such as a company obtaining net profit, or the net dividend payments to the shareholders. Lofthouse (2001, 543) suggested that return in value should be presented in two main forms: income or capital appreciation/depreciation. One always computes return as a relative fraction in percentage rather than an absolute number. Therefore, it is also called *rate of return*. (Rivers 2013.) The rate of return formula is very straightforward and formally revealed in most of finance-related textbooks. Note that this equation can only be implemented within a single period:

$$\text{Rate of Return} = \frac{V_1 - V_0}{V_0}$$

In which:

- V_1 = the price/value at the end of the period
- V_0 = the price/value at the beginning of the period

Practically, the attractiveness of a rate of return always follows with an appropriate period. Especially when comparing profitability of various investments, it is usual to unify the periods by annualizing them. On the other hand, investors also want to acknowledge the average return of an asset over a specific period based on annual data. (Lofthouse 2001, 23-24.) For instance, if a researcher wants to obtain the average return of equity in 3 years, with annual return rate of R_1, R_2, R_3 respectively, one can implement the equation of arithmetic average or geometric average:

Table 2. Arithmetic and Geometric mean formula

Arithmetic	Geometric
$R_{average} = \frac{R_1 + R_2 + R_3}{3}$	$R_{average} = \sqrt[3]{(1 + R_1) \times (1+R_2) \times (1+R_3)} - 1$

Mathematicians have justified that geometric means are always lower than arithmetic, as long as the returns are not constant (ibid.). According to Gallant (2018), geometric means is the better measurement when it comes to calculating average return or any other types of financial averages. It indicates that the figures are interdependent, which is realistic as a high rate of return results in more capital to be generated and vice versa.

In accounting, returns are the performance assessing tool for businesses, which are especially implemented into ratio analysis and interpretation. Britton and Waterston (2009, 195-199) suggested two primary types of returning ratios: Return on Capital Employed (ROCE) and Return on Equity (ROE). Formally:

Table 3. ROCE and ROE formula

ROCE	ROE
EBIT / Capital Employed	Net Income / Shareholders' Equity

Both measurements are conducted to evaluate the performance as well as potential for obtaining future value. While ROE focuses on profit generated by shareholders' equity, ROCE illustrates the ability to gain income based on capital. (Maverick 2015b.) However, Groot and Selto (2013, 349) claimed that Return on Assets (ROA) - ROCE with capital employed replaced by total assets - is the most impactful measurement to be brought into strategy maps of US corporates. Additionally, Damodaran (2007, 12) claimed that there are also other return measurements, but most are irrelevant to valuation due to the matter of inconsistency.

In investment, volatility of return is also an influential driver in the decision-making process of strategy. The tricky characteristic of historical return that challenges even experienced investors is that it never recurs itself (Kennon 2018b). As a result, it is undeniably essential to compare the variability of fundamentals with actual return (Lofthouse 2001, 447). Capturing the actual return is feasible by assembling data from the financial statements. In several cases, the rate of return appeared directly in the annual report, which beneficially reduces practitioners' assignments. Otherwise, obtaining such measurements can be processed by computational

software like Microsoft Excel. Combining closing prices within a particular time frame, actual returns are calculated using the rate of return formula (Boyte-White 2018). Thus, the question arises: how could one determine the fundamental return? That is the incentive of pricing and valuation models (Lofthouse 2001, 447).

2.1.2 Risk

Risk is defined as the potential of gaining or losing value. In other word, risk can also be described as the deliberate interaction with uncertainty. Uncertainty includes any unpredictable and negative results. (Cline 2015, 43.) Looking into a financial perspective, there are always risks involved when a shareholder invests in a firm, or an investor decides to purchase or sell a share. Risk is also interpreted when a company's total debt exceeds the ability to pay back. As discussed above in the *Return* section, volatility is a risk itself, because your actual return can be substantially contrast to your fundamental or expected return (Horne & Wachowicz 2008, 99). The source of risks is numerous. Take an example of some market stocks from Tanous (1999, 171-2). These stocks always vary together when fluctuating and form a concrete pattern, which means there are common elements of risk existing in these stocks, because investors will be anxious if the market return does not meet their expectations. Concerning the causes and consequences of risks, there are multiple ways to categorize risks into distinct types.

According to Lofthouse (2001, 64), when acknowledging a specific security in the market, there are always two opposite sides of the coin worth being considered: expected and unexpected factors. Formally:

$$\text{Actual Return} = \text{Expected Return} + \text{Unexpected Return}$$

The unexpected part of the return is the total risk of investment (could be either positive or negative). Nonetheless, one primary component that distinguishes risks into various types is the concept of diversification. The rule of thumb is that: you can reduce your portfolio risks by spreading the risks across a number of assets or portfolios. (Horne & Wachowicz 2008, 104.) From an investor's view point, when considering his or her own portfolio, risk consists of two components:

- Systematic risks: also called undiversifiable risk or market risk, refer to the entire market which can influence massive amounts of shares. In such cases, the overall volatility and return of these shares are likely to be correlated, especially in the same industry (Lofthouse 2001, 65). Therefore, a well-diversified investor with significantly weighted portfolio will still be exposed to systematic risks. In other words, this type of risk is inevitable and can only be overcome via efficient hedging (Turner 2011). However, Shovlin (2011) argued that apart from techniques like options or forwards, an investor can also mitigate systematic risk through asset allocation. Formally, even such risks have their own boundaries, from one to a range of interconnected market sectors. Therefore, distributing shares across dissimilar segments will sharply deteriorate the reciprocal correlation of assets (Johnson 2010). Systematic risks include interest rate volatility, inflation, recession, wars, natural catastrophes, etc.

- Unsystematic risks: also called diversifiable risk or firm risk, refer to a particular firm or industry, or even to a single share, which is independent of any economic or political status (Horne & Wachowicz 2008, 105). In other words, unsystematic risks of a share must not associate with any other unrelated ones (Lofthouse 2001, 65). Considering the diversification matters, this type of risk affects heavily portfolios with low number of securities. For instance, a sick-leave of an operating manager in a factory have a negative impact on the revenue during that period. Nevertheless, as opposed to systematic risks, unsystematic risks are avoidable via appropriate diversification. There are two dimensions where one can spread his or her portfolio: through different segments or assets classes. A combination of these two approaches will reduce the sensitivity to any market fluctuations (Lioudis 2018). However, such risks might be minimized or even eliminated only if diversification is efficient. It may prevent the loss, but it can also reduce the potential gain in case of, for example, a technological breakthrough in a specific sector. That is, Horne & Wachowicz (2008, 106)

justified that over-diversification can make the risk involved in holding a stock become irrational.

Generally, when measuring the total risk of a portfolio, three indicators must be taken into account: systematic risks, unsystematic risks and portfolio size. The relationship between the above factors is illustrated in figure 1 below:

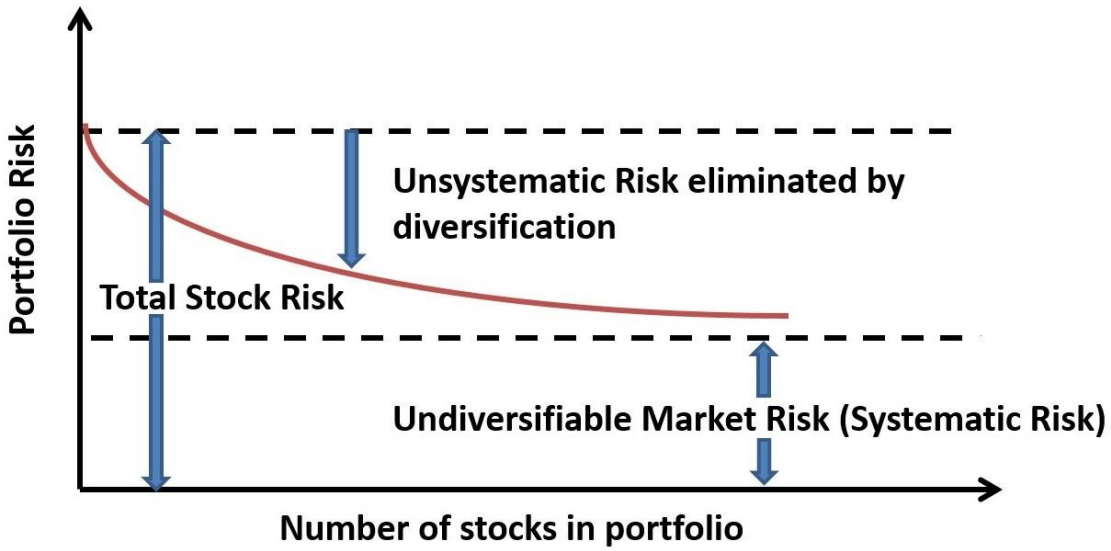


Figure 1. Systematic and Unsystematic Risk (adapted from Schmidt 2008)

Statistically, risk can be measured using the formula of standard deviation to probability distribution of each security's actual return (ibid., 117). However, there is always the factor of subjectivity in assessing risks, which make a risk-loving investor come up with a slightly different result than a risk-averse. Either way, the bottom line is that in an investment, risk will never be eliminated completely (Lioudis 2018). Overall, a successful investor needs to find a rational balance between rate and return, in order to continually get profit but still have a good night sleep.

2.2 Capital Asset Pricing Model (CAPM)

The association between risk and expected return of a particular security can be implied based on the behavior of risk-averse investors (Horne & Wachowicz 2008, 106). That is the essence of the CAPM – one of the most valuable concepts in the financial sector which is still genuinely applicable in this dynamic era. This model is not reflective of only investors' behavior, nonetheless, it also reflects the minimum

rate of return that the firms must produce in order to convince their potential stockholders. Therefore, the CAPM sets the bar for every corporate to focus on Investor Relations activities since most of the shareholders already have their expected return benchmark. The CAPM comprises components as following:

2.2.1 Beta

Beta is one of the most vital elements in the CAPM model, which evaluate the systematic risk (Jan 2012). The most fundamental way to calculate beta is from the historical price of the investigated company and the market itself. It is recommended to take a considerable period of over two years in order to recognize the return pattern. The formulation is indicated as following (ibid.):

$$\beta = \frac{\text{Covariance } (r_i,\ r_m)}{\text{Variance } (r_m)}$$

The criteria below are eligible to set the boundaries among types of investors:

- A risk-lover has beta > 1.
- A risk-neutral takes beta approximately from 0,8 to 1 (if beta is 1 then they are investing in the market index).
- A risk-averse has beta < 0,8.

Therefore, the primary purpose is to compare your expected rate of return, which depends on the market's performance, with your actual rate of return. Furthermore, the Government-backed securities such as the central banks or AAA-rate firm could have no risk whatsoever, meaning beta is close to zero. Nonetheless, for any securities in the market beta must be positive even in equilibrium (Sharpe 1973, 8).

Subsequently, we can see that only adopting the rate of return on a single day basis is impossible. The whole portfolio of the market and the company must be applied to the main formulation. Therefore, beta is estimated based on the regression return against the stock market, which cannot be solved by diversification.

2.2.2 Risk-free rate

At heart, the Government-backed securities expect their rate of return as equal to risk-free rate. Because the name is self-explanatory, risk-free rate of return is expected with a risk-free investment over a specific time frame. As one of the components in the CAPM model, it is also crucial to indicate an approximately accurate risk-free rate. A very interesting point is that Damodaran, in his up-to-date valuation documents, had always committed to the risk-free rate in calculation as 4% (Damodaran 2009). Nonetheless, analysts and practitioners may come up with different risk-free rates based on the market background. Taking into consideration the US company valuation, the interest rate of 3-month US treasury bills is also the risk-free rate for US investors since these treasury securities have its risk-free history of defaults for decades. Treasury bills (T-bills) interest rate embeds suitable characteristics to be chosen as the risk-free rate (Schmidt 2008):

- T-bills are usually assumed to have zero default risk and backed by the US government.
- T-bills does not require any interest payments unlike Treasury bonds (more than 10 years interest) or Treasury notes (from 1 to 10 years interest).
- T-bills can be purchased directly from the government by individuals or enterprises.

In addition, this risk-free rate can also be applied to indicate the initial cost of debt from any kinds of investment (Damodaran 2009d), which is a significant element when estimating financial ratios or the discount rates. Even though the risk-free rate is indeed not technically presented in any sources of finance (Schmidt 2008), still there needs to be set a benchmark for investors to forecast their return. An example to validate the stability of risk-free rate is from Lexicon (2008). There is a severe downward trend of US debt from a rating firm named Stanley & Poor's in 2011, which barely had any effect on the US Treasury bills value, and in this case, the risk-free rate. Nevertheless, this raised the question about the creditability of US Treasuries as the main indicator for the risk-free rate. Still, nothing changed. (Kenny 2017.)

2.2.3 Market Risk Premium

We need to look at the market portfolio to calculate the market risk premium. It consists of two components:

- The risk-free rate (R_f) as explained above.
- The market rate of return (R_m) indicates the theoretical perspective of the market performance during a specific time window. It depends on plenty of factors with both types of risks involved. The data might be taken in multiple ways based on the regions and market sector. For instance, the exemplary index for the Nordic market is OMX40, while in this case, the proxy for the US housing market is FTSE100. Hence, based on the historical market price, we can have an overview of how every market reacts to the economic volatilities.

The market risk premium is also used to calculate the cost of equity, especially for start-up entrepreneurship (Damodaran 2008). The formula is presented below:

$$\text{Market risk premium} = R_m - R_f$$

By the historical data assembled, it is feasible to collect the daily and annual market rate of return (R_m). Nonetheless, the risk-free rate (R_f) may be attained differently by investors and empiricists, which leads to the variations among the estimated market risk premia.

2.2.4 CAPM formula and application

All the previous components come to form the final equation of CAPM, which is first established by John Lintner and William Sharpe in 1964. CAPM has been a very original theory, with critical content adjustments been made during the 1990s. Its significance is evident with a total of 3 Nobel Memorial Prizes in economics.

Nonetheless, equivalent to any other models, there are assumptions to make CAPM ideally applicable (Horne & Wachowicz 2008, 106):

- Investors need to be well informed about the capital markets.

- Transaction costs are low enough to make it inconsiderable when selling or buying shares.
- The market price is stable and not affected by a single investment.
- The investors are capable of holding the securities within a specific period, ideally one fiscal year.

CAPM has been applied widely in the financial sector, from start-ups to massive enterprises, as a fundamental tool to evaluate their performance with the industry. In other words, it compares the systematic risk with the expected rate of return, taking the market as a benchmark. The model is presented as following:

$$\text{Cost of Equity} = R_f + \beta * (R_m - R_f)$$

In which:

- R_f = risk-free rate
- $R_m - R_f$ = market risk premium
- β = beta

From the equation, we can see that all the companies vary within the beta, which is a representative of unsystematic risk. It can be interpreted that the more of a risk-lover an investor is, the more return he or she expects to gain from stocks. This also explained clearly how the market beta equal to 1. However, there are such limitations and exceptions that make it insufficient to be applied in some cases and need to be adjusted severally (Zucchi, 2006):

- The market indexes are all estimations. It is impossible to give an accurate inclusion, whereas minor differences may turn the investors' point of view rapidly.
- Many claimed that this theory is far from the real world, as the global digital market fluctuates exponentially and is problematic to capture any reliable data for valuation.
- It will be challenging for a risk-loving investor if at a specific point of time the market rate of return turns below zero. Because subsequently, one might "expect" the return to be relatively negative.

- The beta coefficient might not give a fulfilled picture about the asset, as it also depends on the market performance.

Nonetheless, thanks to the simplicity of the model, investors may come up with various possible results in order to eliminate the negative investments with diversified portfolios and focus on systematic risk. Moreover, CAPM is also applied to have a broad comparison with the performances of different firms, especially in the same market sector. After all, this model is not perfect and might continue to be renovated in the upcoming future. But its influence is undeniable, which is proved by the 3 Nobel Prizes.

2.2.5 Weighted Average Cost of Capital (WACC)

This is one of the most fundamental elements of the Discounted Cash Flows model (DCF). It is the sum of the cost of equity and debt, with the weights representing the capital structure (Rao 2016, 50). In addition, Berkman, Bradbury and Ferguson (2000, 76) stated that WACC represented the discount rate when calculating the enterprise value of equity. Conversely, Rao (2016, 54) argued that even with such discount rates it is genuinely difficult to cover the security and financial risks. WACC consists of different components:

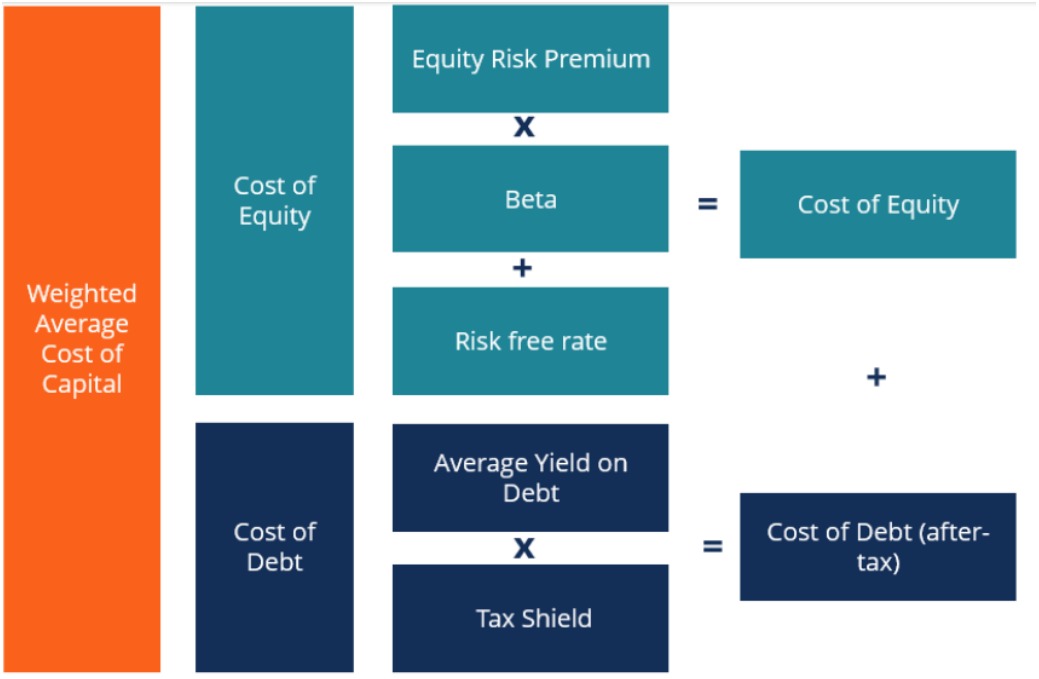


Figure 2. WACC Components (adapted from Rao 2016)

The formula of WACC (Fernandez 2015, 13):

$$WACC = \frac{E.r_e + D.r_d.(1 - T)}{E + D}$$

In which:

- E = market value of equity
- D = market value of debt
- r_e = cost of equity
- r_d = cost of debt
- T = corporate tax rate

Nonetheless, it is nearly infeasible to obtain the exact WACC. Therefore, different approaches of WACC calculation have been applied. (Penman 1995, 18.) For instance, Ibbotson (1984, 45) suggested that the cost of capital can be used by adding the equity premium of 6% per year to the risk-free rate for all firms.

2.3 Valuation in general

Fernandez (2007) emphasized the necessity of valuation in different circumstances, mostly in the view of the buyer and seller:

- The buyer will acknowledge the maximum value to buy certain assets.
- From the seller's perspective, valuation helps determining the minimum value of equity so that the company can maintain the operation.

Concretely, valuing a publicly listed business usually involves the comparison between the intrinsic value per share with the market stock price. Thereby, investors can decide whether to sell, buy or hold the shares. Considering other valuation purposes, Wilkinson (2016) clarified that there are situations where valuation needs bringing into practice:

- Shareholders' dispute: a company on the verge of bankruptcy might be a chance to transfer the remaining share to shareholders' pockets.
- Mergers and Acquisition: when a company stands in front of a transitional milestone such as M&A, the value obtained must be guaranteed.

- Price allocation: determining the current assets, current liabilities, tangible and intangible assets is a compulsory part in every annual report.

In the article *Value Maximization,* Jensen (2001) mentioned the "Stakeholder Theory", which is: valuing an enterprise includes interests from all internal and external stakeholders. Therefore, valuation approaches are significantly various and only represent a portion of the equity value.

2.3.1 Fundamental Valuation methods

According to Damodaran (2006, 3), practitioners frequently apply a broad spectrum of valuation models, ranging from the simplest to the most sophisticated. The fundamental analysis of equity includes historical and current financial data of firms as well as other macroeconomic factors in order to find the real value of equity (Penman 2004, 74-75). From there, practitioners seek for mispriced stocks and apply suitable investment actions (Schreiner 2007, 40).

There are four absolute approaches applied into this research: the Dividend Discount Model (DDM), the Discounted Cash Flows model (DCF), the Residual Income Valuation (RIV) and the Abnormal Earning Growth model (AEG). The first three model are classical methods which are mentioned in several academic books and articles; while the last model is a recent advancement by Ohlson (2005).

2.3.2 Sustainable Growth Rate (SGR)

A key input when valuing a firm is its long-term growth rate in terms of cash flows and earnings, but it cannot be obtained only by the expectation and perspectives of individual analysts (Damodaran 2008, 2). The historical performance of firms must be brought into account as the past might forecast the future itself. There is a close relation between growth and value, which can stay in place or even be destructive to equity (ibid.). Platti, Plat, and Chen (1995, 147) defined sustainable growth as the rate that assets or turnover can grow without any significant change in equity, financing policy or capital structure. Many scholars and practitioners have generated their own growth framework based on fundamental financial data. However, there are two factors that most of the approved frameworks take into considerations: the

dividend payout ratio and the equity performance (Kijewska 2015, 140). From that point of view, the SGR equation can be written as follows:

$$SGR = (1 - \text{dividend payout ratio}) \times ROE$$

Other analysts suggested that ROA is a better measurement rather than ROE since liabilities is also a growth indicator (Brealey, Myers, & Allen 2016, 748). Nonetheless, in equity valuation, only the equity value would be brought into measurement. Developed from the basic form, Higgins (2018) justified that the profit margin could be considered to influence the SGR formula, or Horne and Wachowicz (2008) explained how financial leverage has a positive correlation with SGR. This formula has been utilized by Damodaran (2008) to calculate the long-term growth rate of dividend used in the Gordon Growth model (next section).

Nevertheless, none suggested that high SGR is a positive signal to firms, as growth can only be healthy to a certain level. Beyond-the-limit SGR may lead to financial distress such as high expenses, debt burden or even bankruptcy (Fonseka, Ramos, & Tian 2010, 2). Furthermore, Kijewska (2015, 142) indicated that too rapid growth might lead to exposure of companies being scarce of investment funds. That is why the word “sustainable” is essential for this context, as SGR must facilitate balance in expansion of value. Such concepts are applicable in the modern financial management for strategic planning because sustainable growth can help firms to survive and maintain their competitiveness in the industry (ibid., 27). Still, growth is the irreplaceable input in valuation methods, within which SGR can represent the long-term growth rate to capture the terminal value of equity.

2.3.3 Terminal value

After forecasting cash flows or earnings, terminal value needs to be obtained as a phase in the stepwise valuation base. Damodaran (2008) emphasized that it is infeasible to forecast forever, hence the terminal value is captured to illustrate the company’s value into infinity. Despite its significant impact, advancing appropriate assumptions to calculate terminal value can be problematic, especially when fluctuations in growth regularly transpire (Alfredsson & Lehmann 2016, 19).

Nonetheless, three approaches of estimating terminal value were summarized by Damodaran (2008) depending on the firm's characteristics and personal judgements:

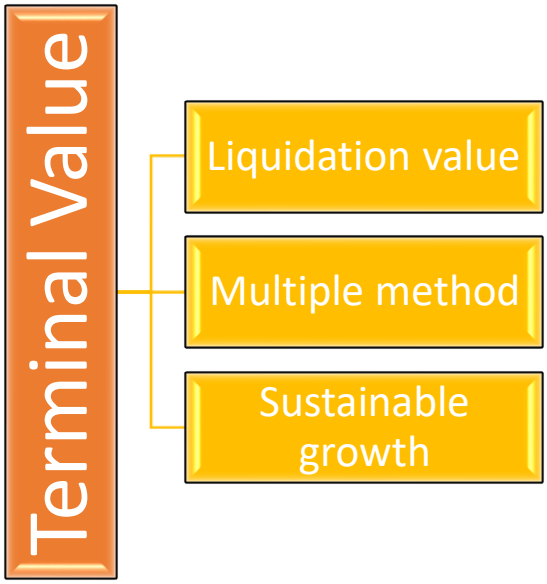


Figure 3. Terminal Value estimation approaches (adapted from Damodaran 2008)

According to the first approach, the firms' assets are assumed to be terminated at an exact time in the future, which would be traded when accumulated to the highest bidders. Therefore, the terminal value is equivalent to liquidation value. The second approach involves different multiples application to revenues and profits. When generating DDM or DCF, this approach may shift the base into relative valuation, as multiples can only be estimated by using comparable firms. The last, also the most common approach in practice, is opposed to the first approach's assumption. That is, equity is believed to be reinvested and extend its lifespan ideally into infinity (ibid.). A striking advantage of sustainable growth is that terminal value has its general form applying the equation in perpetuity with only a few distinctions between models (Penman & Sougiannis 1998, 350). Thus, it is suitable for studies considering different valuation methods, as terminal value will be screened in a consistent way.

2.4 Dividend Discount Model (DDM)

2.4.1 Dividend

One of the key elements of the DDM is dividend. It is defined by Foerster and Sapp (2005, 56) as a part of the profit that firms share with the shareholders. Dividend

could be issued in two primary ways: cash or stocks. Usually the dividend payment process is managed by the corporate board and require the shareholders' approval. Nevertheless, paying dividend is not legally compulsory. (Bayraktar 2010, 325.) In the company's annual report, the dividends per share (DPS) and dividend yield, which is the measurement of dividends proportionally to the enterprise market value, are applicable into the DDM. However, there was a hypothesis of Modigliani and Miller (1961, 431) indicating that dividend policy is irrelevant since it does not affect the value of equity and thus, cannot be applied into any valuation approaches. This theory faced criticism, since many analysts claimed that investors usually prefer dividend as the cost of transaction imperative for selling shares (Jiraporn, Leelalai, & Tong 2016, 862).

2.4.2 Introduction and Formula

This is also one of the most fundamental methods in the valuation process. When calculating the company's stock price, we cannot leave out the future dividend payments. (McClure 2017a.) However, the main component to be considered is the discount rate, which includes various types of risk rates such as interest, policy, bankruptcy, inflation...and time value. There are numerous confusions between the rate of interest and the rate of discount. One is an extra that you have to pay for using someone else's money, while the other solely symbolizes the time value of money. (Merritt 2016.) It is likely to make the dividend become undervalued over a time period in comparison to the present. The initial theory of this model stated that the specific stock value is worth the sum of its future dividend payments, discounted by an appropriate rate (McClure 2017b). The formula is self-explanatory (Schreiner 2007):

$$V = \sum_{i=1}^{\infty} \frac{D_{t+i}}{(1 + r_e)^i}$$

In which:

- V = Intrinsic value of equity
- D = expected future cash dividend

- r_e = discount rate (assumed constant)
- t is the investigated point of time

However, it is really challenging to estimate the discount rate. It differentiates among investors and practitioners based on their characteristics and valuation approaches. For instance, if a risk-neutral imposes the discount rate of 7%, then it is likely for a risk-averse to consider that rate as below 7% (4 – 6%). Therefore, each investor may come up with various numbers with extreme differences. Fortunately, most researchers approved that the discount rate applied into the DDM is the cost of equity (Penman 1995).

2.4.3 Pros and Cons

Maverick (2015a) indicated some drawbacks of DDM:

- It is infeasible to evaluate the stocks which have no dividend. Because without dividends, the stock's intrinsic value would always be undervalued regardless of the current price.
- The estimation process can be slightly different but then result in extremely under or overpriced securities.
- It does not regard the stock buybacks situations, which Janssen (2017) explained as the way corporates purchase their own shares from the investors in order to increase the stock price. It is considered as an alternative to the traditional dividend rate of return.

In addition, Penman (1995, 4) emphasized even though it is not absolutely coherent that equity estimates can be based on future dividend payments to the shareholders, other technical issues still remain in the DDM. The future dividend forecast is hardly connected to intrinsic value hence, the forecast time frame must assure its longevity, or even terminality. This characteristic makes DDM comparatively inappropriate in a finite period. Enterprises can easily borrow money from outsourcing to create its own dividends, rather than from any financing or investing activities (Penman 2004, 79).

From the investors' perspective, the DDM in fact consists of many preferable characteristics (Juneja, 2016):

- DDM is totally based on ground theory with simple and relevant logic.
- There is no subjectivity during the valuation process. Therefore, if a few practitioners apply the model to a specific asset, the eventual results are relatively similar.
- The model can be easily implemented in a mature business, where dividend is paid constantly at a stable rate.

If we assume that the dividend will remain unchanged to infinity, the formula will be reduced using the perpetuity equation (McClure 2017a):

$$V = \frac{D}{r}$$

Combining with the Gordon Growth Model equation, assuming the dividend will grow at a constant rate g in time, and g < r, then:

$$V = \frac{D(1 + g)}{r - g}$$

Damodaran (2008) stated that DDM is an ultimate extension for start-ups, as they can adjust the value today for the possibility of failure. It also associates closely with risk management as well as evaluating stock prices. Still, there must be implicit assumptions made by marginal investors.

2.5 Discounted Cash Flows (DCF)

2.5.1 Free cash flows (FCF)

This is the amount of cash a business generated throughout the operating process, excluding the capital expenditure such as properties and equipment. According to Schreiner (2007, 25), the free cash flows does not influence any financing activities in the firm. Hence, it is not affected by capital structure, although capital structure is significantly considered to acquire the intrinsic value.

FCF can also be obtained by the firm's total value through this simple formula (Fernandez 2015, 9):

$$FCF = \text{Equity Cash Flows} + \text{Debt Cash Flows}$$

Furthermore, the free cash flows is computed by collecting book data from the financial statement, starting with the net operating profit after tax (NOPAT):

$$NOPAT = EBIT\ (1 - T)$$

Next input required is the working capital, which is the resource that represent the firm's short-term financial capacity, usually in one year. It is believed to be one of the most reliable financial data since it illustrates how a company will use its short-term assets to cover any short-term debt. (Kennon 2018a.)

$$\text{Working Capital} = \text{Current Assets} - \text{Current Liabilities}.$$

When obtaining current assets and liabilities, there are plenty of factors in the balance sheet to be considered (ibid.):

Table 4. Working Capital components

Current Assets	Current Liabilities
Cash	Accounts Payable
Marketable Securities	Accrued Expenses
Inventory	Notes Payable
Accounts Receivable	Portion Long-term Debt

Subsequently, we need to find the depreciation and amortization (D&A). According to Ross (2017), both parameters are used to evaluate the most of a specific asset over its life span. Even though these expenses differ in the tangibility of the asset (Kennon 2018a), both are included in the free cash flows which can be candidly derived from the income statement.

Capital expenditure (CAPEX): the fund usage for purchasing long-term assets such as land, constructions, equipment which are continually used for generating cash flows. These costs were recorded into accounting as Property, Plant and Equipment (PP&E). The monetary benefit from CAPEX will be spread throughout a few years of accounting. (Bragg, 2017.) Below is the formula using the income statement and balance sheet:

$$CAPEX = PP\&E\ (current) - PP\&E\ (prior) + Depreciation.$$

Aggregating all the above financial parameters, the free cash flows equation is obtained (Schreiner 2007):

$$FCF = NOPAT + D\&A - \Delta working\ capital - CAPEX$$

There are some limitations when determining the FCF, as suggested by Gode and Ohlson (2006):

- FCF is occasionally immeasurable, as operating, financing and investing activities in a firm are completely separated.
- FCF might be easily manipulated by rudimentary accounting actions, such as delaying the payment to the suppliers.
- FCF only concerns the cash generation, not wealth generation aspects. Therefore, it is challenging to forecast the FCF directly from the collected book values.

There are other methods to calculate the free cash flows using book value, nonetheless all should obtain similar results (Penman 1995, 41). Concerning the eventual FCF value, Wright (2007) claimed that FCF can also be negative as the company is preparing large investments, which will be paid back in the long-term. Conversely, enterprises with stable financial performance always have positive FCF in order to generate other financing and investing activities.

2.5.2 Introduction and Formula

In fact, the intellectual framework of DCF was created by Bohm Bawerk and Alfred Marshall, who first discussed the concept of monetary time value (Damodaran 2006,

5). This approach focuses more on the process of cash generation rather than cash distribution (Schreiner 2007, 24). Furthermore, Gode and Ohlson (2006) claimed that DCF has no linkage to any value generating activities. Fernandez (2015), in his research, also called it: Cash Flows discounting-based method. The main purpose is to determine the real value of an investment, adjusted by the time value of money. The DCF is also considered an alternative to the DDM to cover some technical issues (Penman 1995, 3).

It starts with a key principle, which is to evaluate equity value by forecasting the future cash flows it generates and then discount back to the present time using a discount rate. Even though the valuation methods implementing multiples have proved their credibility recently, DCF is still the most ubiquitous approach as it is conceptually correct (Fernandez 2015). It works best for firms that has positive cash flows, reliability for future forecasting, and the risk factors easily captured (Damodaran 2005, 10).

Here is the formula of the model applied to all the various DCF sub-models:

$$V = \frac{CF_1}{1 + r} + \frac{CF_2}{(1 + r)^2} + \frac{CF_3}{(1 + r)^3} + \ldots + \frac{CF_n + VR_n}{(1 + r)^n}$$

In which:

- V = Intrinsic value of equity
- $CF_{(1,2,3\ldots)}$ = cash flows generated in period 1, 2, 3...
- r = discount rate
- VR_n = residual value in year n. Fernandez (2015) explained that the residual value is the sum of all the discounted value of cash flows after a specific period

If we assume that the residual value of equity also grows at a constant rate g after every year, then the formula is: $VR_n = CF_n(1 + g)/(r - g)$.

The discount rate applied into this model is the weighted average cost of capital (WACC). Because the firm is examined as an enterprise, including both debt and

equity, the discount rate must involve the cost of these two elements (Fernandez 2015).

Alternatively, Schreiner (2007, 25) suggested a more condensed formula based on the assumption that free cash flows could be considered as “firm dividends” that represent separately the company’s value of entity and equity:

$$V_{entity} = \sum_{i=1}^{\infty} \frac{FCF_{t+i}}{(1 + WACC)^i}$$

The difference between enterprise value (value of entity) and equity value is that enterprise value also includes the market capitalization, as well as all the debts in the company (Nigudkar 2011). Therefore, to yield the equity value, we must subtract the above factors from the enterprise value. This subtotal can be regarded as the market value of net debt p (Schreiner 2007, 26):

$$V_{equity} = \sum_{i=1}^{\infty} \frac{FCF_{t+i}}{(1 + WACC)^i} - p$$

2.5.3 Variations

Nonetheless, several controversial sub-methods of DCF has been applied by researchers and practitioners. Fernandez (2017, 2) indicated ten different methods based on the theoretical framework:

Table 5. DCF Variations (adapted from Fernandez 2017)

Method	Cash flows	Discount rate
1	Equity Cash Flows	Cost of Equity
2	Free Cash Flows	WACC
3	Capital Cash Flows	WACC after tax
4	Adjusted Presented Value (APV)	
5	Risk-adjusted Free Cash Flows	Required Return to Assets
6	Risk-adjusted Equity Cash Flows	Required Return to Assets
7	Economic Profit	Cost of Equity
8	Economic Value Added (EVA)	WACC
9	Risk-free rate adjusted Free Cash Flows	Risk-free rate
10	Risk-free rate adjusted Equity Cash Flows	Required Return to Assets

Even though all of these methods always deliver identical intrinsic equity values, since they only differ in the cash flows initially taken (Fernandez 2017, 2), the "Free Cash Flows discounted by WACC" method is still the most well-known (Rao 2016, 50).

2.5.4 Pros and Cons

According to Schreiner (2007, 26), the DCF have two primary deficiencies corresponding to the DDM. First, the measurement of FCF can be challenging, regarding the fact that there are no coherent boundaries between operations, investment and financing. For instance, a bank receiving deposits can be an operating and a financing activity as well. However, based on the FCF definition, an operating activity should be included in the FCF, while financing must be excluded. Second, a negative capital expenditure is the incentive for managers to relax the short term FCF via investment delay. Since the cash inflows and outflows must form a match, the investment period needs to be captured within the horizon (Penman & Sougiannis 1998, 350). Third, the initial step of DCF involves operating profit forecasting in order to explain the action, which severely influence the invested

capital. Other than FCF-related problems, Gokhale (2015) claimed that the most significant drawback is the estimation of the expected return of equity, including the assets pricing model; the risk factors; the sample companies; the estimated period; the observation interval; and the risk premium.

On the other hand, DCF also have its outstanding advantages competing with the other peers. When collecting input to generate this method, analysts have to dig into all of the company's financial statements, including income statement, balance sheet and cash flows statement. By doing so, they were able to see the clear picture, and indicate relevant interpretation based on the valuation results. Moreover, the reason why DCF is the controversy among academia is its strong theoretical framework (Damodaran 2006, 4). Therefore, if the data collection as well as analysis is correctly implemented, then DCF can be used as a confrontation to other approaches.

In a broader view, Folger (2016) pointed out some technical pros and cons of DCF:

Table 6. Pros and Cons of DCF

Advantages	**Disadvantages**
Offer the most accurate intrinsic value	Small adjustments lead to various results
Omit subjectivity of accounting	Time-consuming with numerous inputs
Not influenced by non-economic factors	Involve forecasting future performances
Useful with high confidence of future cash flows	Significantly dependent on the expectation of the company

2.6 Residual Income Valuation (RIV)

2.6.1 Residual Income

As Bragg (2018) defined, Residual Income is the remaining amount of profit after extracting all the required cost of capital after an investigated period. That exceeded cost can be considered as the opportunity cost for the invested capital (Presnell 1981, 54). Apart from the valuation purpose, as the initiative of the Residual Income

Valuation (RIV), Residual Income is also used for decision making process – to accept or reject a capital investment. Ohlson (1995) defined it through a formula:

$$\text{Residual Income} = \text{Net Income} - r_e \,.\, B\,(\text{prior})$$

In which:

- r_e = cost of equity (assumed constant)
- B (prior) = book value of common equity in the previous time

Residual Income approach can be applied to individuals, business units or corporates, especially to evaluate the performance of different financial departments (Bragg 2018). This is believed to be a better measurement of investment ability than the return on investment (ROI) approach, since it could accept proposals that surpass the minimum requirement of ROI (Hanks 2008).

Identical to the FCF, negative residual income, which means the return on equity is less than the cost of capital, is not always interpreted as poor financial health (Osyasar 2010). However, such circumstances validate the limited horizon of the company with negative values likely to soar from time to time (Penman 1995).

2.6.2 Introduction and Formula

Even though RIV was a new model compared to DDM and DCF, it has gained massive popularity in corporate finance as well as classrooms and textbooks (Ohlson 2000, 3). Corresponding to the DCF, the RIV involves forecasting its key measurement – residual income (Schreiner 2007, 27). The underlying attribute of RIV is the net dividend payments to the company, and the value of equity is also obtained through the future dividend forecasting. Therefore, RIV shares the same initiative as the DDM. (Skogsvik 2002, 2.) The advancement of RIV is that by taking into consideration the future residual earnings, as a substitution for future dividend payments, the book and market value divergences will be revealed. Nonetheless, RIV is believed to cover several fundamental accounting principles, as empiricists found the model critically reasonable (Ohlson 2000, 20). RIV is listed in the category of Accounting-based Valuation Models. Conversely, Stewart (2002, 5) argued that the creation of this concept protested completely the previous accounting frameworks. Its base

accounting characteristic is called clean surplus relation, which stated that the changes of the book value of equity depends on two factors: net income and net dividends (O'Hanlon & Peasnell 2002, 230). The relationship between these variables is reflected:

$$B_t - B_{t-1} = NI_t - D_t$$

In which:

- B = book value of common equity
- NI_t = net income from t - 1 to t
- D = net dividends paid to the shareholders

In the studies of Peasnell (1982), the theoretical basis of this model was first introduced based on the connection between economic and accounting value. From there Ohlson (1995) developed into an extended version with the formula equivalent to the DDM and DCF:

$$V = B_t + \sum_{i=1}^{\infty} \frac{RI_{t+i}}{(1 + r_e)^{t+i}}$$

In which:

- V = Intrinsic value of equity
- RI = expected residual income
- B = book value of common equity
- r_e = cost of equity
- t is the investigated point of time

2.6.3 Variations

In addition to the principal method which is the representative of this model implemented in most studies, Fernandez (2000, 2) suggested three more methods that yield identical intrinsic estimates:

- The Economic Profit (EP) discounted by the cost of equity plus the book value of equity equals the equity value. EP is another name for residual income

based on its definition. This is a more accurate measurement of profit since all the cost of resources used to gain revenue is assessed.

- The Economic Value Added (EVA) discounted by WACC plus the book value of entity equals the entity value. The concept of EVA was generated by Stewart (1999) in one of his books called *The Quest of Value*, as a developed factor of RIV. EVA has been applied in global financial management and become a standard for corporate governance. (Lee 1996, 1.)
- The Cash Value Added (CVA) discounted by WACC plus the book value of entity equals the entity value.

2.6.4 Pros and Cons

Rather than focusing on cash distribution or generation, RIV identifies the firm's ability to create value. In other words, RIV always looks for economic profitability rather than conventional accounting profitability. (Richardson & Tinaikar 2004, 239.) Furthermore, RIV is suitable for companies that have no dividend payment or negative free cash flows, as a perfect alternative for DDM and DCF in such circumstances. Even for enterprises with negative cash flows, supposed it is expected to generate positive cash flows at some point, RIV can recognize these patterns immediately based on book values in the financial statements.

Nevertheless, there are two major issues in its practical framework, as proposed by Ohlson (2000, 19) and other empiricists. First, RIV can only be executed based on the clean surplus relation, which will not maintain if the shares outstanding or any other capital transactions change and become immeasurable by the market (Schreiner 2007, 28). This market disability is the key constitution of dirty surplus – the manipulation in the income statement (Lee 2017). There are numerous flows of dirty surplus in accounting detected in prior researches: goodwill write-offs, subsidies, currency translation differences, asset revaluations, prior-year adjustments (Isidro 2006, 303). Moreover, even global accounting principles such as International Financial Reporting Standard (IFRS) or Generally Accepted Accounting Principles (GAAP) violate clean surplus relation because some capital transactions are not included in the market value terms, such as employee stock options (Lee 2017). Another condition eliminated from RIV application is when the company plan to add

a new shareholder who is beneficial to its capital structure, since RIV is based on the equity book value. Interpreting the main formula, it literally verifies that the intrinsic equity value is the book equity value plus a future growth in equity – discounted residual income. Even though book value of equity can be used as an initiative as long as the market value is accurately estimated, only a few empiricists appreciate this starting point. Others prefer to utilize expected earnings to evaluate performance, since it is easier for earnings to grow at a steady rate than book values. (Ohlson 2002, 248.)

2.7 Abnormal Earnings Growth Model (AEG)

2.7.1 Abnormal Earnings

According to Almeida (2012), it is defined as the residual earnings above or below the cost of capital. Abnormal Earnings is also the groundwork for a modern valuation method created by Ohlson (1995) – The Abnormal Earnings Growth model. The growth of abnormal earnings (AEG) is represented by the below formula (Schreiner 2007):

AEG = Residual Income (current) – Residual Income (prior).

2.7.2 Introduction, Formula and Advantages

Apart from future earnings, analysts and practitioners were also intrigued in forecasting earnings growth. Unfortunately, earnings-based approaches have not been popularized in textbooks. (Schreiner 2007, 29.) From that cognition, Ohlson (1995), in one of his researches, identified this concept and extended to a new valuation model. It enabled investors to estimate the future earnings and convert into a concrete valuation technique. Another name for this was Forward Earnings Growth Model, utilized by Gode and Ohlson (2005, 9). Nevertheless, most analysts still prefer the original name mentioned in their researches. Without the word “Growth”, it is an alternative name of RIV. The word “Abnormal” does not imply negative future earnings in anyway. Instead of starting from the equity book value, one can attain the future earnings then add a premium of abnormal earnings growth (Gode & Ohlson 2006, 9). AEG was also considered an upgraded version of RIV, as

both start with the same accounting principles and formula, but AEG covers the conceptual drawbacks of RIV. In other words, the book value of equity as well as clean surplus relations are left out (Almeida 2012, 13).

The equations of abnormal earnings growth may explain these characteristics by developing theoretical terms:

$$AEG_t = RI_t - RI_{t-1}$$
$$AEG_t = NI_t - r_e.B_{t-1} - (NI_{t-1} - r_e.B_{t-2})$$
$$AEG_t = NI_t - NI_{t-1} - r_e.(B_{t-1} - B_{t-2})$$
$$AEG_t = NI_t - NI_{t-1} - r_e(NI_{t-1} - D_{t-1})$$
$$AEG_t = NI_t - NI_{t-1}(1 + r_e) + r_e.D_{t-1}$$

Based on the above formula, the book value of equity is utterly removed. Therefore, only the income statement is needed to evaluate the company, without having to consider the balance sheet. (Almeida 2012, 13.) AEG shifts the anchor value from the equity book value to earnings growth, hence the changes in book value become redundant (Schreiner 2007, 30). There is always one factor that affects the forecasting of variables – accounting policies. However, it only has influence on earnings while the stock is self-fluctuating, but the book value estimation associates with accounting policies in every state, even in stable times (Gode & Ohlson 2006, 12). One of those is clean surplus relation under IRFS or GAAP, which this alternative model does not require. Therefore, the AEG obtained is the direct conversion between accounting and market value (Almeida 2012, 16). As a starting point, acquiring earnings growth also makes this model correlated to investment activities. In fact, Lopes (2001, 107) emphasized this relation as a revelation of accounting, since the concept have been extended from conventional accounting principles to analytical practice of financial theories.

In this model, the forecast period will be a decisive factor to yield the intrinsic value estimate. If the average growth of abnormal earnings during that period is irrational, it is suggested that the forecast horizon needs to be prolonged. (Penman & Sougiannis 1998, 37.) Arguably, Olsson (2002, 25) recommended that abnormal earnings should be estimated in perpetuity at a constant growth rate to be most

reasonable. Because assuming the firm at a steady state at some point and a constant cost of equity, its residual income will be zero and the equity book value can be obtained directly from the net income: $B_{t-1} = NI_t/r_e$ (Schreiner 2007, 29).

Subsequently, the formula to capture the equity intrinsic value was utilized from RIV by Ohlson and Juetter-Nauroth (2005):

$$V = \frac{NI_{t+1}}{r_e} + \frac{1}{r_e} \cdot \left[\sum_{i=2}^{\infty} \frac{AEG_{t+i}}{(1 + r_e)^{i-1}} \right]$$

In which:

- V = Intrinsic value of equity
- NI_{t+1} = expected net income
- AEG = expected abnormal earnings growth
- r_e = cost of equity
- t is the investigated point of time

2.7.3 Limitations

As a rudimentary valuation model, it is inevitable for AEG to possess some disadvantages. First, before generating the formula without concerning the book value, we must assume that the firm is in a stabilized period, so that the book value can be converted from net income by: $B_{t-1} = NI_t/r_e$. Such assumptions significantly decrease the model's practical efficiency, since steady periods are not so usual. (Schreiner 2007, 30.) Furthermore, when the book value drops out, the anchor value cannot be computed directly from the financial statement. Thus, it is erroneous if the forecasting process is not accurately taken. In other words, any small changes in the forecasting calculations may lead to severe irrationalities in the final intrinsic estimates. Finally, even though AEG has been deemed a fundamental method alongside DDM, DCF and RIV, still there are very few empirical studies to test its practicality in the current financial sector (Jorgensen, Lee, & Yoo 2011, 450). As a result, its application during erratic periods such as 2008 Financial Crisis is questionable.

2.8 Empirical Literature Review

The analysis of previous empirical findings in a specific expertise is an interdisciplinary process to justify the contribution of the researcher (Schmidt 1982). Thereby, one can base on the application of valuation methods to historical studies and question the extent of plausibility in the research (Schreiner 2007, 15).

According to Strong and Walker (2004), apart from using multiples, DCF is the most employed method among the fundamental approaches.

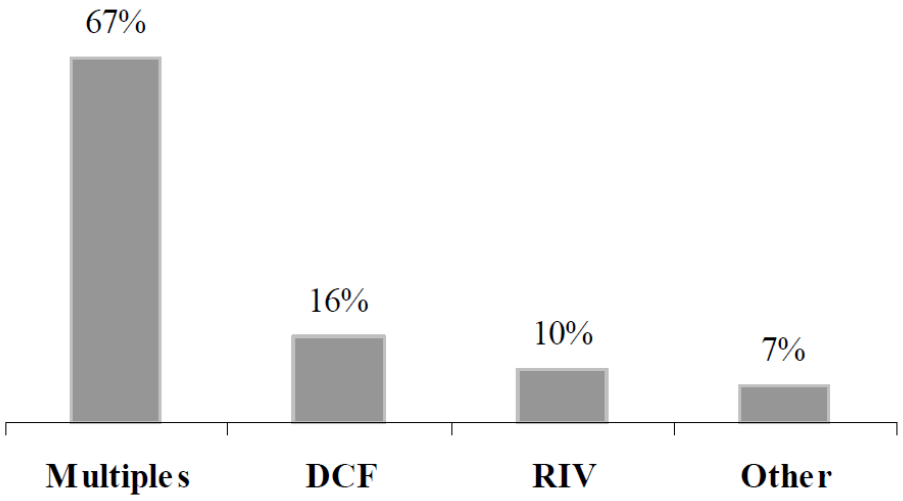


Figure 4. Valuation Models in analysts' reports (adapted from Schreiner 2007)

In general, the accuracy of each model will be discussed with comparable mindset. Furthermore, empirical studies of valuation during the financial crisis as well as some technical drawbacks will also be questioned in this segment.

2.8.1 The Accuracy of DDM

Lofthouse (2001, 177) claimed that even though DDM accounts for great length in every financial textbook, very few evidences are provided that the model works. Following with that, nowadays there are not many studies which evaluate the accuracy of DDM. Nonetheless, an exception took place when Sorensen and Williamson (1985) tested the model to a random sample of 150 firms in the S&P 400. At that time, only two sources were assembled for calculation which are Institutional Brokers' Estimate System (IBES) and Merrill Lynch. The results came out to be

excellent, as all the investigated shares were ordered correctly in terms of real return. From there plenty of US practitioners suggested that DDM is the perfect approach for ranking corporate shares (ibid.). However, since then no other researches have provided empirical findings as successful as Sorensen and Williamson. For instance, Jacobs and Levy (1988) examined four samples consisting of massive number of stocks in four different periods ranging from 1973 to 1988. Despite the positive outcomes, the forecasting performance was statistically misleading (Lofthouse 2001, 178).

Looking into more recent studies of DDM, Yabs (2014) questioned the validity of DDM in today's business by valuing 15 companies traded in the Nairobi Securities Exchange (NSE) based on their financial statements from 2008 to 2013. The researcher concluded that the intrinsic value of growth stocks produced by DDM had very weak correlation with the actual return. Nonetheless, Healy and Palepu (1988) argued that the DDM and market stock return in the NSE noticeably associated to a certain degree, which were also agreed by other empirical researches like Kiweu (1991) or Asiemwa (1992).

The statistical inaccuracy of DDM in the forecasting of securities was emphasized by Cancino (2011) in his study of US blue chip companies. Based on the characteristic that DDM is most applicable for mature firms with constant growth rate, the results surprisingly turned out to be substandard. He concluded that dividend, in such cases, failed to be the suitable measurement for predicting stock growth (ibid.). This is one of the academic researches where Miller – Modigliani dividend theory was statistically evident. Arguably, Campbell and Schiller (1988) successfully proved the highly positive correlation between dividend payments and expected future growth. They recommended that the rate of return is more predictable when applying DDM in a long period, preferably more than one fiscal year.

2.8.2 The Accuracy of DCF

One of the most significant studies that justify the high validity of DCF is from Kaplan and Ruback (1995) when they examined 51 highly leveraged transactions (HLTs) and

compared them with the discounted future cash flows. The study suggested that DCF provided reasonably precise estimates of transaction values, even though high rate of debt in HLTs is challenging in valuation. As a result, DCF is a reliable approach to obtain the intrinsic market value (ibid., 1092). Collaborating with this study, Berkman et al. (2000) analyzed 45 publicly-traded firms in the New Zealand Stock Exchange (NZSE) and obtained lower valuation errors in comparison to other industry-based models. However, he criticized the methodology of Kaplan and Ruback (1995) which made the potential errors much lower than it should have been.

Numerous practitioners have applied the DCF into firms belonging to specific sectors. Villiger and Bogdan (2005) examined pharmaceutical projects to forecast their chance of profitable success. Nevertheless, the intrinsic values attained using DCF was lower compared with other approaches. Fortunately, they suggested that DCF is a powerful tool to value highly profitable projects as the risk of abandonment is also considered (ibid., 118). Another example is from Damodaran (2002) who assessed 11 financial service firms and emphasized the similarity in valuing this sector to others. Still, some unique characteristics need to be reconsidered to assure the credibility of input, including debt, capital expenditure and working capital (ibid., 43). Concretely, in many of his works, Damodaran (2009a) has examined different types of firms including commodity companies, companies with intangible assets, multinational enterprises, etc. These researches concluded that assumptions involving firm characteristics cannot be made arbitrarily (ibid.).

One feasible approach to evaluate the accuracy of DCF is to apply heterogeneous variations of the model, as Inselbag and Kaufold (1997) discussed two sub-methods for valuing debt-financed transactions: WACC and APV. They suggested that WACC is applicable if the firm wants to maintain its capital structure, while APV is more suitable when the leverage ratio is likely to deteriorate overtime (ibid., 121). Fernandez (2007, 10) supported this finding but still emphasized the fixed debt levels in obtaining consistent results. In another project, he expanded the scale to 10 different sub-methods of DCF and evaluate Toro Inc. – an industrial-based company – and surprisingly yielded identical estimates.

Based on the researches of reputable practitioners, recent papers have shown more dynamic views of cash flows discounting. Schueler (2017) has been productive in applying non-standard DCF methods to provide a general framework whereof all the risky cash flows were included in the valuation process, especially the capital cash flows (CCF). Another outstanding example is from Tan (2017) when he evaluated the share price of Walmart and successfully forecast a sore from $69.24 to $80.47 (predicted price: $81.63). As a result, DCF is believed to be significantly reliable for grocery chains or consumer goods (ibid., 11).

2.8.3 The Accuracy of RIV

There were a massive number of empirical papers concerning the application of RIV during the 1990s, which have contributively opposite outcomes. Dechow, Hutton, and Sloan (1999) analyzed stock return using three sources of accounting data to objectively assess Ohlson's model and suggested major improvements needed which lied in the overestimation of equity book value. Myers (1999) agreed with the contradiction when he computed intrinsic values and compared the coefficients of stock price with the regression coefficients, the results came out to be unexplainable. However, proponents of RIV justified that the model is a breaking point as soon as it was finalized (Bernard 1995, 733). Combining with the regression model, by evaluating 54313 firm-years ranging from 1998 to 2002, Easton and Pae (2003) argued that RIV is the perfect tool to obtain the relationship between returns and accounting values. Still, there were diverse empirical studies where practitioners include other "rational" variables into the equation to assure the accuracy.

Concerning the positive characteristics, Nekrasov and Shroff (2009) proved that valuing securities using RIV yields significantly lower errors (deviations) in comparison to other benchmark models like CAPM or Fama-French. Supportively, Lyle, Callen, and Elliott (2013) obtained similar estimates when analyzing publicly-traded firms from 1980 to 2010 and suggested adjusted RIV to be suitable for forecasting future returns. Nonetheless, Callen and Segal (2005, 409) strongly protested that Ohlson's model was nearly inappropriate to risk-averse investors, and

its ability to forecast future value was no more than a simple forward price to earnings model.

Similar to DCF, RIV can also be generated through different variations, one of which is economic value added (EVA). Fernandez (2000) successfully delivered identical intrinsic values when comparing EVA with the original framework. But in one of his other studies, Fernandez (2001) emphasized previous analysts' misconception of EVA and residual income as a measurement for "value creation".

Looking into a more dynamic point of view, recent empiricists have been very impactful in enhancing the enterprise value with RIV. Even for non-economic factors like managers' networking skills, by examining US firms constituted Standard and Poor 1500 index, Shahghlogian and Vergos (2017) have found out its contribution to the companies' value. In other words, US financial markets is believed to consider board networking as a precious intangible asset (ibid., 18). Another noticeable RIV study is from Aggelopoulos (2016) when he implemented the framework to financial portfolios of Greek banks and verified the equity book value is underpriced by 75%. Therefore, the Greek banking crisis have significantly influenced the intrinsic value of banks and recommended future researchers to persist with his study.

2.8.4 The Accuracy of AEG

As the main accounting-based valuation model, RIV has always been the benchmark to assess the reliability of AEG. These two have their own pros and cons, whose extent of accuracy depend on the data collecting and analysis technique. Nonetheless, there were very few empirical studies in accordance with AEG applications. One of the rare researches came from Alfredsson and Lehmann (2016) when they investigated the performance of 30 publicly-traded firms on the Swedish Stock Exchange (OMX30 index). AEG is believed to be sufficiently accurate as they claimed that regardless of the time horizon, its valuation errors were much lower. Unfortunately, its standard deviation was too high to be considered useful from a practical standpoint (ibid., 25). On the other side of the world, 45 securities listed on the Bovespa segment was evaluated, and the results implied the impractical threat

of AEG, as it failed to fit the market value in comparison to the RIV (Almeida 2012, 19). The demonstration of this research supported other AEG assessment papers such as Penman (2004) and Martins (2001). Especially, while underestimating the potential of AEG, Jorgensen et al. (2011) still approved its high accuracy when the investigated time horizon is extended.

Formally, the accuracy of AEG is still questionable since a limited number of prior studies were conducted to have a broad view of its application in the financial sector across distinctive segments and industries. However, each related research raised a paramount perspective for future analysts to keep following the path and acknowledge its full potential as well as the necessity for improvements (Alfredsson & Lehmann 2016, 26).

2.8.5 Model Comparison

There had been very few empirical papers which assessed all the applied valuation models to a certain stock during a concrete period. An outstanding study which successfully evaluated four fundamental approaches is from Alfredsson and Lehmann (2016) when they examined traded securities listed on the OMX30 index from 2009 to 2014. All the models tended to overestimate the stock price by 18% up to 101% (ibid., 22). However, while AEG outperformed others, DCF produced surprisingly poor results with high valuation errors (77% and 101%). Even though the findings were consistent to many prior researches such as Penman (2004), Jorgensen et al. (2011) or Bernard (2005), there were also empirical contradictions. Francis, Olsson, and Oswald (2000, 69) justified that RIV was the most trustworthy tool compared with DDM and DCF in terms of explaining the variations in stock prices.

In addition, due to the coherent financial background and teaching focus, DCF has always been regarded as a benchmark to assess new models (Alfredsson & Lehmann 2016, 14), especially accounting-based methods. Fernandez (2000) valued an equity-funded firm using DCF and RIV and came up with identical intrinsic values. This contributed to the theoretical proposition that cash-based and accounting-based methods should be equivalent (Penman & Sougiannis 1998, 1). Nonetheless, RIV

statistically outperformed the other cash-based models when the investigating horizon is finite (ibid., 37). In contrast to these researches, Lundfolm and O'Keefe (2001) protested the superiority of RIV over DDM and DCF. They argued that any empirical interpretations of the methods were not worthwhile as they are already equivalent in theory (ibid., 332). Penman (2001) critically dismissed the attribution of Lundfolm and O'Keefe (2001) by addressing some misconceptions related to accrual accounting. Having the same opinion to the former response, Fernandez (2017, 2) claimed that the major reason behind such superiorities between models is the failure to make full use of the financial statements. Still, the academic argument considering the essence of valuation and deviation between cash flows and accounting-based methods is still progressive. But all have agreed insofar that valuation is about expectations and various assumptions will lead to distinguished estimates (ibid.).

2.8.6 Valuation in Financial Crisis

Empirical practitioners have been using the 2008 Financial Crisis as a shock, in which the expected value of firms is unpredictable (Khramov 2012, 9). He examined the cash flows sensitivity of US companies from 1990 to 2011 and concluded that the estimates strongly varied during the crisis (2007 to 2009). As the dramatic changes is expected to regulations, assumptions should be reconsidered to be relevant to this particular circumstance. For instance, the crisis forced the banks to urgently self-rocket their betas as an immediate pro-action to strive out of the recession (Damodaran 2009a, 18). This led to significant changes in the cost of equity, the discount rate, and eventually the intrinsic estimates. However, valuation during unstable periods as an unbiased assessment of the firm's value is not recommended (ibid., 20). Charlton (2012) agreed with uncertainty when applying fundamental methods into such time windows but emphasized the potential that the crisis itself may imply to valuation techniques, especially concerning methodology and damage measurement. In addition, Damodaran (2009c) suggested three adjustments needed when valuing securities during recession:

- Distress probability needs to be considered by generating different simulations.
- Forecasted cash flows as well as discount rate must be adjusted.
- One can value firms separately from distress and then adjust gradually.

Another recent paper came from Swanson and Alltizer (2017) who successfully evaluated the RIV in the context of 2008 recession. They examined firms from SIC codes 10-79 from 2000 to 2016 and divided the horizon into two sub-periods: pre and post-crisis. The RIV is dominant in this research as it significantly explained all the risky factors related to the crisis and suggested to be as powerful as investigating stable periods (ibid., 18). Furthermore, DDM and DCF were also put into practice as Implied Growth Rate (IGR) measurement during the financial crisis. Even though the period witnessed massive market volatility, Christofi (2017) suggested that traded stocks listed in the S&P 500 index were mostly overvalued before the crisis, but extremely undervalued during the crisis. This finding created a benchmark for future studies since stock prices are believed to self-adjust to their fundamentals as a systematic reaction to the market (ibid., 12).

2.8.7 Errors in Valuation

During the process of seeking the intrinsic value, common mistakes are inevitable as several input data and calculations need to be accurately generated. From experience and previous researches, Fernandez and Bilan (2017) collected a detailed list concerning all the feasible valuation errors that every financial analyst or investment fund might step on. The errors were classified into six main categories:

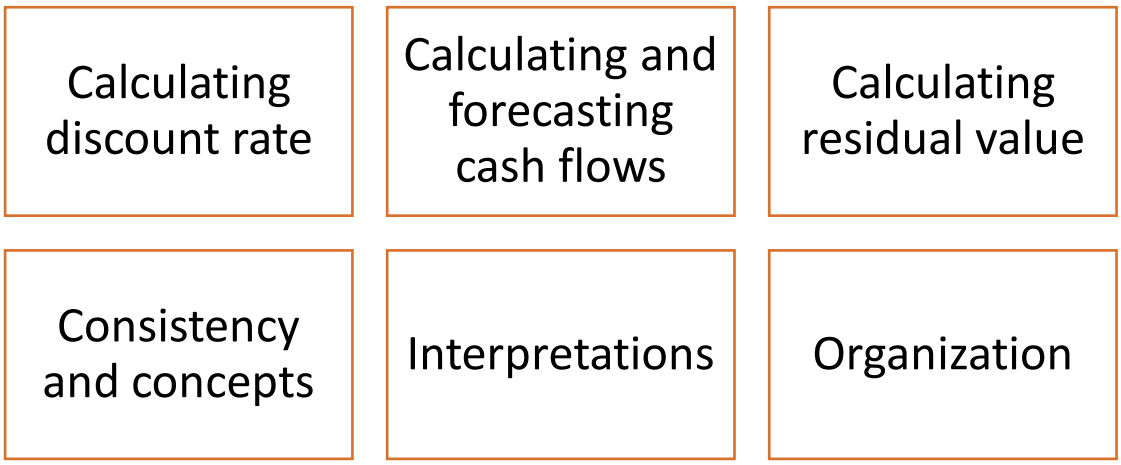


Figure 5. Valuation error categories (adapted from Fernandez & Bilan 2017)

Some of the errors considered by Fernandez and Bilan (ibid., 23) were the most common and noticeable:

- Using historical industry beta or relative beta.
- Assuming the market risk premium is equal to the expected risk premium.
- The D/E ratio used to compute WACC is different from the D/E ratio obtained from valuation.
- Errors in calculating the taxes to yield the FCF.
- Using arithmetic instead of geometric average to forecast growth.
- Using real cash flows with nominal discount rate.
- Assuming the debt value is equal to its book value.
- Assuming the company's value is the same to all of its buyers.
- Misunderstanding ROE as the return to the shareholders rather than equity.
- The value of equity and entity obtained are not timely consistent.
- Assuming the wrong starting point of a perpetuity period.

2.9 Hypotheses

There have been different hypothesis definitions throughout the revolution of research. One of which is from Creswell (2018): "Hypothesis is a formal statement that presents the expected relationship between independent and dependent variables." Hypothesis is the connection between theory and data, ensuring each variable is logically operational (Sutton & Staw 1995, 376). However, Saunders,

Lewis, and Thornhill (2015, 36) emphasized that hypotheses do not comprise logical arguments about expected occurrence of relationship despite their conceptual relevance.

The main purpose of these is to generate answers for research questions concerning the methodology of valuation methods. Two research questions were introduced in the first chapter and following with that, two research hypotheses will be formulated with explicit answers:

- Hypothesis 1: the intrinsic corporate values obtained from the four methods: DDM, DCF, RIV and AEG will be considerably various in mean.
- Hypothesis 2: the explanatory power of each method will be distinctive ranging from most to least: AEG, RIV, DCF and DDM.

Both hypotheses are formulated based on theoretical sense as well as previous empirical findings. By generating the valuation models for three sub-periods as well as some descriptive statistic techniques, the hypotheses will be investigated and accompanied to the research questions. The statistics implementation will be the most functional to examine hypothesis 2, note that the range of accuracy is no more than pure assumption with little base from prior researches.

The underlying reason behind these hypotheses, especially the former is the financial crisis itself. A shock will illustrate how far valuation methods can be from theory, since data fluctuate arbitrarily. Therefore, I believe the ability to successfully apply equity valuation during the great recession is nearly infeasible as I expect the obtained results to be unimaginably inaccurate. The word “inaccurate” here symbolizes the incapability to pursue the exact intrinsic estimates even with four different approaches. However, through collecting and analyzing data a new hypothesis might be suggested (Saunders et al. 2015, 135). Such aspects I need to notice as new data may be yielded to examine the new hypothesis.

3 Methodology

According to Saunders et al. (2015, 3), methodology is the theory related to the way research should be undertaken. From there, the empiricist can base on some philosophical matters as the research benchmark and interpret these for the methods adopted (ibid.). These methods will be utilized as the key factors to tackle the research problem. When the data provided enable one to answer the research questions, the problem is eventually solved. (Kananen 2013.)

The main goal of this thesis is to examine each valuation model step by step:

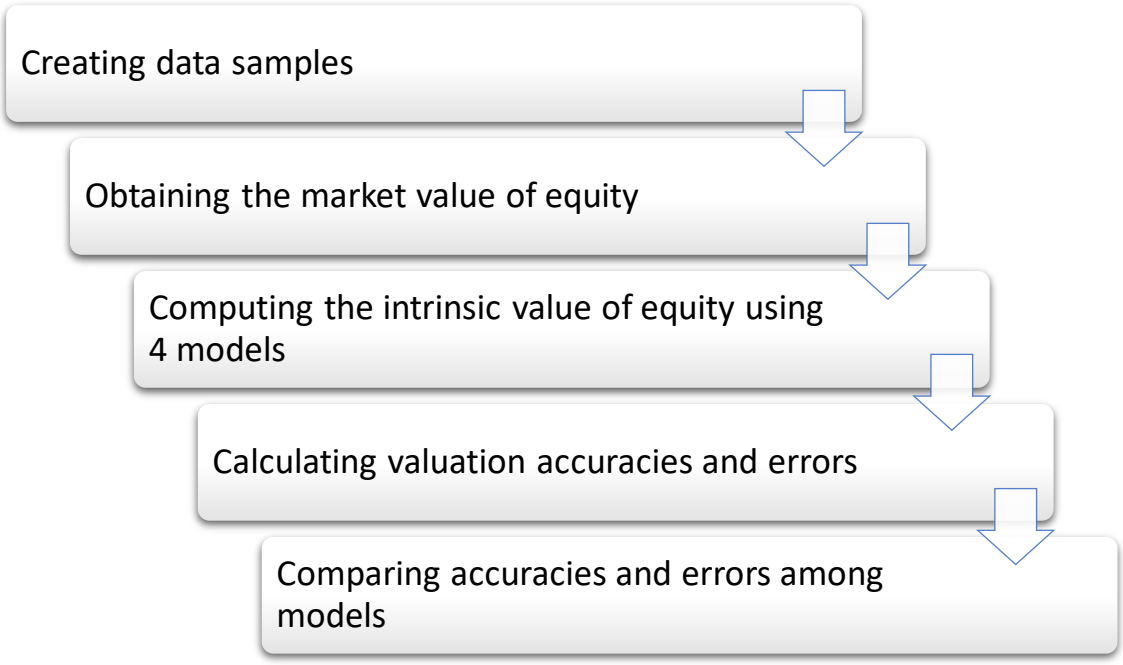


Figure 6. Phases of valuation

3.1 Research philosophies and approaches

Saunders et al. (2015, 136) indicated that the research design is basically the approach of answering the research question. It is the key to solve these following issues:

- What kind of data to be collected?
- How to quantify those data into measurable figures?
- What kind of variables will be considered during the study?

- Where is the data come from? What is the source?
- How long is the investigation time window? (5 years, 10 years…)

From there we will be able to have intensive data collection as well as data analysis in order to reach the final goal. However, reliability and validity of the data itself also need to be reconsidered. Krishnaswami and Satyaprasad (2010) suggested that accurate definitions of concepts are necessary for planning the subsequent steps in the research process.

The first layer that needs to be studied based on the research onion is the philosophy (Saunders et al. 2015) – how one views the world. Business analysts and empiricists consider every philosophical commitment as the way to understand of what to do and what it is investigating (Johnson & Clark 2006). One must be able to reflect upon philosophical choices and defend them against other alternatives rather than just philosophically informed (ibid.). In this study, positivism is the one with most relevant characteristics to my research. Saunders et al. (2015, 113) pointed out that a positivist is like a natural scientist; he or she will base on realistic observation to create credible data, thereby using the existing theories to generate such assumptions. Especially during the data collection, a positivist tends to be external in a sense that only minor matters can be utilized to alter the data substance (Remenyi, Williams, Money, & Swartz 1998, 33). Based on the CAPM and four fundamental models, I would like to examine their accuracy and credibility during an erratic period. The next layer is the research approach, whether it is deductive (quantitative data) or inductive (qualitative data). Saunders et al. (2015, 127) summarized the major distinctions of the two:

Deduction emphasises	Induction emphasises
• scientific principles • moving from theory to data • the need to explain causal relationships between variables • the collection of quantitative data • the application of controls to ensure validity of data • the operationalisation of concepts to ensure clarity of definition • a highly structured approach • researcher independence of what is being researched • the necessity to select samples of sufficient size in order to generalise conclusions	• gaining an understanding of the meanings humans attach to events • a close understanding of the research context • the collection of qualitative data • a more flexible structure to permit changes of research emphasis as the research progresses • a realisation that the researcher is part of the research process • less concern with the need to generalise

Figure 7. Deduction and Induction approach (adapted from Saunders et al. 2015)

I believe that the deduction approach would be conducted during this research, based on all the listed emphases. Gill and Johnson (2010) suggested that a highly structured methodology should be implemented to facilitate replication. Nonetheless, qualitative data would also be essential for the research objectives such as the financial policy of the firms collected from their annual reports, especially to cope with the crisis impact. The cycle of deduction is presented by Robson (2016):

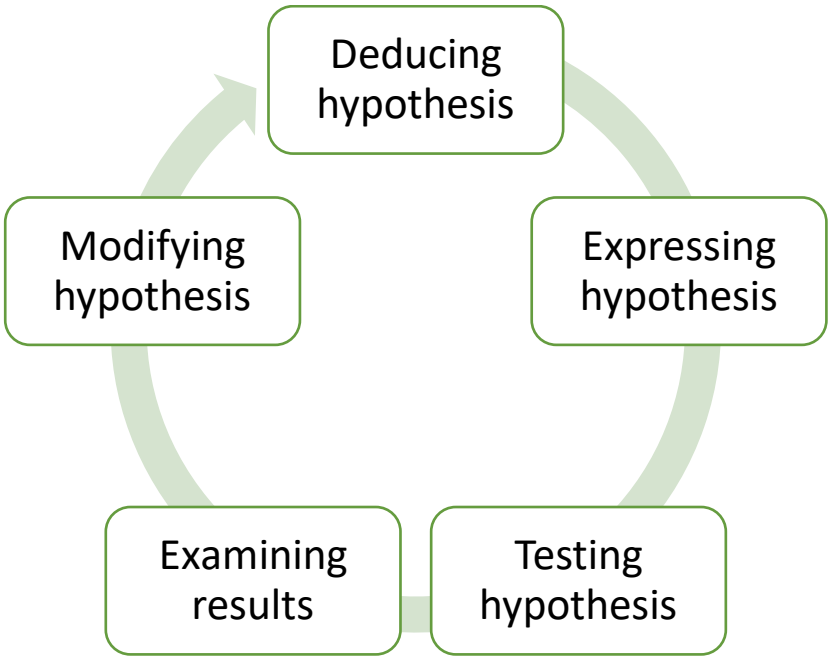


Figure 8. Cycle of hypothesis deduction (adapted from Robson 2016)

The deduction approach is more cyclical rather than a dead-end process since after the theory is revised, it is verified by applying the identical order (Saunders et al. 2015, 125). Nonetheless, as an empirical research, my aim is only to test the theoretical aspects in abnormal contexts without any modification afterwards.

The inner layers of the research onion emphasize how one turns research questions into research projects (Robson 2016). In other word, the process of answering the research questions must be converted to a general plan influenced by the research approach (Saunders et al. 2015, 136). Therefore, formulating the research design is an irreplaceable component of an intensive methodology.

It is infeasible to generate the research questions without being aware of the research purpose. Saunders et al. (2015, 138) classified the purpose into three categories: exploratory, descriptive and explanatory. This research prefers more explanatory aspects to uncover rather than exploratory, with different variables to be analyzed. I believe there are no new insights to be discovered because the financial crisis itself has been dug for a couple of years with numerous articles discussing its root causes and impacts. Formally, the main objective is to seek the differences among valuation models in terms of numerical performance and accuracy during pre-crisis, crisis and post-crisis. Explanatory studies emphasize on studying an issue to explain the association among variables. In this case, I would like to examine the influence of the shock period on the ability to obtain realistic value of equity. Nonetheless, it is possible that there might be some pop-ups halfway during the research, which are considered descriptive. Either way, the study might have more than one purpose, as it tends to gradually change parallel with the research process (Robson 2016).

Next thing demanded is a coherent research strategy, whose significance was indicated from Krishnaswami and Satyaprasad (2010, 40): it is the strategy of investigation conceived in order to obtain answers to the research questions. Following that, Saunders et al. (2015, 141) concerned a wide range of strategies:

- Experiment
- Survey

- Case study
- Action research
- Grounded theory
- Ethnography
- Archival research

Based on the intensive definition and application of each, the suitable strategies for the objectives are:

Case study	**Archival Research**
• From the investigation of the 2008 Financial Crisis. • The boundaries between the phenomenon and the context might not be evident (Yin 2018). • Generate answers to the question: “What?”, “How?” and “Why?” (Saunders et al. 2015, 146)	• Financial statements and historical stock prices are the primary source of data. • Those will be analyzed since they are the results of trading activities (Hakim 2000). • Despite that, the documents have limited reliabilities to precisely answer the research questions.

Associating with the research design, method selection is the next layer to be pealed from the research onion. When conducting a quantitative research, data collection technique and analysis procedures can be single or various, advocated within business management (Curran & Blackburn 2001). There will be numerous valuation methods to be taken for analyzing the numeric data, not to mention the CAPM model. As a result, it is self-explanatory to have a multi-method quantitative study. This is significantly efficient when evaluating the extent of reliability of the research as well as addressing the most paramount issues (Tashakkori & Teddlie 2010).

Following with that, the time horizons also need to be covered when planning the study. The researcher may want to have a “snapshot” taken at a specific moment or write a “diary” about how the phenomenon changed over a period (Saunders et al.

2015, 155). In my opinion, the former frame best fits this research, which is also called “cross-sectional study”. The reason is that even though the intrinsic equity estimates is acquired over three sequential sub-periods, each will be assessed separately with no interpretation to growth and development.

3.2 Data Collection

There are always two types of data used as the gathered information for research: primary and secondary data. We can define each based on the name itself; while primary data is the data collected for the first time, secondary data is the data which has been assembled before the study. Saunders et al. (2015, 600) considered secondary data as the information used for researches that was originally collected for other purposes. Correspondingly, primary data was collected for that concrete project undertaken (ibid., 598). These definitions are the most common in dictionaries and methodology-based classroom textbooks. The key differences among these data set were condensed by Surbhi (2016) in Table 7:

Table 7. Primary and Secondary Data

DIFFERENCE	PRIMARY DATA	SECONDARY DATA
Definition	Data collected first hand by the researcher him or herself	Data collected by someone else earlier
Data	Real time data	Historical data
Process	Complex	Quick and easy
Source	Experiments, surveys, interviews, questionnaires…	Text books, journals, blogs, websites, Youtube videos…
Cost	Costly	Economical
Time of collecting	Long	Short
Specification	Always meet the researcher’s needs	Might or might not meet the researcher’s needs
Availability	Crude	Refined
Reliability	More	Less

Identical to prior valuation studies on publicly traded firms, this research is generated using only secondary data. According to the above table, secondary data

have three primary deficiencies. First, past data without any update might lead to irrelevance when applying to the present case. Second, it may be collected for a purpose that does not match your need. Therefore, sometimes secondary data can be inappropriate to solve the research problem (Denscombe 2017). Lastly, even though data available from academic sources or governments are usually of guaranteed quality, in other cases, their reliability are questionable. Selecting the data sets as well as evaluating the source is positively significant in such type of researches (Saunders et al. 2015, 272).

However, these drawbacks are minimized in this study. The historical data obtained were published from the early 2000s up to the recent years, with authentic sources and data sets. Furthermore, all the book and market values needed from the financial statements and stock exchange websites will directly contribute to the research question. Secondary research has always been the typical approach when conducting securities reports (Nigudkar 2015). Even popular studies on equity use mainly data extracted from annual reports or financial statements of firms, as the information has been through consolidation and disciplined auditing process. Although collecting primary data through interviews with market professionals would be beneficial in terms of forecasting growth or making the results less biased, still its inconvenience directs me to stick with only secondary data.

Subsequently, it is impractical to collect the data from the whole population, which is all housing firms in the US during the financial crisis. Therefore, there is a need to sample as an alternative solution (Saunders et al. 2015, 212). If one can assemble a portion that can represent the characteristics of the whole population, it would be much less time-consuming as fewer data are involved. In addition, Henry (1990) argued that sampling can maximize the general precision because of having more time for designing and piloting each case. Most empiricists categorize sampling techniques into probability and non-probability sampling. While the cases in probability sampling have frequently equal chances of being chosen and often related to survey-based researches, empiricists implementing non-probability sampling have obvious intentions of extracting data from the population.

The above characteristics make non-probability sampling (judgmental sampling) ideal for this thesis. The selection of firms will heavily influence the research questions and objectives, which requires in-depth analysis of only a small portion (Saunders et al. 2015, 233). As a methodology-based research, rather than interpreting the intrinsic equity estimates, I would like to examine valuation models in the financial crisis to see whether the models are still well-functional when the US housing market was negatively fluctuating. Hence, companies chosen must be capable of representing the whole industry with large market shares in the stock exchange. In my opinion, selecting the top US construction firms is the most efficient sampling strategy for this study, especially when grounded theories of valuation are adopted into practice (Patton 2015). In line with the above criteria, not all the biggest firms could be eligible for analyzing. Some firms are scarce of historical data during the 15-year required period, or others do not comply with the US accounting standard which lead to unsystematic overlapping of data. Thus, there would be some additional qualifications for the listed securities to be selected.

Considering the data gathering process, collecting accounting data within organizations is advantageous as they provide unobtrusive measurement, but with higher quality compared to data self-gathering (Cowton 1998, 425). Without having any interactions between firms and researchers, data collection is still adequate to meet the research objectives. In details, companies' websites, Yahoo Finance, US Treasury Department, World Bank would be the main source of data. Each is suitable for a specific range of variables, and the mix-and-match procedure will be in the researcher's hands.

3.3 Data Analysis

It is advantageous for current empiricists to compute valuation methods or any other approaches of data analysis thanks to the advent of powerful personal computers. In the form of computer-based analysis software such as Minitab, SAS, SPSS or even Microsoft Excel, data was managed and designed in a more systematic, accurate but less time-consuming than by hand (Saunders et al. 2015, 407). Despite technological

elevation of this era, Robson (2016, 393) argued every practitioner should carefully prepare the data and select the most ideal charting and statistical techniques.

In this study, the core operational rationale is based on the relevance of value. That is, the relationship between forecast of valuation models with the reasonable explanation of market values (Chang 1999). Therefore, the convergence of intrinsic values with trading estimates will be the primary variable for statistical analysis and data implementation.

3.3.1 Raw data inputs

The case companies mentioned in the Introduction were publicly-listed construction firms in the New York Stock Exchange (NYSE). Although Schreiner (2007, 93) claimed that using US dataset as proxies for generating valuation models is biased, I strongly believe these case companies are the most suboptimal for this research, not only thanks to the attribute of the collapsing market, but also the systematic accounting data. All of the collected financial statements are implemented in identical forms (10-K pursuant to Section 13 of the Securities Exchange Act of 1934). Overall, the book values are extracted from the Income Statement (Statement of Operations), Balance Sheet and Cash Flows Statement of each firm ranging from 2002 to 2017. Two types of book values are assembled:

- Type 1: historical data must be collected annually meaning 15 numbers from 2003 to 2017.
- Type 2: historical data are collected at the end of each valuation period meaning three numbers from 2003 to 2017. For instance, the total debt of firms used in the post-crisis period are taken from the 2017 financial statement.

Table 8 lists all the main accounting raw input to be utilized for ulterior calculations:

Table 8. Valuation input needed

Variable	Source	Type	Method Applied
Total Revenue	Income Statement	1	DCF
EBIT (Operating Profit)	Income Statement	1	DCF
Net Income	Income Statement	1	DDM
Earnings per share	Income Statement	1	DDM, RIV, AEG
Dividends per share	Income Statement	1	DDM, RIV, AEG
Weighted shares outstanding	Income Statement	2	DCF, RIV
Cash and cash equivalent	Balance Sheet	1	DCF
Inventory	Balance Sheet	1	DCF
Accounts receivable	Balance Sheet	1	DCF
Accounts payable	Balance Sheet	1	DCF
Accrued expenses	Balance Sheet	1	DCF
Notes payable	Balance Sheet	1	DCF
Shareholder's Equity	Balance Sheet	1	DDM, RIV
Total Debt	Balance Sheet	2	DCF
Property and equipment	Balance Sheet	1	DCF
Depreciation & Amortization	Cash Flow Statement	1	DCF
Depreciation	Cash Flow Statement	1	DCF

Apart from book data collected from the financial statements, other market values will also be assembled for obtaining the cost of equity and WACC.

- Historical price: a total of 41,514 pieces of trading price was collected from Yahoo Finance including S&P 500 and 10 firms starting from 31 December 2002 to 29 December 2017. The raw data converted into Excel format consist of prices at several points of time in a day: opening price, high price, low price, closing price, adjusted closing price and total volume. Subsequently, only the closing prices with corresponding date are assembled to compute the rate of return. Converted historical data is presented below:

Table 9. Stock historical price display

Date	Open	High	Low	Close	Adj Close	Volume
1/3/2017	27.71	27.8	27.21	27.56	27.086931	3225300
1/4/2017	27.75	28.47	27.63	28.23	27.745432	7423300
1/5/2017	28.09	28.38	28.08	28.35	27.863377	3815300
1/6/2017	28.21	28.43	27.8	27.85	27.371956	5339500
1/9/2017	27.8	28.15	27.61	27.96	27.480068	4461000
1/10/2017	28.14	28.38	27.88	28.15	27.666805	3319900
1/11/2017	28.1	28.72	27.97	28.61	28.118912	5440200
1/12/2017	28.51	28.75	27.98	28.69	28.197538	4171300
1/13/2017	28.61	28.8	28.42	28.5	28.010798	2360900
1/17/2017	28.4	28.76	28.25	28.57	28.079596	3699900
1/18/2017	28.56	28.68	28.37	28.5	28.010798	2951700
1/19/2017	28.53	28.82	27.97	28.01	27.529209	4121800
1/20/2017	28.08	28.38	28.03	28.31	27.82406	4869400
1/23/2017	28.4	28.86	28.33	28.74	28.246679	6132700
1/24/2017	29.86	30.83	29.51	30.64	30.114065	11197400
1/25/2017	30.91	31.66	30.7	31.37	30.831535	7794500
1/26/2017	31.47	31.9	31.17	31.35	30.811878	7853000
1/27/2017	31.44	31.48	30.83	30.94	30.408916	4262600
1/30/2017	30.86	30.86	30.23	30.71	30.182863	4935900
1/31/2017	30.61	30.63	29.78	29.91	29.396597	7352000

- Risk-free rate: 10-year Treasury Yield Rates assembled from US department of Treasury. Daily figures were taken on the last date of each period.
- Tax rate: US corporate tax rate collected from KPMG. Although some localities also impose other capital and receipt taxes, KPMG table is a decent reflection of federal tax rate, which roughly leveled off throughout all sub-periods.
- Cost of debt: US lending interest rate obtained from World Bank.

These inputs are summarized in Table 10:

Table 10. Risk-free rate, Tax rate and Cost of debt

	Risk-free rate	Tax rate	Cost of debt
Pre-crisis	4.04%	40%	8.05%
Crisis	1.78%		3.25%
Post-crisis	2.4%		3.52%

3.3.2 Discount Rate

The discount factor applied in different valuation methods of this study is the cost of equity, except for DCF which uses WACC as the discount rate.

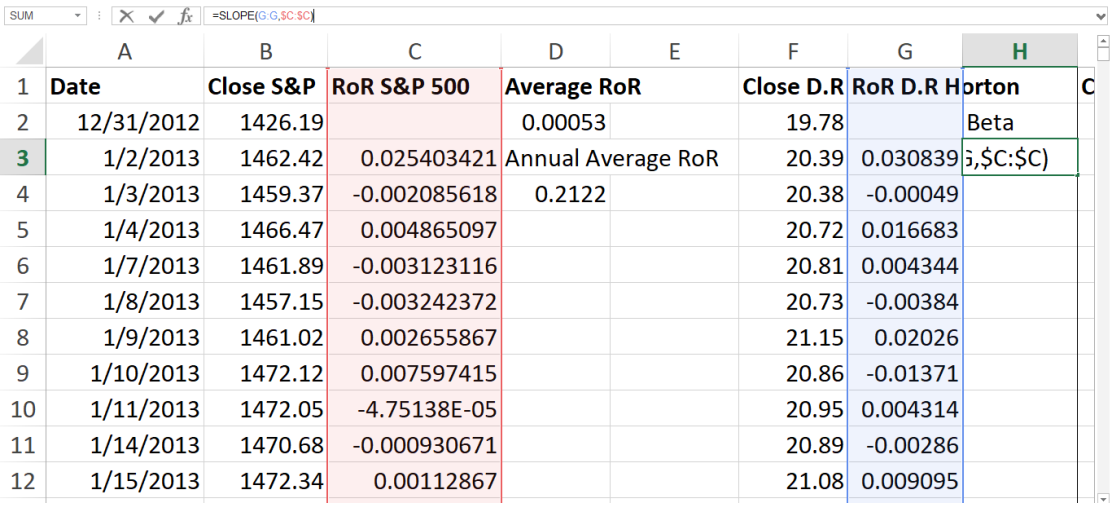
COST OF EQUITY

As mentioned in the *Literature Review*, CAPM is the ubiquitous model to obtain the cost of equity. Before generating the final formula, average annual market rate of return (r_m) and beta shall be calculated. Starting from historical trading price of S&P 500, daily rates of return are formally computed using the fundamental rate of return equation: $\frac{V_1 - V_0}{V_0}$.

After finding the average of all the daily return rates during that period, the average annual rate (r_m) is captured via this formula:

$$r_m = \text{Annual Return} = (1 + \text{Daily Return})^{365} - 1$$

Daily return of each security is also calculated and coupled with daily return of market to get the firm-specific beta using the Linear Regression function (SLOPE):



	A	B	C	D	E	F	G	H
1	Date	Close S&P	RoR S&P 500	Average RoR		Close D.R	RoR D.R	Horton
2	12/31/2012	1426.19		0.00053		19.78		Beta
3	1/2/2013	1462.42	0.025403421	Annual Average RoR		20.39	0.030839	;,$C:$C)
4	1/3/2013	1459.37	-0.002085618	0.2122		20.38	-0.00049	
5	1/4/2013	1466.47	0.004865097			20.72	0.016683	
6	1/7/2013	1461.89	-0.003123116			20.81	0.004344	
7	1/8/2013	1457.15	-0.003242372			20.73	-0.00384	
8	1/9/2013	1461.02	0.002655867			21.15	0.02026	
9	1/10/2013	1472.12	0.007597415			20.86	-0.01371	
10	1/11/2013	1472.05	-4.75138E-05			20.95	0.004314	
11	1/14/2013	1470.68	-0.000930671			20.89	-0.00286	
12	1/15/2013	1472.34	0.00112867			21.08	0.009095	

Figure 9. SLOPE function illustration in Excel

Eventually, CAPM finalizes the cost of equity capital as the discount factor for DDM, RIV and AEG:

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

WACC

For DCF, the weighted average cost of capital is the discount rate which consists of the cost of equity (as obtained above) and the after-tax cost of debt:

$$WACC = \frac{E.r_e + D.r_d(1 - T)}{E + D}$$

3.3.3 Value estimates and forecast

The core principle is to calculate 5-year "historical" values and thereby forecasting 5-year "future" values. Those elements are put in double quotations as relative measurements, since the assumed valuation date is the final date of each period rather than at present. Take the crisis period as an example, the 2008 – 2012 value will be used to forecast the 2013 – 2017 value. Note that the 2013 – 2017 historical value obtained cannot be replicated into the "future" value of the crisis period because it would be incoherent without value forecasting.

Most of the imported parameters are forecast by assuming that they will grow at a constant rate in the future. The historical growth rate (%) every fiscal year is calculated using the rate of return equation, then find the average to capture the future growth rate of value. Nonetheless, it is noticeable that some adjustments must be implemented to maximize the accuracy. Concretely, if the average growth rate attained is extremely negative (below -40%) or absurdly high (above 100%), then the abnormal historical growth rate would be eliminated from the computations as those aberrations irrationalize the value forecasting. The predicted estimates include: dividends per share (DPS), earnings per share (EPS), revenue, cash and cash equivalent, inventory, accounts receivable, accounts payable, accrued expense, notes payable, property and equipment. Each model has other specific values which are obtained and forecast using separate approaches.

DDM

A significant deficiency in DDM as mentioned in the literature review is that some firms are limited from dividend payments - a massive challenge for practitioners to attempt DDM. More and more companies are rather to buy back stocks as the return

to their owners than pay dividends (Damodaran 2009b). Fortunately, he (ibid.) has proposed an alternative approach to apply DDM by dividend assumption. In other words, it is feasible to predict firms' dividend payment even without dividend policy. The core principle is transformed from the SGR equation:

$$\text{Payout ratio} = \frac{DPS_t}{EPS_t} = 1 - SGR/ROE_t$$

Noticeably, SGR is easily assumed which will be explained later (in the *Terminal value* section). The retention ratio obtained with the historical earnings per share is all one needs to predict dividends. From there, dividend forecast will be generated in the similar framework to other fundamental variables.

Half of the case companies restrict themselves from any cash dividend, and do not have any plan for such payments in the future including NVR, Toll Brothers, Hovnanian, Meritage Homes and Beazer Homes. Therefore, this sub-sample of firms can also be used to test the accuracy of dividend assumption, which means to see whether these firms can formulate equivalent DDM results to others in the sample.

DCF, RIV, AEG

Unlike dividend, it is not technically relevant to forecast cash flows solely through a constant growth rate. Instead, those will be calculated based on the forecast of other data extracted from financial statements:

$$FCF_t = NOPAT_t + D\&A_t - \Delta\text{working capital}_t - CAPEX_t$$

$$RIPS_t = EPS_t - r_e.BVPS_t = EPS_t - r_e.(BVPS_{t-1} + EPS_t - DPS_t)$$

$$AEGPS_t = EPS_t - EPS_{t-1}(1 + r_e) + r_e.DPS_{t-1}$$

3.3.4 Terminal Value

After successfully forecast the 5-year future values, terminal values will be obtained by expecting constant growth rates beyond the investigation period into infinity. These growth rates are implemented for cash flows and earnings in perpetuity with identical numbers to ascertain the consistency among models. Formally:

Table 11. Growth rate in perpetuity

	Pre-crisis	Crisis	Post-crisis
DPS (assumed), FCF, RIPS, AEGPS	5%	3%	5%
DPS (financial statements)	SGR		

It is self-explanatory to consider SGR as the benchmark growth rate of future dividend. For assumed dividend, cash flows and earnings, the rates are attained based on previous researches. According to Francis et al. (2000), the majority of analysts used the perpetual growth rate of 4%, which express neutral behaviors towards market performance at that present. Based on such standards, investors and analysts:

- Would have been optimistic in the pre-crisis and post-crisis, as the market was outperformed, with equivalent growth rate assumed above 4% (5%).
- Would have been pessimistic in the crisis, as the market was underperformed, with equivalent growth rate assumed under 4% (3%).

There are exceptions from companies having extremely negative earnings in all the investigation years which makes it impossible to predict equally positive outcome to others. Hovnanian and Beazer Homes are those outliers. As a result, the corresponding growth rates are subjectively decreased by the researcher to 3% and 2% respectively.

Eventually, the terminal values of methods are expressed in the similar manner to the equation of perpetuity, noting that the forecast period is always five years:

$$DPS_T = \frac{DPS_{t+5}(1 + g_D)}{r_e - g_D} \qquad FCF_T = \frac{FCF_{t+5}(1 + g_{FCF})}{WACC - g_{FCF}}$$

$$RIPS_T = \frac{RIPS_{t+5}(1 + g_{RI})}{r_e - g_{RI}} \qquad AEGPS_T = \frac{AEGPS_{t+5}(1 + g_{AEG})}{r_e - g_{AEG}}$$

3.3.5 Model Specification

For all the models, the intrinsic value of equity will be obtained by utilizing model formula derived from equations mentioned in the literature review. Since all the investigation time horizons including pre-crisis, crisis and post-crisis are five years, all the "∞" values are replaced with "5".

Additionally, it is worth noting that apart from DCF, all the other formula will be generated in per share unit. Because eventually, the trading value selected for comparison is not the market capitalization but the share price. In contrast, it is inadvisable to attempt DCF in per share data as some of its core components such as current assets or depreciation cannot be extracted directly from financial statements in per share value. Alternatively, the obtained equity value will be divided by total number of shares outstanding to compare with the trading price.

DDM

$$V = \sum_{i=1}^{5} \frac{DPS_{t+i}}{(1 + r_e)^i} + \frac{DPS_T}{(1 + r_e)^5}$$

DCF

$$V = \sum_{i=1}^{5} \frac{FCF_{t+i}}{(1 + WACC)^i} + \frac{FCF_T}{(1 + WACC)^5} - p$$

RIV

$$V = BVPS_t + \sum_{i=1}^{5} \frac{RIPS_{t+i}}{(1 + r_e)^i} + \frac{RIPS_T}{(1 + r_e)^5}$$

AEG

$$V = \frac{EPS_{t+1}}{r_e} + \sum_{i=2}^{5} \frac{AEGPS_{t+i}}{r_e(1 + r_e)^{i-1}} + \frac{AEGPS_T}{r_e(1 + r_e)^5}$$

3.3.6 Intrinsic value

Finalizing the models involves comparing the obtained intrinsic value with the trading price on the assumed valuation date. Even though most valuation studies and

templates stop at this point without further calculations, as a methodology research, the accuracy of models is evaluated by calculating the V/P proportions:

V/P = Intrinsic Equity Value Per Share/Trading Price

This is the final variable of each firm in each period which will be tested for model similarity and accuracy. The secondary meaning of data analysis is the potential result patterns (Cooper & Schindler 2013). Considering the valuation results:

- The stock price is overvalued if V/P < 1.
- The stock price is undervalued if V/P > 1.
- The stock price matches its value if V/P = 1.

To illustrate clearly the V/P proportions, each side of overvalued and undervalued will be broken down into smaller extents presented in the *Result* chapter.

The interval data obtained will be presented in a data matrix to categorize the data into three dimensions: firms, periods and methods. A total of 120 observations are assembled for later statistic computation.

3.3.7 Model comparison

There are two aspects involved when examining the models: similarity and reflectivity, corresponding to the two research questions and hypotheses. With the intervention of statistics, one can solve the research problem with high level of assurance. When considering the relationships between variables, distinctive approaches can be utilized such as Descriptive, Correlation or Regression, depending on the type of variables and purpose of the researcher (Kumar 2011, 47). The most common platform utilized by practitioners is SPSS, also known as “Statistical Package for the Social Sciences” widely used by business students (Landau & Everitt 2003, 12). However, Microsoft Excel is a perfect alternative for statistical methods, not to mention the basic for business decision making. A few reasons for Excel to be more attractive than other specialized programs (Levine, Stephan, & Szabat 2016, 13): more economical, more familiar, user-friendlier, more visual outputs, etc. Small

number of observations with common properties allows this study to generate statistical analysis with Excel.

MODEL SIMILARITIES (ONE-WAY ANOVA TEST)

Most empiricists acknowledged the t-test as to examine the difference in means between variables. Nonetheless, t-test is only valid for comparing pairs of samples, which is the incentive for other approaches concerning multiple samples. One of those is ANOVA – Analysis of Variance – applicable for three or more independent groups. By comparing means, the spread and distribution of values between and within group of data will be determined (Saunders et al. 2015, 458). Like most of the statistical models, these assumptions ought to be met before implementing ANOVA (Dancey & Reidy 2017):

- Each value is independent without any association to other values, which is appropriate for this study. Even though there are some overlapping of inputs among models, the data set was tested in completely different approaches.
- Within groups there must be normal distributions. This is a special type of distribution, where values are spread either side of the highest frequency in a bell-shaped plot (Saunders et al. 2015, 436). This is a challenging precondition to be met, especially when the sample groups are small (10 securities). No comments can be given unless all the V/P values are attained and summarized.
- The data for each group shares the same variance. Nevertheless, this does not have a significant impact on the results as soon as groups' size are identical (ibid., 459).

This test is computed in Excel 2016 in the Data Analysis section, with the command "ANOVA: Single Factor". Because in-depth calculations are roughly lengthy and complex, this study only illustrate technical steps and the possible outcomes.

The ANOVA command is presented as follows:

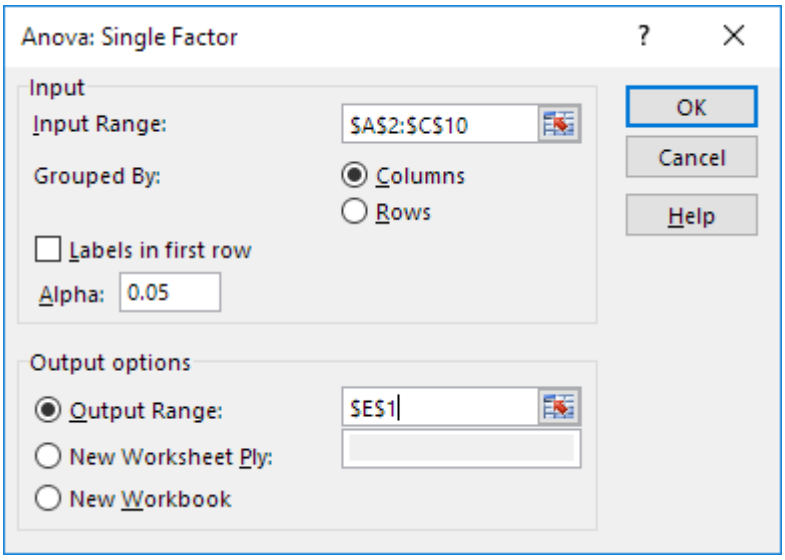


Figure 10. ANOVA input

There will be four tests run in total, corresponding to the three sub-periods and the investigated time window as a whole. The input range will be 40 values of 10 firms examined via four valuation methods. The core benchmark in one-way ANOVA as well as any other statistical tests is the significant level – α, used for determining the probability of a pattern such as difference in means between samples (Brown & Saunders 2008). More statistically, it is the probability of rejecting the null hypothesis, which is "there are no significant differences between variables", given that it is true (Dalgaard 2008, 155). In this research, the first hypothesis concerning variation in means between models is the alternative hypothesis, which is "there are statistically significant differences between variables". The researcher will attempt to accept the alternative hypothesis or, in other words, reject the null hypothesis. It is worth noting that there is no absolute answer to the hypothesis, but whether the deviation among models is significant (Saunders et al. 2015, 450). In this study, 5% of significant level is applied as most statisticians would consider, despite some arguments that 1% is increasingly recommended (Brooks 2014, 117).

The result sample of the ANOVA test is revealed as follows:

Table 12. ANOVA result sample

Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Column 1	10	7.10229	0.710229	0.13205		
Column 2	10	9.067525	0.906753	0.205362		
Column 3	10	3.742583	0.374258	1.187029		
Column 4	10	-32.5382	-3.25382	184.2787		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	116.5554	3	38.8518	0.836408	0.482791	2.866266
Within Groups	1672.228	36	46.45078			
Total	1788.783	39				

After running the test, the final phase involves interpreting the obtained numbers. The table consists of unique statistics such as sum, average, variance, degree of freedom (df), mean square (MS)…Particularly, the result lies in the two elements:

- F-statistics: equals the division between MS among groups with MS within groups. It denotes the spread of value among models in comparison to within models. The larger this ratio, the more confident to conclude that there are significant differences between valuation models (Gravetter & Wallnau 2016, 402). In contrast, when the difference is not significant, the F-value is expected to be around 1 (ibid., 403).
- p-value: the probability that, if the null hypotheses is true, the difference in means between samples is equal or bigger than the actual observed results (Wasserstein & Lazar 2016, 130). In this case, this represents the probability to determine whether there is evidence to claim the significant differences between models. The rule of thumb is that: if p-value ≥ α, there is not enough evidence to reject the null hypothesis. Conversely, if p-value < α, difference among samples is significant enough for the null hypothesis to be rejected. (Levine et al. 2016, 337.)

Eventually, it is worthwhile to state the statistical decision and conclusion in the context of this study. In other words, the researcher can claim if there are enough

evidences to verify the models are different in means. Nonetheless, it is worth mentioning that being unable to reject the null hypothesis does not mean the models are identical, but rather there are no sufficient evidences to state the difference. In addition, the analysis does not specify the hypothesis but rather the probability of relationship in the research context is examined (Saunders et al. 2015, 450). After interpreting the results, the researcher is now able to answer the research question based on statistics.

MODEL ACCURACY (CENTRAL TENDENCY AND SPREAD)

There are no intensive statistical tests implemented at this part of the study. Alternatively, noticeable assumptions need to be made to examine the model accuracy related to the pricing errors (PE): $|V/P - 1|$. The minimum pricing errors is considered as the most efficient benchmark for valuing securities based on historical data (Sehgal & Pandey 2010, 79). In addition, the spread of value will be the secondary element to test the reliability of models as future expectation is somehow met (Alfredsson & Lehmann 2016, 23). While the majority of studies measured PE by subtracting trading price from the intrinsic value (ibid., 20), other researches such as Liu, Nissim, and Thomas (2002, 143) formulated PE as price minus intrinsic estimate. Either ways, PE can be positive or negative depending on the results between the two components. Hence, to unify the obtained PEs, absolute value will be implemented into the formula. At the same time, this addition will evaluate model accuracy as being diverse from trading price without concerning higher or lower values.

Subsequently, the mean, median, standard deviation and coefficient of PE will be calculated using the common equation. Two represent the tendency of PE, while the rest indicate the dispersion (spread):

Table 13. Comparable Variables

Central tendency	**Dispersion (Spread)**
Mean	Standard deviation
Median	Coefficient

- Mean: identical to arithmetic mean as explained in the *Literature Review*. Even though the geometric mean can be more accurate to reflect the tendency of values, it is not widely used in statistics. The strength of using mean is that it comprises all the involved PE values in the models. On the other hand, it is likely that an extreme data value will draw the mean into the long tail and make it significantly less reflective (Saunders et al. 2015, 446).
- Median: an alternative to the mean as it tends to eliminate outliers in skewed distributions (Anderson, Sweeney, & Williams 2016). It is obtained by ranking the PE values in ascending orders and selecting the mid-point.
- Standard deviation: captured as an extent of dispersion to PE values. Nonetheless, standard deviation is ideally compared with similar magnitude between samples, which are in this case, model results (Morris 2014).
- Coefficient: generating meaningful comparison of valuation models is to consider this magnitude. Therefore, coefficient of PE is captured by dividing the standard deviation with the mean (Saunders et al. 2015, 448). The higher coefficient of PE has the larger relative spread of values and, thus, the more questionable reliability.

Finally, the second research question can be answered by comparing these variables. The applied models will be ranked from the most accurate to the least accurate, and from the most reliable to the least reliable. It is noticeable that accuracy and reliability are highly independent, which means they have insignificant relationship. Therefore, a model can be the most accurate but least trustworthy among the four valuation methods and vice versa. This reasonable conflict happened when Alfredsson and Lehmann (2016, 25) examined AEG and obtained the lowest PE but highest variations.

3.4 Validity and Reliability

Through the process of forming methodology, the researcher will always wonder if my findings and conclusions have been controlled thoroughly. In other words, is there a way to assure the models to generate relevant results for further evaluation? The answer is no, but one can only reduce the probability of getting irrational results

(Rogers 2004). Therefore, the subjectivity and over-creativity must be prevented from separating the researcher from materials, by concerning two emphases: validity and reliability.

Validity is defined as the degree of how the findings are really about what the researcher supposed to explore (Saunders et al. 2015, 157). In quantitative studies, it is concerned with how well the test measures what it tends to measure (Wilson 2013, 308). There are two types of validity: internal validity and external validity (generalizability). Internal validity considers the match between the chosen methods with their capacity to reach the target, whereas external validity implies the abilities for the findings to be applied to other research settings (Cooper & Schindler 2013, 257). From there, the lack of validity in such studies needs to be minimized within the research design. Robson (2016) summarized various threats which may lead to significant scarcity of this aspect:

- History: certain events take place besides the treatment during the research process. This thesis collects historical data from financial statements of firms and the market without critical intervention, hence the data is ensured to be accurate.
- Testing: the research subject might be sensitized by the pre-test which may end up in misleading results of the post-test. This factor is unrelated to the nature of this research as the valuation models do not influence, in any ways, financial performance.
- Instrumentation: changes occur in the measurement approaches of dependent variables (Saunders et al. 2015, 145). In this case, the difference in dividend policies among firms enforced the researcher to be more pro-active; still its validity is ensured through implementing SGR formula as an alternative.
- Mortality: during the group research, some subjects may have dropped out of the study. Obviously, applying valuation methods requires a wise selection of firms which can represent the US housing market. Any particular company not meeting any of the selection criteria will be deliberately left out of the sample.

- Maturation: the participants might change both physically and psychologically during the procedure (Saunders et al. 2015, 157). Nonetheless, the firms are expected to grow eventually but forecast based on historical performance.
- Ambiguity about causal direction: being mistaken between specific dependent and independent variables. This section is unrelated to this study as the objectives are not to seek cause-and-effect associations.

In terms of reliabilities, it is related to consistency in the empirical findings obtained through data collection and analysis progress (Saunders et al. 2015, 158). To reach such standards, several questions need to be self-assessed by the practitioners: whether the measurement attain similar results on other circumstances; whether others will have identical observations as this study; and whether the logics behind its findings was sufficiently transparent (Easterby-Smith, Thorpe, Jackson, & Jaspersen 2018). Equivalent to validity, there are four threats that may have negatives impacts on the research nature (Robson 2016):

- Subject errors: the secondary data has been proven to be authentic and accurate as stated earlier in this chapter. The book values are taken directly from the financial statements and the market value are assembled from solid sources such as Yahoo Finance.
- Subject bias: it is infeasible for the firms to be biased in its own financial performance, even in crisis since they are publicly-traded with credible auditing processes. Still, there might be some manipulations regarding the accounting data, which are the missions of auditing without direct relations to the researcher.
- Observer error: the templates were generated based on theoretical foundation of methods. Therefore, those can absolutely be applied in other occasions and studies with equivalent outcomes.
- Observer bias: the principle of this methodology is very straightforward which is to make equal and objective assumptions for all the case companies, except for a minority of outliers.

To sum up, this research paper is ensured in both validity and reliability perspective owing to the aforementioned.

4 Results

All the obtained empirical findings will be presented in this chapter, whereof the data is classified into three groups corresponding to the three sub-periods. Each period will be assembled in one table including all the attained PE of firms, mean, median, standard deviation, coefficient, and an additional ANOVA table. For the period as the whole, the same approach will be applied to gain the broadest view of this study's results. Furthermore, a chart is generated to visually illustrate the V/P estimates using different methods. It is worth verifying that the results chapter will primarily present facts rather than opinions about the findings (Saunders et al. 2015, 535). Instead, interpretation concerning models' similarities and reflectivity is the vast content of the subsequent chapter.

In terms of detailed calculations of each method for each firm, they are supposed to be revealed in this chapter. Unfortunately, there will be 120 spreadsheets in total which make it infeasible to deliver in the main body of the thesis. Hence, those computations are brought into the appendices.

As mentioned earlier in the methodology, the V/P values is categorized with the red side represent the overvalues, whereas the blue side represent the undervalues, divided into smaller extents:

Table 14. Degree of intrinsic values

Notes	0.8 < V/P < 1	Slightly Overvalued	
	0.2 < V/P < 0,8	Overvalued	
	0 < V/P < 0.2	Extremely Overvalued	
	V/P < 0	Negative Intrinsic Value	
	1 < V/P < 1.3	Slightly Undervalued	
	1.3 < V/P < 5	Overvalued	
	V/P < 5	Extremely Overvalued	

To simplify the listing of intrinsic values obtained to the same firm, the usual order set by the researcher will be respectively DDM value, DCF value, RIV value and AEG value.

4.1 Pre-crisis

Table 15 is the summary of 40 V/P observations during the pre-crisis period, with the rows indicate the investigated companies including DIH, LEN, PHM, NVR, TOL, KBH, MTH, HOV, MDC and BZH. Whereas the columns represent the applied valuation models including DDM, DCF, RIV and AEG.

Table 15. Pre-crisis V/P values

Period		Pre-crisis (2003-2007)			
Method		*DDM*	*DCF*	*RIV*	*AEG*
V/P	DHI	1.306	0.084	0.104	0.797
	LEN	0.252	1.520	0.489	0.360
	PHM	0.113	-1.272	0.765	0.861
	NVR	0.574	1.516	0.616	0.639
	TOL	0.913	1.295	0.792	0.857
	KBH	0.552	1.917	1.155	0.401
	MTH	0.746	2.814	0.531	1.778
	HOV	0.270	4.325	0.347	1.040
	MDC	0.664	0.416	1.178	0.784
	BZH	0.229	0.083	1.126	1.550
Mean V/P		**0.562**	**1.270**	**0.710**	**0.907**

According to the obtained table, most trading prices are overvalued, account for 67.5% of all the attained values, identical to what Christofi (2017) derived from valuing traded stocks before the crisis. Each model recommends investors different actions in buying and selling stocks on 31 December 2007:

- DDM: investors should have bought stocks of DHI and bet against stocks of LEN, PHM, NVR, TOL, KBH, MTH, HOV, MDC, BZH
- DCF: investors should have bought stocks of LEN, NVR, TOL, KBH, MTH, HOV and bet against stocks of DHI, PHM, MDC, BZH
- RIV: investors should have bought stocks of KBH, MDC, BZH and bet against stocks of DHI, LEN, PHM, NVR, TOL, MTH, HOV

- AEG: investors should have bought stocks of MTH, HOV, BZH and bet against stocks of DHI, LEN, PHM, NVR, TOL, KBH, MDC

Among them, PHM has negative intrinsic value by applying DCF, with concretely $10.32 of trading price on 31 December 2007 but -$13.13 of equity value per share. Nonetheless, DCF is the only model underpricing stocks in this period with mean V/P above 1, contrary to the study of Villiger and Bogdan (2005) which justified the low DCF values compared to other approaches. Especially, HOV is extremely undervalued through DCF with trading price of $6.81 but nearly $30 of equity value per share. On the other hand, there are also a few stocks which has the obtained intrinsic value very close to its market price. For example, applying DDM to TOL results in the equity value per share of $18.31 with market value of $20.06. For BZH which was valued at $35.55 by the market, RIV values this stock as slightly outperformed ($40.02). Below is the corresponding chart of the table to visualize the outcome:

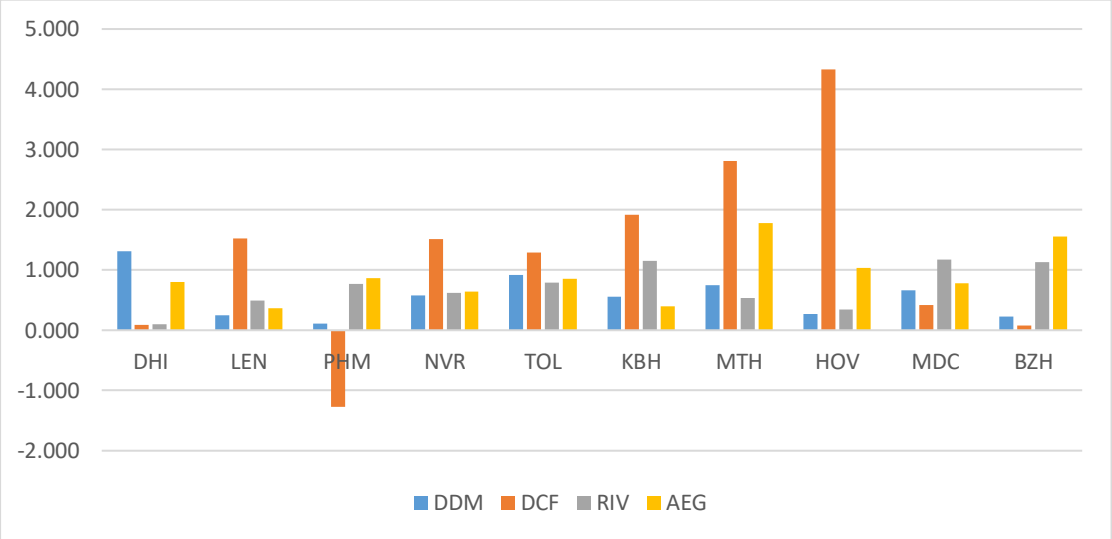


Figure 11. Pre-crisis V/P value chart

Through observing the chart, it is noticeable that few stocks are evaluated in similar extent among models, which hardens the ability for setting up anchor values by method combination. Accordingly, this visual supports Alfredsson and Lehmann (2016) in stating empirical contradictions between cash and accounting-based valuation. Take DHI with $13.17 of market price as an example, the results obtained by each approach in usual order are respectively $17.2, $1.1, $1.37 and $10.5.

However, stocks like TOL have decently comparable height of bars, with the respective equity values of $18.31, $25.97, $15.89, $17.19.

In terms of statistical differences between models, the one-way ANOVA test was utilized to examine the data set. The F-statistics and p-value are mostly taken into consideration to evaluate the similarities among valuation models.

Table 16. ANOVA Test Pre-crisis

ANOVA Pre-crisis

	SS	*df*	*MS*	*F*	*P-value*	*F crit*
Between Models	2.813084	3	0.937695	1.273069	0.29824	2.866266
Within Models	26.51624	36	0.736562			
Total	29.32932	39				

Concerning the p-value, it is critically above 0.05. Hence, there are no significant statistical differences between models, or there is not enough evidence to reject the null hypothesis. Furthermore, the F-value just slightly surpasses 1, which means the researcher is unconfident to state the valuation methods obtain discrepant estimates in means.

Eventually, each valuation model will be compared and ranked based on their accuracy. The closer intrinsic value to its trading price is interpreted to more accuracy in models. In addition, a lower spread would indicate that the method is more reliable as the anchor values are more solid for future expectations. Table 17 fulfills the purpose of describing absolute numbers for testing accuracy:

Table 17. Pre-crisis accuracy and reliability comparison

Period	Pre-crisis (2003-2007)			
Method	*DDM*	*DCF*	*RIV*	*AEG*
Mean PE	0.438	0.270	0.290	0.093
Median PE	0.437	0.405	0.310	0.173
Standard Deviation PE	0.367	1.573	0.363	0.453
Coefficient PE	0.839	5.832	1.254	4.860

According to the table, AEG has the dominantly lowest mean PE of only 0.093, indicating that the intrinsic value of equity is only differ from trading prices by less than 10%. Such initial finding is in line with Alfredsson and Lehmann (2016) who emphasized AEG's superiority to other models. Subsequently, DCF ranked second with 27% of divergence, and RIV follows right behind with 29% equivalent. Lastly, DDM is deemed the least accurate model for this pre-crisis period, with the average PE of nearly 44%.

The median which also represents accuracy obtained slightly distinct results. While AEG still outperform others with only 17% of error, RIV is ranked second but with 31% of median PE, followed by DCF and still lastly, DDM with error of nearly 44%, approximately equal to its mean. The high PE of DDM during pre-crisis strengthens the argument by most empiricists indicating fragile correlation between dividends with actual return (Yabs 2014).

Looking at the spread by calculating standard deviations of estimates, the study finds surprisingly weak relations to the mean and median. In this aspect, RIV and DDM exhibit superior reliabilities compared to the others, with the standard deviation of only more than 0.36. While dominating the accuracy ranking, AEG generate relatively varied values with more than 0.4 of corresponding dispersion. This threat of AEG's practicality fairly follows previous discussions of Penman (2004) and Martins (2001). DCF delivers the lowest reliability with an extreme 1.57 of standard deviation which seems to be reasonable as the DCF range contain both the maximum and minimum PE in this dataset.

When influencing the accuracy factor to the models' reliabilities, the ranking of coefficient turns out to be unpredictable, with DDM taking the first spot and RIV coming in second. The other two shows negatively high variations with AEG third and DCF last (coefficient of 4.86 and 5.32 respectively). The decent value of mean PE cannot control its high variations due to extreme underprice and overprice of stocks. As a comparison, this variation order is fully correlated with the finding of Alfredsson and Lehmann (2016) where DDM, RIV, AEG and DCF was ranked from the most to least reliable.

4.2 Crisis

Table 18 is the summary of 40 V/P observations during the crisis period, with the rows indicate the investigated companies including DIH, LEN, PHM, NVR, TOL, KBH, MTH, HOV, MDC and BZH. Whereas the columns represent the applied valuation models including DDM, DCF, RIV and AEG. The performance indicators will be compared not only among models but also with the previous investigation period to affirm the uncertainty of valuation in unstable periods (Damodaran 2009a).

Table 18. Crisis V/P values

Period		Crisis (2008-2012)			
Method		*DDM*	*DCF*	*RIV*	*AEG*
V/P	DHI	0.480	0.632	0.473	-0.507
	LEN	0.126	5.103	0.644	-0.578
	PHM	-0.412	3.630	0.814	-0.401
	NVR	2.135	1.950	1.515	1.653
	TOL	0.440	0.795	1.711	0.868
	KBH	0.033	-4.242	-0.936	2.112
	MTH	0.912	0.811	2.430	1.518
	HOV	0.871	-1.719	-1.856	-0.719
	MDC	1.155	1.684	1.576	1.406
	BZH	-1.997	-41.181	-1.604	1.281
Mean V/P		**0.374**	**-3.254**	**0.477**	**0.663**

According to the obtained table, the majority of trading prices are overvalued, account for 62.5% of all the attained values. One significant feature is that among the overvalued stocks, negative values account for nearly a half. Each model recommends investors different actions in buying and selling stocks on 31 December 2012:

- DDM: investors should have bought stocks of NVR, MDC and bet against stocks of DHI, LEN, PHM, TOL, KBH, MTH, HOV, BZH
- DCF: investors should have bought stocks of LEN, PHM, NVR, MDC and bet against stocks of DHI, TOL, KBH, MTH, HOV, BZH

- RIV: investors should have bought stocks of NVR, TOL, MTH, MDC and bet against stocks of DHI, LEN, PHM, KBH, HOV, BZH
- AEG: investors should have bought stocks of NVR, KBH, MTH, MDC, BZH and bet against stocks of DHI, LEN, PHM, TOL, HOV

Obviously, the cell colors are critically more varied compared to the pre-crisis period. Severe complexity of values is in accordance with those reported by Damodaran (2009a), and Charlton (2012) which led to the scarcity of explanatory power. Although there are more observations of undervalued stocks, the overvalued obtained are far more extreme in numbers concerning the valuation date is 31 December 2012. The most undervalued belongs to LEN with DCF value of $188.77 whilst trading price is $36.99. On the contrary side of valuation, DCF also attains the most severe cases of overvalued. For instance, KBH was valued as -$65.2 with $15.37 of market price. Notwithstanding, the biggest gap between extrinsic and intrinsic estimates which impacts the whole table in means as well as other parameters is BZH. While the market evaluated the stock as $16.26, the DCF value is an extreme -$669.61 driving the average of 10 DCF values to a minus figure. The negative DCF values might be an empirical evidence to clarify the risk of abandonment and bankruptcy (Villiger & Bogdan 2005). Still, some stocks result in very reflective intrinsic values, such as DDM equity per share of MTH is $11.08 compared to $14.85 market price. Another example is from MDC, valued by DDM and the market at $37.8 and $32.71 respectively. Below is the corresponding chart of the table to visualize the context:

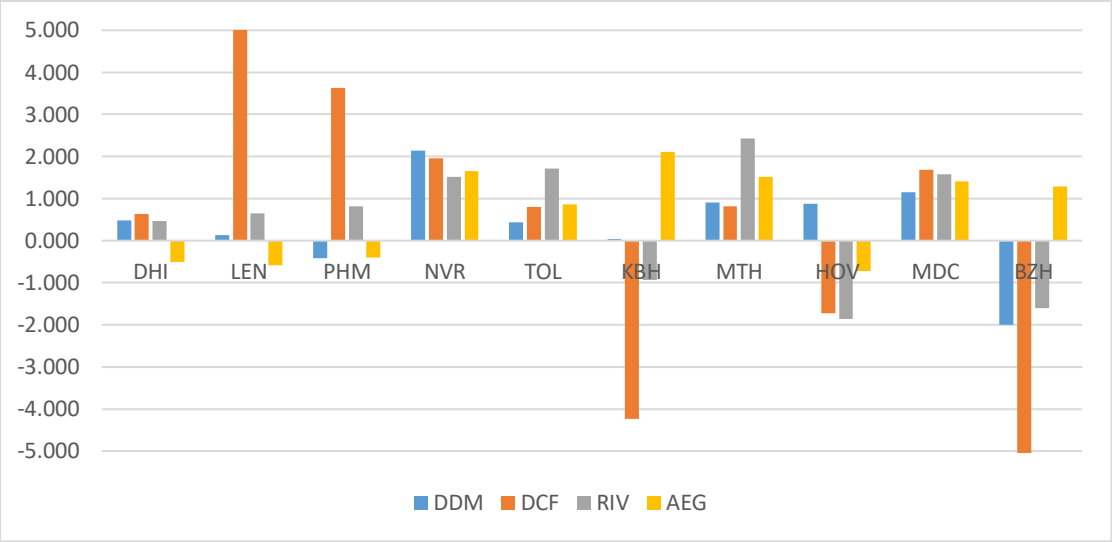


Figure 12. Crisis V/P values chart

Through observing the chart, it is noticeable that few stocks are valued in similar extent among models, which hardens the ability for setting up anchor values by method combination. Take PHM with $17.6 of market price as an example, the results obtained by each approach in usual order are respectively -$7.26, $63.88, $14.33 and -$7.06. However, stocks like MDC have decently comparable height of bars, with the respective equity values of $37.8, $55.7, $51.57 and $46.

In terms of statistical differences between models, the one-way ANOVA test was utilized to examine the data set. The F-value and p-value are mostly taken into consideration to evaluate the similarities among valuation methods.

Table 19. ANOVA Test Crisis

ANOVA Crisis

	SS	*df*	*MS*	*F*	*P-value*	*F crit*
Between Models	106.3821	3	35.46069	0.751168	0.528874	2.866266
Within Models	1699.467	36	47.20743			
Total	1805.849	39				

Concerning the p-value, it is critically above 0.05, nearly doubled the pre-crisis p-value. Hence, there are no significant statistical differences between models, or there are not enough evidences to reject the null hypothesis. Furthermore, the F-

value is well-below 1, which means the researcher is unconfident to state the valuation models obtain different values in means.

Eventually, each valuation methods will be compared and ranked based on their accuracy. The closer intrinsic value to its trading price is interpreted to more accuracy in models. In addition, a lower dispersion would indicate that the methods are more reliable as the anchor values are more solid for future expectations. Table 20 fulfills the purpose of describing absolute numbers for testing accuracy:

Table 20. Crisis accuracy and reliability comparison

Period	Crisis (2008-2012)			
Method	*DDM*	*DCF*	*RIV*	*AEG*
Mean PE	0.626	4.254	0.523	0.337
Median PE	0.540	0.197	0.271	0.074
Standard Deviation PE	1.090	13.575	1.473	1.092
Coefficient PE	1.741	3.191	2.815	3.245

It is worth mentioning that this period valuation obtains much higher errors compared to the pre-crisis reflecting by mean PE. AEG is still the dominant model, but with the mean PE of more than 33%, three times as high as pre-crisis PE. The result is repeatedly consistent to what Alfredsson and Lehmann (2016) found in the context of Swedish corporates. Ranked in second is RIV with 52% different, and DDM attain the average PE of more than 62%. Finally, the last place is not surprising with more than 400% of difference between intrinsic and extrinsic values, as previously explained. The extreme variance of outliers results in severe errors of DCF which disapproves the ability to explain the market patterns. Obviously, this finding provides no rationale why DCF obtain low valuation errors as proposed by Kaplan and Ruback (1995).

It is reasonable to claim that median might be the more reflective measurement for this crisis period, as the values acquired is much lower than the mean. While AEG still outperforms others with only 7% of error, DCF unpredictably gains the second place with median PE of almost 20%. RIV attains 27% and twice as much, DDM ranks in last with 54% of median PE. The ranking is roughly parallel with pre-crisis measurement

regarding the high PE of DDM, which continuously opposed the close relation to the market return reported by Kiwew (1991) or Asiemwa (1992).

Regarding the distinction between the mean and median, the various spread among models can easily explain this phenomenon. During this period, DDM followed by AEG provides the most reliable data ranges, with the standard deviations of 1.09. While indicating decent accuracy performance, RIV is lagging behind the former two in terms of reliability. Finally, significant irrelevance takes place at DCF as its deviation is above 13, due to the massive effects from LEN and BZH values as mentioned earlier. The overall picture goes completely against the statement that cash-based and accounting-based valuation should be theoretically equivalent (Penman & Sougiannis 1998). Still, the unequal spreads between crisis and pre-crisis period in general put equity valuation during crisis in questions.

When influencing the accuracy factor to the models' reliabilities, the ranking of coefficient turns out to be unpredictable, with DDM taking the first spot and RIV comes in second, identical to the preceding period. AEG surprisingly takes the last rank due to the dominant impact of its accuracy. The DCF which underperformed in both categories ranks third, with respective coefficients of 3.24 and 3.19. This is the only parameter that obtains lower dispersion compared with pre-crisis values but is not sufficient to approve the explanation of stock prices in such periods.

4.3 Post-crisis

Table 21 is the summary of 40 V/P observations during the post-crisis period, with the rows indicate the investigated companies including DIH, LEN, PHM, NVR, TOL, KBH, MTH, HOV, MDC and BZH. Whereas the columns represent the applied valuation models including DDM, DCF, RIV and AEG. The performance indicators will be compared not only among models but also with the previous investigation periods.

Table 21. Post-crisis V/P values

Period		Post-crisis (2013-2017)			
Method		*DDM*	*DCF*	*RIV*	*AEG*
V/P	DHI	0.190	0.289	0.244	0.272
	LEN	0.016	0.419	0.155	0.114
	PHM	0.137	0.531	0.118	0.156
	NVR	0.855	0.422	0.781	1.477
	TOL	0.659	0.592	0.825	1.401
	KBH	0.018	0.230	0.625	1.035
	MTH	0.244	0.553	0.221	0.286
	HOV	0.235	-2.345	0.346	0.297
	MDC	0.160	0.218	0.682	1.002
	BZH	0.900	0.839	1.285	2.517
Mean V/P		**0.341**	**0.175**	**0.528**	**0.856**

According to the obtained table, the vast majority of trading prices are overvalued, account for 85% of all the attained values. Each model recommends investors different actions in buying and selling stocks on 31 December 2017:

- DDM: investors should bet against stocks of DHI, LEN, PHM, NVR, TOL, KBH, MTH, HOV, MDC, BZH
- DCF: investors should bet against stocks of DHI, LEN, PHM, NVR, TOL, KBH, MTH, HOV, MDC, BZH
- RIV: investors should have bought stocks BZH and bet against stocks of DHI, LEN, PHM, NVR, TOL, KBH, MTH, HOV, MDC
- AEG: investors should have bought stocks of NVR, TOL, KBH, MDC, BZH and bet against stocks of DHI, LEN, PHM, MTH, HOV

In comparison to the former sub-periods, post-crisis values seem to be much less varied based on the overall color cells regarding the valuation date on 31 December 2017. Especially, the two cash-based models evaluated all the investigated stocks as overvalued. Among those, only HOV acquired the negative DCF values of -$7.86 corresponding to $3.35 of trading price. Such characteristics repeatedly question DCF's ability to be considered a benchmark for assessing new methods (Alfredsson &

Lehmann 2016). Comparably, the most undervalued stock obtaining a non-extreme gap between the market and AEG values of $19.21 and $48.36 respectively belongs to BZH. In contrast, there are some reflective equity values to the market, such as BZH which is valued at $17.29 by DDM but at $19.21 by the market. Solely, this observation is in line with studies derived by Sorensen and Williamson (1985) or Campbell and Schiller (1988). Nevertheless, the most accurate stock recorded in this whole study is MDC with intrinsic value of $31.95 and traded at only 7 cents lower on 31 December 2017. In general, the accuracy among models is more superior compared to the other periods and thus, increase the researcher's ability to make precise expectations. Formally, below is the corresponding chart of the table to visualize the outcome:

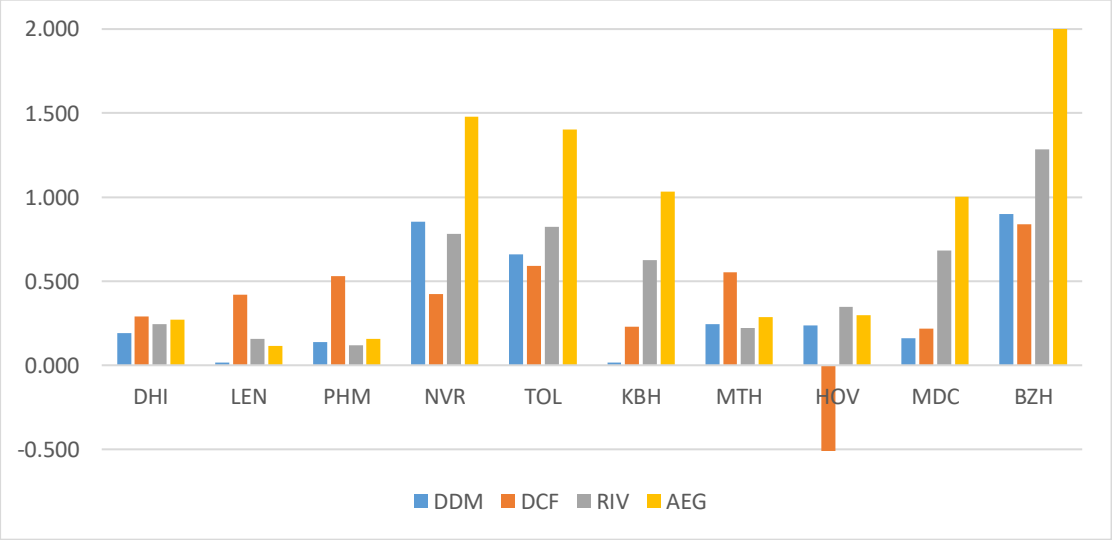


Figure 13. Post-crisis V/P values chart

The chart verifies decent similarities among methods, although some stocks still obtain various equity values such as KBH with $31.95 market price but results in $0.56, $7.35, $19.97 and $33.06 in usual order, or NVR with $3,508.22 market price but attains $2,998.36, $1,479.8, $2,741.66 and $5,181.77 in usual order. Still, chart bars from DHI show relatively small variations, with respective intrinsic values of $9.71, $14.74, $12.46 and $13.91.

In terms of statistical differences between models, the one-way ANOVA test was utilized to examine the data set. The F-value and p-value are mostly taken into consideration to evaluate the similarities among valuation methods.

Table 22. ANOVA Test Post-crisis

ANOVA Post-crisis

	SS	*df*	*MS*	*F*	*P-value*	*F crit*
Between Models	2.558754	3	0.852918	2.024792	0.127752	2.866266
Within Models	15.16454	36	0.421237			
Total	17.7233	39				

Concerning the p-value, it is still critically above 0.05, but only about half the pre-crisis and a fifth of crisis value. Hence, there are no significant statistical differences between models, or there are no sufficient evidences to reject the null hypothesis. Furthermore, the F-value is close to 1 meaning the researcher is unconfident to state the valuation methods obtain different estimates in means.

Eventually, each valuation model will be compared and ranked based on their accuracy. The closer intrinsic value to its trading price is interpreted to more accuracy in models. In addition, a lower spread would indicate that the method is more reliable as the anchor values are more solid for future expectations. Table 23 fulfills the purpose of describing absolute numbers for testing accuracy:

Table 23. Post-crisis accuracy and reliability comparison

Period	Post-crisis (2013-2017)			
Method	*DDM*	*DCF*	*RIV*	*AEG*
Mean PE	0.659	0.825	0.472	0.144
Median PE	0.787	0.579	0.515	0.351
Standard Deviation PE	0.334	0.905	0.376	0.783
Coefficient PE	0.507	1.096	0.797	5.426

The mean PE shows the post-crisis period obtains slightly higher errors than the pre-crisis, but still much lower than the crisis. A noticeable pattern has been set as AEG continues to take the lead in accuracy, with mean PE of 14%. RIV lags behind in second place with mean PE of 47%. DDM comes third with 66% but is still superior to DCF with above 80%. The over-performance of RIV to cash-based valuation is consistent to previous studies by Nekrasov and Shroff (2009) or Francis et al. (2000)

who claimed that RIV is the better measurement to explain stock movements. It is obvious that the post-crisis ranking is in line with the crisis whereas the most significant improvement comes from DCF with mean PE of only a fifth compared to the crisis period.

Subsequently, the median ranking witnesses a switch between the third and fourth place when matching with the mean. Concretely, the accounting-based model shows superiority with median PE of 35% and 51%. The cash-based achieve lower performance in accuracy, with 58% and 79% of median PE. Various studies such as Myers (1999), Callen and Segal (2005) contradicted this explicit boundary by denying practical capability of the accounting-based. While having a consistent ranking to the preceding periods, this parameter questions the accuracy of models to be applied in post-2012, as the overall median attains higher numbers.

In terms of dispersion, the patterns among sub-periods is no longer consistent owing to the distinction of each ranking. Still, the extent to which there are considerable gaps between mean and median can be explained using variation measurement. DDM and RIV take the lead with respective standard deviation of 0.334 and 0.376. AEG, again, denies its relative reliability with 0.783, spread twice as much as the first two models which is reasonable as the obtained intrinsic values balance between the sides of value extent. DCF unsurprisingly takes the last spot since it contains the only negative equity value of HOV throughout the whole sub-period. Generally, this ranking decently matches Alfredsson and Lehmann (2016) by the same token.

Combining accuracy and reliability elements gives us the coefficient ranking. In this category, DDM consistently outperforms others with post-crisis value of 0.507, followed by RIV with 0.797 of coefficient. This is somehow explainable due to the low spread but relatively neutral level of mean which positively impact the final numbers. Despite the modest performance of RIV, its superiority over cash-based methods as proposed by Penman and Sougiannis (1998) is not evident in this period. DCF ranks third repeatedly as despite the high variation, the mean decreases the extent of volatility. Up to this point of findings, the last place of AEG becomes predictable due to top accuracy but low reliability.

4.4 Full period

In addition to taking together all the sub-periods for answering the research questions, intensive interpretations will be made to assess the models' similarity and accuracy. By doing so, the key findings are compared with previous researches to detect any significant equivalence or contradiction. Although three one-way ANOVA tests has been generated to examine the null hypothesis, the final test is utilized regarding the intrinsic values ranging from pre-crisis till post-crisis. Hence, the total observations for each variable are tripled compared to the former tests.

Table 24. ANOVA Test Full period

ANOVA Full period

	SS	*df*	*MS*	*F*	*P-value*	*F crit*
Between Models	34.92165	3	11.64055	0.728536	0.536977	2.682809
Within Models	1853.448	116	15.978			
Total	1888.37	119				

Concerning the p-value, it is critically above 0.05, nearly doubled the pre-crisis p-value. Hence, there are no significant statistical differences between models, or there are not enough evidences to reject the null hypothesis. Furthermore, the F-value is well-below 1, which means the author is unconfident to verify the valuation models capture different values in means. Up to this point of study, the results again validate the disability to reject the null hypothesis which is surprising at first glance. Even though the stocks are valued at very distinct intrinsic estimates presented by the tables, statistics disapproved the significance of differences among valuation models. As a corresponding answer to the hypothesis, there is no statistical evidence to state the intrinsic corporate values obtained from the four methods: DDM, DCF, RIV and AEG are considerably various in mean. Still, it is worth noting that when reflecting with the research question, concluding the similarity between models are paramount is not statistically correct. As an alternative, the ideal answer to the research question would be: there are no statistical evidences to claim the various valuation methods provide different corporate values during the investigation

periods. This conclusion is fairly in line with original valuation theorists such as Ohlson (1995), Damodaran (2006) and Fernandez (2007) who strictly emphasized the theoretical equivalence among concepts. In contrast, regarding the application of models to one stock at a concrete sub-period, there are no equal V/P values at least when comparing up to the second decimal place. Hence, the models cannot be considered equivalent at first glance. Still, such differences are reasonable, in my opinion, due to the following reasons:

- Assumptions are made very subjectively which might fall into the trap of arbitrariness since the empiricist cannot understand thoroughly the firms' characteristics. These are considered a "dark side" of valuation (Damodaran 2009a) and the main initiatives for such manipulations of managers and analysts.
- The researcher cannot make full use of the financial statements leading to superiority between models (Fernandez 2017). This is a potential deficiency in this study, as the number of observations is too small for intensive data assembling to a certain degree. For instance, some firms do not present EBIT which is the core element to calculate FCF in their financial statements. Instead, I frequently use operating profit as an alternative for EBIT since they are roughly equivalent. In fact, EBIT are operating profit excluding any SG&A expenses but including other expenses in the income statement.
- In erratic periods, there is always a feasibility that firms tried to pro-act against the market to stand out, such as forcing the banks to increase their betas (Damodaran 2009a). Such actions tend to result in over-valuation or devaluation of firms but relate various methods to different degrees.

Looking back into the controversial argument of Penman (2001) against Lundfolm and O'Keefe (2001), it is blurry which side this study leans on. Nonetheless, as long as the researcher realizes the core nature of valuation which is all about future expectations, statistical results are acceptable at all costs. To answer the second question and test the second hypothesis, isolated factors related to PE value must be taken into account. First, we look at the accuracy of each method by comparing and ranking the means and medians.

For the full period, AEG showed its superiority in accuracy in both mean and median PE. Therefore, it is considered the most reflective model in this study. This finding is critically equivalent to those reported by Alfredsson and Lehmann (2016), who attained the mean and median PE from Swedish Stock Exchange of respectively 18% and 29%. The reason for such high accuracy obtained can be explained by Almeida (2012) claiming that AEG creates very close correlation between accounting and market values. Hence, one can trust AEG to render intrinsic value of stocks by extracting book data from the financial statements. However, since most of the previous findings reported went against its low valuation errors, it is essential to clarify the opposite results. On a subjective point of view, it is possible that the stocks are positively "exaggerated" by AEG. To justify, the summarized table of V/P values shows that AEG contains the most overpriced observations (13 out of 30) which balance the undervalue side. Such exaggeration stems from the fact that AEG hinges on abnormal earning growth rather than abnormal earning itself. A constant growth rate might lead to exponential changes in the final value, which in this study, is believed as increases. Take TOL stock during post-crisis as an example: when applying average growth rate of more than 35% to both earnings and dividends, AEG values from 2018 to 2022 are forecast to range from only $0.91 to $2.58. But it leads to the terminal value of $30.56 contributing over 45% to the equity value of $67.27. In general, the superiority of AEG in this study is mainly believed to originate from variability mathematics, though conceptual correctness is assured.

The same analysis mindset is also implemented when looking at AEG variations. It is obvious that AEG disappoints in its reliability to explain market estimates. Concerning the six rankings in deviations and coefficient, AEG was ranked third three times, fourth twice, and second only once. This outcome again corroborates the belief voiced by Alfredsson and Lehmann (2016) that AEG failed to determine its anchor for restricting equity value, especially in comparison to other accounting-based approaches. The standard deviation of PE they obtained is 2.39 for period 2009-2014, which is even higher than this study, noting that their investigation frame is more stable. Critically, the same reason of accuracy can be applied to explain this phenomenon both theoretically and empirically. The fact that AEG contains the

majority of undervalued stocks also makes the value distribution no longer single-sided. Such deficiency is comparable to the conclusion of Schreiner (2007) and Jorgensen et al. (2011), who claimed that AEG can be impractical especially when the investigated period is erratic. Thus, the financial crisis, even including pre and post period may have extremely negative impact on the model's utility. Intuitively, in terms of negativity of estimates, there are observations in this study valued as negative owing to minus AEG. LEN stock in crisis is forecast with constant dividends of $0.16 and earnings of $1.37 leading to slight deteriorations of AEG by $0.06 per year. This decline "exaggerates" the terminal value up to -$42.62 resulting in final equity value of -$21.4. Another characteristic recognized in this example as well as other stocks is the overwhelming effect of terminal values on the intrinsic values, which is fairly in line with the case study of Penman (2004). Nevertheless, terminal values can only have major impacts as long as the firm is assumed to gradually grow into perpetuity. Overall, the two explanations are mutually associated to prove a drawback of AEG that there are hardly any steady anchors to rely on and the result will mostly depend on future expectation.

In the accuracy ranking, RIV can be considered a runner-up after AEG, with four times ranked second and twice ranked third. This finding is the ultimate evidence indicating the superiority of accounting-based valuation models to cash-based, which agrees with those reported by Bernard (1995) and Francis et al. (2000). Especially, different from AEG, there were several empiricists concluding that RIV is dominant in explaining the fluctuation in securities prices. In theory, RIV was always believed to identify stocks' ability to create value rather than simply cash. Therefore, even some stocks recorded negative earnings or dividends, RIV enables investors to generate positive value as soon as positive cash flow is detected in the future. However, among the observations there are no stocks following this characteristic, since forecasting negative earnings will lead to 100% of negative intrinsic estimates in this study. An example came from HOV during the crisis, whose earnings were so arduous making the positive forecast infeasible. EPS was estimated ranging from -$0.55 to -$0.71 during 2012-2017 and delivered the intrinsic value of -$12.48. Fortunately, all of these outliers belong to the crisis sub-period, leaving RIV still well-performed

regarding the other periods. In contrast, RIV provides slightly poorer value estimates than AEG which quite contradicts its reliability as a benchmark for accounting-based models. As an explanation, while AEG estimates self-balance over two sides, RIV restricts its values to the underperformed hence, transits overall errors upwards. The steady book values of equity anchor the method to a critical degree which disregard the power of future forecasting. One distinguishable feature is that while AEG hinges on terminal value, most of RIV's intrinsic value relies on BVPS. For instance, KBH 2017 book equity value is $22.17, the model expects RI to be -$2.53 in 2018. But the total residual income together with terminal value only reduce the final intrinsic value by $2.2. From a pragmatic standpoint, accounting data is not appreciated by empiricists as a valuation initiative, as Dechow et al. (1999) or Callen and Segal (2005) reported. Still, I approve RIV's relatively high accuracy due to its conceptual correctness.

The other element to evaluate delivers very positive results for RIV in general, ranked first and third once and the rest are ranked second. The low variations yielded are in line with Nekrasov and Shroff (2009) especially when comparing with CAPM or Fama-French in forecasting future returns. The restriction of accounting value though prevents the model from gaining accuracy, in contrary, creates reliability. As mentioned above, since BVPS contributes to the majority of intrinsic value, V/P will be fairly equivalent to P/B ratio, a well-known multiple approach. Despite the similarity to market-based model which might negatively waive RIV from a fundamental valuation method, its reliability is reasonable as similar firms frequently yield equivalent P/B values. Thus, even if future expectations are pessimistic with negative terminal value, accounting data can reduce the severity by shifting the intrinsic value upwards. Take DHI in pre-crisis as an example with terminal value of -$3.43. Its BVPS turned the intrinsic value upside down to $1.37, indicating that the final figure though still erroneous, was pulled by BVPS closer to the trading price. In my point of view, RIV is slightly more practical than AEG thanks to its balance between accuracy and reliability hence, more ideal to explain market values.

The most unexpected finding from this study comes from DCF which provides very poor performance in accuracy. Though utilized as a benchmark for other fundamental valuation methods (Alfredsson & Lehmann 2016), such extreme degree

of errors makes the model genuinely questionable in the context of 2008 Financial Crisis, or any erratic periods in general. Among the six accuracy rankings, DCF comes twice at each second, third and fourth place. Nonetheless, the median delivers lower PE values than the mean, emphasizing the negative effects of outliers on the overall result. There are two oppositions associated to the accuracy of DCF, one of which claimed the DCF terminal value is the key driver for most erroneous yields (Penman & Sougiannis 1998). HOV's terminal value in 2012 is a massive -$1.572 billion, before being valued at -$1.459 billion of equity. It is possible that FCF's scarcity of estimate ability make the model unable to forecast future cash flows. The assembled accounting estimates might be roughly scarce to give the full picture of the firms' wealth generation, especially in unstable times when such manipulations take place to confront investors. It is worth mentioning that as having several parameters during the computation, DCF is the most potential for "massaging" the numbers. Eventually, major changes in one factor are not as easy to implement as minor changes in ten factors, though both approaches lead to significant differences in the intrinsic values. This threat is very common not only in accounting but also in valuation affecting heavily cash flow forecast. In theory, EBIT and invested capital are the most predominant in the FCF formula as representing cash inflows and outflows. DCF in this study rationally anchors on those two factors which account for 80% to 90% of attaining the final figures. However, some observations exhibit absolute dominance of working capital to EBIT, like KBH in pre-crisis. Its working capital is expected to decrease by $279 million in 2012, resulting in high FCF of $549 million. Based on that, every corporate need more current capital to generate more earnings thus, the implementation seems to be irrelevant. Still, since the historical book value also yields significant downtrend of working capital, such phenomena can only be explained by delay of investment (ibid.). Among the stocks, negative intrinsic values commonly happen due to extreme amount of debt. Even though the company is generating stable business performance, high net debt is a risk of bankruptcy and abandonment which may drive the entity value to the opposite path. In 2008, Hovnanian carried an eminent debt amount of nearly $1.3 billion, while its enterprise value was expected only at $128 million. Thus, this stock having the only negative V/P value among the post-crisis data set is not surprising. In the end, the inability of

DCF to explain the market is not only due to accounting manipulation and business performance but also immaturity of investment during erratic times, as supported by Penman (2004), Wright (2007), Alfredsson and Lehmann (2016).

The extent of reliability has the same pessimistic scope with five times coming in the last place. While containing the most intense record of undervalued, DCF also provides the highest number of negative intrinsic estimates. The same reasons regarding accounting manipulation can be applied to explain its severe deviation. Notwithstanding, when looking at the post-crisis period, the stocks was valued very similarly based on the unity of cell colors. Should one eliminated HOV as outliers in the range, DCF standard deviation would have been only 0.199 and ranked first in terms of spread. Thus, it is rational to an extent that DCF can be a very reflective model as long as FCF is expected in a confident manner (Folger 2016). Some observations in this sub-period witnessed very stable growth of FCF including MDC and MTH with annual FCF growth of 15% and 25% respectively. Most well-known empiricists such as Kaplan and Ruback (1995), Damodaran (2002), Fernandez (2015) approved the conceptual correctness of DCF making it the most popular fundamental model. Still, being the benchmark comes as a risk. In some circumstances that DCF is inapplicable, it might lose lots of trust from investors and analysts to consider this method as well-performed. This study can be a potential evidence to prove the inability of DCF to value firms during the financial crisis, and the capability of others to be utilized as alternatives.

As expected, DDM significantly underperforms in this research, with the lowest average ranking compared to other models (four times last place and twice third place). This finding is somehow associated with dividend theory by Miller and Modigliani (1961) who claimed that dividend have no connection with return equity thus, making the model non-functional. Looking into financial statements of firms, it is usual to impose dividend policy non-related to their financial performance. For instance, dividend payments of LEN from 2013 to 2017 are constantly $0.16 per share, despite the continuous growth of earnings from $2.1 to $3.38. This peculiar policy leads to a critical undervalued stock of only $1, while valued at $63.24 by the market. However, the figure is roughly relevant in the point of investors' view,

especially the risk-averse. One needs a stable, or even constant annual dividend payment, regardless of business performance. Therefore, when the company delivers poor financial health, they still have to pay dividends via borrowings as well as outsourcing to prevent stockholders from selling shares. When assuming dividends' positive correlation to earnings, the acquired results are slightly better, but high errors still occur. BZH stock during crisis, for example, has negative earnings throughout the whole period which crucially impact dividend forecast. Assuming negative dividend ought to be made since it is irrational for corporates to maintain positive dividend with 5-year of repeated loss. As a result, the stock was valued at -$32.48. To sum up, the low accuracy of DDM brings the model on the verge of invalidity as reported by Jacobs and Levy (1988), Cancino (2011) and Yabs (2014).

Strikingly, the deviation shows performance dominance of DDM since it stays at the top five times and second only once. As consisting of only 3 out of 30 undervalued stock data, the distribution of DDM values hinges on one side of valuation degree. Among the negative findings from various empiricists, DDM is still considered the simplest and most straightforward method where future dividend symbolizes equity return (Maverick 2015a). In comparison with AEG, both models include DPS and EPS as the core variables for obtaining intrinsic values. AEG is generated based on a more complex formula, equity value in this model is identically dependent on each component. In contrast, DDM brings out a much simpler equation with DPS as the initial parameter. More than half of DDM observations only utilize EPS to attain the perpetuity growth rate. Hence, such fluctuations can hardly occur, especially when dividends are forecast to mutate by a constant rate. MDC's dividend payments range from $0.28 to $1 throughout the pre-crisis, leading to increasing future DPS of $5.47 in 2012 forecast year. In the end, the stock was expected to grow at 7.7% into infinity and valued at $22.79, while the market price was $34.32. Generally, the high reliability of DDM can be explained by a straightforward ground theory with only minor probabilities of data manipulation, one of the rare advantages of this model (ibid.).

5 Conclusions

This final chapter of the thesis should draw up a condensed summary of all the findings as presented and interpreted in the *Result* chapter. At this point, the researcher needs to rewind the literature review and see whether the conclusions can add to the knowledge displayed in the literature (Saunders et al. 2015, 538).

After the summary, I will indicate practical implications of valuation models to the society, to stakeholders of firms and to the researcher. Through this journey, I sincerely hope that the findings can give other empiricists another spectrum of model application as a methodology-based study. Eventually, it is impossible that a regular thesis does not contain any limitations to a certain degree. Still, rather than considering those as absolute deficiencies, limitations should be justified as a reflection insofar that research findings is said to be "true" (ibid.).

5.1 Summary of key findings

This study is set to determine whether the underlying valuation methods meet the theoretical expectations as claimed by most analysts. If one can make full use of the book value and give precise forecast of earnings and cash flows, the models should obtain similar results. But in the financial sector, accounting data is continuously manipulated and future forecast cannot be ideally accurate whatsoever, hence it is relevant to examine such tendency by testing the models in an erratic period. Each characteristic regarding both strengths and weaknesses of models again will be briefly exposed and compared to explain the capability of utilization. Recalling the two research questions with corresponding hypotheses:

1. **Do the various valuation methods provide similar corporate values during the investigation periods?**

Hypothesis 1: the intrinsic corporate values obtained from the 4 methods: DDM, DCF, RIV and AEG will be considerably various in mean.

2. **What is the extent of discrepancies in the corporate valuation provided by different methods?**

Hypothesis 2: the explanatory power of each method will be distinctive ranging from most to least: AEG, RIV, DCF and DDM.

Regarding the aspect of similarity, the four ANOVA tests deliver identical results, which are unable to reject the null hypothesis. Thus, there are no statistical evidences verifying that the models' range of V/P estimates are various in means. Although initially, the variables have no equal observations when comparing up to the second decimal place. Such conflicts may occur due to the subjectivity in making assumptions, inability to utilize book values, and manipulation in downturn period. Regarding the first research question, it is concluded that there is no statistical evidence to claim the various valuation methods provide different corporate values during the investigation periods.

In terms of models' accuracy, AEG is the most dominant, RIV comes in second, DCF comes in third and DDM is considerably lagging behind. This ranking is totally in line with the study of Alfredsson and Lehmann (2016) who confirmed the superiority of accounting-based methods to the cash-based. While AEG's data set balance between the two sides of valuation degree, RIV mostly resorts to BVPS with very minor impact from earnings and terminal value. Even during the crisis, both show high accuracy in explaining market value. In sum, accounting-based methods might be more recommended in this study when applying in crisis or any unstable periods in general. On the other hand, DCF and DDM as more common absolute models provide relatively poor outcomes associating with those reported by Bernard (1995), Francis et al. (2000) and Penman (2001). For DCF, the high errors are owing to the fact that working capital and terminal value have significant impacts on the intrinsic estimate, especially during recession when such variables become erroneous. DDM findings fairly agree with Miller – Modigliani dividend theory as a considerable amount of stocks yield non-related dividends to actual return. Still, it is probable that these accuracy measurements only fit this specific study, though has been supported by many previous researches.

With the same attitude, variations of models are also examined for reliability testing, where DDM shows the least deviations, followed by RIV, AEG and finally, DCF. The surprising performance of DDM in terms of spread can be clarified by its straightforward framework, which simplifies value expectations without any major distinctions among the securities. Subsequently, RIV's over-dependence to equity book value may also explain its decent degree of variation. For AEG, the complexity of formula as well as inability to gain steady anchor values make the PE values fluctuate at an exponential rate. Eventually, the disappointing performance of DCF is technically reasonable since outliers in the data set shift the standard deviation and coefficient to critically exceed other models. The unexpected is this ranking also matches with what Alfredsson and Lehmann (2016) derived when they extended the investigated horizon.

To finalize the second research question hypothesis, the researcher needs to combine both accuracy and reliability perspective to evaluate the market explanatory power of the models, though it is already mentioned that accuracy is more significant. AEG though dominating in the accuracy scale, provides poor performance regarding value deviations. RIV as the benchmark accounting-based approach, shows favorable V/P estimates with decent accuracy and reliability. Being the most balanced model between the two elements, RIV is ranked first followed by AEG. DCF delivers negatively extreme errors throughout the data set, in contrary to its reputation as the most employed fundamental methods (Strong & Walker 2004). Hence, the last place belongs to DCF. DDM, as opposed to AEG, have very high degree of errors but low variations between values. Still, since accuracy is primary, DDM comes as the third place. Taken together, the eventual ranking regarding the explanatory power of models is: RIV, AEG, DDM and DCF (the hypothesis is rejected).

5.2 Practical Implications

A methodology-based research can be fully utilized not only to the empirical application but also to the methodology itself. In a manner of speaking, this study is considered empirical regarding the fact that valuation models are implemented for business decision-making. Most investment bankers conduct valuation to determine

the deviation between intrinsic value and trading price, thus evaluate the buy-and-sell potential of corporate stocks in the short term. Therefore, based on the V/P values obtained, internal and external stakeholders can be pro-active in implementing business solutions to enhance their values. However, the above incentive does not connect with this study because:

- Instead of comparing intrinsic and extrinsic value for any decision-making actions, this framework uses market price as the benchmark to test the accuracy and reliability of models. The closer intrinsic value to trading price implies a stronger market explanatory power of methods and vice versa.
- Assumed giving the research findings to investors, it is hardly possible for them to make use of current information as the four methods acquire distinct value estimates. For instance, if DDM and DCF undervalue the stock but RIV and AEG overvalue that same stock, should investors consider buying or betting against that stock?
- The investigated sub-periods are all historical with valuation dates assumed in the past. Hence, such intrinsic values attained are not useful for current investors.

This research is a minor contribution to corporate investors and analysts to consider applying the best fundamental valuation model. Even though relative multiple has been the most well-known approach by not being cumbersome to use with hardly any sensitive assumptions (Schreiner 2007, 19), cash-based and accounting-based methods are ideal substitutes due to thorough inclusion of firms' financial portfolios. However, it is worth noting that such models are not recommended for erratic circumstances like the 2008 Financial Crisis. The historical book values can be extremely volatile and troublesome for future expectations. Still, this study tries to test the models in downturn period to examine their remaining degree of functionality. Subsequently, investors and analysts may utilize these methods additionally to, but not instead of, multiples valuation framework. The findings provide decent estimates of how historical financial data can be taken advantage for future forecasting since intensive analysis of firms' fundamentals is necessary. Internal and external stakeholders can acknowledge a perspective of models'

efficiencies in crisis and select the most appropriate to generate in equivalent situations. Either ways, the four fundamental methods are all comparable in theory and has already been proved by statistical analysis in this study. Finally, utilizing the most reflective model may maximize investors' ability of screening stocks and from there, implementing pro-active investment decisions.

5.3 Recommendations and Limitations

Despite the thorough conduction of research, stepping on such limitations is inevitable especially when the data set is too numerous to handle. Regarding the valuation process, all the observations are restricted to the underlying problem of future expectations. Though using historical performance for forecasting earnings and cash flows is a systematic approach to eliminate subjective predictions, it does not always give a reflective picture of the business in terms of financial status. More critically, the fluctuation of values during financial crisis makes the future estimates unbearable for investors since it involves several factors related to systematic and unsystematic risks. There have been several negative estimates obtained in the *Result* chapter stressing the poor securities performance. Hence, a question arises: how can one forecast future value with such negativity in the past? It is perhaps because the company is having big investments which significantly reduce its earnings and cash flows. Looking in a pessimistic scope is also possible as firms continuously disappoint in creating values and are on the verge of bankruptcy. Nonetheless, giving either assumptions are relevant due to the core nature of valuation as aforementioned. The ultimate factors deciding the usefulness of valuation methods are how skilled investors and analysts in practice, and how they understand the corporates. On a technical viewpoint, the one-way ANOVA tests are fairly questionable in giving a precise judgement of how the models being discrepant from others. It is worth recalling that this study does not meet an initial requirement to run the test, which claimed the necessity of samples to have equal variances. Nevertheless, such tests are rational standpoints to justify the application of statistics to equity valuation or any investment analysis in general.

It is strongly suggested that this research is pushed further for more intensive analysis, especially in terms of methodology. There might be other approaches to evaluate valuation models apart from statistical analysis. My recommendation is that future empiricists ought to go in depth and make the most use of the financial data rather than increase the number of observations. Schreiner (2007, 130) also preferred a small sample study as to assess model accuracy. In the context of 2008 Financial Crisis, the practicality of underlying methods can be further explored in different recessions, segments and markets. Eventually, relative multiple is still the most advanced approach to examine stock prices within a peer group, but absolute fundamentals can also successfully alternate as long as the future expectations are met.

What is more, one can extend the research methodology on accounting-based methods, especially AEG, since opposed to the evident performance in this study, very few empirical researches have been conducted for this concrete model. It is noticeable that there are no official framework bases of RIV and AEG online, which enforces the practitioners to build these templates themselves. While it is absolutely appropriate to self-generate the models to fit the concrete circumstance, having a technical benchmark for barely-known models is essential. Looking into stock analysis of most securities firms, only DCF is utilized as an alternative to industry multiples. Hence, the importance of bringing such theorized models into practice is emphasized as a transitional point in equity valuation. I am eagerly looking forward to where this staked path might lead to.

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Appendices of valuation spreadsheet

Appendix 1. Pre-crisis - DHI - DDM

Rf	4.04%		Average Dividend payout			1.050 %		Intrinsic value of equity per share 2007 ($)			17.20
RM	17.75%		Average RoE			15.813 %		Share price (31/12/2007)			13.17
Beta	1.6504		Sustainable Growth rate			15.6465%					
Cost of Equity	26.663 %		Terminal Value of future Dividend			40.978					
			Discounted Terminal Value			12.569					**Undervalued**
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	0.135	0.215	0.3075	0.44	0.6	0.873	1.269	1.846	2.684	3.904	
Dividend per share growth rate (%)		59.259 %	43.023 %	43.089 %	36.364 %	45.43%	45.43%	45.43%	45.43%	45.43%	
Discounted future dividend ($)						0.689	0.791	0.908	1.043	1.197	
Earnings per share ($)	1.99	3.09	4.62	3.9	-2.27						
Dividend payout	6.784 %	6.958 %	6.656 %	11.282 %	-26.432 %						
Net income (Million $)	626	975.1	1470.5	1233.3	-712.5						
Shareholder's equity (Million $)	3031.3	3960.7	5360.4	6452.9	5586.9						
Return on Equity	20.651 %	24.619 %	27.433 %	19.112 %	-12.753 %						

Appendix 2. Pre-crisis - DHI – DCF

Rf	4.04%		Cost of Debt	8.05%		WACC	17.07%		Intrinsic value of equity		346.75
RM	17.75%		After tax Cost of Debt	4.83%		Intrinsic value of entity	4,495.25		Intrinsic equity per share		1.10
Beta	1.6504		Total equity	5586.9		Total Debt	4376.8		Share price		13.17
Cost of Equity	26.663 %					Net Debt	4148.5				**Overvalued**
Shares Outstanding million	314										
					Forecast Year	1	2	3	4	5	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Revenues (million $)	8,552.1	10,658.0	13,863.7	15,051.3	11,296.5	12,378.8	13,564.7	14,864.3	16,288.3	17,848.8	
Revenue Growth rate		24.624 %	30.078 %	8.566 %	-24.947 %	9.580 %	9.580 %	9.580 %	9.580 %	9.580 %	
EBIT (million $)	914.7	1,508.2	2,273	1,878.7	-1,020	1,107	1,213	1,329	1,456	1,595	
EBIT Margin	10.696%	14.151%	16.395%	12.482%	-9.029%	8.939%	8.939%	8.939%	8.939%	8.939%	
Depreciation & Amortization (million $)	**41.8**	**49.6**	**52.8**	**56.5**	**64.4**	**56.5**	**61.9**	**67.8**	**74.3**	**81.4**	
% to revenue	0.489%	0.465%	0.381%	0.375%	0.570%	0.456%	0.456%	0.456%	0.456%	0.456%	
NOPAT (million $)	**548.82**	**904.92**	**1,363.80**	**1,127.22**	**-612.00**	**663.91**	**727.52**	**797.22**	**873.60**	**957.29**	
Cash (million $)	542.464	480.1	1,111.6	457.8	228.3	234.63	241.14	247.82	254.69	261.76	
Cash growth rate		-11.496%	131.535%	-58.816%	-50.131%	2.773%	2.773%	2.773%	2.773%	2.773%	
	5,082.295	6,567.4	8,486.8	11,343.1	9,343.5	10,092.26	10,901.03	11,774.61	12,718.19	13,737.39	
Inventories growth rate		29.221%	29.226%	33.656%	-17.628%	8.014%	8.014%	8.014%	8.014%	8.014%	
Accounts receivable ($)		3282.7	3969.3	4,814.70	4,005.30	4,344	4,712	5,111	5,544	6,014	
Accounts receivable growth rate			20.916%	21.298%	-16.811%	8.468%	8.468%	8.468%	8.468%	8.468%	
Accounts payable (million $)	501	585.2	820.7	982.3	566.2	614.86	667.71	725.10	787.42	855.10	
Accounts payable growth rate		16.806%	40.243%	19.691%	-42.360%	8.595%	8.595%	8.595%	8.595%	8.595%	
Accrued expense (million $)	630	756.9	1196.9	1143.0	933.3	1062.62	1209.86	1377.50	1568.37	1785.69	
Accrued expense growth rate		20.143%	58.132%	-4.503%	-18.346%	13.856%	13.856%	13.856%	13.856%	13.856%	
Notes payable (million $)	2565.145	3006.5	3660.1	4886.9	3989.00	4528.413	5140.767	5835.928	6625.091	7520.970	
Notes payable growth rate		17.206%	21.740%	33.518%	-18.374%	13.523%	13.523%	13.523%	13.523%	13.523%	
Working capital (million $)	6,743.314	6,704.2	7,926.0	8,794.0	8,898.0	8,465.5	8,836.2	9,195.3	9,536.2	9,851.0	
Delta Working capital (million $)		**-39.114**	**1,221.8**	**868**	**104.0**	**-432.547**	**370.708**	**359.102**	**340.917**	**314.855**	
Property, plant & Equipment (million $)	81.675	91.9	107.2	131.4	110.2	120.01	130.69	142.328	154.998	168.796	
PP & E growth rate		12.519%	16.649%	22.575%	-16.134%	8.902%	8.902%	8.902%	8.902%	8.902%	
Depreciation & Amortization (million $)	41.8	49.6	52.8	56.5	64.4	56.5	61.9	67.8	74.3	81.4	
% to revenue	0.489%	0.465%	0.381%	0.375%	0.570%	0.456%	0.456%	0.456%	0.456%	0.456%	
Capital expenditure		**59.8**	**68.1**	**80.7**	**43.2**	**66.3**	**72.6**	**79.4**	**87.0**	**95.2**	
											Terminal Value
Unlevered free cash flow (million $)		**933.81**	**126.70**	**235.02**	**-694.80**	**1,086.65**	**346.13**	**426.48**	**520.01**	**628.64**	**5,467.52**
Unlever FCF growth rate			-86.43%	85.49%	-395.63%	-256.40%	-68.15%	23.22%	21.93%	20.89%	
Discounted to the present FCF (million $)						928.19	252.54	265.79	276.82	285.84	2,486.08

Appendix 3. Pre-crisis - DHI – RIV

Rf	4.04%		Intrinsic Value per share		1.37					
RM	17.75%		Share price		13.17					
Beta	1.6504				**Overvalued**					
Cost of Equity	26.663 %									
Shares Outstanding (million)	314									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Equity per Share ($)	9.654	12.614	17.071	20.551	17.793	15.042	12.218	9.086	5.338	0.553
Dividend per share ($)	0.135	0.215	0.3075	0.44	0.6	0.873	1.269	1.846	2.684	3.904
Dividend per share growth rate (%)		59.259 %	43.023 %	43.089 %	36.364 %	45.43%	45.43%	45.43%	45.43%	45.43%
Earnings per share ($)	1.99	3.09	4.62	3.9	-2.27	-1.88	-1.55	-1.29	-1.06	-0.88
Earnings per share growth rate		55.28%	49.51%	-15.58%	-158.21%	-17.25%	-17.25%	-17.25%	-17.25%	-17.25%
Residual income (million $)		0.52	1.26	-0.65	-7.75	-6.62	-5.57	-4.54	-3.49	-2.30
Discounted residual income						-5.23	-3.47	-2.24	-1.35	-0.71
Shareholder's equity (Million $)	3031.3	3960.7	5360.4	6452.9	5586.9					
								Terminal growth rate		Terminal value
								5.00%		-3.43

Appendix 4. Pre-crisis - DHI – AEG

Rf	4.04%		Intrinsic Value per share		10.50					
RM	17.75%		Share price		13.17					
Beta	1.6504				**Overvalued**					
Cost of Equity	26.663 %									
Shares Outstanding (million)	314									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Dividend per share ($)	0.135	0.215	0.3075	0.44	0.6	0.873	1.269	1.846	2.684	3.904
Dividend per share growth rate (%)		59.259 %	43.023 %	43.089 %	36.364 %	45.43%	45.43%	45.43%	45.43%	45.43%
Earnings per share ($)	1.99	3.09	4.62	3.9	-2.27	-1.88	-1.55	-1.29	-1.06	-0.88
Earnings per share growth rate		55.28%	49.51%	-15.58%	-158.21%	-17.25%	-17.25%	-17.25%	-17.25%	-17.25%
Abnormal earnings growth ($)						1.16	1.06	1.02	1.06	1.18
Discounted AEG ($)							3.13	2.39	1.95	1.72
								Terminal growth rate		Terminal value
								5.00%		8.36

Appendix 5. Pre-crisis - LEN – DDM

Rf	4.04%		Average Dividend payout			6.241 %		Intrinsic value of equity per share 2007 ($)			4.33
RM	17.75%		Average RoE			6.358 %		Share price (31/12/2007)			17.21
Beta	1.3606		Sustainable Growth rate			5.9612%					
Cost of Equity	22.692 %		Terminal Value of future Dividend			5.900					
			Discounted Terminal Value			2.122					**Overvalued**
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	0.144	0.513	0.573	0.64	0.64	0.690	0.744	0.802	0.864	0.932	
Dividend per share growth rate (%)		256.250 %	11.696 %	11.693 %	0.000 %	7.80%	7.80%	7.80%	7.80%	7.80%	
Discounted future dividend ($)						0.562	0.494	0.434	0.381	0.335	
Earnings per share ($)	4.65	5.7	8.23	3.69	-12.31						
Dividend payout	3.097 %	9.000 %	6.962 %	17.344 %	-5.199 %						
Net income (Million $)	751.391	945.619	1355.155	593.869	-1941.081						
Shareholder's equity (Million $)	3263.774	4052.972	5251.411	5701.372	3822.119						
Return on Equity	23.022 %	23.331 %	25.806 %	10.416 %	-50.785 %						

Appendix 6. Pre-crisis - LEN – DCF

Rf	4.04%		Cost of Debt	8.05%		WACC	15.99%		Intrinsic value of equity		4,181.34
RM	17.75%		After tax Cost of Debt	4.83%		Intrinsic value of entity	5,834.30		Intrinsic equity per share		26.15
Beta	1.3606		Market value of equity	3822.119		Total Debt	2295.436		Share price		17.21
Cost of Equity	22.692 %					Net Debt	1652.969				**Undervalued**
Shares Outstanding million	159.89										
					Forecast Year	1	2	3	4	5	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Revenues (million $)	8,905.2	10,501.0	13,867.0	16,266.7	10,186.8	10,948.3	11,766.7	12,646.4	13,591.8	14,607.8	
Revenue Growth rate		17.919 %	32.054 %	17.305 %	-37.376 %	7.476 %	7.476 %	7.476 %	7.476 %	7.476 %	
EBIT (million $)	1,164.1	1,548.5	2,277	986.2	-2,914	475.06	510.58	548.75	589.77	633.86	
EBIT Margin	13.072%	14.746%	16.421%	6.062%	-28.606%	4.339%	4.339%	4.339%	4.339%	4.339%	
Depreciation & Amortization (million $)	**54.5**	**55.6**	**58.3**	**45.4**	**54.3**	**52.0**	**55.9**	**60.0**	**64.5**	**69.3**	
% to revenue	0.612%	0.529%	0.420%	0.279%	0.533%	0.475%	0.475%	0.475%	0.475%	0.475%	
NOPAT (million $)	**698.45**	**929.09**	**1,366.25**	**591.69**	**-1,748.40**	**285.04**	**306.35**	**329.25**	**353.86**	**380.31**	
Cash (million $)	1,201.276	1,310.9	909.6	661.7	642.5	559.52	487.28	424.36	369.57	321.86	
Cash growth rate		9.127%	-30.617%	-27.254%	-2.901%	-12.911%	-12.911%	-12.911%	-12.911%	-12.911%	
	3,656.101	5,142.1	7,863.5	7,831.5	4,500.4	5,070.01	5,711.70	6,434.61	7,249.02	8,166.51	
Inventories growth rate		40.644%	52.925%	-0.408%	-42.534%	12.657%	12.657%	12.657%	12.657%	12.657%	
Accounts receivable ($)	60.392	153.285	299.232	159.04	207.69	328.55	519.74	822.19	1,300.64	2,057.50	
Accounts receivable growth rate		153.817%	95.213%	-46.850%	30.588%	58.192%	58.192%	58.192%	58.192%	58.192%	
Accounts payable (million $)	1,040.96	554.7	876.8	751.5	376.1	326.41	283.26	245.82	213.32	185.13	
Accounts payable growth rate		-46.716%	58.083%	-14.294%	-49.949%	-13.219%	-13.219%	-13.219%	-13.219%	-13.219%	
Accrued expense (million $)	630.00	756.90	1,196.90	1,143.00	933.30	1,062.62	1,209.86	1,377.50	1,568.37	1,785.69	
Accrued expense growth rate		20.143%	58.132%	-4.503%	-18.346%	13.856%	13.856%	13.856%	13.856%	13.856%	
Notes payable (million $)	45.21	222.77	306.45	333.72	719.08	1,107.23	1,704.90	2,625.18	4,042.21	6,224.13	
Notes payable growth rate		392.699%	37.562%	8.901%	115.472%	53.979%	53.979%	53.979%	53.979%	53.979%	
Working capital (million $)	3,300.245	5,126.3	6,600.6	6,472.6	3,273.4	3,461.8	3,520.7	3,432.7	3,095.3	2,350.9	
Delta Working capital (million $)		**1,826.101**	**1,474.3**	**-128**	**-3,199.2**	**188.411**	**58.887**	**-88.028**	**-337.340**	**-744.406**	
Property, plant & Equipment (million $)	450.62	249.23	266.75	474.09	1,744.68	537.41	609.18	690.54	782.77	887.32	
PP & E growth rate		-44.692%	7.029%	77.730%	268.005%	13.356%	13.356%	13.356%	13.356%	13.356%	
Depreciation & Amortization (million $)	54.5	55.6	58.3	45.4	54.3	52.0	55.9	60.0	64.5	69.3	
% to revenue	0.612%	0.529%	0.420%	0.279%	0.533%	0.475%	0.475%	0.475%	0.475%	0.475%	
Capital expenditure		**-145.8**	**75.8**	**252.8**	**1,324.9**	**115.3**	**127.6**	**141.4**	**156.8**	**173.9**	
											Terminal Value
Unlevered free cash flow (million $)		**-695.62**	**-125.52**	**512.36**	**180.21**	**33.31**	**175.68**	**335.92**	**598.97**	**1,020.18**	**9,747.25**
Unlever FCF growth rate			-81.96%	-508.18%	-64.83%	-81.52%	427.43%	91.20%	78.31%	70.32%	
Discounted to the present FCF (million $)						28.72	130.59	215.26	330.93	485.94	4,642.87

Appendix 7. Pre-crisis - LEN – RIV

Rf	4.04%		Intrinsic Value per share		8.41					
RM	17.75%		Share price		17.21					
Beta	1.3606				**Overvalued**					
Cost of Equity	22.692 %									
Shares Outstanding (million)	160									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Equity per Share ($)	20.413	25.349	32.845	35.659	23.905	27.050	30.293	33.634	37.076	40.619
Dividend per share ($)	0.144	0.513	0.573	0.64	0.64	0.690	0.744	0.802	0.864	0.932
Dividend per share growth rate (%)		256.250 %	11.696 %	11.693 %	0.000 %	7.80%	7.80%	7.80%	7.80%	7.80%
Earnings per share ($)	4.65	5.7	8.23	3.69	-12.31	3.84	3.99	4.14	4.31	4.48
Earnings per share growth rate		22.58%	44.39%	-55.16%	-433.60%	3.93%	3.93%	3.93%	3.93%	3.93%
Residual income (million $)		1.07	2.48	-3.76	-20.40	-1.59	-2.15	-2.73	-3.33	-3.94
Discounted residual income						-1.30	-1.43	-1.48	-1.47	-1.42
Shareholder's equity (Million $)	3263.774	4052.972	5251.411	5701.372	3822.119					
								Terminal growth rate		Terminal value
								5.00%		-8.41

Appendix 8. Pre-crisis - LEN – AEG

Rf	4.04%		Intrinsic Value per share		6.20						
RM	17.75%		Share price		17.21						
Beta	1.3606				**Overvalued**						
Cost of Equity	22.692 %										
Shares Outstanding (million)	160										
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	0.144	0.513	0.573	0.64	0.64	0.690	0.744	0.802	0.864	0.932	
Dividend per share growth rate (%)		256.250 %	11.696 %	11.693 %	0.000 %	7.80%	7.80%	7.80%	7.80%	7.80%	
Earnings per share ($)	4.65	5.7	8.23	3.69	-12.31	-12.79	-13.30	-13.82	-14.36	-14.93	
Earnings per share growth rate		22.58%	44.39%	-55.16%	-433.60%	3.93%	3.93%	3.93%	3.93%	3.93%	
Abnormal earnings growth ($)						2.45	2.56	2.66	2.77	2.89	
Discounted AEG ($)							9.18	7.80	6.62	5.62	
								Terminal growth rate		Terminal value	
								5.00%		33.36	

Appendix 9. Pre-crisis - PHM – DDM

Rf	4.04%		Average Dividend payout			2.234 %		Intrinsic value of equity per share 2007 ($)			1.17
RM	17.75%		Average RoE			4.642 %		Share price (31/12/2007)			10.32
Beta	1.6527		Sustainable Growth rate			4.5382%					
Cost of Equity	26.695 %		Terminal Value of future Dividend			1.705					
			Discounted Terminal Value			0.522					**Overvalued**
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	0.05	0.1	0.13	0.16	0.16	0.188	0.222	0.261	0.307	0.361	
Dividend per share growth rate (%)		100.000 %	30.000 %	23.077 %	0.000 %	17.69%	17.69%	17.69%	17.69%	17.69%	
Discounted future dividend ($)						0.149	0.138	0.128	0.119	0.111	
Earnings per share ($)	2.48	3.79	5.68	2.66	-8.94						
Dividend payout	2.016 %	2.639 %	2.289 %	6.015 %	-1.790 %						
Net income (Million $)	624.634	986.541	1491.913	687.471	-2255.755						
Shareholder's equity (Million $)	3448.123	4522.674	5957.342	6577.361	4320.193						
Return on Equity	18.115 %	21.813 %	25.043 %	10.452 %	-52.214 %						

Appendix 10. Pre-crisis - PHM – DCF

Rf	4.04%		Cost of Debt	8.05%		WACC	17.80%		Intrinsic value of equity			-3,310.21
RM	17.75%		After tax Cost of Debt	4.83%		Intrinsic value of entity	-1,407.88		Intrinsic equity per share			-13.13
Beta	1.6527		Market value of equity	4320.193		Total Debt	2962.634		Share price			10.32
Cost of Equity	26.695 %					Net Debt	1902.323					**Overvalued**
Shares Outstanding million	252.19											
					Forecast Year	1	2	3	4	5		5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**		
Revenues (million $)	8,701.7	11,400.0	14,528.2	14,075.2	9,121.7	9,581.0	10,063.4	10,570.0	11,102.2	11,661.2		
Revenue Growth rate		31.010 %	27.441 %	-3.118 %	-35.193 %	5.035 %	5.035 %	5.035 %	5.035 %	5.035 %		
EBIT (million $)	994.0	1,592.3	2,277	1,082.7	-2,497	409.75	430.38	452.04	474.80	498.71		
EBIT Margin	11.423%	13.968%	15.673%	7.692%	-27.373%	4.277%	4.277%	4.277%	4.277%	4.277%		
Depreciation & Amortization (million $)	**39.4**	**46.3**	**61.5**	**83.7**	**83.4**	**53.5**	**56.2**	**59.0**	**62.0**	**65.1**		
% to revenue	0.453%	0.406%	0.423%	0.594%	0.914%	0.558%	0.558%	0.558%	0.558%	0.558%		
NOPAT (million $)	**596.40**	**955.39**	**1,366.21**	**649.64**	**-1,498.14**	**245.85**	**258.23**	**271.23**	**284.88**	**299.22**		
Cash (million $)	404.092	308.1	1,002.3	551.3	1,060.3	1,311.27	1,621.62	2,005.43	2,480.08	3,067.07		
Cash growth rate		-23.751%	225.287%	-44.996%	92.332%	23.668%	23.668%	23.668%	23.668%	23.668%		
Inventories (million $)	5,528.410	7,241.4	8,756.1	9,374.3	7,027.5	7,623.59	8,270.23	8,971.72	9,732.71	10,558.25		
Inventories growth rate		30.984%	20.918%	7.061%	-25.035%	8.482%	8.482%	8.482%	8.482%	8.482%		
Accounts receivable ($)	0	0	0	0	0	0	0	0	0	0		
Accounts receivable growth rate							58.192%	58.192%	58.192%	58.192%		
Accounts payable (million $)	452.65	609.04	789.399	576.32	418.64	428.91	439.43	450.20	461.25	472.56		
Accounts payable growth rate		34.550%	29.614%	-26.992%	-27.360%	2.453%	2.453%	2.453%	2.453%	2.453%		
Accrued expense (million $)	1,072.55	1,251.76	1,402.62	1,403.79	1,308.55	1,380.72	1,456.87	1,537.21	1,621.99	1,711.44		
Accrued expense growth rate		16.709%	12.052%	0.084%	-6.784%	5.515%	5.515%	5.515%	5.515%	5.515%		
Notes payable (million $)	2,150.97	2,861.55	3,386.527	3,537.95	3,478.23	3,949.22	4,483.99	5,091.17	5,780.57	6,563.33		
Notes payable growth rate		33.035%	18.346%	4.471%	-1.688%	13.541%	13.541%	13.541%	13.541%	13.541%		
Working capital (million $)	2,256.332	2,827.1	4,179.8	4,407.6	2,882.4	3,176.0	3,511.6	3,898.6	4,349.0	4,878.0		
Delta Working capital (million $)		**570.784**	**1,352.7**	**228**	**-1,525.2**	**293.612**	**335.560**	**386.993**	**450.420**	**529.011**		
Property, plant & Equipment (million $)	942.77	971.63	1,023.74	982.03	1,050.93	1,080.80	1,111.51	1,143.09	1,175.58	1,208.98		
PP & E growth rate		3.062%	5.363%	-4.074%	7.016%	2.842%	2.842%	2.842%	2.842%	2.842%		
Depreciation & Amortization (million $)	31.2	38.0	53.3	75.4	75.6	46.4	48.8	51.2	53.8	56.5		
% to revenue	0.359%	0.333%	0.367%	0.536%	0.829%	0.485%	0.485%	0.485%	0.485%	0.485%		
Capital expenditure		**66.9**	**105.4**	**33.7**	**144.5**	**145.2**	**79.5**	**82.8**	**86.3**	**89.9**		
												Terminal Value
Unlevered free cash flow (million $)		**364.04**	**-30.38**	**471.87**	**-34.12**	**-139.49**	**-100.65**	**-139.58**	**-189.86**	**-254.62**		**-2,088.62**
Unlever FCF growth rate			-108.35%	-1653.03%	-107.23%	308.75%	-27.84%	38.68%	36.02%	34.11%		
Discounted to the present FCF (million $)						-118.41	-72.53	-85.39	-98.59	-112.24		-920.72

Appendix 11. Pre-crisis - PHM – RIV

Rf	4.04%		Intrinsic Value per share		7.89					
RM	17.75%		Share price		10.32					
Beta	1.6527				**Overvalued**					
Cost of Equity	26.695 %									
Shares Outstanding (million)	252.19									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Equity per Share ($)	13.673	17.933	23.622	26.081	17.131	20.041	23.430	27.376	31.970	37.319
Dividend per share ($)	0.05	0.1	0.13	0.16	0.16	0.188	0.222	0.261	0.307	0.361
Dividend per share growth rate (%)		100.000 %	30.000 %	23.077 %	0.000 %	17.69%	17.69%	17.69%	17.69%	17.69%
Earnings per share ($)	2.48	3.79	5.68	2.66	-8.94	3.10	3.61	4.21	4.90	5.71
Earnings per share growth rate		52.82%	49.87%	-53.17%	-436.09%	16.51%	16.51%	16.51%	16.51%	16.51%
Residual income (million $)		0.14	0.89	-3.65	-15.90	-1.47	-1.74	-2.05	-2.41	-2.82
Discounted residual income						-1.16	-1.08	-1.01	-0.93	-0.87
Shareholder's equity (Million $)	3448.123	4522.674	5957.342	6577.361	4320.193					
								Terminal growth rate		Terminal value
								5.00%		-4.19

Appendix 12. Pre-crisis - PHM – AEG

Rf	4.04%		Intrinsic Value per share		8.88					
RM	17.75%		Share price		10.32					
Beta	1.3606				**Overvalued**					
Cost of Equity	22.692 %									
Shares Outstanding (million)	160									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Dividend per share ($)	0.05	0.1	0.13	0.16	0.16	0.188	0.222	0.261	0.307	0.361
Dividend per share growth rate (%)		100.000 %	30.000 %	23.077 %	0.000 %	17.69%	17.69%	17.69%	17.69%	17.69%
Earnings per share ($)	2.48	3.79	5.68	2.66	-8.94	-8.79	-8.65	-8.50	-8.36	-8.23
Earnings per share growth rate		52.82%	49.87%	-53.17%	-436.09%	-1.65%	-1.65%	-1.65%	-1.65%	-1.65%
Abnormal earnings growth ($)						2.21	2.18	2.16	2.13	2.11
Discounted AEG ($)							7.84	6.31	5.08	4.10
								Terminal growth rate		Terminal value
								5.00%		24.30

Appendix 13. Pre-crisis - NVR – DDM

Rf	4.04%		Average Dividend payout			90.911 %		Intrinsic value of equity per share 2007 ($)			295.86
RM	17.75%		Average RoE			66.212 %		Share price (31/12/2007)			515
Beta	1.2723		Sustainable Growth rate			5.0000%					
Cost of Equity	21.481 %		Terminal Value of future Dividend			381.302					
			Discounted Terminal Value			144.121					**Overvalued**
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	45.54	61.12	85.26	79.42	44.99	47.629	50.428	53.391	56.528	59.850	
Dividend per share growth rate (%)		34.218 %	39.497 %	-6.855 %	-43.354 %	5.88%	5.88%	5.88%	5.88%	5.88%	
Discounted future dividend ($)						39.207	34.171	29.781	25.956	22.622	
Earnings per share ($)	48.39	66.42	89.61	88.05	54.14						
Dividend payout	94.106 %	92.020 %	95.146 %	90.194 %	83.091 %						
Net income (Million $)	419.791	523.204	697.559	587.412	333.955						
Shareholder's equity (Million $)	494.868	834.995	677.162	1152.074	1129.375						
Return on Equity	84.829 %	62.660 %	103.012 %	50.987 %	29.570 %						

Appendix 14. Pre-crisis - NVR – DCF

Rf	4.04%		Cost of Debt	8.05%		WACC	18.11%		Intrinsic value of equity		4,814.89
RM	17.75%		After tax Cost of Debt	4.83%		Intrinsic value of entity	4,440.46		Intrinsic equity per share		780.62
Beta	1.2723		Market value of equity	1129.375		Total Debt	286.283		Share price		515
Cost of Equity	21.481 %					Net Debt	-374.426				**Undervalued**
Shares Outstanding million	6.17										
					Forecast Year	1	2	3	4	5	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Revenues (million $)	3,600.9	4,247.5	5,177.7	6,036.2	5,048.2	5,553.9	6,110.2	6,722.3	7,395.7	8,136.5	
Revenue Growth rate		17.956 %	21.901 %	16.580 %	-16.369 %	10.017 %	10.017 %	10.017 %	10.017 %	10.017 %	
EBIT (million $)	660.48	833.08	1,100.49	916.26	498.73	936.03	1,029.79	1,132.95	1,246.44	1,371.30	
EBIT Margin	18.342%	19.613%	21.254%	15.179%	9.879%	16.854%	16.854%	16.854%	16.854%	16.854%	
Depreciation & Amortization (million $)	**8.4**	**8.9**	**10.7**	**14.2**	**17.0**	**13.6**	**14.9**	**16.4**	**18.1**	**19.9**	
% to revenue	0.234%	0.209%	0.206%	0.235%	0.337%	0.244%	0.244%	0.244%	0.244%	0.244%	
NOPAT (million $)	**396.29**	**499.85**	**660.29**	**549.76**	**299.24**	**561.62**	**617.88**	**679.77**	**747.86**	**822.78**	
Cash (million $)	228.59	362.46	170.09	551.74	660.71	716.30	776.56	841.90	912.73	989.53	
Cash growth rate		58.563%	-53.073%	224.380%	19.750%	8.413%	8.413%	8.413%	8.413%	8.413%	
Inventories (million $)	536.580	588.5	794.0	733.6	688.9	742.04	799.34	861.06	927.55	999.17	
Inventories growth rate		9.684%	34.906%	-7.602%	-6.102%	7.721%	7.721%	7.721%	7.721%	7.721%	
Accounts receivable ($)	9.55	14.02	40.562	12.213	10.855	15.06	20.91	29.01	40.26	55.88	
Accounts receivable growth rate		46.806%	189.315%	-69.891%	-11.119%	38.778%	38.778%	38.778%	38.778%	38.778%	
Accounts payable (million $)	185.91	215.00	262.086	273.94	219.05	231.11	243.84	257.27	271.44	286.39	
Accounts payable growth rate		15.647%	21.899%	4.521%	-20.037%	5.508%	5.508%	5.508%	5.508%	5.508%	
Accrued expense (million $)	175.26	177.04	308.62	265.22	251.48	286.74	326.95	372.80	425.08	484.69	
Accrued expense growth rate		1.017%	74.322%	-14.062%	-5.184%	14.023%	14.023%	14.023%	14.023%	14.023%	
Notes payable (million $)	200.00	200.00	303.000	200.00	200.00	208.75	217.89	227.43	237.38	247.77	
Notes payable growth rate		0.000%	51.500%	-33.993%	0.000%	4.377%	4.377%	4.377%	4.377%	4.377%	
Working capital (million $)	216.210	369.8	101.2	557.1	691.3	746.8	808.1	874.5	946.6	1,025.7	
Delta Working capital (million $)		**153.600**	**-268.6**	**456**	**134.2**	**55.547**	**61.328**	**66.348**	**72.168**	**79.077**	
Property, plant & Equipment (million $)	24.53	25.33	31.10	40.43	32.91	35.99	39.36	43.04	47.07	51.48	
PP & E growth rate		3.257%	22.764%	30.017%	-18.598%	9.360%	9.360%	9.360%	9.360%	9.360%	
Depreciation & Amortization (million $)	8.4	8.9	10.7	14.2	17.0	13.6	14.9	16.4	18.1	19.9	
% to revenue	0.234%	0.209%	0.206%	0.235%	0.337%	0.244%	0.244%	0.244%	0.244%	0.244%	
Capital expenditure		**9.7**	**16.5**	**23.5**	**9.5**	**9.1**	**18.3**	**20.1**	**22.1**	**24.3**	
											Terminal Value
Unlevered free cash flow (million $)		**345.45**	**923.12**	**84.59**	**172.55**	**510.51**	**553.18**	**609.74**	**671.67**	**739.30**	**5,919.41**
Unlever FCF growth rate			167.23%	-90.84%	104.00%	195.86%	8.36%	10.22%	10.16%	10.07%	
Discounted to the present FCF (million $)						432.22	396.52	370.03	345.10	321.60	2,574.99

Appendix 15. Pre-crisis - NVR – RIV

Rf	4.04%		Intrinsic Value per share		317.32					
RM	17.75%		Share price		515.00					
Beta	1.2723				**Overvalued**					
Cost of Equity	21.481 %									
Shares Outstanding (million)	6.17									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Equity per Share ($)	80.232	135.375	109.786	186.782	183.102	193.934	206.632	221.404	238.479	258.105
Dividend per share ($)	45.54	61.12	85.26	79.42	44.99	47.629	50.428	53.391	56.528	59.850
Dividend per share growth rate (%)		34.218 %	39.497 %	-6.855 %	-43.354 %	5.88%	5.88%	5.88%	5.88%	5.88%
Earnings per share ($)	48.39	66.42	89.61	88.05	54.14	58.46	63.13	68.16	73.60	79.48
Earnings per share growth rate		37.26%	34.91%	-1.74%	-38.51%	7.98%	7.98%	7.98%	7.98%	7.98%
Residual income (million $)		49.19	60.53	64.47	14.02	19.13	21.47	23.78	26.04	28.25
Discounted residual income						15.75	14.55	13.26	11.96	10.68
Shareholder's equity (Million $)	494.868	834.995	677.162	1152.074	1129.375					
								Terminal growth rate		Terminal value
								5.00%		68.02

Appendix 16. Pre-crisis - NVR – AEG

Rf	4.04%		Intrinsic Value per share		329.04					
RM	17.75%		Share price		515					
Beta	1.2723				**Overvalued**					
Cost of Equity	21.481 %									
Shares Outstanding (million)	6.17									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Dividend per share ($)	45.54	61.12	85.26	79.42	44.99	47.629	50.428	53.391	56.528	59.850
Dividend per share growth rate (%)		34.218 %	39.497 %	-6.855 %	-43.354 %	5.88%	5.88%	5.88%	5.88%	5.88%
Earnings per share ($)	48.39	66.42	89.61	88.05	54.14	58.46	63.13	68.16	73.60	79.48
Earnings per share growth rate		37.26%	34.91%	-1.74%	-38.51%	7.98%	7.98%	7.98%	7.98%	7.98%
Abnormal earnings growth ($)						2.35	2.34	2.31	2.27	2.21
Discounted AEG ($)							8.96	7.29	5.88	4.72
								Terminal growth rate		Terminal value
								5.00%		30.04

Appendix 17. Pre-crisis - TOL – DDM

Rf	4.04%		Average Dividend payout			55.076 %		Intrinsic value of equity per share 2007 ($)			18.31
RM	17.75%		Average RoE			9.234 %		Share price (31/12/2007)			20.06
Beta	1.5942		Sustainable Growth rate			5.0000%					
Cost of Equity	25.893 %		Terminal Value of future Dividend			27.235					
			Discounted Terminal Value			8.612					**Overvalued**
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	0.82	1.34	3.07	2.31	0.12	2.744	3.253	3.856	4.571	5.419	
Dividend per share growth rate (%)		63.904 %	129.715 %	-24.665 %	-94.765 %	18.55%	18.55%	18.55%	18.55%	18.55%	
Discounted future dividend ($)						2.180	2.052	1.933	1.820	1.714	
Earnings per share ($)	1.72	2.52	4.78	4.17	0.22						
Dividend payout	47.444 %	53.076 %	64.277 %	55.507 %	55.076 %						
Net income (Million $)	259.82	409.111	806.11	687.213	35.561						
Shareholder's equity (Million $)	2731.044	3839.451	5759.301	6115.28	4635.093						
Return on Equity	9.514 %	10.655 %	13.997 %	11.238 %	0.767 %						

Appendix 18. Pre-crisis - TOL – DCF

Rf	4.04%		Cost of Debt	8.05%		WACC	18.99%		Intrinsic value of equity		4,078.05
RM	17.75%		After tax Cost of Debt	4.83%		Intrinsic value of entity	5,437.99		Intrinsic equity per share		25.97
Beta	1.5942		Market value of equity	4635.093		Total Debt	2260.273		Share price		20.06
Cost of Equity	25.893 %					Net Debt	1359.936				**Undervalued**
Shares Outstanding million	157.01										
					Forecast Year	1	2	3	4	5	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Revenues (million $)	2,731.0	3,839.5	5,759.3	6,115.3	4,635.1	5,476.0	6,469.4	7,643.0	9,029.5	10,667.6	
Revenue Growth rate		40.585 %	50.003 %	6.181 %	-24.205 %	18.141 %	18.141 %	18.141 %	18.141 %	18.141 %	
EBIT (million $)	411.15	647.43	1,323.13	1,126.62	70.68	819.63	968.32	1,143.99	1,351.52	1,596.70	
EBIT Margin	15.055%	16.863%	22.974%	18.423%	1.525%	14.968%	14.968%	14.968%	14.968%	14.968%	
Depreciation & Amortization (million $)	**12.1**	**15.0**	**20.3**	**30.4**	**29.9**	**25.5**	**30.1**	**35.6**	**42.1**	**49.7**	
% to revenue	0.442%	0.392%	0.353%	0.496%	0.646%	0.466%	0.466%	0.466%	0.466%	0.466%	
NOPAT (million $)	**246.69**	**388.46**	**793.88**	**675.97**	**42.41**	**491.78**	**580.99**	**686.39**	**810.91**	**958.02**	
Cash (million $)	425.25	580.86	689.22	632.52	900.34	1,101.48	1,347.55	1,648.60	2,016.90	2,467.49	
Cash growth rate		36.593%	18.654%	-8.226%	42.340%	22.340%	22.340%	22.340%	22.340%	22.340%	
Inventories (million $)	3,080.349	3,878.3	5,068.6	6,095.7	5,572.7	5,898.18	6,242.72	6,607.38	6,993.35	7,401.86	
Inventories growth rate		25.903%	30.693%	20.263%	-8.581%	5.841%	5.841%	5.841%	5.841%	5.841%	
Accounts receivable ($)	113.633	146.212	185.62	160.446	135.91	145.01	154.71	165.06	176.11	187.89	
Accounts receivable growth rate		28.670%	26.953%	-13.562%	-15.292%	6.692%	6.692%	6.692%	6.692%	6.692%	
Accounts payable (million $)	151.73	181.97	256.557	292.17	236.88	269.97	307.68	350.65	399.64	455.46	
Accounts payable growth rate		19.931%	40.987%	13.882%	-18.925%	13.969%	13.969%	13.969%	13.969%	13.969%	
Accrued expense (million $)	346.94	574.20	791.77	825.29	724.23	896.92	1,110.80	1,375.67	1,703.70	2,109.96	
Accrued expense growth rate		65.503%	37.890%	4.233%	-12.245%	23.845%	23.845%	23.845%	23.845%	23.845%	
Notes payable (million $)	546.67	845.67	1,140.028	1,141.17	1,142.31	1,398.47	1,712.09	2,096.04	2,566.09	3,141.55	
Notes payable growth rate		54.694%	34.808%	0.100%	0.100%	22.426%	22.426%	22.426%	22.426%	22.426%	
Working capital (million $)	2,620.703	2,993.2	3,705.4	4,605.5	4,530.0	4,579.3	4,614.4	4,598.7	4,516.9	4,350.3	
Delta Working capital (million $)		**372.491**	**712.2**	**900**	**-75.5**	**49.269**	**35.115**	**-15.732**	**-81.748**	**-166.656**	
Property, plant & Equipment (million $)	43.71	52.43	79.52	99.09	85.27	102.80	123.95	149.44	180.18	217.24	
PP & E growth rate		19.945%	51.679%	24.603%	-13.951%	20.569%	20.569%	20.569%	20.569%	20.569%	
Depreciation (million $)	12.1	15.0	20.3	30.4	29.9	25.5	30.1	35.6	42.1	49.7	
% to revenue	0.442%	0.392%	0.353%	0.496%	0.646%	0.466%	0.466%	0.466%	0.466%	0.466%	
Capital expenditure		**23.8**	**47.4**	**49.9**	**16.1**	**43.1**	**51.3**	**61.1**	**72.8**	**86.8**	
											Terminal Value
Unlevered free cash flow (million $)		**7.25**	**54.58**	**-243.71**	**131.72**	**424.97**	**524.73**	**676.63**	**861.92**	**1,087.62**	**8,163.71**
Unlever FCF growth rate			652.76%	-546.54%	-154.05%	222.64%	23.47%	28.95%	27.38%	26.19%	
Discounted to the present FCF (million $)						357.15	370.62	401.64	429.98	455.98	3,422.62

Appendix 19. Pre-crisis - TOL – RIV

Rf	4.04%		Intrinsic Value per share		15.89					
RM	17.75%		Share price		20.06					
Beta	1.5942				**Overvalued**					
Cost of Equity	25.893 %									
Shares Outstanding (million)	157.01									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Equity per Share ($)	17.394	24.454	36.682	38.949	29.521	31.247	32.784	34.062	34.993	35.471
Dividend per share ($)	0.82	1.34	3.07	2.31	0.12	2.744	3.253	3.856	4.571	5.419
Dividend per share growth rate (%)		63.904 %	129.715 %	-24.665 %	-94.765 %	18.55%	18.55%	18.55%	18.55%	18.55%
Earnings per share ($)	1.72	2.52	4.78	4.17	0.22	4.47	4.79	5.13	5.50	5.90
Earnings per share growth rate		46.51%	89.68%	-12.76%	-94.72%	7.18%	7.18%	7.18%	7.18%	7.18%
Residual income (million $)		-1.98	-1.55	-5.33	-9.87	-3.17	-3.30	-3.35	-3.32	-3.16
Discounted residual income						-2.52	-2.08	-1.68	-1.32	-1.00
Shareholder's equity (Million $)	2731.044	3839.451	5759.301	6115.28	4635.093					
								Terminal growth rate		Terminal value
								5.00%		-5.03

Appendix 20. Pre-crisis - TOL – AEG

Rf	4.04%		Intrinsic Value per share		17.19					
RM	17.75%		Share price		20.06					
Beta	1.5942				**Overvalued**					
Cost of Equity	25.893 %									
Shares Outstanding (million)	157.01									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Dividend per share ($)	0.82	1.34	3.07	2.31	0.12	2.744	3.253	3.856	4.571	5.419
Dividend per share growth rate (%)		63.904 %	129.715 %	-24.665 %	-94.765 %	18.55%	18.55%	18.55%	18.55%	18.55%
Earnings per share ($)	1.72	2.52	4.78	4.17	0.22	0.24	0.25	0.27	0.29	0.31
Earnings per share growth rate		46.51%	89.68%	-12.76%	-94.72%	7.18%	7.18%	7.18%	7.18%	7.18%
Abnormal earnings growth ($)						-0.01	0.67	0.79	0.95	1.13
Discounted AEG ($)							2.04	1.94	1.83	1.74
								Terminal growth rate		Terminal value
								5.00%		8.73

Appendix 21. Pre-crisis - KBH – DDM

Rf	4.04%		Average Dividend payout			5.851 %		Intrinsic value of equity per share 2007 ($)			11.64
RM	17.75%		Average RoE			8.466 %		Share price (31/12/2007)			21.08
Beta	1.6019		Sustainable Growth rate			7.9710%					
Cost of Equity	25.998 %		Terminal Value of future Dividend			20.401					
			Discounted Terminal Value			6.424					**Overvalued**
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	0.15	0.5	0.75	1	1	1.278	1.633	2.086	2.666	3.406	
Dividend per share growth rate (%)		233.333 %	50.000 %	33.333 %	0.000 %	27.78%	27.78%	27.78%	27.78%	27.78%	
Discounted future dividend ($)						1.014	1.028	1.043	1.058	1.073	
Earnings per share ($)	4.37	5.62	9.32	5.82	-12.04						
Dividend payout	3.432 %	8.897 %	8.047 %	17.182 %	-8.306 %						
Net income (Million $)	367.921	474.036	823.712	482.351	-929.414						
Shareholder's equity (Million $)	1592.162	2039.39	2773.797	2922.748	1850.687						
Return on Equity	23.108 %	23.244 %	29.696 %	16.503 %	-50.220 %						

Appendix 22. Pre-crisis - KBH – DCF

Rf	4.04%		Cost of Debt	8.05%		WACC	20.50%		Intrinsic value of equity		3,119.18
RM	17.75%		After tax Cost of Debt	4.83%		Intrinsic value of entity	2,443.93		Intrinsic equity per share		40.42
Beta	1.6019		Market value of equity	1850.687		Total Debt	650		Share price		21.08
Cost of Equity	25.998 %					Net Debt	-675.255				**Undervalued**
Shares Outstanding million	77.17										
					Forecast Year	1	2	3	4	5	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Revenues (million $)	4,870.5	5,974.5	8,123.3	9,359.8	6,400.6	7,076.5	7,823.7	8,649.9	9,563.3	10,573.1	
Revenue Growth rate		22.666 %	35.966 %	15.222 %	-31.616 %	10.560 %	10.560 %	10.560 %	10.560 %	10.560 %	
EBIT (million $)	505.20	645.92	1,199.90	584.63	-1,347.20	299.38	330.99	365.94	404.59	447.31	
EBIT Margin	10.373%	10.811%	14.771%	6.246%	-21.048%	4.231%	4.231%	4.231%	4.231%	4.231%	
Depreciation & Amortization (million $)	**12.1**	**15.0**	**20.3**	**30.4**	**29.9**	**21.8**	**24.1**	**26.7**	**29.5**	**32.6**	
% to revenue	0.248%	0.252%	0.250%	0.324%	0.468%	0.308%	0.308%	0.308%	0.308%	0.308%	
NOPAT (million $)	**303.12**	**387.55**	**719.94**	**350.78**	**-808.32**	**179.63**	**198.60**	**219.57**	**242.75**	**268.39**	
Cash (million $)	116.56	190.66	144.78	700.04	1,325.26	1,587.11	1,900.70	2,276.25	2,726.00	3,264.62	
Cash growth rate		63.579%	-24.062%	383.510%	89.311%	19.759%	19.759%	19.759%	19.759%	19.759%	
Inventories (million $)	2,883.482	4,143.3	6,128.3	5,751.6	3,312.4	3,668.87	4,063.69	4,500.99	4,985.35	5,521.83	
Inventories growth rate		43.689%	47.911%	-6.147%	-42.409%	10.761%	10.761%	10.761%	10.761%	10.761%	
Accounts receivable ($)	430.266	513.974	580.931	224.077	295.739	297.98	300.24	302.52	304.82	307.13	
Accounts receivable growth rate		19.455%	13.027%	-61.428%	31.981%	0.759%	0.759%	0.759%	0.759%	0.759%	
Accounts payable (million $)	554.39	749.05	892.727	626.24	699.85	763.18	832.25	907.56	989.69	1,079.25	
Accounts payable growth rate		35.113%	19.181%	-29.851%	11.754%	9.049%	9.049%	9.049%	9.049%	9.049%	
Accrued expense (million $)	574.53	810.91	1,338.63	1,600.62	975.83	1,187.48	1,445.04	1,758.46	2,139.87	2,603.99	
Accrued expense growth rate		41.144%	65.076%	19.572%	-39.034%	21.690%	21.690%	21.690%	21.690%	21.690%	
Notes payable (million $)	1,253.93	1,975.60	2,463.814	2,920.33	2,161.79	2,566.15	3,046.15	3,615.92	4,292.27	5,095.13	
Notes payable growth rate		57.552%	24.712%	18.529%	-25.974%	18.705%	18.705%	18.705%	18.705%	18.705%	
Working capital (million $)	841.268	1,094.1	1,873.7	1,600.2	1,024.3	1,037.1	941.2	797.8	594.3	315.2	
Delta Working capital (million $)		**252.822**	**779.6**	**-273**	**-575.9**	**12.868**	**-95.952**	**-143.383**	**-203.474**	**-279.135**	
Property, plant & Equipment (million $)	13.05	23.17	22.10	17.60	0.70	0.62	0.56	0.50	0.44	0.39	
PP & E growth rate		77.521%	-4.618%	-20.362%	-96.023%	-10.871%	-10.871%	-10.871%	-10.871%	-10.871%	
Depreciation (million $)	21.5	21.8	17.4	17.2	17.3	20.9	23.1	25.5	28.2	31.2	
% to revenue	0.441%	0.365%	0.214%	0.184%	0.270%	0.295%	0.295%	0.295%	0.295%	0.295%	
Capital expenditure		**31.9**	**16.3**	**12.7**	**0.4**	**20.8**	**23.0**	**25.4**	**28.1**	**31.1**	
											Terminal Value
Unlevered free cash flow (million $)		**117.84**	**-55.65**	**641.90**	**-202.82**	**167.79**	**295.67**	**364.18**	**447.57**	**549.00**	**3,719.95**
Unlever FCF growth rate			-147.22%	-1253.46%	-131.60%	-182.73%	76.21%	23.17%	22.90%	22.66%	
Discounted to the present FCF (million $)						139.25	203.64	208.16	212.31	216.13	1,464.44

Appendix 23. Pre-crisis - KBH – RIV

Rf	4.04%		Intrinsic Value per share		24.35					
RM	17.75%		Share price		21.08					
Beta	1.6019				**Undervalued**					
Cost of Equity	25.998 %									
Shares Outstanding (million)	77.17									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Equity per Share ($)	20.631	26.427	35.943	37.873	23.981	29.738	36.614	44.824	54.628	66.333
Dividend per share ($)	0.15	0.50	0.75	1.00	1.00	1.167	1.361	1.588	1.853	2.161
Dividend per share growth rate (%)		233.333 %	50.000 %	33.333 %	0.000 %	16.67%	16.67%	16.67%	16.67%	16.67%
Earnings per share ($)	4.37	5.62	9.32	5.82	-12.04	6.92	8.24	9.80	11.66	13.87
Earnings per share growth rate		28.60%	65.84%	-37.55%	-306.87%	18.96%	18.96%	18.96%	18.96%	18.96%
Residual income (million $)		0.26	2.45	-3.52	-21.89	0.69	0.50	0.28	0.00	-0.34
Discounted residual income						0.55	0.32	0.14	0.00	-0.11
Shareholder's equity (Million $)	1592.162	2039.39	2773.797	2922.748	1850.687					
								Terminal growth rate		Terminal value
								5.00%		-0.53

Appendix 24. Pre-crisis - KBH – AEG

Rf	4.04%		Intrinsic Value per share		8.46					
RM	17.75%		Share price		21.08					
Beta	1.6019				**Overvalued**					
Cost of Equity	25.998 %									
Shares Outstanding (million)	77.17									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Dividend per share ($)	0.15	0.50	0.75	1.00	1.00	1.167	1.361	1.588	1.853	2.161
Dividend per share growth rate (%)		233.333 %	50.000 %	33.333 %	0.000 %	16.67%	16.67%	16.67%	16.67%	16.67%
Earnings per share ($)	4.37	5.62	9.32	5.82	-12.04	-4.52	-1.69	-0.64	-0.24	-0.09
Earnings per share growth rate		28.60%	65.84%	-37.55%	-306.87%	-62.50%	-62.50%	-62.50%	-62.50%	-62.50%
Abnormal earnings growth ($)						10.91	4.30	1.85	0.97	0.69
Discounted AEG ($)							13.12	4.49	1.87	1.06
								Terminal growth rate		Terminal value
								5.00%		5.28

Appendix 25. Pre-crisis - MTH – DDM

Rf	4.04%		Average Dividend payout			80.096 %		Intrinsic value of equity per share 2007 ($)			11.08
RM	17.75%		Average RoE			12.469 %		Share price (31/12/2007)			14.85
Beta	1.3204		Sustainable Growth rate			5.0000%					
Cost of Equity	22.141 %		Terminal Value of future Dividend			7.239					
			Discounted Terminal Value			2.663					**Overvalued**
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	2.67	4.08	7.40	6.46	-8.82	4.600	3.275	2.331	1.660	1.182	
Dividend per share growth rate (%)		52.745 %	81.191 %	-12.688 %	-236.480 %	-28.81%	-28.81%	-28.81%	-28.81%	-28.81%	
Discounted future dividend ($)						3.766	2.195	1.280	0.746	0.435	
Earnings per share ($)	3.42	5.03	8.88	8.32	-11.01						
Dividend payout	78.185 %	81.199 %	83.338 %	77.661 %	80.096 %						
Net income (Million $)	94.406	138.968	255.665	225.354	-288.851						
Shareholder's equity (Million $)	411.895	522.555	851.995	1006.832	730.164						
Return on Equity	22.920 %	26.594 %	30.008 %	22.382 %	-39.560 %						

Appendix 26. Pre-crisis - MTH – DCF

Rf	4.04%		Cost of Debt	8.05%		WACC	13.49%		Intrinsic value of equity		1,096.02	
RM	17.75%		After tax Cost of Debt	4.83%		Intrinsic value of entity	1,798.24		Intrinsic equity per share		41.79	
Beta	1.3204		Market value of equity	730.164		Total Debt	729.9		Share price		14.85	
Cost of Equity	22.141 %					Net Debt	702.223				**Undervalued**	
Shares Outstanding million	26.23											
					Forecast Year	1	2	3	4	5	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**		
Revenues (million $)	1,471.0	2,040.0	3,001.1	3,461.3	2,343.6	2,746.9	3,219.6	3,773.7	4,423.1	5,184.3		
Revenue Growth rate		38.681 %	47.113 %	15.335 %	-32.292 %	17.209 %	17.209 %	17.209 %	17.209 %	17.209 %		
EBIT (million $)	151.46	244.76	416.23	364.01	-456.48	149.44	175.16	205.30	240.64	282.05		
EBIT Margin	10.296%	11.998%	13.869%	10.516%	-19.478%	5.440%	5.440%	5.440%	5.440%	5.440%		
Depreciation & Amortization (million $)	**9.9**	**13.7**	**17.2**	**23.7**	**17.8**	**18.5**	**21.7**	**25.4**	**29.8**	**34.9**		
% to revenue	0.673%	0.673%	0.573%	0.686%	0.760%	0.673%	0.673%	0.673%	0.673%	0.673%		
NOPAT (million $)	**90.88**	**146.85**	**249.74**	**218.41**	**-273.89**	**89.67**	**105.10**	**123.18**	**144.38**	**169.23**		
Cash (million $)				56.71	27.68	42.19	64.32	98.06	149.49	227.90		
Cash growth rate					-51.196%	52.450%	52.450%	52.450%	52.450%	52.450%		
Inventories (million $)				1,530.6	1,267.9	1,399.24	1,544.21	1,704.20	1,880.77	2,075.63		
Inventories growth rate					-17.165%	10.361%	10.361%	10.361%	10.361%	10.361%		
Accounts receivable ($)				68.725	56.079	62.40	69.44	77.27	85.98	95.67		
Accounts receivable growth rate					-18.401%	11.275%	11.275%	11.275%	11.275%	11.275%		
Accounts payable (million $)				117.44	59.68	88.56	45.00	22.87	11.62	5.91		
Accounts payable growth rate					-49.184%	-49.184%	-49.184%	-49.184%	-49.184%	-49.184%		
Accrued expense (million $)				266.68	202.79	234.74	178.50	135.73	103.21	78.48		
Accrued expense growth rate					-23.958%	-23.958%	-23.958%	-23.958%	-23.958%	-23.958%		
Notes payable (million $)				478.64	628.80	553.72	727.44	955.67	1,255.50	1,649.39		
Notes payable growth rate					31.374%	31.374%	31.374%	31.374%	31.374%	31.374%		
Working capital (million $)	68.725	56.1	56.1	780.6	473.0	626.8	727.0	765.3	745.9	665.4		
Delta Working capital (million $)		**-12.646**	**0.0**	**725**	**-307.6**	**153.810**	**100.213**	**38.233**	**-19.348**	**-80.487**		
Property, plant & Equipment (million $)				40.71	30.97	35.84	41.48	48.00	55.54	64.28		
PP & E growth rate					-23.922%	15.722%	15.722%	15.722%	15.722%	15.722%		
Depreciation (million $)	9.9	13.7	17.2	23.7	17.8	18.5	21.7	25.4	29.8	34.9		
% to revenue	0.673%	0.673%	0.573%	0.686%	0.760%	0.673%	0.673%	0.673%	0.673%	0.673%		
Capital expenditure		**13.7**	**17.2**	**64.4**	**8.1**	**23.4**	**27.3**	**31.9**	**37.3**	**43.6**		
											Terminal Value	
Unlevered free cash flow (million $)		**159.50**	**249.74**	**-546.86**	**43.47**	**-69.01**	**-0.75**	**78.43**	**156.18**	**240.98**	**2,981.46**	
Unlever FCF growth rate			56.57%	-318.97%	-107.95%	-258.76%	-98.91%	-10541.29%	99.14%	54.29%		
Discounted to the present FCF (million $)						-60.81	-0.58	53.66	94.16	128.01	1,583.80	

Appendix 27. Pre-crisis - MTH – RIV

Rf	4.04%		Intrinsic Value per share		7.89					
RM	17.75%		Share price		14.85					
Beta	1.3204				**Overvalued**					
Cost of Equity	22.141 %									
Shares Outstanding (million)	26.23									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Equity per Share ($)	15.706	19.926	32.488	38.392	27.842	29.170	30.118	30.795	31.279	31.625
Dividend per share ($)	2.67	4.08	7.40	6.46	-8.82	4.600	3.275	2.331	1.660	1.182
Dividend per share growth rate (%)		52.745 %	81.191 %	-12.688 %	-236.480 %	-28.81%	-28.81%	-28.81%	-28.81%	-28.81%
Earnings per share ($)	3.42	5.03	8.88	8.32	-11.01	5.93	4.22	3.01	2.14	1.53
Earnings per share growth rate		47.08%	76.54%	-6.31%	-232.33%	-28.76%	-28.76%	-28.76%	-28.76%	-28.76%
Residual income (million $)		1.55	4.47	1.13	-19.51	-0.24	-2.24	-3.66	-4.67	-5.40
Discounted residual income						-0.19	-1.50	-2.01	-2.10	-1.99
Shareholder's equity (Million $)	411.895	522.555	851.995	1006.832	730.164					
								Terminal growth rate		Terminal value
								5.00%		-12.17

Appendix 28. Pre-crisis - MTH – AEG

Rf	4.04%		Intrinsic Value per share		26.40					
RM	17.75%		Share price		14.85					
Beta	1.3204				**Undervalued**					
Cost of Equity	22.141 %									
Shares Outstanding (million)	26.23									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Dividend per share ($)	2.67	4.08	7.40	6.46	-8.82	4.600	3.275	2.331	1.660	1.182
Dividend per share growth rate (%)		52.745 %	81.191 %	-12.688 %	-236.480 %	-28.81%	-28.81%	-28.81%	-28.81%	-28.81%
Earnings per share ($)	3.42	5.03	8.88	8.32	-11.01	-7.84	-5.59	-3.98	-2.84	-2.02
Earnings per share growth rate		47.08%	76.54%	-6.31%	-232.33%	-28.76%	-28.76%	-28.76%	-28.76%	-28.76%
Abnormal earnings growth ($)						3.65	5.01	3.57	2.54	1.81
Discounted AEG ($)							18.53	10.81	6.30	3.68
								Terminal growth rate		Terminal value
								5.00%		22.52

Appendix 29. Pre-crisis - HOV – DDM

Rf	4.04%		Average Dividend payout			69.493 %		Intrinsic value of equity per share 2007 ($)			1.84
RM	17.75%		Average RoE			9.146 %		Share price (31/12/2007)			6.81
Beta	1.8045		Sustainable Growth rate			5.0000%					
Cost of Equity	28.777 %		Terminal Value of future Dividend			1.872					
			Discounted Terminal Value			0.529					**Overvalued**
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	3.30	4.44	5.79	0.64	-7.03	0.592	0.545	0.501	0.461	0.424	
Dividend per share growth rate (%)		34.230 %	30.609 %	-88.885 %	-1191.210 %	-8.02%	-8.02%	-8.02%	-8.02%	-8.02%	
Discounted future dividend ($)						0.460	0.329	0.235	0.168	0.120	
Earnings per share ($)	3.93	5.35	7.16	2.14	-10.11						
Dividend payout	84.077 %	82.902 %	80.906 %	30.086 %	69.493 %						
Net income (Million $)	257.4	348.7	469.1	138.9	-637.8						
Shareholder's equity (Million $)	819.7	1192.4	1791.4	1942.2	1321.8						
Return on Equity	31.402 %	29.244 %	26.186 %	7.152 %	-48.252 %						

Appendix 30. Pre-crisis - HOV – DCF

Rf	4.04%		Cost of Debt	8.05%		WACC	14.03%		Intrinsic value of equity		1,857.67
RM	17.75%		After tax Cost of Debt	4.83%		Intrinsic value of entity	3,940.67		Intrinsic equity per share		29.45
Beta	1.8045		Market value of equity	1321.8		Total Debt	2117.4		Share price		6.81
Cost of Equity	28.777 %					Net Debt	2083.001				**Undervalued**
Shares Outstanding million	63.08										
					Forecast Year	1	2	3	4	5	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Revenues (million $)	3,201.9	4,153.9	5,348.4	6,148.2	4,798.9	5,416.7	6,114.1	6,901.2	7,789.6	8,792.4	
Revenue Growth rate		29.730 %	28.757 %	14.954 %	-21.946 %	12.874 %	12.874 %	12.874 %	12.874 %	12.874 %	
EBIT (million $)	480.33	631.80	875.67	681.25	-47.44	613.99	693.03	782.25	882.96	996.63	
EBIT Margin	15.001%	15.210%	16.372%	11.080%	-0.989%	11.335%	11.335%	11.335%	11.335%	11.335%	
Depreciation & Amortization (million $)	**15.1**	**35.1**	**55.2**	**69.7**	**180.4**	**78.4**	**88.5**	**99.9**	**112.8**	**127.3**	
% to revenue	0.471%	0.845%	1.031%	1.134%	3.759%	1.448%	1.448%	1.448%	1.448%	1.448%	
NOPAT (million $)	**288.20**	**379.08**	**525.40**	**408.75**	**-28.46**	**368.39**	**415.82**	**469.35**	**529.77**	**597.98**	
Cash (million $)	128.22	78.02	229.50	65.84	34.40	37.49	40.86	44.53	48.52	52.88	
Cash growth rate		-39.149%	194.139%	-71.313%	-47.751%	8.982%	8.982%	8.982%	8.982%	8.982%	
Inventories (million $)	1,660.044	2,467.3	3,436.6	4,070.8	3,518.3	4,334.57	5,340.16	6,579.05	8,105.36	9,985.75	
Inventories growth rate		48.629%	39.286%	18.455%	-13.572%	23.199%	23.199%	23.199%	23.199%	23.199%	
Accounts receivable ($)	42.5	56.753	125.388	94.75	109.856	149.95	204.67	279.37	381.32	520.49	
Accounts receivable growth rate		33.536%	120.936%	-24.435%	15.943%	36.495%	36.495%	36.495%	36.495%	36.495%	
Accounts payable (million $)	229.99	113.87	191.469	201.79	170.09	173.21	176.39	179.63	182.93	186.29	
Accounts payable growth rate		-50.490%	68.153%	5.388%	-15.707%	1.836%	1.836%	1.836%	1.836%	1.836%	
Accrued expense (million $)	45.31	28.02	48.65	102.79	97.75	119.99	147.28	180.78	221.91	272.38	
Accrued expense growth rate		-38.161%	73.640%	111.306%	-4.904%	22.747%	22.747%	22.747%	22.747%	22.747%	
Notes payable (million $)	817.84	1,519.55	1,033.259	2,100.88	2,161.29	2,932.05	3,977.68	5,396.19	7,320.57	9,931.22	
Notes payable growth rate		85.800%	-32.002%	103.326%	2.876%	35.662%	35.662%	35.662%	35.662%	35.662%	
Working capital (million $)	789.883	993.8	2,502.6	1,841.1	1,218.3	1,296.8	1,284.3	1,146.3	809.8	169.2	
Delta Working capital (million $)		**203.877**	**1,508.8**	**-662**	**-622.7**	**78.406**	**-12.411**	**-138.000**	**-336.543**	**-640.565**	
Property, plant & Equipment (million $)	26.26	44.10	96.90	110.70	174.03	286.76	472.50	778.56	1,282.87	2,113.83	
PP & E growth rate		67.917%	119.728%	14.246%	57.205%	64.774%	64.774%	64.774%	64.774%	64.774%	
Depreciation (million $)	23.9	27.8	30.5	42.7	57.4	42.0	47.4	53.5	60.4	68.2	
% to revenue	0.746%	0.669%	0.570%	0.695%	1.196%	0.775%	0.775%	0.775%	0.775%	0.775%	
Capital expenditure		**45.6**	**83.3**	**56.5**	**120.7**	**154.7**	**233.1**	**359.6**	**564.7**	**899.1**	
											Terminal Value
Unlevered free cash flow (million $)		**164.68**	**-1,011.58**	**1,083.48**	**653.94**	**213.71**	**283.63**	**347.73**	**414.43**	**466.75**	**5,425.14**
Unlever FCF growth rate			-714.27%	-207.11%	-39.64%	-67.32%	32.72%	22.60%	19.18%	12.62%	
Discounted to the present FCF (million $)						187.41	218.11	234.50	245.09	242.06	2,813.50

Appendix 31. Pre-crisis - HOV – RIV

Rf	4.04%		Intrinsic Value per share		2.36					
RM	17.75%		Share price		6.81					
Beta	1.8045				**Overvalued**					
Cost of Equity	28.777 %									
Shares Outstanding (million)	63.08									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Equity per Share ($)	12.995	18.903	28.399	30.790	20.955	22.501	24.095	25.730	27.405	29.116
Dividend per share ($)	3.30	4.44	5.79	0.64	-7.03	0.592	0.545	0.501	0.461	0.424
Dividend per share growth rate (%)		34.230 %	30.609 %	-88.885 %	-1191.210 %	-8.02%	-8.02%	-8.02%	-8.02%	-8.02%
Earnings per share ($)	3.93	5.35	7.16	2.14	-10.11	2.14	2.14	2.14	2.14	2.13
Earnings per share growth rate		36.13%	33.83%	-70.11%	-572.43%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%
Residual income (million $)		1.61	1.72	-6.03	-18.97	-3.89	-4.34	-4.80	-5.27	-5.75
Discounted residual income						-3.02	-2.62	-2.25	-1.92	-1.62
Shareholder's equity (Million $)	819.7	1192.4	1791.4	1942.2	1321.8					
								Terminal growth rate		Terminal value
								5.00%		-7.17

Appendix 32. Pre-crisis - HOV – AEG

Rf	4.04%		Intrinsic Value per share		20.86					
RM	17.75%		Share price		6.81					
Beta	1.8045				**Undervalued**					
Cost of Equity	28.777 %									
Shares Outstanding (million)	63.08									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Dividend per share ($)	3.30	4.44	5.79	0.64	-7.03	5.329	4.901	4.509	4.147	3.815
Dividend per share growth rate (%)		34.230 %	30.609 %	-88.885 %	-1191.210 %	-8.02%	-8.02%	-8.02%	-8.02%	-8.02%
Earnings per share ($)	3.93	5.35	7.16	2.14	-10.11	-10.11	-10.10	-10.10	-10.09	-10.09
Earnings per share growth rate		36.13%	33.83%	-70.11%	-572.43%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%
Abnormal earnings growth ($)						0.89	4.45	4.32	4.21	4.10
Discounted AEG ($)							12.00	9.06	6.85	5.18
								Terminal growth rate		Terminal value
								5.00%		22.89

Appendix 33. Pre-crisis - MDC – DDM

Rf	4.04%		Average Dividend payout			6.114 %		Intrinsic value of equity per share 2007 ($)			22.79
RM	17.75%		Average RoE			8.225 %		Share price (31/12/2007)			34.32
Beta	1.3204		Sustainable Growth rate			7.7220%					
Cost of Equity	22.141 %		Terminal Value of future Dividend			40.865					
			Discounted Terminal Value			15.033					**Overvalued**
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	0.28	0.43	0.76	1	1	1.405	1.973	2.772	3.894	5.470	
Dividend per share growth rate (%)		53.571 %	76.744 %	31.579 %	0.000 %	40.47%	40.47%	40.47%	40.47%	40.47%	
Discounted future dividend ($)						1.150	1.323	1.521	1.750	2.012	
Earnings per share ($)	5.11	9.19	11.48	4.77	-13.94						
Dividend payout	5.479 %	4.679 %	6.620 %	20.964 %	-7.174 %						
Net income (Million $)	212.229	391.165	505.723	214.25	-636.94						
Shareholder's equity (Million $)	1015.92	1418.821	1952.109	2161.882	1476.013						
Return on Equity	20.890 %	27.570 %	25.906 %	9.910 %	-43.153 %						

Appendix 34. Pre-crisis - MDC – DCF

Rf	4.04%		Cost of Debt	8.05%		WACC	14.88%		Intrinsic value of equity		652.65
RM	17.75%		After tax Cost of Debt	4.83%		Intrinsic value of entity	715.12		Intrinsic equity per share		14.29
Beta	1.3204		Market value of equity	1476.013		Total Debt	1067.239		Share price		34.32
Cost of Equity	22.141 %					Net Debt	62.476				**Overvalued**
Shares Outstanding million	45.69										
					Forecast Year	1	2	3	4	5	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Revenues (million $)	2,846.2	3,922.8	4,792.7	4,650.6	2,766.0	2,880.2	2,999.0	3,122.8	3,251.7	3,386.0	
Revenue Growth rate		37.826 %	22.174 %	-2.966 %	-40.524 %	4.128 %	4.128 %	4.128 %	4.128 %	4.128 %	
EBIT (million $)	348.22	636.91	808.76	333.14	-756.46	144.93	150.91	157.14	163.63	170.38	
EBIT Margin	12.235%	16.236%	16.875%	7.163%	-27.349%	5.032%	5.032%	5.032%	5.032%	5.032%	
Depreciation & Amortization (million $)	**5.4**	**10.6**	**15.3**	**18.9**	**14.3**	**9.8**	**10.2**	**10.6**	**11.1**	**11.5**	
% to revenue	0.191%	0.270%	0.320%	0.406%	0.516%	0.341%	0.341%	0.341%	0.341%	0.341%	
NOPAT (million $)	**208.93**	**382.15**	**485.26**	**199.88**	**-453.88**	**86.96**	**90.55**	**94.28**	**98.18**	**102.23**	
Cash (million $)	170.29	400.96	214.53	507.95	1,004.76	1,262.55	1,586.48	1,993.51	2,504.98	3,147.67	
Cash growth rate		135.458%	-46.496%	136.771%	97.809%	25.657%	25.657%	25.657%	25.657%	25.657%	
Inventories (million $)	1,496.313	1,951.6	2,923.1	2,753.8	1,456.6	1,556.00	1,662.23	1,775.71	1,896.94	2,026.45	
Inventories growth rate		30.425%	49.783%	-5.791%	-47.108%	6.827%	6.827%	6.827%	6.827%	6.827%	
Accounts receivable ($)	8.394	31.018	134.27	128.614	33.647	55.12	90.30	147.94	242.36	397.05	
Accounts receivable growth rate		269.526%	332.878%	-4.212%	-73.839%	63.825%	63.825%	63.825%	63.825%	63.825%	
Accounts payable (million $)	72.21	94.18	117.767	171.01	71.93	96.07	128.31	171.37	228.87	305.68	
Accounts payable growth rate		30.419%	25.047%	45.206%	-57.936%	33.557%	33.557%	33.557%	33.557%	33.557%	
Accrued expense (million $)	25.01	165.71	216.87	418.95	339.35	458.19	618.65	835.30	1,127.81	1,522.77	
Accrued expense growth rate		562.528%	30.878%	93.180%	-19.000%	35.019%	35.019%	35.019%	35.019%	35.019%	
Notes payable (million $)	497.70	746.31	996.297	996.68	997.09	1,205.30	1,456.99	1,761.24	2,129.03	2,573.61	
Notes payable growth rate		49.952%	33.496%	0.039%	0.041%	20.882%	20.882%	20.882%	20.882%	20.882%	
Working capital (million $)	1,200.293	1,380.0	1,840.3	1,708.8	1,181.6	1,114.1	1,135.1	1,149.3	1,158.6	1,169.1	
Delta Working capital (million $)		**179.681**	**460.4**	**-132**	**-527.2**	**-67.454**	**20.952**	**14.200**	**9.314**	**10.545**	
Property, plant & Equipment (million $)	10.15	28.93	30.66	44.61	44.37	51.90	60.71	71.01	83.07	97.17	
PP & E growth rate		184.988%	5.973%	45.486%	-0.534%	16.975%	16.975%	16.975%	16.975%	16.975%	
Depreciation (million $)	5.4	10.6	15.3	18.9	14.3	9.8	10.2	10.6	11.1	11.5	
% to revenue	0.191%	0.270%	0.320%	0.406%	0.516%	0.341%	0.341%	0.341%	0.341%	0.341%	
Capital expenditure		**29.4**	**17.0**	**32.8**	**14.0**	**17.3**	**19.0**	**20.9**	**23.1**	**25.6**	
											Terminal Value
Unlevered free cash flow (million $)		**183.69**	**23.16**	**317.49**	**73.58**	**146.88**	**60.79**	**69.78**	**76.81**	**77.58**	**824.81**
Unlever FCF growth rate			-87.39%	1270.71%	-76.82%	99.61%	-58.62%	14.80%	10.07%	1.01%	
Discounted to the present FCF (million $)						127.86	46.06	46.03	44.10	38.78	412.29

Appendix 35. Pre-crisis - MDC – RIV

Rf	4.04%		Intrinsic Value per share		24.83					
RM	17.75%		Share price		21.08					
Beta	1.3204				**Undervalued**					
Cost of Equity	22.141 %									
Shares Outstanding (million)	45.69									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Equity per Share ($)	22.237	31.055	42.728	47.319	32.307	36.409	40.792	45.358	49.934	54.242
Dividend per share ($)	0.28	0.43	0.76	1.00	1.00	1.405	1.973	2.772	3.894	5.470
Dividend per share growth rate (%)		53.571 %	76.744 %	31.579 %	0.000 %	40.47%	40.47%	40.47%	40.47%	40.47%
Earnings per share ($)	5.11	9.19	11.48	4.77	-13.94	5.51	6.36	7.34	8.47	9.78
Earnings per share growth rate		79.84%	24.92%	-58.45%	-392.24%	15.44%	15.44%	15.44%	15.44%	15.44%
Residual income (million $)		4.27	4.60	-4.69	-24.42	-1.65	-1.70	-1.69	-1.57	-1.28
Discounted residual income						-1.35	-1.14	-0.93	-0.71	-0.47
Shareholder's equity (Million $)	1015.92	1418.821	1952.109	2161.882	1476.013					
								Terminal growth rate		Terminal value
								5.00%		-2.88

Appendix 36. Pre-crisis - MDC – AEG

Rf	4.04%		Intrinsic Value per share		16.52					
RM	17.75%		Share price		21.08					
Beta	1.3204				**Overvalued**					
Cost of Equity	22.141 %									
Shares Outstanding (million)	45.69									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Dividend per share ($)	0.28	0.43	0.76	1.00	1.00	1.405	1.973	2.772	3.894	5.470
Dividend per share growth rate (%)		53.571 %	76.744 %	31.579 %	0.000 %	40.47%	40.47%	40.47%	40.47%	40.47%
Earnings per share ($)	5.11	9.19	11.48	4.77	-13.94	-1.88	-0.25	-0.03	0.00	0.00
Earnings per share growth rate		79.84%	24.92%	-58.45%	-392.24%	-86.48%	-86.48%	-86.48%	-86.48%	-86.48%
Abnormal earnings growth ($)						15.36	2.36	0.71	0.65	0.87
Discounted AEG ($)							8.72	2.16	1.61	1.76
								Terminal growth rate		Terminal value
								5.00%		10.78

Appendix 37. Pre-crisis - BZH – DDM

Rf	4.04%		Average Dividend payout			1.976 %		Intrinsic value of equity per share 2007 ($)			8.14
RM	17.75%		Average RoE			9.170 %		Share price (31/12/2007)			35.55
Beta	1.8203		Sustainable Growth rate			8.9885%					
Cost of Equity	28.993 %		Terminal Value of future Dividend			17.258					
			Discounted Terminal Value			4.833					**Overvalued**
				Forecast year		1	2	3	4	5	
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Dividend per share ($)	0.1	0.13	0.33	0.4	0.4	0.605	0.915	1.384	2.094	3.168	
Dividend per share growth rate (%)		30.000 %	153.846 %	21.212 %	0.000 %	51.26%	51.26%	51.26%	51.26%	51.26%	
Discounted future dividend ($)						0.469	0.550	0.645	0.756	0.887	
Earnings per share ($)	4.47	5.91	6.49	9.76	-10.7						
Dividend payout	2.237 %	2.200 %	5.085 %	4.098 %	-3.738 %						
Net income (Million $)	173	236	263	389	-411						
Shareholder's equity (Million $)	994	1232	1505	1702	1324						
Return on Equity	17.404 %	19.156 %	17.475 %	22.855 %	-31.042 %						

Appendix 38. Pre-crisis - BZH – DCF

Rf	4.04%		Cost of Debt	8.05%		WACC	14.89%		Intrinsic value of equity		112.70
RM	17.75%		After tax Cost of Debt	4.83%		Intrinsic value of entity	1,509.70		Intrinsic equity per share		2.93
Beta	1.8203		Market value of equity	1324		Total Debt	1857		Share price		35.55
Cost of Equity	28.993 %					Net Debt	1397				**Overvalued**
Shares Outstanding million	38.41										
					Forecast Year	1	2	3	4	5	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Revenues (million $)	3,177.0	3,907.0	4,995.0	5,462.0	3,491.0	3,701.2	3,924.1	4,160.4	4,411.0	4,676.6	
Revenue Growth rate		22.978 %	27.847 %	9.349 %	-36.086 %	6.022 %	6.022 %	6.022 %	6.022 %	6.022 %	
EBIT (million $)	342.18	469.75	593.39	679.23	-493.40	244.10	258.80	274.39	290.91	308.43	
EBIT Margin	10.770%	12.023%	11.880%	12.436%	-14.133%	6.595%	6.595%	6.595%	6.595%	6.595%	
Depreciation & Amortization (million $)	**15.8**	**21.2**	**36.0**	**42.4**	**33.6**	**25.9**	**27.5**	**29.1**	**30.9**	**32.7**	
% to revenue	0.496%	0.542%	0.721%	0.777%	0.962%	0.700%	0.700%	0.700%	0.700%	0.700%	
NOPAT (million $)	**205.31**	**281.85**	**356.04**	**407.54**	**-296.04**	**146.46**	**155.28**	**164.63**	**174.55**	**185.06**	
Cash (million $)	73.00	321.00	297.00	172.00	460.00	640.75	892.51	1,243.20	1,731.69	2,412.11	
Cash growth rate		339.726%	-7.477%	-42.088%	167.442%	39.293%	39.293%	39.293%	39.293%	39.293%	
Inventories (million $)	1,723.000	2,344.0	2,901.0	3,520.0	2,775.0	3,191.09	3,669.58	4,219.80	4,852.53	5,580.14	
Inventories growth rate		36.042%	23.763%	21.337%	-21.165%	14.994%	14.994%	14.994%	14.994%	14.994%	
Accounts receivable ($)	66.003	70.574	161.88	338.033	45.501	63.54	88.73	123.91	173.03	241.63	
Accounts receivable growth rate		6.925%	129.376%	108.817%	-86.539%	39.645%	39.645%	39.645%	39.645%	39.645%	
Accounts payable (million $)	125.52	123.29	141.623	140.01	118.03	116.92	115.83	114.75	113.67	112.61	
Accounts payable growth rate		-1.780%	14.873%	-1.140%	-15.698%	-0.936%	-0.936%	-0.936%	-0.936%	-0.936%	
Accrued expense (million $)	39.22	80.29	98.31	18.50	17.60	19.41	21.40	23.60	26.02	28.70	
Accrued expense growth rate		104.699%	22.438%	-81.181%	-4.865%	10.273%	10.273%	10.273%	10.273%	10.273%	
Notes payable (million $)	541.37	928.91	1,275.882	1,551.42	1,521.97	2,011.42	2,658.27	3,513.15	4,642.95	6,136.08	
Notes payable growth rate		71.586%	37.353%	21.596%	-1.899%	32.159%	32.159%	32.159%	32.159%	32.159%	
Working capital (million $)	1,427.923	1,578.0	1,727.7	2,027.6	1,915.4	1,747.6	1,855.3	1,935.4	1,974.6	1,956.5	
Delta Working capital (million $)		**150.095**	**149.7**	**300**	**-112.1**	**-167.809**	**107.685**	**80.104**	**39.191**	**-18.115**	
Property, plant & Equipment (million $)	19.19	24.67	28.37	76.45	71.68	80.60	90.63	101.91	114.60	128.86	
PP & E growth rate		28.595%	14.981%	169.517%	-6.242%	12.445%	12.445%	12.445%	12.445%	12.445%	
Depreciation (million $)	15.8	21.2	36.0	42.4	33.6	25.9	27.5	29.1	30.9	32.7	
% to revenue	0.496%	0.542%	0.721%	0.777%	0.962%	0.700%	0.700%	0.700%	0.700%	0.700%	
Capital expenditure		**26.7**	**39.7**	**90.5**	**28.8**	**34.8**	**37.5**	**40.4**	**43.5**	**47.0**	
											Terminal Value
Unlevered free cash flow (million $)		**126.27**	**202.67**	**59.57**	**-179.13**	**305.35**	**37.57**	**73.25**	**122.67**	**188.91**	**2,006.22**
Unlever FCF growth rate			60.50%	-70.61%	-400.71%	-270.46%	-87.70%	94.99%	67.47%	54.00%	
Discounted to the present FCF (million $)						265.78	28.46	48.30	70.41	94.38	1,002.36

Appendix 39. Pre-crisis - BZH – RIV

Rf	4.04%		Intrinsic Value per share		40.02					
RM	17.75%		Share price		35.55					
Beta	1.8203				**Undervalued**					
Cost of Equity	28.993 %									
Shares Outstanding (million)	38.41									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Equity per Share ($)	25.879	32.075	39.183	44.311	34.470	46.081	60.455	78.207	100.064	126.874
Dividend per share ($)	0.10	0.13	0.33	0.40	0.40	0.605	0.915	1.384	2.094	3.168
Dividend per share growth rate (%)		30.000 %	153.846 %	21.212 %	0.000 %	51.26%	51.26%	51.26%	51.26%	51.26%
Earnings per share ($)	4.47	5.91	6.49	9.76	-10.7	12.22	15.29	19.14	23.95	29.98
Earnings per share growth rate		32.21%	9.81%	50.39%	-209.63%	25.16%	25.16%	25.16%	25.16%	25.16%
Residual income (million $)		-1.59	-2.81	-1.60	-23.55	2.22	1.93	1.61	1.28	0.97
Discounted residual income						1.72	1.16	0.75	0.46	0.27
Shareholder's equity (Million $)	994	1232	1505	1702	1324					
								Terminal growth rate		Terminal value
								5.00%		1.18

Appendix 40. Pre-crisis - BZH – AEG

Rf	4.04%		Intrinsic Value per share		55.11					
RM	17.75%		Share price		35.55					
Beta	1.8203				**Undervalued**					
Cost of Equity	28.993 %									
Shares Outstanding (million)	38.41									
				Forecast year		1	2	3	4	5
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Dividend per share ($)	0.10	0.13	0.33	0.40	0.40	0.605	0.915	1.384	2.094	3.168
Dividend per share growth rate (%)		30.000 %	153.846 %	21.212 %	0.000 %	51.26%	51.26%	51.26%	51.26%	51.26%
Earnings per share ($)	4.47	5.91	6.49	9.76	-10.7	12.77	16.70	21.84	28.57	37.37
Earnings per share growth rate		32.21%	9.81%	50.39%	-209.63%	30.80%	30.80%	30.80%	30.80%	30.80%
Abnormal earnings growth ($)						26.68	0.41	0.57	0.80	1.12
Discounted AEG ($)							1.09	1.18	1.28	1.40
								Terminal growth rate		Terminal value
								5.00%		6.13

Appendix 41. Crisis - DHI – DDM

Rf	1.78%		Average Dividend payout			15.123 %		Intrinsic value of equity per share 2007 ($)			9.24
RM	3.75%		Average RoE			3.945 %		Share price (31/12/2012)			19.24
Beta	1.5207		Sustainable Growth rate			3.3488%					
Cost of Equity	4.778 %		Terminal Value of future Dividend			10.844					
			Discounted Terminal Value			8.587					**Overvalued**
				Forecast year		1	2	3	4	5	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Dividend per share ($)	0.45	0.15	0.15	0.15	0.15	0.150	0.150	0.150	0.150	0.150	
Dividend per share growth rate (%)		-66.667 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%	
Discounted future dividend ($)						0.143	0.137	0.130	0.124	0.119	
Earnings per share ($)	-8.34	-1.73	0.77	0.23	3.01						
Dividend payout	-5.396 %	-8.671 %	19.481 %	65.217 %	4.983 %						
Net income (Million $)	-2633.6	-549.8	245.1	71.8	956.3						
Shareholder's equity (Million $)	2864.8	2400.6	2622.9	2623.5	3594.7						
Return on Equity	-91.930 %	-22.903 %	9.345 %	2.737 %	26.603 %						

Appendix 42. Crisis - DHI – DCF

Rf	1.78%		Cost of Debt	3.25%		WACC	3.62%		Intrinsic value of equity		3,903.94
RM	3.75%		After tax Cost of Debt	1.95%		Intrinsic value of entity	5,366.64		Intrinsic equity per share		12.17
Beta	1.5207		Market value of equity	3594.7		Total Debt	2493.1		Share price		19.24
Cost of Equity	4.778 %					Net Debt	1462.7				**Overvalued**
Shares Outstanding million	320.90										
					Forecast Year	1	2	3	4	5	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Revenues (million $)	6,646.1	3,657.6	4,400.2	3,636.8	4,354.0	4,683.1	5,037.0	5,417.7	5,827.2	6,267.6	
Revenue Growth rate		-44.966 %	20.303 %	-17.349 %	19.721 %	7.558 %	7.558 %	7.558 %	7.558 %	7.558 %	
EBIT (million $)	-67.90	-149.10	164.20	57.50	249.10	81.46	87.61	94.23	101.36	109.02	
EBIT Margin	-1.022%	-4.076%	3.732%	1.581%	5.721%	1.739%	1.739%	1.739%	1.739%	1.739%	
Depreciation & Amortization (million $)	**60.4**	**36.6**	**48.0**	**57.1**	**59.2**	**55.5**	**59.7**	**64.3**	**69.1**	**74.3**	
% to revenue	0.909%	1.001%	1.091%	1.570%	1.360%	1.186%	1.186%	1.186%	1.186%	1.186%	
NOPAT (million $)	**-40.74**	**-89.46**	**98.52**	**34.50**	**149.46**	**48.87**	**52.57**	**56.54**	**60.81**	**65.41**	
Cash (million $)	1,355.60	1,922.80	1,282.60	715.50	1,030.40	1,051.89	1,073.83	1,096.22	1,119.09	1,142.43	
Cash growth rate		41.841%	-33.295%	-44.215%	44.011%	2.086%	2.086%	2.086%	2.086%	2.086%	
Inventories (million $)	4,683.20	3,663.0	3,449.0	3,449.7	4,165.2	4,093.71	4,023.45	3,954.40	3,886.53	3,819.82	
Inventories growth rate		-21.784%	-5.842%	0.020%	20.741%	-1.716%	-1.716%	-1.716%	-1.716%	-1.716%	
Accounts receivable ($)	676.2	293.1	297.7	297.6	298	257.04	221.70	191.23	164.94	142.27	
Accounts receivable growth rate		-56.655%	1.569%	-0.034%	0.134%	-13.746%	-13.746%	-13.746%	-13.746%	-13.746%	
Accounts payable (million $)	254.00	216.80	135.10	154.00	216.20	217.31	218.42	219.54	220.66	221.79	
Accounts payable growth rate		-14.646%	-37.685%	13.990%	40.390%	0.512%	0.512%	0.512%	0.512%	0.512%	
Accrued expense (million $)	1,055.90	932.00	957.20	829.80	893.80	861.12	829.63	799.29	770.06	741.90	
Accrued expense growth rate		-11.734%	2.704%	-13.310%	7.713%	-3.657%	-3.657%	-3.657%	-3.657%	-3.657%	
Notes payable (million $)	3,544.90	3,208.60	2,085.300	1,588.10	2,305.30	2,171.72	2,045.88	1,927.33	1,815.65	1,710.44	
Notes payable growth rate		-9.487%	-35.009%	-23.843%	45.161%	-5.795%	-5.795%	-5.795%	-5.795%	-5.795%	
Working capital (million $)	1,481.600	1,526.4	1,852.0	1,891.3	2,077.9	2,152.5	2,225.1	2,295.7	2,364.2	2,430.4	
Delta Working capital (million $)		**44.800**	**325.6**	**39**	**186.6**	**74.597**	**72.562**	**70.633**	**68.490**	**66.199**	
Property, plant & Equipment (million $)	65.90	57.80	60.50	57.60	72.60	75.07	77.63	80.28	83.01	85.84	
PP & E growth rate		-12.291%	4.671%	-4.793%	26.042%	3.407%	3.407%	3.407%	3.407%	3.407%	
Depreciation (million $)	53.2	25.7	18.4	19.9	18.8	25.9	27.5	29.1	30.9	32.7	
% to revenue	0.800%	0.703%	0.418%	0.547%	0.432%	0.580%	0.580%	0.580%	0.580%	0.580%	
Capital expenditure		**17.6**	**21.1**	**17.0**	**33.8**	**28.4**	**30.0**	**31.8**	**33.6**	**35.5**	
											Terminal Value
Unlevered free cash flow (million $)		**-115.26**	**-200.18**	**35.30**	**-11.74**	**1.45**	**9.73**	**18.41**	**27.84**	**38.00**	**6,311.83**
Unlever FCF growth rate			73.68%	-117.63%	-133.26%	-112.34%	571.99%	89.16%	51.23%	36.49%	
Discounted to the present FCF (million $)						1.40	9.06	16.55	24.15	31.81	5,283.68

Appendix 43. Crisis - DHI – RIV

Rf	1.78%		Intrinsic Value per share		9.10					
RM	3.75%		Share price		19.24					
Beta	1.5207				**Overvalued**					
Cost of Equity	4.778 %									
Shares Outstanding (million)	320.90									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Equity per Share ($)	8.927	7.481	8.174	8.175	11.202	11.622	12.042	12.462	12.882	13.302
Dividend per share ($)	0.45	0.15	0.15	0.15	0.15	0.150	0.150	0.150	0.150	0.150
Dividend per share growth rate (%)		-66.667 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	-8.34	-1.73	0.77	0.23	3.01	0.57	0.57	0.57	0.57	0.57
Earnings per share growth rate		-79.26%	-144.51%	-70.13%	1208.70%	228.70%	228.70%	228.70%	228.70%	228.70%
Residual income (million $)		-2.16	0.41	-0.16	2.62	0.03	0.01	-0.01	-0.03	-0.05
Discounted residual income						0.03	0.01	0.00	-0.02	-0.04
Shareholder's equity (Million $)	2864.8	2400.6	2622.9	2623.5	3594.7					
								Terminal growth rate		Terminal value
								3.00%		-2.09

Appendix 44. Crisis - DHI – AEG

Rf	1.78%		Intrinsic Value per share		-9.75					
RM	3.75%		Share price		19.24					
Beta	1.5207				**Overvalued**					
Cost of Equity	4.778 %									
Shares Outstanding (million)	320.90									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dividend per share ($)	0.45	0.15	0.15	0.15	0.15	0.150	0.150	0.150	0.150	0.150
Dividend per share growth rate (%)		-66.667 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	-8.34	-1.73	0.77	0.23	3.01	0.57	0.57	0.57	0.57	0.57
Earnings per share growth rate		-79.26%	-144.51%	-70.13%	1208.70%	228.70%	228.70%	228.70%	228.70%	228.70%
Abnormal earnings growth ($)						-2.58	-0.02	-0.02	-0.02	-0.02
Discounted AEG ($)							-0.40	-0.38	-0.37	-0.35
								Terminal growth rate		Terminal value
								3.00%		-20.18

Appendix 45. Crisis - LEN – DDM

Rf	1.78%		Average Dividend payout			11.180 %		Intrinsic value of equity per share 2007 ($)			4.66
RM	3.75%		Average RoE			2.472 %		Share price (31/12/2012)			36.99
Beta	1.8187		Sustainable Growth rate			2.1953%					
Cost of Equity	5.366 %		Terminal Value of future Dividend			5.157					
			Discounted Terminal Value			3.971					**Overvalued**
				Forecast year		1	2	3	4	5	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Dividend per share ($)	0.52	0.16	0.16	0.16	0.16	0.160	0.160	0.160	0.160	0.160	
Dividend per share growth rate (%)		-69.231 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%	
Discounted future dividend ($)						0.152	0.144	0.137	0.130	0.123	
Earnings per share ($)	-7.01	-2.45	0.51	0.48	3.11						
Dividend payout	-7.418 %	-6.531 %	31.373 %	33.333 %	5.145 %						
Net income (Million $)	-1109.09	-417.15	95.26	92.20	679.12						
Shareholder's equity (Million $)	2623.01	2443.48	2608.95	2696.47	3414.76						
Return on Equity	-42.283 %	-17.072 %	3.651 %	3.419 %	19.888 %						

Appendix 46. Crisis - LEN – DCF

Rf	1.78%		Cost of Debt	3.25%		WACC	3.21%		Intrinsic value of equity		35,564.93
RM	3.75%		After tax Cost of Debt	1.95%		Intrinsic value of entity	37,780.82		Intrinsic equity per share		188.77
Beta	1.5207		Market value of equity	2696.47		Total Debt	3362.8		Share price		36.99
Cost of Equity	4.778 %					Net Debt	2215.892				**Undervalued**
Shares Outstanding million	188.40										
					Forecast Year	1	2	3	4	5	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Revenues (million $)	4,263.0	2,834.3	2,705.6	2,675.1	3,581.2	3,533.7	3,486.8	3,440.5	3,394.8	3,349.8	
Revenue Growth rate		-33.515 %	-4.539 %	-1.128 %	33.872 %	-1.328 %	-1.328 %	-1.328 %	-1.328 %	-1.328 %	
EBIT (million $)	-404.88	-676.29	100.06	109.04	253.10	47.21	46.59	45.97	45.36	44.76	
EBIT Margin	-9.498%	-23.861%	3.698%	4.076%	7.067%	1.336%	1.336%	1.336%	1.336%	1.336%	
Depreciation & Amortization (million $)	**32.4**	**19.9**	**13.5**	**21.5**	**28.1**	**25.1**	**24.8**	**24.4**	**24.1**	**23.8**	
% to revenue	0.760%	0.702%	0.500%	0.804%	0.784%	0.710%	0.710%	0.710%	0.710%	0.710%	
NOPAT (million $)	**-242.93**	**-405.78**	**60.04**	**65.43**	**151.86**	**28.33**	**27.95**	**27.58**	**27.21**	**26.85**	
Cash (million $)	1,091.47	1,330.60	1,207.25	1,024.21	1,146.87	1,218.45	1,294.49	1,375.28	1,461.12	1,552.31	
Cash growth rate		21.909%	-9.271%	-15.161%	11.976%	6.241%	6.241%	6.241%	6.241%	6.241%	
Inventories (million $)	4,500.09	4,088.0	4,169.6	4,360.5	5,071.7	5,458.60	5,875.00	6,323.16	6,805.52	7,324.66	
Inventories growth rate		-9.158%	1.997%	4.579%	16.309%	7.628%	7.628%	7.628%	7.628%	7.628%	
Accounts receivable ($)	94.52	122.053	78.419	53.977	53.745	48.61	43.97	39.76	35.97	32.53	
Accounts receivable growth rate		29.129%	-35.750%	-31.168%	-0.430%	-9.555%	-9.555%	-9.555%	-9.555%	-9.555%	
Accounts payable (million $)	246.73	169.60	168.01	201.10	220.69	219.17	217.66	216.15	214.66	213.18	
Accounts payable growth rate		-31.262%	-0.938%	19.699%	9.741%	-0.690%	-0.690%	-0.690%	-0.690%	-0.690%	
Accrued expense (million $)	592.78	518.36	384.23	326.20	268.16	220.34	181.05	148.77	122.24	100.44	
Accrued expense growth rate		-12.554%	-25.875%	-15.104%	-17.793%	-17.831%	-17.831%	-17.831%	-17.831%	-17.831%	
Notes payable (million $)	2,544.94	2,761.35	3,128.154	3,362.76	4,005.05	4,456.76	4,959.42	5,518.77	6,141.21	6,833.84	
Notes payable growth rate		8.504%	13.283%	7.500%	19.100%	11.279%	11.279%	11.279%	11.279%	11.279%	
Working capital (million $)	2,261.096	2,023.0	1,750.2	1,548.4	1,778.7	1,829.4	1,855.3	1,854.5	1,824.5	1,762.0	
Delta Working capital (million $)		**-238.066**	**-272.8**	**-202**	**230.2**	**50.727**	**25.946**	**-0.808**	**-30.030**	**-62.457**	
Property, plant & Equipment (million $)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PP & E growth rate							3.407%	3.407%	3.407%	3.407%	
Depreciation (million $)	32.4	19.9	13.5	21.5	28.1	25.1	24.8	24.4	24.1	23.8	
% to revenue	0.760%	0.702%	0.500%	0.804%	0.784%	0.710%	0.710%	0.710%	0.710%	0.710%	
Capital expenditure		**19.9**	**13.5**	**21.5**	**28.1**	**25.1**	**24.8**	**24.4**	**24.1**	**23.8**	
											Terminal Value
Unlevered free cash flow (million $)		**-167.71**	**332.86**	**267.20**	**-78.36**	**-22.40**	**2.01**	**28.39**	**57.24**	**89.31**	**44,088.32**
Unlever FCF growth rate			-298.47%	-19.73%	-129.33%	-71.42%	-108.95%	1315.65%	101.65%	56.01%	
Discounted to the present FCF (million $)						-21.70	1.88	25.82	50.45	76.26	37,648.10

Appendix 47. Crisis - LEN – RIV

Rf	1.78%		Intrinsic Value per share		23.82					
RM	3.75%		Share price		36.99					
Beta	1.8187				**Overvalued**					
Cost of Equity	5.366 %									
Shares Outstanding (million)	188.40									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Equity per Share ($)	13.923	12.970	13.848	14.312	18.125	19.332	20.538	21.745	22.952	24.158
Dividend per share ($)	0.52	0.16	0.16	0.16	0.16	0.160	0.160	0.160	0.160	0.160
Dividend per share growth rate (%)		-69.231 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	-7.01	-2.45	0.51	0.48	3.11	1.37	1.37	1.37	1.37	1.37
Earnings per share growth rate		-65.05%	-120.82%	-5.88%	547.92%	89.04%	89.04%	89.04%	89.04%	89.04%
Residual income (million $)		-3.20	-0.19	-0.26	2.34	0.39	0.33	0.26	0.20	0.14
Discounted residual income						0.37	0.30	0.23	0.16	0.10
Shareholder's equity (Million $)	2623.007	2443.479	2608.949	2696.468	3414.764					
								Terminal growth rate		Terminal value
								3.00%		4.53

Appendix 48. Crisis - LEN – AEG

Rf	1.78%		Intrinsic Value per share		-21.40					
RM	3.75%		Share price		36.99					
Beta	1.8187				**Overvalued**					
Cost of Equity	5.366 %									
Shares Outstanding (million)	188.40									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dividend per share ($)	0.52	0.16	0.16	0.16	0.16	0.160	0.160	0.160	0.160	0.160
Dividend per share growth rate (%)		-69.231 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	-7.01	-2.45	0.51	0.48	3.11	1.37	1.37	1.37	1.37	1.37
Earnings per share growth rate		-65.05%	-120.82%	-5.88%	547.92%	228.70%	228.70%	228.70%	228.70%	228.70%
Abnormal earnings growth ($)						-1.90	-0.06	-0.06	-0.06	-0.06
Discounted AEG ($)							-1.15	-1.09	-1.03	-0.98
								Terminal growth rate		Terminal value
								3.00%		-42.62

Appendix 49. Crisis - PHM – DDM

Rf	1.78%		Average Dividend payout			29.630 %		Intrinsic value of equity per share 2007 ($)			-7.26
RM	3.75%		Average RoE			9.415 %		Share price (31/12/2012)			17.60
Beta	1.6022		Sustainable Growth rate			6.6251%					
Cost of Equity	4.939 %		Terminal Value of future Dividend			-10.118					
			Discounted Terminal Value			-7.951					**Overvalued**
				Forecast year		1	2	3	4	5	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Dividend per share ($)	0.16	0.16	0.16	0.16	0.16	0.160	0.160	0.160	0.160	0.160	
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%	
Discounted future dividend ($)						0.152	0.145	0.138	0.132	0.126	
Earnings per share ($)	-5.81	-3.94	-2.9	-0.55	0.54						
Dividend payout	-2.754 %	-4.061 %	-5.517 %	-29.091 %	29.630 %						
Net income (Million $)	-1473.133	-1182.57	-1096.73	-210.388	206.145						
Shareholder's equity (Million $)	2835.698	3194.44	2135.167	1938.615	2189.616						
Return on Equity	-51.950 %	-37.020 %	-51.365 %	-10.852 %	9.415 %						

Appendix 50. Crisis - PHM – DCF

Rf	1.78%		Cost of Debt	3.25%		WACC	3.34%		Intrinsic value of equity		24,565.93
RM	3.75%		After tax Cost of Debt	1.95%		Intrinsic value of entity	25,660.30		Intrinsic equity per share		63.88
Beta	1.6022		Market value of equity	2189.616		Total Debt	2509.13		Share price		17.60
Cost of Equity	4.939 %					Net Debt	1094.37				**Undervalued**
Shares Outstanding million	384.56										
					Forecast Year	1	2	3	4	5	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Revenues (million $)	6,263.1	4,084.4	4,569.3	4,136.7	4,820.0	4,628.8	4,445.3	4,269.0	4,099.7	3,937.1	
Revenue Growth rate		-34.786 %	11.872 %	-9.468 %	16.518 %	-3.966 %	-3.966 %	-3.966 %	-3.966 %	-3.966 %	
EBIT (million $)	-1,682.60	-1,975.12	-1,234.55	-310.30	183.55	176.27	169.28	162.57	156.12	149.93	
EBIT Margin	-26.865%	-48.358%	-27.018%	-7.501%	3.808%	3.808%	3.808%	3.808%	3.808%	3.808%	
Depreciation & Amortization (million $)	**74.0**	**52.2**	**45.7**	**32.1**	**30.0**	**45.0**	**43.2**	**41.5**	**39.8**	**38.3**	
% to revenue	1.181%	1.279%	0.999%	0.776%	0.623%	0.972%	0.972%	0.972%	0.972%	0.972%	
NOPAT (million $)	**-1,009.56**	**-1,185.07**	**-740.73**	**-186.18**	**110.13**	**105.76**	**101.57**	**97.54**	**93.67**	**89.96**	
Cash (million $)	1,655.26	1,858.23	1,470.63	1,083.07	1,414.76	1,399.46	1,384.33	1,369.36	1,354.56	1,339.91	
Cash growth rate		12.262%	-20.859%	-26.353%	30.625%	-1.081%	-1.081%	-1.081%	-1.081%	-1.081%	
Inventories (million $)	4,201.29	4,940.4	4,781.8	4,636.5	4,214.0	4,373.38	4,538.73	4,710.34	4,888.43	5,073.26	
Inventories growth rate		17.591%	-3.209%	-3.040%	-9.111%	3.781%	3.781%	3.781%	3.781%	3.781%	
Accounts receivable ($)	373.569	955.186	81.307	37.187	30.976	30.45	29.94	29.43	28.93	28.45	
Accounts receivable growth rate		155.692%	-91.488%	-54.263%	-16.702%	-1.690%	-1.690%	-1.690%	-1.690%	-1.690%	
Accounts payable (million $)	218.14	278.33	226.47	196.45	178.27	172.24	166.41	160.77	155.33	150.07	
Accounts payable growth rate		27.597%	-18.635%	-13.255%	-9.251%	-3.386%	-3.386%	-3.386%	-3.386%	-3.386%	
Accrued expense (million $)	1,079.20	1,843.55	1,599.94	1,411.94	1,418.06	1,582.19	1,765.31	1,969.62	2,197.58	2,451.92	
Accrued expense growth rate		70.826%	-13.214%	-11.750%	0.434%	11.574%	11.574%	11.574%	11.574%	11.574%	
Notes payable (million $)	3,166.31	4,281.53	3,391.668	3,088.34	2,509.61	2,426.52	2,346.17	2,268.49	2,193.38	2,120.75	
Notes payable growth rate		35.222%	-20.784%	-8.943%	-18.739%	-3.311%	-3.311%	-3.311%	-3.311%	-3.311%	
Working capital (million $)	1,430.105	426.2	1,065.3	1,053.8	1,560.0	1,622.3	1,675.1	1,710.3	1,725.6	1,718.9	
Delta Working capital (million $)		**-1,003.947**	**639.2**	**-12**	**506.3**	**62.307**	**52.765**	**35.138**	**15.387**	**-6.766**	
Property, plant & Equipment (million $)	69.30	82.42	59.26	53.18	44.18	40.17	36.52	33.20	30.18	27.44	
PP & E growth rate		18.936%	-28.095%	-10.261%	-16.921%	-9.085%	-9.085%	-9.085%	-9.085%	-9.085%	
Depreciation (million $)	74.0	52.2	45.7	32.1	30.0	45.0	43.2	41.5	39.8	38.3	
% to revenue	1.181%	1.279%	0.999%	0.776%	0.623%	0.972%	0.972%	0.972%	0.972%	0.972%	
Capital expenditure		**65.4**	**22.5**	**26.0**	**21.0**	**41.0**	**39.5**	**38.2**	**36.8**	**35.5**	
											Terminal Value
Unlevered free cash flow (million $)		**-194.25**	**-1,356.75**	**-168.54**	**-387.13**	**47.47**	**52.45**	**65.72**	**81.30**	**99.47**	**29,880.04**
Unlever FCF growth rate			598.47%	-87.58%	129.69%	-112.26%	10.50%	25.29%	23.71%	22.34%	
Discounted to the present FCF (million $)						45.94	49.12	59.55	71.28	84.39	25,350.03

Appendix 51. Crisis - PHM – RIV

Rf	1.78%		Intrinsic Value per share		14.33					
RM	3.75%		Share price		17.60					
Beta	1.6022				**Overvalued**					
Cost of Equity	4.939 %									
Shares Outstanding (million)	384.56									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Equity per Share ($)	7.374	8.307	5.552	5.041	5.694	6.074	6.454	6.834	7.214	7.594
Dividend per share ($)	0.16	0.16	0.16	0.16	0.16	0.160	0.160	0.160	0.160	0.160
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	-5.81	-3.94	-2.9	-0.55	0.54	0.54	0.54	0.54	0.54	0.54
Earnings per share growth rate		-32.19%	-26.40%	-81.03%	-198.18%	-84.45%	-84.45%	-84.45%	-84.45%	-84.45%
Residual income (million $)		-4.30	-3.31	-0.82	0.29	0.26	0.24	0.22	0.20	0.18
Discounted residual income						0.25	0.22	0.19	0.17	0.14
Shareholder's equity (Million $)	2835.698	3194.44	2135.167	1938.615	2189.616					
								Terminal growth rate		Terminal value
								3.00%		7.67

Appendix 52. Crisis - PHM – AEG

Rf	1.78%		Intrinsic Value per share		-7.06					
RM	3.75%		Share price		17.60					
Beta	1.6022				**Overvalued**					
Cost of Equity	4.939 %									
Shares Outstanding (million)	384.56									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dividend per share ($)	0.16	0.16	0.16	0.16	0.16	0.160	0.160	0.160	0.160	0.160
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	-5.81	-3.94	-2.9	-0.55	0.54	0.54	0.54	0.54	0.54	0.54
Earnings per share growth rate		-32.19%	-26.40%	-81.03%	-198.18%	228.70%	228.70%	228.70%	228.70%	228.70%
Abnormal earnings growth ($)						-0.02	-0.02	-0.02	-0.02	-0.02
Discounted AEG ($)							-0.36	-0.35	-0.33	-0.31
								Terminal growth rate		Terminal value
								3.00%		-16.65

Appendix 53. Crisis - NVR – DDM

Rf	1.78%		Average Dividend payout			69.982 %		Intrinsic value of equity per share 2007 ($)			1,990.92
RM	3.75%		Average RoE			10.346 %		Share price (31/12/2007)			932.5
Beta	0.9113		Sustainable Growth rate			3.0000%					
Cost of Equity	3.577 %		Terminal Value of future Dividend			2278.665					
			Discounted Terminal Value			1911.485					**Undervalued**
				Forecast year		1	2	3	4	5	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Dividend per share ($)	10.08	22.68	24.95	15.68	26.48	22.883	19.773	17.086	14.764	12.757	
Dividend per share growth rate (%)		125.065 %	9.984 %	-37.165 %	68.925 %	-13.59%	-13.59%	-13.59%	-13.59%	-13.59%	
Discounted future dividend ($)						22.093	18.431	15.376	12.828	10.702	
Earnings per share ($)	17.04	31.26	33.42	23.01	35.12						
Dividend payout	59.151 %	72.568 %	74.655 %	68.132 %	75.406 %						
Net income (Million $)	100.892	192.18	206.005	129.42	180.588						
Shareholder's equity (Million $)	1373.789	1757.262	1740.374	1374.799	1480.477						
Return on Equity	7.344 %	10.936 %	11.837 %	9.414 %	12.198 %						

Appendix 54. Crisis - NVR – DCF

Rf	1.78%		Cost of Debt	3.25%		WACC	3.11%		Intrinsic value of equity		9,350.60
RM	3.75%		After tax Cost of Debt	1.95%		Intrinsic value of entity	8,811.50		Intrinsic equity per share		1,818.48
Beta	0.9113		Market value of equity	1480.48		Total Debt	600		Share price		932.50
Cost of Equity	3.577 %					Net Debt	-539.103				**Undervalued**
Shares Outstanding million	5.14										
					Forecast Year	1	2	3	4	5	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Revenues (million $)	3,638.7	2,683.5	2,980.8	2,611.2	3,121.2	3,058.5	2,997.1	2,936.8	2,877.8	2,820.0	
Revenue Growth rate		-26.252 %	11.079 %	-12.398 %	19.533 %	-2.010 %	-2.010 %	-2.010 %	-2.010 %	-2.010 %	
EBIT (million $)	167.46	298.41	322.39	207.58	275.08	256.34	251.19	246.14	241.20	236.35	
EBIT Margin	4.602%	11.120%	10.816%	7.949%	8.813%	8.381%	8.381%	8.381%	8.381%	8.381%	
Depreciation & Amortization (million $)	**13.6**	**9.7**	**7.3**	**6.7**	**8.1**	**9.1**	**9.0**	**8.8**	**8.6**	**8.4**	
% to revenue	0.375%	0.362%	0.244%	0.256%	0.260%	0.299%	0.299%	0.299%	0.299%	0.299%	
NOPAT (million $)	**100.47**	**179.05**	**193.44**	**124.55**	**165.05**	**153.81**	**150.71**	**147.69**	**144.72**	**141.81**	
Cash (million $)	1,146.43	1,248.69	1,190.73	475.57	1,139.10	1,163.47	1,188.36	1,213.79	1,239.75	1,266.27	
Cash growth rate		8.920%	-4.642%	-60.061%	-4.336%	2.139%	2.139%	2.139%	2.139%	2.139%	
Inventories (million $)	440.57	418.7	431.3	533.2	678.1	760.95	853.88	958.17	1,075.19	1,206.50	
Inventories growth rate		-4.960%	3.012%	23.606%	27.193%	12.213%	12.213%	12.213%	12.213%	12.213%	
Accounts receivable ($)	11.594	7.995	6.948	6.789	9.421	9.24	9.06	8.89	8.72	8.55	
Accounts receivable growth rate		-31.042%	-13.096%	-2.288%	38.769%	-1.914%	-1.914%	-1.914%	-1.914%	-1.914%	
Accounts payable (million $)	137.29	120.46	115.58	125.65	163.45	172.63	182.34	192.59	203.42	214.85	
Accounts payable growth rate		-12.253%	-4.056%	8.714%	30.081%	5.622%	5.622%	5.622%	5.622%	5.622%	
Accrued expense (million $)	194.87	221.35	237.05	185.42	234.80	244.15	253.87	263.98	274.49	285.42	
Accrued expense growth rate		13.590%	7.093%	-21.780%	26.632%	3.982%	3.982%	3.982%	3.982%	3.982%	
Notes payable (million $)	17.84	19.31	13.171	26.40	20.69	23.54	26.79	30.49	34.69	39.48	
Notes payable growth rate		8.205%	-31.778%	100.402%	-21.629%	13.800%	13.800%	13.800%	13.800%	13.800%	
Working capital (million $)	1,243.789	1,315.7	1,265.7	680.7	1,405.1	1,493.3	1,588.3	1,693.8	1,811.1	1,941.6	
Delta Working capital (million $)		**71.917**	**-50.0**	**-585**	**724.4**	**88.248**	**94.973**	**105.478**	**117.272**	**130.515**	
Property, plant & Equipment (million $)	25.66	20.22	19.52	23.24	27.02	27.74	28.47	29.23	30.01	30.81	
PP & E growth rate		-21.214%	-3.423%	19.054%	16.233%	2.663%	2.663%	2.663%	2.663%	2.663%	
Depreciation (million $)	13.6	9.7	7.3	6.7	8.1	9.1	9.0	8.8	8.6	8.4	
% to revenue	0.375%	0.362%	0.244%	0.256%	0.260%	0.299%	0.299%	0.299%	0.299%	0.299%	
Capital expenditure		**4.3**	**6.6**	**10.4**	**11.9**	**9.9**	**9.7**	**9.5**	**9.4**	**9.2**	
											Terminal Value
Unlevered free cash flow (million $)		**112.57**	**244.15**	**705.84**	**-563.14**	**64.84**	**55.00**	**41.45**	**26.67**	**10.50**	**10,052.75**
Unlever FCF growth rate			116.88%	189.09%	-179.78%	-111.51%	-15.17%	-24.64%	-35.66%	-60.64%	
Discounted to the present FCF (million $)						62.88	51.74	37.81	23.59	9.01	8,626.46

Appendix 55. Crisis - NVR – RIV

Rf	1.78%		Intrinsic Value per share		1413.16					
RM	3.75%		Share price		932.50					
Beta	0.9113				**Undervalued**					
Cost of Equity	3.577 %									
Shares Outstanding (million)	5.14									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Equity per Share ($)	267.170	341.747	338.462	267.367	287.919	295.899	303.248	309.998	316.181	321.832
Dividend per share ($)	10.08	22.68	24.95	15.68	26.48	22.883	19.773	17.086	14.764	12.757
Dividend per share growth rate (%)		125.065 %	9.984 %	-37.165 %	68.925 %	-13.59%	-13.59%	-13.59%	-13.59%	-13.59%
Earnings per share ($)	17.04	31.26	33.42	23.01	35.12	30.86	27.12	23.84	20.95	18.41
Earnings per share growth rate		83.45%	6.91%	-31.15%	52.63%	-12.12%	-12.12%	-12.12%	-12.12%	-12.12%
Residual income (million $)		21.70	21.20	10.90	25.56	20.57	16.54	12.99	9.86	7.10
Discounted residual income						19.86	15.42	11.69	8.57	5.96
Shareholder's equity (Million $)	1373.789	1757.262	1740.374	1374.799	1480.477					
								Terminal growth rate		Terminal value
								3.00%		1063.76

Appendix 56. Crisis - NVR – AEG

Rf	1.78%		Intrinsic Value per share		1541.55					
RM	3.75%		Share price		932.50					
Beta	0.9113				**Undervalued**					
Cost of Equity	3.577 %									
Shares Outstanding (million)	5.14									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dividend per share ($)	10.08	22.68	24.95	15.68	26.48	8.709	7.526	6.503	5.619	4.855
Dividend per share growth rate (%)		125.065 %	9.984 %	-37.165 %	68.925 %	-13.59%	-13.59%	-13.59%	-13.59%	-13.59%
Earnings per share ($)	17.04	31.26	33.42	23.01	35.12	23.01	23.83	24.69	25.57	26.48
Earnings per share growth rate		83.45%	6.91%	-31.15%	52.63%	3.58%	3.58%	3.58%	3.58%	3.58%
Abnormal earnings growth ($)						-12.42	0.31	0.27	0.23	0.20
Discounted AEG ($)							8.41	7.01	5.85	4.88
								Terminal growth rate		Terminal value
								3.00%		872.05

Appendix 57. Crisis - TOL – DDM

Rf	1.78%		Average Dividend payout			47.095 %		Intrinsic value of equity per share 2007 ($)			13.75
RM	3.75%		Average RoE			5.671 %		Share price (31/12/2007)			31.27
Beta	1.2205		Sustainable Growth rate			3.0000%					
Cost of Equity	4.186 %		Terminal Value of future Dividend			14.308					
			Discounted Terminal Value			11.655					**Overvalued**
				Forecast year		1	2	3	4	5	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Dividend per share ($)	-0.89	-2.20	-0.01	0.11	1.37	0.897	0.587	0.385	0.252	0.165	
Dividend per share growth rate (%)		148.936 %	-99.573 %	-1300.000 %	1112.500 %	-34.53%	-34.53%	-34.53%	-34.53%	-34.53%	
Discounted future dividend ($)						0.861	0.541	0.340	0.214	0.134	
Earnings per share ($)	-1.88	-4.68	-0.02	0.24	2.91						
Dividend payout	47.095 %	47.095 %	47.095 %	47.095 %	47.095 %						
Net income (Million $)	-297.81	-755.825	-3.374	39.795	487.146						
Shareholder's equity (Million $)	3237.653	2513.199	2555.453	2586.353	3121.7						
Return on Equity	-9.198 %	-30.074 %	-0.132 %	1.539 %	15.605 %						

Appendix 58. Crisis - TOL – DCF

Rf	1.78%		Cost of Debt	3.25%		WACC	3.25%		Intrinsic value of equity		4,190.28
RM	3.75%		After tax Cost of Debt	1.95%		Intrinsic value of entity	5,225.34		Intrinsic equity per share		24.85
Beta	1.2205		Market value of equity	3121.7		Total Debt	2252.944		Share price		31.27
Cost of Equity	4.186 %					Net Debt	1035.052				**Overvalued**
Shares Outstanding million	168.64										
					Forecast Year	1	2	3	4	5	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Revenues (million $)	3,148.2	1,755.3	1,494.8	1,475.9	1,882.7	1,728.4	1,586.8	1,456.7	1,337.3	1,227.7	
Revenue Growth rate		-44.243 %	-14.843 %	-1.264 %	27.567 %	-8.196 %	-8.196 %	-8.196 %	-8.196 %	-8.196 %	
EBIT (million $)	-466.79	-496.47	-117.19	-29.37	112.94	-22.07	-20.26	-18.60	-17.08	-15.68	
EBIT Margin	-14.827%	-28.284%	-7.840%	-1.990%	5.999%	-1.277%	-1.277%	-1.277%	-1.277%	-1.277%	
Depreciation & Amortization (million $)	**28.3**	**23.0**	**20.0**	**23.1**	**22.6**	**21.8**	**20.1**	**18.4**	**16.9**	**15.5**	
% to revenue	0.900%	1.312%	1.341%	1.568%	1.200%	1.264%	1.264%	1.264%	1.264%	1.264%	
NOPAT (million $)	**-280.07**	**-297.88**	**-70.31**	**-17.62**	**67.76**	**-13.24**	**-12.16**	**-11.16**	**-10.25**	**-9.41**	
Cash (million $)	1,633.50	1,908.89	1,236.93	1,139.91	1,217.89	1,211.79	1,205.72	1,199.67	1,193.66	1,187.68	
Cash growth rate		16.859%	-35.202%	-7.843%	6.841%	-0.501%	-0.501%	-0.501%	-0.501%	-0.501%	
Inventories (million $)	4,127.48	3,183.6	3,241.7	3,416.7	3,761.2	3,978.17	4,207.67	4,450.40	4,707.15	4,978.70	
Inventories growth rate		-22.869%	1.827%	5.398%	10.082%	5.769%	5.769%	5.769%	5.769%	5.769%	
Accounts receivable ($)	113.762	95.774	97.039	105.576	148.315	161.21	175.23	190.48	207.04	225.05	
Accounts receivable growth rate		-15.812%	1.321%	8.797%	40.482%	8.697%	8.697%	8.697%	8.697%	8.697%	
Accounts payable (million $)	134.84	79.10	91.74	96.82	99.91	95.76	91.78	87.96	84.31	80.80	
Accounts payable growth rate		-41.341%	15.982%	5.536%	3.196%	-4.157%	-4.157%	-4.157%	-4.157%	-4.157%	
Accrued expense (million $)	738.60	640.22	570.32	521.05	476.35	426.98	382.73	343.06	307.51	275.64	
Accrued expense growth rate		-13.319%	-10.918%	-8.639%	-8.579%	-10.364%	-10.364%	-10.364%	-10.364%	-10.364%	
Notes payable (million $)	1,143.45	1,587.65	1,544.110	1,490.97	2,080.46	2,311.77	2,568.79	2,854.38	3,171.73	3,524.36	
Notes payable growth rate		38.848%	-2.742%	-3.441%	39.537%	11.118%	11.118%	11.118%	11.118%	11.118%	
Working capital (million $)	3,849.662	2,933.8	2,420.8	2,596.1	2,427.9	2,516.7	2,545.3	2,555.1	2,544.3	2,510.6	
Delta Working capital (million $)		**-915.853**	**-513.0**	**175**	**-168.2**	**88.733**	**28.658**	**9.821**	**-10.842**	**-33.679**	
Property, plant & Equipment (million $)	86.46	70.44	79.92	99.71	106.21	113.17	120.59	128.49	136.91	145.89	
PP & E growth rate		-18.530%	13.451%	24.771%	6.521%	6.553%	6.553%	6.553%	6.553%	6.553%	
Depreciation (million $)	28.3	23.0	20.0	23.1	22.6	21.8	20.1	18.4	16.9	15.5	
% to revenue	0.900%	1.312%	1.341%	1.568%	1.200%	1.264%	1.264%	1.264%	1.264%	1.264%	
Capital expenditure		**7.0**	**29.5**	**42.9**	**29.1**	**28.8**	**27.5**	**26.3**	**25.3**	**24.5**	
											Terminal Value
Unlevered free cash flow (million $)		**634.00**	**433.22**	**-212.73**	**229.44**	**-108.94**	**-48.23**	**-28.88**	**-7.82**	**15.30**	**6,331.60**
Unlever FCF growth rate			-31.67%	-149.10%	-207.86%	-147.48%	-55.72%	-40.11%	-72.91%	-295.53%	
Discounted to the present FCF (million $)						-105.51	-45.24	-26.24	-6.89	13.04	5,396.18

Appendix 59. Crisis - TOL – RIV

Rf	1.78%		Intrinsic Value per share		53.49					
RM	3.75%		Share price		31.27					
Beta	1.2205				**Undervalued**					
Cost of Equity	4.186 %									
Shares Outstanding (million)	168.64									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Equity per Share ($)	19.199	14.903	15.154	15.337	18.511	20.150	21.773	23.314	24.741	26.038
Dividend per share ($)	-0.89	-2.20	-0.01	0.11	1.37	0.897	0.587	0.385	0.252	0.165
Dividend per share growth rate (%)		148.936 %	-99.573 %	-1300.000 %	1112.500 %	-34.53%	-34.53%	-34.53%	-34.53%	-34.53%
Earnings per share ($)	-1.88	-4.68	-0.02	0.24	2.91	2.54	2.21	1.93	1.68	1.46
Earnings per share growth rate		148.94%	-99.57%	-1300.00%	1112.50%	-12.85%	-12.85%	-12.85%	-12.85%	-12.85%
Residual income (million $)		-5.48	-0.64	-0.39	2.27	1.76	1.37	1.01	0.70	0.43
Discounted residual income						1.69	1.26	0.90	0.60	0.35
Shareholder's equity (Million $)	3237.653	2513.199	2555.453	2586.353	3121.7					
								Terminal growth rate		Terminal value
								3.00%		30.19

Appendix 60. Crisis - TOL – AEG

Rf	1.78%		Intrinsic Value per share		27.13					
RM	3.75%		Share price		31.27					
Beta	1.2205				**Overvalued**					
Cost of Equity	4.186 %									
Shares Outstanding (million)	168.64									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dividend per share ($)	-0.89	-2.20	-0.01	0.11	1.37	0.074	0.048	0.032	0.021	0.014
Dividend per share growth rate (%)		148.936 %	-99.573 %	-1300.000 %	1112.500 %	-34.53%	-34.53%	-34.53%	-34.53%	-34.53%
Earnings per share ($)	-1.88	-4.68	-0.02	0.24	2.91	0.21	0.18	0.16	0.14	0.12
Earnings per share growth rate		148.94%	-99.57%	-1300.00%	1112.50%	-12.85%	-12.85%	-12.85%	-12.85%	-12.85%
Abnormal earnings growth ($)						-2.77	-0.03	-0.03	-0.03	-0.02
Discounted AEG ($)							-0.75	-0.64	-0.54	-0.46
								Terminal growth rate		Terminal value
								3.00%		-39.99

Appendix 61. Crisis - KBH – DDM

Rf	1.78%		Average Dividend payout			-16.379 %		Intrinsic value of equity per share 2007 ($)			0.51
RM	3.75%		Average RoE			-20.350 %		Share price (31/12/2012)			15.37
Beta	1.6584		Sustainable Growth rate			-23.6834%					
Cost of Equity	5.050 %		Terminal Value of future Dividend			0.162					
			Discounted Terminal Value			0.127					**Overvalued**
				Forecast year		1	2	3	4	5	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Dividend per share ($)	0.8125	0.25	0.25	0.25	0.1375	0.117	0.099	0.084	0.072	0.061	
Dividend per share growth rate (%)		-69.231 %	0.000 %	0.000 %	-45.000 %	-15.00%	-15.00%	-15.00%	-15.00%	-15.00%	
Discounted future dividend ($)						0.111	0.090	0.073	0.059	0.048	
Earnings per share ($)	-12.59	-1.33	-0.9	-2.32	-0.76						
Dividend payout	-6.454 %	-18.797 %	-27.778 %	-10.776 %	-18.092 %						
Net income (Million $)	-976.131	-101.784	-69.368	-178.768	-58.953						
Shareholder's equity (Million $)	830.605	707.224	631.878	442.657	376.806						
Return on Equity	-117.520 %	-14.392 %	-10.978 %	-40.385 %	-15.645 %						

Appendix 62. Crisis - KBH – DCF

Rf	1.78%		Cost of Debt	3.25%		WACC	2.51%		Intrinsic value of equity		-5,027.32
RM	3.75%		After tax Cost of Debt	1.95%		Intrinsic value of entity	-3,832.09		Intrinsic equity per share		-65.20
Beta	1.6584		Market value of equity	376.806		Total Debt	1720		Share price		15.37
Cost of Equity	5.050 %					Net Debt	1195.235				**Overvalued**
Shares Outstanding million	77.11										
					Forecast Year	1	2	3	4	5	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Revenues (million $)	3,033.9	1,824.9	1,590.0	1,315.9	1,560.1	1,500.1	1,442.3	1,386.8	1,333.4	1,282.1	
Revenue Growth rate		-39.852 %	-12.870 %	-17.241 %	18.562 %	-3.850 %	-3.850 %	-3.850 %	-3.850 %	-3.850 %	
EBIT (million $)	-854.37	-231.34	-10.93	-96.28	-11.56	-80.34	-77.25	-74.27	-71.41	-68.66	
EBIT Margin	-28.160%	-12.677%	-0.687%	-7.317%	-0.741%	-5.356%	-5.356%	-5.356%	-5.356%	-5.356%	
Depreciation & Amortization (million $)	**9.3**	**5.2**	**3.3**	**2.0**	**1.6**	**3.2**	**3.1**	**2.9**	**2.8**	**2.7**	
% to revenue	0.307%	0.287%	0.207%	0.154%	0.104%	0.212%	0.212%	0.212%	0.212%	0.212%	
NOPAT (million $)	**-512.62**	**-138.80**	**-6.56**	**-57.77**	**-6.94**	**-48.20**	**-46.35**	**-44.56**	**-42.85**	**-41.20**	
Cash (million $)	1,135.40	1,174.72	904.40	415.05	524.77	462.81	408.18	359.99	317.49	280.01	
Cash growth rate		3.463%	-23.011%	-54.108%	26.434%	-11.805%	-11.805%	-11.805%	-11.805%	-11.805%	
Inventories (million $)	2,106.72	1,501.6	1,696.7	1,731.6	1,706.6	1,642.07	1,580.00	1,520.29	1,462.83	1,407.54	
Inventories growth rate		-28.723%	12.995%	2.057%	-1.447%	-3.780%	-3.780%	-3.780%	-3.780%	-3.780%	
Accounts receivable ($)	357.719	337.93	108.048	66.179	64.821	46.29	33.05	23.60	16.86	12.04	
Accounts receivable growth rate		-5.532%	-68.027%	-38.750%	-2.052%	-28.590%	-28.590%	-28.590%	-28.590%	-28.590%	
Accounts payable (million $)	541.29	340.98	233.22	104.41	118.54	85.85	62.18	45.03	32.61	23.62	
Accounts payable growth rate		-37.007%	-31.603%	-55.229%	13.533%	-27.577%	-27.577%	-27.577%	-27.577%	-27.577%	
Accrued expense (million $)	721.40	560.37	466.51	374.41	340.35	282.56	234.59	194.76	161.69	134.24	
Accrued expense growth rate		-22.322%	-16.750%	-19.742%	-9.097%	-16.978%	-16.978%	-16.978%	-16.978%	-16.978%	
Notes payable (million $)	1,941.36	1,820.37	1,775.529	1,583.57	1,722.82	1,676.67	1,631.76	1,588.06	1,545.52	1,504.13	
Notes payable growth rate		-6.232%	-2.463%	-10.811%	8.793%	-2.678%	-2.678%	-2.678%	-2.678%	-2.678%	
Working capital (million $)	104.246	19.4	190.7	149.1	115.8	106.1	92.7	76.0	57.3	37.6	
Delta Working capital (million $)		**-84.831**	**171.3**	**-42**	**-33.3**	**-9.725**	**-13.379**	**-16.676**	**-18.689**	**-19.748**	
Property, plant & Equipment (million $)	16.30	12.50	9.60	7.80	7.90	6.64	5.57	4.68	3.93	3.30	
PP & E growth rate		-23.313%	-23.200%	-18.750%	1.282%	-15.995%	-15.995%	-15.995%	-15.995%	-15.995%	
Depreciation (million $)	9.3	5.2	3.3	2.0	1.6	3.2	3.1	2.9	2.8	2.7	
% to revenue	0.307%	0.287%	0.207%	0.154%	0.104%	0.212%	0.212%	0.212%	0.212%	0.212%	
Capital expenditure		**1.4**	**0.4**	**0.2**	**1.7**	**1.9**	**2.0**	**2.0**	**2.1**	**2.1**	
											Terminal Value
Unlevered free cash flow (million $)		**-50.17**	**-174.94**	**-14.39**	**26.26**	**-37.21**	**-31.91**	**-27.00**	**-23.41**	**-20.82**	**-4,188.50**
Unlever FCF growth rate			248.68%	-91.78%	-282.53%	-241.72%	-14.26%	-15.39%	-13.28%	-11.06%	
Discounted to the present FCF (million $)						-36.30	-30.37	-25.06	-21.20	-18.40	-3,700.76

Appendix 63. Crisis - KBH – RIV

Rf	1.78%		Intrinsic Value per share		-14.39					
RM	3.75%		Share price		15.37					
Beta	1.6584				**Overvalued**					
Cost of Equity	5.050 %									
Shares Outstanding (million)	77.11									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Equity per Share ($)	10.772	9.172	8.195	5.741	4.887	4.069	3.324	2.644	2.023	1.456
Dividend per share ($)	0.81	0.25	0.25	0.25	0.14	0.117	0.099	0.084	0.072	0.061
Dividend per share growth rate (%)		-69.231 %	0.000 %	0.000 %	-45.000 %	-15.00%	-15.00%	-15.00%	-15.00%	-15.00%
Earnings per share ($)	-12.59	-1.33	-0.9	-2.32	-0.76	-0.70	-0.65	-0.60	-0.55	-0.51
Earnings per share growth rate		-89.44%	-32.33%	157.78%	-67.24%	-7.81%	-7.81%	-7.81%	-7.81%	-7.81%
Residual income (million $)		-1.87	-1.36	-2.73	-1.05	-0.95	-0.85	-0.76	-0.68	-0.61
Discounted residual income						-0.90	-0.77	-0.66	-0.56	-0.48
Shareholder's equity (Million $)	830.605	707.224	631.878	442.657	376.806					
								Terminal growth rate		Terminal value
								2.00%		-15.90

Appendix 64. Crisis - KBH – AEG

Rf	1.78%		Intrinsic Value per share		32.47					
RM	3.75%		Share price		15.37					
Beta	1.6584				**Undervalued**					
Cost of Equity	5.050 %									
Shares Outstanding (million)	77.11									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dividend per share ($)	0.81	0.25	0.25	0.25	0.14	0.117	0.099	0.084	0.072	0.061
Dividend per share growth rate (%)		-69.231 %	0.000 %	0.000 %	-45.000 %	-15.00%	-15.00%	-15.00%	-15.00%	-15.00%
Earnings per share ($)	-12.59	-1.33	-0.9	-2.32	-0.76	-0.70	-0.65	-0.60	-0.55	-0.51
Earnings per share growth rate		-89.44%	-32.33%	157.78%	-67.24%	-7.81%	-7.81%	-7.81%	-7.81%	-7.81%
Abnormal earnings growth ($)						0.10	0.10	0.09	0.08	0.07
Discounted AEG ($)							1.81	1.58	1.38	1.21
								Terminal growth rate		Terminal value
								2.00%		40.36

Appendix 65. Crisis - MTH – DDM

Rf	1.78%		Average Dividend payout			26.601 %		Intrinsic value of equity per share 2007 ($)			33.42	
RM	3.75%		Average RoE			4.087 %		Share price (31/12/2007)			36.63	
Beta	1.9302		Sustainable Growth rate			3.0000%						
Cost of Equity	5.586 %		Terminal Value of future Dividend			38.838						
			Discounted Terminal Value			29.596					Overvalued	
				Forecast year		1	2	3	4	5		
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**		
Dividend per share ($)	-2.65	-0.56	0.06	-0.17	0.80	0.831	0.865	0.900	0.937	0.975		
Dividend per share growth rate (%)		-78.693 %	-110.377 %	-395.455 %	-561.538 %	4.09%	4.09%	4.09%	4.09%	4.09%		
Discounted future dividend ($)						0.787	0.776	0.765	0.754	0.743		
Earnings per share ($)	-9.95	-2.12	0.22	-0.65	3							
Dividend payout	26.601 %	26.601 %	26.601 %	26.601 %	26.601 %							
Net income (Million $)	-291.935	-66.456	7.15	-21.106	105.163							
Shareholder's equity (Million $)	527.206	485.425	499.995	488.912	694.21							
Return on Equity	-55.374 %	-13.690 %	1.430 %	-4.317 %	15.149 %							

Appendix 66. Crisis - MTH – DCF

Rf	1.78%		Cost of Debt	3.25%		WACC	3.73%		Intrinsic value of equity		1,011.37	
RM	3.75%		After tax Cost of Debt	1.95%		Intrinsic value of entity	1,563.71		Intrinsic equity per share		29.70	
Beta	1.9302		Market value of equity	694.21		Total Debt	722.8		Share price		36.63	
Cost of Equity	5.586 %					Net Debt	552.343				**Overvalued**	
Shares Outstanding million	34.06											
					Forecast Year	1	2	3	4	5	5	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**		
Revenues (million $)	1,505.1	962.8	940.4	860.9	1,184.4	1,157.0	1,130.3	1,104.2	1,078.7	1,053.8		
Revenue Growth rate		-36.032 %	-2.326 %	-8.456 %	37.575 %	-2.310 %	-2.310 %	-2.310 %	-2.310 %	-2.310 %		
EBIT (million $)	-275.97	-154.80	2.48	-20.38	28.85	28.19	27.54	26.90	26.28	25.67		
EBIT Margin	-18.335%	-16.078%	0.264%	-2.367%	2.436%	2.436%	2.436%	2.436%	2.436%	2.436%		
Depreciation & Amortization (million $)	**15.7**	**8.8**	**8.0**	**7.2**	**8.2**	**10.0**	**9.8**	**9.6**	**9.3**	**9.1**		
% to revenue	1.041%	0.918%	0.848%	0.834%	0.692%	0.867%	0.867%	0.867%	0.867%	0.867%		
NOPAT (million $)	**-165.58**	**-92.88**	**1.49**	**-12.23**	**17.31**	**16.91**	**16.52**	**16.14**	**15.77**	**15.40**		
Cash (million $)	205.92	249.33	103.95	173.61	170.46	182.37	195.12	208.77	223.36	238.98		
Cash growth rate		21.080%	-58.307%	67.010%	-1.817%	6.991%	6.991%	6.991%	6.991%	6.991%		
Inventories (million $)	859.31	675.0	738.9	815.4	1,113.2	1,197.08	1,287.29	1,384.30	1,488.63	1,600.81		
Inventories growth rate		-21.444%	9.465%	10.352%	36.516%	7.536%	7.536%	7.536%	7.536%	7.536%		
Accounts receivable ($)	142.554	115.443	20.835	14.932	20.29	15.55	11.92	9.14	7.00	5.37		
Accounts receivable growth rate		-19.018%	-81.952%	-28.332%	35.883%	-23.355%	-23.355%	-23.355%	-23.355%	-23.355%		
Accounts payable (million $)	31.37	30.30	23.59	37.74	49.80	58.07	67.71	78.95	92.05	107.33		
Accounts payable growth rate		-3.408%	-22.138%	59.969%	31.976%	16.599%	16.599%	16.599%	16.599%	16.599%		
Accrued expense (million $)	125.10	103.24	87.81	79.46	96.38	102.05	108.06	114.43	121.17	128.30		
Accrued expense growth rate		-17.478%	-14.941%	-9.506%	21.284%	5.889%	5.889%	5.889%	5.889%	5.889%		
Notes payable (million $)	628.97	605.01	605.780	606.41	722.80	792.54	869.00	952.85	1,044.78	1,145.59		
Notes payable growth rate		-3.809%	0.127%	0.104%	19.193%	9.648%	9.648%	9.648%	9.648%	9.648%		
Working capital (million $)	294.726	206.1	146.0	285.7	429.6	442.3	449.6	456.0	461.0	463.9		
Delta Working capital (million $)		**-88.609**	**-60.1**	**140**	**143.9**	**12.747**	**7.216**	**6.423**	**5.008**	**2.946**		
Property, plant & Equipment (million $)	22.69	30.30	23.59	13.49	15.72	15.13	14.57	14.02	13.50	13.00		
PP & E growth rate		33.510%	-22.138%	-42.808%	16.507%	-3.732%	-3.732%	-3.732%	-3.732%	-3.732%		
Depreciation (million $)	15.7	8.8	8.0	7.2	8.2	10.0	9.8	9.6	9.3	9.1		
% to revenue	1.041%	0.918%	0.848%	0.834%	0.692%	0.867%	0.867%	0.867%	0.867%	0.867%		
Capital expenditure		**16.4**	**1.3**	**-2.9**	**10.4**	**9.4**	**9.2**	**9.0**	**8.8**	**8.6**		
											Terminal Value	
Unlevered free cash flow (million $)		**-11.87**	**68.32**	**-141.86**	**-128.80**	**4.75**	**9.87**	**10.26**	**11.28**	**12.96**	**1,825.81**	
Unlever FCF growth rate			-675.38%	-307.62%	-9.21%	-103.69%	107.71%	3.96%	9.96%	14.87%		
Discounted to the present FCF (million $)						4.58	9.17	9.19	9.75	10.79	1,520.23	

Appendix 67. Crisis - MTH – RIV

Rf	1.78%		Intrinsic Value per share		89.01					
RM	3.75%		Share price		36.63					
Beta	1.9302				**Undervalued**					
Cost of Equity	5.586 %									
Shares Outstanding (million)	34.06									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Equity per Share ($)	15.480	14.253	14.681	14.356	20.384	22.676	25.061	27.545	30.129	32.820
Dividend per share ($)	-2.65	-0.56	0.06	-0.17	0.80	0.831	0.865	0.900	0.937	0.975
Dividend per share growth rate (%)		-78.693 %	-110.377 %	-395.455 %	-561.538 %	4.09%	4.09%	4.09%	4.09%	4.09%
Earnings per share ($)	-9.95	-2.12	0.22	-0.65	3	3.12	3.25	3.38	3.52	3.67
Earnings per share growth rate		-78.69%	-110.38%	-395.45%	-561.54%	4.09%	4.09%	4.09%	4.09%	4.09%
Residual income (million $)		-2.98	-0.58	-1.47	2.20	1.98	1.98	1.98	1.98	1.98
Discounted residual income						1.88	1.78	1.68	1.60	1.51
Shareholder's equity (Million $)	527.206	485.425	499.995	488.912	694.21					
								Terminal growth rate		Terminal value
								3.00%		60.17

Appendix 68. Crisis - MTH – AEG

Rf	1.78%		Intrinsic Value per share		55.62					
RM	3.75%		Share price		36.63					
Beta	1.9302				**Undervalued**					
Cost of Equity	5.586 %									
Shares Outstanding (million)	34.06									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dividend per share ($)	-2.65	-0.56	0.06	-0.17	0.80	0.831	0.865	0.900	0.937	0.975
Dividend per share growth rate (%)		-78.693 %	-110.377 %	-395.455 %	-561.538 %	4.09%	4.09%	4.09%	4.09%	4.09%
Earnings per share ($)	-9.95	-2.12	0.22	-0.65	3	3.12	3.25	3.38	3.52	3.67
Earnings per share growth rate		-78.69%	-110.38%	-395.45%	-561.54%	4.09%	4.09%	4.09%	4.09%	4.09%
Abnormal earnings growth ($)						0.00	0.00	0.00	0.00	0.00
Discounted AEG ($)							-0.01	-0.01	-0.01	-0.01
								Terminal growth rate		Terminal value
								3.00%		-0.26

Appendix 69. Crisis - HOV – DDM

Rf	1.78%		Average Dividend payout			172.791 %		Intrinsic value of equity per share 2007 ($)			5.85
RM	3.75%		Average RoE			6.437 %		Share price (31/12/2007)			6.72
Beta	2.1574		Sustainable Growth rate			3.0000%					
Cost of Equity	6.034 %		Terminal Value of future Dividend			6.842					
			Discounted Terminal Value			5.105					**Overvalued**
				Forecast year		1	2	3	4	5	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Dividend per share ($)	-16.18	-9.03	0.15	-2.70	-0.41	0.157	0.167	0.178	0.189	0.202	
Dividend per share growth rate (%)		-44.218 %	-101.634 %	-1931.323 %	-84.986 %	6.44%	6.44%	6.44%	6.44%	6.44%	
Discounted future dividend ($)						0.148	0.149	0.149	0.150	0.150	
Earnings per share ($)	-16.04	-9.16	0.03	-2.85	-0.52						
Dividend payout	100.881 %	98.540 %	491.736 %	94.792 %	78.005 %						
Net income (Million $)	-1124.59	-716.712	2.588	-286.087	-66.197						
Shareholder's equity (Million $)	330.264	-348.868	-337.938	-496.603	-485.345						
Return on Equity	-340.512 %	205.439 %	-0.766 %	57.609 %	13.639 %						

Appendix 70. Crisis - HOV – DCF

Rf	1.78%		Cost of Debt	3.25%		WACC	5.80%		Intrinsic value of equity		-1,459.65
RM	3.75%		After tax Cost of Debt	1.95%		Intrinsic value of entity	-1,747.07		Intrinsic equity per share		-11.55
Beta	2.1574		Market value of equity	-485.345		Total Debt	-29.1		Share price		6.72
Cost of Equity	6.034 %					Net Debt	-287.423				**Overvalued**
Shares Outstanding million	126.35										
					Forecast Year	1	2	3	4	5	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Revenues (million $)	3,308.1	1,596.3	1,371.8	1,134.9	1,485.4	1,483.1	1,480.9	1,478.6	1,476.4	1,474.2	
Revenue Growth rate		-51.746 %	-14.061 %	-17.271 %	30.879 %	-0.151 %	-0.151 %	-0.151 %	-0.151 %	-0.151 %	
EBIT (million $)	-281.59	-222.26	-2.27	-291.59	-101.25	-172.78	-172.51	-172.25	-171.99	-171.73	
EBIT Margin	-8.512%	-13.924%	-0.166%	-25.693%	-6.816%	-11.650%	-11.650%	-11.650%	-11.650%	-11.650%	
Depreciation & Amortization (million $)	**18.4**	**18.5**	**12.6**	**9.3**	**6.2**	**11.5**	**11.5**	**11.5**	**11.4**	**11.4**	
% to revenue	0.557%	1.161%	0.917%	0.823%	0.419%	0.775%	0.775%	0.775%	0.775%	0.775%	
NOPAT (million $)	**-168.96**	**-133.36**	**-1.36**	**-174.95**	**-60.75**	**-103.67**	**-103.51**	**-103.35**	**-103.20**	**-103.04**	
Cash (million $)	838.21	419.96	359.12	244.36	258.32	199.80	154.53	119.52	92.44	71.50	
Cash growth rate		-49.898%	-14.485%	-31.958%	5.716%	-22.656%	-22.656%	-22.656%	-22.656%	-22.656%	
Inventories (million $)	2,159.08	1,109.9	1,001.9	968.1	981.5	833.47	707.78	601.05	510.42	433.45	
Inventories growth rate		-48.593%	-9.728%	-3.376%	1.379%	-15.080%	-15.080%	-15.080%	-15.080%	-15.080%	
Accounts receivable ($)	78.766	44.418	61.023	52.277	61.794	61.43	61.07	60.71	60.35	60.00	
Accounts receivable growth rate		-43.608%	37.383%	-14.332%	18.205%	-0.588%	-0.588%	-0.588%	-0.588%	-0.588%	
Accounts payable (million $)	420.70	325.72	319.75	303.63	296.51	272.94	251.25	231.27	212.89	195.97	
Accounts payable growth rate		-22.575%	-1.834%	-5.040%	-2.346%	-7.949%	-7.949%	-7.949%	-7.949%	-7.949%	
Accrued expense (million $)	72.48	26.08	23.97	21.33	20.20	15.73	12.26	9.55	7.44	5.79	
Accrued expense growth rate		-64.019%	-8.091%	-11.002%	-5.307%	-22.105%	-22.105%	-22.105%	-22.105%	-22.105%	
Notes payable (million $)	1,562.40	822.31	711.585	802.86	458.74	354.52	273.99	211.74	163.64	126.47	
Notes payable growth rate		-47.368%	-13.465%	12.827%	-42.862%	-22.717%	-22.717%	-22.717%	-22.717%	-22.717%	
Working capital (million $)	993.999	417.6	367.6	146.4	516.6	451.5	385.9	328.7	279.2	236.7	
Delta Working capital (million $)		**-576.449**	**-50.0**	**-221**	**370.2**	**-65.128**	**-65.599**	**-57.178**	**-49.475**	**-42.526**	
Property, plant & Equipment (million $)	92.82	73.92	62.77	53.27	48.52	41.31	35.16	29.93	25.48	21.69	
PP & E growth rate		-20.362%	-15.086%	-15.137%	-8.902%	-14.872%	-14.872%	-14.872%	-14.872%	-14.872%	
Depreciation (million $)	18.4	18.5	12.6	9.3	6.2	11.5	11.5	11.5	11.4	11.4	
% to revenue	0.557%	1.161%	0.917%	0.823%	0.419%	0.775%	0.775%	0.775%	0.775%	0.775%	
Capital expenditure		**-0.4**	**1.4**	**-0.2**	**1.5**	**4.3**	**5.3**	**6.2**	**7.0**	**7.6**	
											Terminal Value
Unlevered free cash flow (million $)		**461.99**	**59.78**	**55.67**	**-426.19**	**-31.32**	**-31.77**	**-40.94**	**-49.27**	**-56.72**	**-2,084.73**
Unlever FCF growth rate			-87.06%	-6.88%	-865.59%	-92.65%	1.42%	28.89%	20.33%	15.13%	
Discounted to the present FCF (million $)						-29.60	-28.38	-34.57	-39.32	-42.78	-1,572.42

Appendix 71. Crisis - HOV – RIV

Rf	1.78%		Intrinsic Value per share		-12.48					
RM	3.75%		Share price		6.72					
Beta	2.1574				**Overvalued**					
Cost of Equity	6.034 %									
Shares Outstanding (million)	126.35									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Equity per Share ($)	2.614	-2.761	-2.675	-3.930	-3.841	-4.552	-5.308	-6.113	-6.970	-7.881
Dividend per share ($)	-16.18	-9.03	0.15	-2.70	-0.41	0.157	0.167	0.178	0.189	0.202
Dividend per share growth rate (%)		-44.218 %	-101.634 %	-1931.323 %	-84.986 %	6.44%	6.44%	6.44%	6.44%	6.44%
Earnings per share ($)	-16.04	-9.16	0.03	-2.85	-0.52	-0.55	-0.59	-0.63	-0.67	-0.71
Earnings per share growth rate		-42.89%	-100.33%	-9600.00%	-81.75%	6.44%	6.44%	6.44%	6.44%	6.44%
Residual income (million $)		-9.32	0.20	-2.69	-0.28	-0.32	-0.31	-0.31	-0.30	-0.29
Discounted residual income						-0.30	-0.28	-0.26	-0.24	-0.22
Shareholder's equity (Million $)	330.264	-348.868	-337.938	-496.603	-485.345					
								Terminal growth rate		Terminal value
								3.00%		-7.34

Appendix 72. Crisis - HOV – AEG

Rf	1.78%		Intrinsic Value per share		-4.83					
RM	3.75%		Share price		6.72					
Beta	2.1574				**Overvalued**					
Cost of Equity	6.034 %									
Shares Outstanding (million)	126.35									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dividend per share ($)	-16.18	-9.03	0.15	-2.70	-0.41	0.157	0.167	0.178	0.189	0.202
Dividend per share growth rate (%)		-44.218 %	-101.634 %	-1931.323 %	-84.986 %	6.44%	6.44%	6.44%	6.44%	6.44%
Earnings per share ($)	-16.04	-9.16	0.03	-2.85	-0.52	-0.55	-0.59	-0.63	-0.67	-0.71
Earnings per share growth rate		-42.89%	-100.33%	-9600.00%	-81.75%	6.44%	6.44%	6.44%	6.44%	6.44%
Abnormal earnings growth ($)						-0.03	0.01	0.01	0.01	0.01
Discounted AEG ($)							0.11	0.11	0.11	0.11
								Terminal growth rate		Terminal value
								3.00%		3.89

Appendix 73. Crisis - MDC – DDM

Rf	1.78%		Average Dividend payout			43.568 %		Intrinsic value of equity per share 2007 ($)			37.80
RM	3.75%		Average RoE			-2.124 %		Share price (31/12/2012)			32.71
Beta	1.2890		Sustainable Growth rate			-1.1984%					
Cost of Equity	4.321 %		Terminal Value of future Dividend			35.799					
			Discounted Terminal Value			28.974					**Undervalued**
				Forecast year		1	2	3	4	5	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Dividend per share ($)	1	1	1	1	2	2.000	2.000	2.000	2.000	2.000	
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	100.000 %	0.00%	0.00%	0.00%	0.00%	0.00%	
Discounted future dividend ($)						1.917	1.838	1.762	1.689	1.619	
Earnings per share ($)	-8.25	0.52	-1.4	-2.12	1.28						
Dividend payout	-12.121 %	192.308 %	-71.429 %	-47.170 %	156.250 %						
Net income (Million $)	-380.545	24.679	-64.77	-98.39	62.699						
Shareholder's equity (Million $)	1080.92	1073.146	983.683	868.636	880.897						
Return on Equity	-35.206 %	2.300 %	-6.584 %	-11.327 %	7.118 %						

Appendix 74. Crisis - MDC – DCF

Rf	1.78%		Cost of Debt	3.25%		WACC	3.23%		Intrinsic value of equity		2,647.12
RM	3.75%		After tax Cost of Debt	1.95%		Intrinsic value of entity	3,232.03		Intrinsic equity per share		55.07
Beta	1.2890		Market value of equity	880.897		Total Debt	745		Share price		32.71
Cost of Equity	4.321 %					Net Debt	584.905				**Undervalued**
Shares Outstanding million	48.06										
					Forecast Year	1	2	3	4	5	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Revenues (million $)	1,452.4	896.1	957.4	843.1	1,203.0	1,200.9	1,198.7	1,196.6	1,194.5	1,192.4	
Revenue Growth rate		-38.302 %	6.838 %	-11.936 %	42.689 %	-0.178 %	-0.178 %	-0.178 %	-0.178 %	-0.178 %	
EBIT (million $)	-382.14	-107.34	-70.60	-107.47	61.12	61.01	60.90	60.79	60.68	60.57	
EBIT Margin	-26.310%	-11.978%	-7.374%	-12.747%	5.080%	5.080%	5.080%	5.080%	5.080%	5.080%	
Depreciation & Amortization (million $)	**9.2**	**5.4**	**5.8**	**6.4**	**4.8**	**7.2**	**7.2**	**7.2**	**7.1**	**7.1**	
% to revenue	0.634%	0.603%	0.602%	0.756%	0.396%	0.598%	0.598%	0.598%	0.598%	0.598%	
NOPAT (million $)	**-229.28**	**-64.40**	**-42.36**	**-64.48**	**36.67**	**36.60**	**36.54**	**36.47**	**36.41**	**36.34**	
Cash (million $)	1,304.73	1,234.25	572.23	343.36	160.10	81.64	41.64	21.23	10.83	5.52	
Cash growth rate		-5.402%	-53.638%	-39.995%	-53.374%	-49.003%	-49.003%	-49.003%	-49.003%	-49.003%	
Inventories (million $)	657.07	523.2	787.7	806.1	1,002.5	1,078.15	1,159.49	1,246.97	1,341.05	1,442.22	
Inventories growth rate		-20.376%	50.551%	2.335%	24.374%	7.544%	7.544%	7.544%	7.544%	7.544%	
Accounts receivable ($)	17.104	10.056	8.53	21.593	28.163	37.12	48.92	64.48	84.98	112.00	
Accounts receivable growth rate		-41.207%	-15.175%	153.142%	30.427%	31.797%	31.797%	31.797%	31.797%	31.797%	
Accounts payable (million $)	28.79	36.09	35.02	25.65	73.06	106.02	153.85	223.26	324.00	470.18	
Accounts payable growth rate		25.333%	-2.962%	-26.766%	184.870%	45.119%	45.119%	45.119%	45.119%	45.119%	
Accrued expense (million $)	332.83	291.97	260.73	119.19	118.46	95.39	76.82	61.87	49.82	40.12	
Accrued expense growth rate		-12.276%	-10.700%	-54.287%	-0.614%	-19.469%	-19.469%	-19.469%	-19.469%	-19.469%	
Notes payable (million $)	997.53	997.99	1,242.815	744.11	744.84	686.76	633.21	583.83	538.31	496.33	
Notes payable growth rate		0.047%	24.532%	-40.127%	0.099%	-7.798%	-7.798%	-7.798%	-7.798%	-7.798%	
Working capital (million $)	624.247	459.6	-150.5	288.6	247.9	308.7	386.2	463.7	524.7	553.1	
Delta Working capital (million $)		**-164.695**	**-610.1**	**439**	**-40.8**	**60.890**	**77.425**	**77.546**	**61.009**	**28.379**	
Property, plant & Equipment (million $)	38.34	38.42	40.83	36.28	33.13	32.02	30.95	29.91	28.91	27.95	
PP & E growth rate		0.203%	6.260%	-11.142%	-8.689%	-3.342%	-3.342%	-3.342%	-3.342%	-3.342%	
Depreciation (million $)	9.2	5.4	5.8	6.4	4.8	7.2	7.2	7.2	7.1	7.1	
% to revenue	0.634%	0.603%	0.602%	0.756%	0.396%	0.598%	0.598%	0.598%	0.598%	0.598%	
Capital expenditure		**5.5**	**8.2**	**1.8**	**1.6**	**6.1**	**6.1**	**6.1**	**6.1**	**6.2**	
											Terminal Value
Unlevered free cash flow (million $)		**100.22**	**565.30**	**-499.08**	**80.60**	**-23.18**	**-39.82**	**-40.04**	**-23.60**	**8.93**	**3,917.94**
Unlever FCF growth rate			464.08%	-188.29%	-116.15%	-128.76%	71.78%	0.56%	-41.06%	-137.85%	
Discounted to the present FCF (million $)						-22.45	-37.36	-36.39	-20.78	7.62	3,341.39

Appendix 75. Crisis - MDC – RIV

Rf	1.78%		Intrinsic Value per share		51.57					
RM	3.75%		Share price		32.71					
Beta	1.2890				**Undervalued**					
Cost of Equity	4.321 %									
Shares Outstanding (million)	48.06									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Equity per Share ($)	22.489	22.327	20.466	18.072	18.328	17.580	16.807	16.007	15.181	14.331
Dividend per share ($)	1.00	1.00	1.00	1.00	2.00	2.000	2.000	2.000	2.000	2.000
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	100.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	-8.25	0.52	-1.4	-2.12	1.28	1.25	1.23	1.20	1.17	1.15
Earnings per share growth rate		-106.30%	-369.23%	51.43%	-160.38%	-2.12%	-2.12%	-2.12%	-2.12%	-2.12%
Residual income (million $)		-0.45	-2.36	-3.00	0.50	0.46	0.47	0.47	0.48	0.49
Discounted residual income						0.44	0.43	0.42	0.41	0.40
Shareholder's equity (Million $)	1080.92	1073.146	983.683	868.636	880.897					
								Terminal growth rate		Terminal value
								3.00%		31.15

Appendix 76. Crisis - MDC – AEG

Rf	1.78%		Intrinsic Value per share		46.00					
RM	3.75%		Share price		32.71					
Beta	1.2890				**Undervalued**					
Cost of Equity	4.321 %									
Shares Outstanding (million)	48.06									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dividend per share ($)	1.00	1.00	1.00	1.00	2.00	2.000	2.000	2.000	2.000	2.000
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	100.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	-8.25	0.52	-1.4	-2.12	1.28	1.25	1.23	1.20	1.17	1.15
Earnings per share growth rate		-106.30%	-369.23%	51.43%	-160.38%	-2.12%	-2.12%	-2.12%	-2.12%	-2.12%
Abnormal earnings growth ($)						0.00	0.01	0.01	0.01	0.01
Discounted AEG ($)							0.13	0.16	0.19	0.21
								Terminal growth rate		Terminal value
								3.00%		16.33

Appendix 77. Crisis - BZH – DDM

Rf	1.78%		Average Dividend payout			110.662 %		Intrinsic value of equity per share 2007 ($)			-32.48
RM	3.75%		Average RoE			-53.492 %		Share price (31/12/2007)			16.26
Beta	2.2525		Sustainable Growth rate			3.0000%					
Cost of Equity	6.221 %		Terminal Value of future Dividend			-23.949					
			Discounted Terminal Value			-17.711					**Overvalued**
				Forecast year		1	2	3	4	5	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Dividend per share ($)	-20.57	-4.63	-3.45	-13.93	-7.76	-7.764	-4.327	-2.411	-1.344	-0.749	
Dividend per share growth rate (%)		-77.480 %	-25.522 %	303.752 %	-44.270 %	-44.27%	-44.27%	-44.27%	-44.27%	-44.27%	
Discounted future dividend ($)						-7.309	-3.835	-2.012	-1.056	-0.554	
Earnings per share ($)	-20.28	-4.48	-2.47	-13.53	-7.34						
Dividend payout	101.444 %	103.416 %	139.700 %	102.970 %	105.779 %						
Net income (Million $)	-779	-173	-30	-200	-136						
Shareholder's equity (Million $)	375	197	397	198	262						
Return on Equity	-207.733 %	-87.817 %	-7.557 %	-101.010 %	-51.908 %						

Appendix 78. Crisis - BZH – DCF

Rf	1.78%		Cost of Debt	3.25%		WACC	2.59%		Intrinsic value of equity		-12,406.87
RM	3.75%		After tax Cost of Debt	1.95%		Intrinsic value of entity	-11,649.87		Intrinsic equity per share		-669.61
Beta	2.2525		Market value of equity	262		Total Debt	1498.00		Share price		16.26
Cost of Equity	6.221 %					Net Debt	757				**Overvalued**
Shares Outstanding million	18.53										
					Forecast Year	1	2	3	4	5	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	
Revenues (million $)	1,726.0	962.0	991.0	742.0	1,006.0	1,051.2	1,098.4	1,147.7	1,199.2	1,253.0	
Revenue Growth rate		-44.264 %	3.015 %	-25.126 %	35.580 %	4.489 %	4.489 %	4.489 %	4.489 %	4.489 %	
EBIT (million $)	-685.91	-205.42	-82.37	-76.79	-8.28	-107.31	-112.13	-117.17	-122.43	-127.92	
EBIT Margin	-39.740%	-21.353%	-8.312%	-10.349%	-0.823%	-10.209%	-10.209%	-10.209%	-10.209%	-10.209%	
Depreciation & Amortization (million $)	**40.3**	**30.7**	**24.8**	**17.9**	**17.6**	**25.6**	**26.8**	**28.0**	**29.2**	**30.5**	
% to revenue	2.333%	3.194%	2.500%	2.409%	1.747%	2.437%	2.437%	2.437%	2.437%	2.437%	
NOPAT (million $)	**-411.54**	**-123.25**	**-49.42**	**-46.08**	**-4.97**	**-64.39**	**-67.28**	**-70.30**	**-73.46**	**-76.75**	
Cash (million $)	585.00	557.00	576.00	647.00	741.00	768.05	796.09	825.15	855.27	886.49	
Cash growth rate		-4.786%	3.411%	12.326%	14.529%	3.650%	3.650%	3.650%	3.650%	3.650%	
Inventories (million $)	1,652.00	1,318.0	1,204.0	1,204.0	1,112.0	1,010.51	918.28	834.46	758.30	689.09	
Inventories growth rate		-20.218%	-8.649%	0.000%	-7.641%	-9.127%	-9.127%	-9.127%	-9.127%	-9.127%	
Accounts receivable ($)	46.555	28.405	32.647	28.303	24.599	21.50	18.79	16.42	14.35	12.54	
Accounts receivable growth rate		-38.986%	14.934%	-13.306%	-13.087%	-12.611%	-12.611%	-12.611%	-12.611%	-12.611%	
Accounts payable (million $)	90.37	70.29	53.42	72.70	69.27	66.70	64.22	61.84	59.54	57.33	
Accounts payable growth rate		-22.226%	-23.998%	36.087%	-4.714%	-3.713%	-3.713%	-3.713%	-3.713%	-3.713%	
Accrued expense (million $)	40.88	30.10	25.82	17.92	15.48	12.20	9.61	7.57	5.97	4.70	
Accrued expense growth rate		-26.373%	-14.216%	-30.615%	-13.614%	-21.204%	-21.204%	-21.204%	-21.204%	-21.204%	
Notes payable (million $)	1,522.44	1,362.90	1,095.783	1,132.15	1,201.07	1,160.26	1,120.84	1,082.75	1,045.96	1,010.42	
Notes payable growth rate		-10.479%	-19.599%	3.319%	6.087%	-3.398%	-3.398%	-3.398%	-3.398%	-3.398%	
Working capital (million $)	611.615	436.3	629.6	652.8	595.5	560.9	538.5	523.9	516.4	515.7	
Delta Working capital (million $)		**-175.303**	**193.3**	**23**	**-57.3**	**-34.588**	**-22.420**	**-14.616**	**-7.421**	**-0.785**	
Property, plant & Equipment (million $)	39.82	25.94	24.00	22.61	18.97	15.93	13.37	11.22	9.42	7.91	
PP & E growth rate		-34.863%	-7.495%	-5.760%	-16.093%	-16.052%	-16.052%	-16.052%	-16.052%	-16.052%	
Depreciation (million $)	40.3	30.7	24.8	17.9	17.6	25.6	26.8	28.0	29.2	30.5	
% to revenue	2.333%	3.194%	2.500%	2.409%	1.747%	2.437%	2.437%	2.437%	2.437%	2.437%	
Capital expenditure		**16.8**	**22.8**	**16.5**	**13.9**	**22.6**	**24.2**	**25.8**	**27.4**	**29.0**	
											Terminal Value
Unlevered free cash flow (million $)		**65.94**	**-240.74**	**-67.95**	**56.02**	**-26.75**	**-42.30**	**-53.54**	**-64.23**	**-74.46**	**-12,964.03**
Unlever FCF growth rate			-465.11%	-71.77%	-182.44%	-147.76%	58.11%	26.56%	19.98%	15.92%	
Discounted to the present FCF (million $)						-26.08	-40.20	-49.59	-58.00	-65.53	-11,410.47

Appendix 79. Crisis - BZH – RIV

Rf	1.78%		Intrinsic Value per share		-26.08					
RM	3.75%		Share price		16.26					
Beta	2.2525				**Overvalued**					
Cost of Equity	6.221 %									
Shares Outstanding (million)	18.53									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Equity per Share ($)	20.239	10.632	21.426	10.686	14.140	18.491	21.230	22.903	23.904	24.493
Dividend per share ($)	-20.57	-4.63	-3.45	-13.93	-7.76	-7.764	-4.327	-2.411	-1.344	-0.749
Dividend per share growth rate (%)		-77.480 %	-25.522 %	303.752 %	-44.270 %	-44.27%	-44.27%	-44.27%	-44.27%	-44.27%
Earnings per share ($)	-20.28	-4.48	-2.47	-13.53	-7.34	-3.41	-1.59	-0.74	-0.34	-0.16
Earnings per share growth rate		-77.91%	-44.87%	447.77%	-45.75%	-53.49%	-53.49%	-53.49%	-53.49%	-53.49%
Residual income (million $)		-5.74	-3.13	-14.86	-8.00	-4.29	-2.74	-2.06	-1.77	-1.65
Discounted residual income						-4.04	-2.43	-1.72	-1.39	-1.22
Shareholder's equity (Million $)	375	197	397	198	262					
								Terminal growth rate		Terminal value
								2.00%		-29.43

Appendix 80. Crisis - BZH – AEG

Rf	1.78%		Intrinsic Value per share		20.83					
RM	3.75%		Share price		16.26					
Beta	2.2525				**Undervalued**					
Cost of Equity	6.221 %									
Shares Outstanding (million)	18.53									
				Forecast year		1	2	3	4	5
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Dividend per share ($)	-20.57	-4.63	-3.45	-13.93	-7.76	-7.764	-4.327	-2.411	-1.344	-0.749
Dividend per share growth rate (%)		-77.480 %	-25.522 %	303.752 %	-44.270 %	-44.27%	-44.27%	-44.27%	-44.27%	-44.27%
Earnings per share ($)	-20.28	-4.48	-2.47	-13.53	-7.34	-3.41	-1.59	-0.74	-0.34	-0.16
Earnings per share growth rate		-77.91%	-44.87%	447.77%	-45.75%	-53.49%	-53.49%	-53.49%	-53.49%	-53.49%
Abnormal earnings growth ($)						3.90	1.56	0.68	0.29	0.12
Discounted AEG ($)							23.54	9.67	3.90	1.53
								Terminal growth rate		Terminal value
								2.00%		37.06

Appendix 81. Post-crisis - DHI – DDM

Rf	2.40%		Average Dividend payout			12.748 %		Intrinsic value of equity per share 2007 ($)			9.71
RM	18.75%		Average RoE			12.108 %		Share price (31/12/2017)			51.07
Beta	1.3745		Sustainable Growth rate			10.5649%					
Cost of Equity	24.873 %		Terminal Value of future Dividend			19.771					
			Discounted Terminal Value			6.512					**Overvalued**
				Forecast year		1	2	3	4	5	
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Dividend per share ($)	0.1875	0.1375	0.25	0.32	0.4	0.580	0.840	1.218	1.765	2.559	
Dividend per share growth rate (%)		-26.667 %	81.818 %	28.000 %	25.000 %	44.94%	44.94%	44.94%	44.94%	44.94%	
Discounted future dividend ($)						0.464	0.539	0.625	0.726	0.843	
Earnings per share ($)	1.33	1.5	2.03	2.36	2.74						
Dividend payout	14.098 %	9.167 %	12.315 %	13.559 %	14.599 %						
Net income (Million $)	462.7	533.5	750.7	866.3	1038.4						
Shareholder's equity (Million $)	4061.4	5199.7	5895.4	6793	7747.6						
Return on Equity	11.393 %	10.260 %	12.734 %	12.753 %	13.403 %						

Appendix 82. Post-crisis - DHI – DCF

Rf	2.40%		Cost of Debt	3.52%		WACC	18.67%		Intrinsic value of equity		5,526.93
RM	18.75%		After tax Cost of Debt	2.11%		Intrinsic value of entity	7,419.13		Intrinsic equity per share		14.74
Beta	1.3745		Market value of equity	7747.6		Total Debt	2900		Share price		51.07
Cost of Equity	24.873 %					Net Debt	1892.2				**Overvalued**
Shares Outstanding million	375.00										
					Forecast Year	1	2	3	4	5	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Revenues (million $)	6,259.3	8,024.9	10,824.0	12,157.4	14,091.0	17,307.7	21,258.6	26,111.5	32,072.2	39,393.7	
Revenue Growth rate		28.208 %	34.880 %	12.319 %	15.905 %	22.828 %	22.828 %	22.828 %	22.828 %	22.828 %	
EBIT (million $)	657.80	814.20	1,123.40	1,353.50	1,602.10	1,861.77	2,286.77	2,808.79	3,449.97	4,237.53	
EBIT Margin	10.509%	10.146%	10.379%	11.133%	11.370%	10.757%	10.757%	10.757%	10.757%	10.757%	
Depreciation & Amortization (million $)	**22.7**	**38.4**	**54.1**	**61.0**	**54.7**	**77.2**	**94.9**	**116.5**	**143.1**	**175.8**	
% to revenue	0.363%	0.479%	0.500%	0.502%	0.388%	0.446%	0.446%	0.446%	0.446%	0.446%	
NOPAT (million $)	**394.68**	**488.52**	**674.04**	**812.10**	**961.26**	**1,117.06**	**1,372.06**	**1,685.27**	**2,069.98**	**2,542.52**	
Cash (million $)	977.40	661.80	1,383.80	1,303.20	1,007.80	1,129.53	1,265.96	1,418.87	1,590.26	1,782.34	
Cash growth rate		-32.290%	109.096%	-5.825%	-22.667%	12.079%	12.079%	12.079%	12.079%	12.079%	
Inventories (million $)	6,197.40	7,700.5	7,807.0	8,340.9	9,327.1	9,950.32	10,615.18	11,324.47	12,081.15	12,888.38	
Inventories growth rate		24.254%	1.383%	6.839%	11.824%	6.682%	6.682%	6.682%	6.682%	6.682%	
Accounts receivable ($)	24.1	38.6	49.2	35.9	38.3	44.74	52.27	61.06	71.33	83.33	
Accounts receivable growth rate		60.166%	27.461%	-27.033%	6.685%	16.820%	16.820%	16.820%	16.820%	16.820%	
Accounts payable (million $)	346.40	480.30	473.00	537.00	575.60	612.44	651.63	693.33	737.70	784.91	
Accounts payable growth rate		38.655%	-1.520%	13.531%	7.188%	6.400%	6.400%	6.400%	6.400%	6.400%	
Accrued expense (million $)	886.00	875.00	929.20	917.10	933.10	945.69	958.44	971.37	984.47	997.75	
Accrued expense growth rate		-1.242%	6.194%	-1.302%	1.745%	1.349%	1.349%	1.349%	1.349%	1.349%	
Notes payable (million $)	3,491.00	3,665.70	3,811.500	3,271.30	2,871.60	2,821.91	2,773.08	2,725.09	2,677.94	2,631.60	
Notes payable growth rate		5.004%	3.977%	-14.173%	-12.218%	-1.730%	-1.730%	-1.730%	-1.730%	-1.730%	
Working capital (million $)	2,487.300	3,379.6	4,015.4	4,957.0	5,990.5	6,744.6	7,550.3	8,414.6	9,342.6	10,339.8	
Delta Working capital (million $)		**892.300**	**635.8**	**942**	**1,033.5**	**754.058**	**805.701**	**864.345**	**928.013**	**997.169**	
Property, plant & Equipment (million $)	106.70	190.80	144.00	139.50	194.40	201.98	209.86	218.05	226.55	235.39	
PP & E growth rate		78.819%	-24.528%	-3.125%	39.355%	3.901%	3.901%	3.901%	3.901%	3.901%	
Depreciation (million $)	22.7	38.4	54.1	61.0	54.7	77.2	94.9	116.5	143.1	175.8	
% to revenue	0.363%	0.479%	0.500%	0.502%	0.388%	0.446%	0.446%	0.446%	0.446%	0.446%	
Capital expenditure		**122.5**	**7.3**	**56.5**	**109.6**	**84.8**	**102.7**	**124.7**	**151.6**	**184.6**	
											Terminal Value
Unlevered free cash flow (million $)		**-487.88**	**85.04**	**-125.00**	**-127.14**	**355.42**	**558.48**	**812.74**	**1,133.47**	**1,536.51**	**11,798.73**
Unlever FCF growth rate			-117.43%	-246.99%	1.71%	-379.55%	57.13%	45.53%	39.46%	35.56%	
Discounted to the present FCF (million $)						299.49	396.55	486.28	571.46	652.77	5,012.58

Appendix 83. Post-crisis - DHI – RIV

Rf	2.40%		Intrinsic Value per share		12.46					
RM	18.75%		Share price		51.07					
Beta	1.3745				**Overvalued**					
Cost of Equity	24.873 %									
Shares Outstanding (million)	375.00									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Equity per Share ($)	10.830	13.866	15.721	18.115	20.660	23.488	26.769	30.543	34.835	39.640
Dividend per share ($)	0.19	0.14	0.25	0.32	0.40	0.464	0.672	0.974	1.412	2.047
Dividend per share growth rate (%)		-26.667 %	81.818 %	28.000 %	25.000 %	44.94%	44.94%	44.94%	44.94%	44.94%
Earnings per share ($)	1.33	1.5	2.03	2.36	2.74	3.29	3.95	4.75	5.70	6.85
Earnings per share growth rate		12.78%	35.33%	16.26%	16.10%	20.12%	20.12%	20.12%	20.12%	20.12%
Residual income (million $)		-1.19	-1.42	-1.55	-1.77	-1.85	-1.89	-1.91	-1.89	-1.81
Discounted residual income						-1.48	-1.21	-0.98	-0.78	-0.60
Shareholder's equity (Million $)	4061.4	5199.7	5895.4	6793	7747.6					
								Terminal growth rate		Terminal value
								5.00%		-3.15

Appendix 84. Post-crisis - DHI – AEG

Rf	2.40%		Intrinsic Value per share		13.91					
RM	18.75%		Share price		51.07					
Beta	1.3745				**Overvalued**					
Cost of Equity	24.873 %									
Shares Outstanding (million)	375.00									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Dividend per share ($)	0.19	0.14	0.25	0.32	0.40	0.464	0.672	0.974	1.412	2.047
Dividend per share growth rate (%)		-26.667 %	81.818 %	28.000 %	25.000 %	44.94%	44.94%	44.94%	44.94%	44.94%
Earnings per share ($)	1.33	1.5	2.03	2.36	2.74	3.29	3.95	4.75	5.70	6.85
Earnings per share growth rate		12.78%	35.33%	16.26%	16.10%	20.12%	20.12%	20.12%	20.12%	20.12%
Abnormal earnings growth ($)						-0.03	-0.04	-0.02	0.02	0.08
Discounted AEG ($)							-0.13	-0.05	0.03	0.13
								Terminal growth rate		Terminal value
								5.00%		0.70

Appendix 85. Post-crisis - LEN – DDM

Rf	2.40%		Average Dividend payout			5.407 %		Intrinsic value of equity per share 2007 ($)			1.00
RM	18.75%		Average RoE			12.446 %		Share price (31/12/2017)			63.24
Beta	1.2717		Sustainable Growth rate			11.7728%					
Cost of Equity	23.192 %		Terminal Value of future Dividend			1.566					
			Discounted Terminal Value			0.552					**Overvalued**
				Forecast year		1	2	3	4	5	
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Dividend per share ($)	0.16	0.16	0.16	0.16	0.16	0.160	0.160	0.160	0.160	0.160	
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%	
Discounted future dividend ($)						0.130	0.105	0.086	0.069	0.056	
Earnings per share ($)	2.1	2.75	3.39	3.86	3.38						
Dividend payout	7.619 %	5.818 %	4.720 %	4.145 %	4.734 %						
Net income (Million $)	479.674	638.916	802.894	911.844	810.48						
Shareholder's equity (Million $)	4168.901	4827.02	5648.944	7026.042	7872.317						
Return on Equity	11.506 %	13.236 %	14.213 %	12.978 %	10.295 %						

Appendix 86. Post-crisis - LEN – DCF

Rf	2.40%		Cost of Debt	3.52%		WACC	13.73%		Intrinsic value of equity		6,362.67
RM	18.75%		After tax Cost of Debt	2.11%		Intrinsic value of entity	10,489.75		Intrinsic equity per share		26.52
Beta	1.2717		Market value of equity	7872.317		Total Debt	6410.003		Share price		63.24
Cost of Equity	23.192 %					Net Debt	4127.078				**Overvalued**
Shares Outstanding million	239.96										
					Forecast Year	1	2	3	4	5	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Revenues (million $)	5,354.9	7,025.1	8,466.9	9,741.3	11,200.2	13,489.0	16,245.6	19,565.4	23,563.6	28,378.9	
Revenue Growth rate		31.190 %	20.524 %	15.051 %	14.976 %	20.435 %	20.435 %	20.435 %	20.435 %	20.435 %	
EBIT (million $)	733.08	1,033.72	1,271.64	1,344.93	1,269.04	1,850.37	2,228.50	2,683.90	3,232.36	3,892.91	
EBIT Margin	13.690%	14.715%	15.019%	13.806%	11.330%	13.718%	13.718%	13.718%	13.718%	13.718%	
Depreciation & Amortization (million $)	**30.3**	**38.5**	**43.7**	**50.2**	**66.3**	**73.9**	**89.0**	**107.2**	**129.1**	**155.4**	
% to revenue	0.567%	0.549%	0.516%	0.516%	0.592%	0.548%	0.548%	0.548%	0.548%	0.548%	
NOPAT (million $)	**439.85**	**620.23**	**762.98**	**806.96**	**761.42**	**1,110.22**	**1,337.10**	**1,610.34**	**1,939.42**	**2,335.74**	
Cash (million $)	695.42	885.73	893.41	1,050.14	2,282.93	2,622.34	3,012.21	3,460.05	3,974.48	4,565.38	
Cash growth rate		27.365%	0.867%	17.543%	117.393%	14.867%	14.867%	14.867%	14.867%	14.867%	
Inventories (million $)	6,601.05	7,736.6	8,740.6	9,178.9	10,860.9	12,160.70	13,616.07	15,245.62	17,070.19	19,113.12	
Inventories growth rate		17.203%	12.977%	5.015%	18.324%	11.968%	11.968%	11.968%	11.968%	11.968%	
Accounts receivable ($)	51.935	93.444	74.538	106.976	137.667	183.06	243.43	323.70	430.44	572.38	
Accounts receivable growth rate		79.925%	-20.232%	43.519%	28.690%	32.975%	32.975%	32.975%	32.975%	32.975%	
Accounts payable (million $)	271.37	412.56	475.91	478.55	604.95	747.65	924.02	1,141.98	1,411.36	1,744.28	
Accounts payable growth rate		52.031%	15.356%	0.554%	26.415%	23.589%	23.589%	23.589%	23.589%	23.589%	
Accrued expense (million $)	19.10	31.50	65.15	45.97	49.72	68.43	94.16	129.58	178.33	245.40	
Accrued expense growth rate		64.921%	106.810%	-29.430%	8.157%	37.615%	37.615%	37.615%	37.615%	37.615%	
Notes payable (million $)	4,194.43	4,690.21	5,025.130	4,575.98	6,410.00	7,212.89	8,116.34	9,132.95	10,276.90	11,564.14	
Notes payable growth rate		11.820%	7.141%	-8.938%	40.079%	12.526%	12.526%	12.526%	12.526%	12.526%	
Working capital (million $)	2,918.551	3,625.7	4,205.5	5,266.2	6,186.1	6,937.1	7,737.2	8,624.9	9,608.5	10,697.1	
Delta Working capital (million $)		**707.174**	**579.8**	**1,061**	**919.9**	**751.023**	**800.060**	**887.662**	**983.661**	**1,088.539**	
Property, plant & Equipment (million $)	428.99	255.80	153.72	139.50	194.40	170.02	148.69	130.04	113.73	99.46	
PP & E growth rate		-40.373%	-39.906%	-9.249%	39.355%	-12.543%	-12.543%	-12.543%	-12.543%	-12.543%	
Depreciation (million $)	30.3	38.5	43.7	50.2	66.3	73.9	89.0	107.2	129.1	155.4	
% to revenue	0.567%	0.549%	0.516%	0.516%	0.592%	0.548%	0.548%	0.548%	0.548%	0.548%	
Capital expenditure		**-134.7**	**-58.4**	**36.0**	**121.2**	**49.5**	**67.7**	**88.5**	**112.8**	**141.2**	
											Terminal Value
Unlevered free cash flow (million $)		**86.25**	**285.30**	**-239.57**	**-213.35**	**383.59**	**558.37**	**741.33**	**972.07**	**1,261.47**	**15,170.78**
Unlever FCF growth rate			230.77%	-183.97%	-10.94%	-279.79%	45.57%	32.77%	31.12%	29.77%	
Discounted to the present FCF (million $)						337.27	431.68	503.94	581.01	662.96	7,972.89

Appendix 87. Post-crisis - LEN – RIV

Rf	2.40%		Intrinsic Value per share		9.83					
RM	18.75%		Share price		63.24					
Beta	1.2717				**Overvalued**					
Cost of Equity	23.192 %									
Shares Outstanding (million)	239.96									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Equity per Share ($)	16.925	21.669	24.568	28.308	32.287	35.977	40.203	45.039	50.570	56.894
Dividend per share ($)	0.16	0.16	0.16	0.16	0.16	0.160	0.160	0.160	0.160	0.160
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	2.1	2.75	3.39	3.86	3.38	3.85	4.39	5.00	5.69	6.48
Earnings per share growth rate		30.95%	23.27%	13.86%	-12.44%	13.91%	13.91%	13.91%	13.91%	13.91%
Residual income (million $)		-1.18	-1.64	-1.84	-3.19	-3.64	-3.96	-4.33	-4.75	-5.24
Discounted residual income						-2.95	-2.61	-2.31	-2.06	-1.85
Shareholder's equity (Million $)	4061.4	5199.7	5895.4	6793	7747.6					
								Terminal growth rate		Terminal value
								5.00%		-10.67

Appendix 88. Post-crisis - LEN – AEG

Rf	2.40%		Intrinsic Value per share		7.22					
RM	18.75%		Share price		63.24					
Beta	1.2717				**Overvalued**					
Cost of Equity	23.192 %									
Shares Outstanding (million)	239.96									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Dividend per share ($)	0.16	0.16	0.16	0.16	0.16	0.160	0.160	0.160	0.160	0.160
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	2.1	2.75	3.39	3.86	3.38	3.85	4.39	5.00	5.69	6.48
Earnings per share growth rate		30.95%	23.27%	13.86%	-12.44%	13.91%	13.91%	13.91%	13.91%	13.91%
Abnormal earnings growth ($)						-0.28	-0.32	-0.37	-0.43	-0.49
Discounted AEG ($)							-1.12	-1.05	-0.98	-0.92
								Terminal growth rate		Terminal value
								5.00%		-5.31

Appendix 89. Post-crisis - PHM – DDM

Rf	2.40%		Average Dividend payout			18.064 %		Intrinsic value of equity per share 2007 ($)			4.56
RM	18.75%		Average RoE			20.063 %		Share price (31/12/2017)			33.25
Beta	1.6527		Sustainable Growth rate			16.4386%					
Cost of Equity	29.421 %		Terminal Value of future Dividend			10.449					
			Discounted Terminal Value			2.878					**Overvalued**
				Forecast year		1	2	3	4	5	
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Dividend per share ($)	0.15	0.23	0.33	0.36	0.36	0.455	0.576	0.728	0.921	1.165	
Dividend per share growth rate (%)		53.333 %	43.478 %	9.091 %	0.000 %	26.48%	26.48%	26.48%	26.48%	26.48%	
Discounted future dividend ($)						0.352	0.344	0.336	0.328	0.321	
Earnings per share ($)	6.72	1.26	1.36	1.75	1.44						
Dividend payout	2.232 %	18.254 %	24.265 %	20.571 %	25.000 %						
Net income (Million $)	2620.116	474.338	494.09	602.703	447.221						
Shareholder's equity (Million $)	4648.952	4804.954	4759.325	4659.363	4154.026						
Return on Equity	56.359 %	9.872 %	10.382 %	12.935 %	10.766 %						

Appendix 90. Post-crisis - PHM – DCF

Rf	2.40%		Cost of Debt	3.52%		WACC	17.95%		Intrinsic value of equity		5,412.37
RM	18.75%		After tax Cost of Debt	2.11%		Intrinsic value of entity	8,147.78		Intrinsic equity per share		17.64
Beta	1.6527		Market value of equity	4154.026		Total Debt	3008.09		Share price		33.25
Cost of Equity	29.421 %					Net Debt	2735.40				**Overvalued**
Shares Outstanding million	306.81										
					Forecast Year	1	2	3	4	5	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Revenues (million $)	5,679.6	5,822.4	5,982.0	7,668.5	8,573.3	9,543.0	10,622.5	11,824.1	13,161.6	14,650.4	
Revenue Growth rate		2.514 %	2.741 %	28.193 %	11.799 %	11.312 %	11.312 %	11.312 %	11.312 %	11.312 %	
EBIT (million $)	527.82	689.76	816.02	933.85	938.84	1,159.88	1,291.08	1,437.12	1,599.68	1,780.63	
EBIT Margin	9.293%	11.847%	13.641%	12.178%	10.951%	12.154%	12.154%	12.154%	12.154%	12.154%	
Depreciation & Amortization (million $)	**31.6**	**39.9**	**46.2**	**54.0**	**51.0**	**63.2**	**70.4**	**78.3**	**87.2**	**97.1**	
% to revenue	0.556%	0.685%	0.773%	0.704%	0.595%	0.663%	0.663%	0.663%	0.663%	0.663%	
NOPAT (million $)	**316.69**	**413.85**	**489.61**	**560.31**	**563.30**	**695.93**	**774.65**	**862.27**	**959.81**	**1,068.38**	
Cash (million $)	1,580.33	1,292.86	754.16	698.88	272.68	185.31	125.93	85.58	58.16	39.52	
Cash growth rate		-18.190%	-41.667%	-7.330%	-60.983%	-32.043%	-32.043%	-32.043%	-32.043%	-32.043%	
Inventories (million $)	3,978.56	4,392.1	5,450.1	6,770.7	7,147.1	8,115.74	9,215.61	10,464.54	11,882.74	13,493.13	
Inventories growth rate		10.394%	24.088%	24.231%	5.560%	13.552%	13.552%	13.552%	13.552%	13.552%	
Accounts receivable ($)	137.428	155.164	241.635	427.169	306.484	396.26	512.33	662.39	856.41	1107.27	
Accounts receivable growth rate		12.906%	55.729%	76.783%	-28.252%	29.291%	29.291%	29.291%	29.291%	29.291%	
Accounts payable (million $)	202.74	270.52	327.73	405.46	393.82	468.08	556.34	661.25	785.94	934.15	
Accounts payable growth rate		33.433%	21.148%	23.718%	-2.871%	18.857%	18.857%	18.857%	18.857%	18.857%	
Accrued expense (million $)	1,377.75	1,343.77	1,284.27	1,429.71	1,356.33	1,364.31	1,372.33	1,380.40	1,388.52	1,396.69	
Accrued expense growth rate		-2.466%	-4.428%	11.325%	-5.132%	0.588%	0.588%	0.588%	0.588%	0.588%	
Notes payable (million $)	2,058.17	1,818.56	1,584.769	3,129.30	3,006.97	3,815.80	4,842.19	6,144.68	7,797.51	9,894.92	
Notes payable growth rate		-11.642%	-12.856%	97.461%	-3.909%	26.899%	26.899%	26.899%	26.899%	26.899%	
Working capital (million $)	2,347.405	2,558.6	3,313.9	2,811.6	3,089.9	3,049.1	3,083.0	3,026.2	2,825.3	2,414.2	
Delta Working capital (million $)		**211.190**	**755.3**	**-502**	**278.3**	**-40.751**	**33.882**	**-56.812**	**-200.845**	**-411.177**	
Property, plant & Equipment (million $)	53.10	86.30	75.20	77.40	70.70	78.46	87.08	96.65	107.26	119.04	
PP & E growth rate		62.524%	-12.862%	2.926%	-8.656%	10.983%	10.983%	10.983%	10.983%	10.983%	
Depreciation (million $)	31.6	39.9	46.2	54.0	51.0	63.2	70.4	78.3	87.2	97.1	
% to revenue	0.556%	0.685%	0.773%	0.704%	0.595%	0.663%	0.663%	0.663%	0.663%	0.663%	
Capital expenditure		**73.1**	**35.1**	**56.2**	**44.3**	**71.0**	**79.0**	**87.9**	**97.8**	**108.8**	
											Terminal Value
Unlevered free cash flow (million $)		**169.46**	**-254.63**	**1,060.49**	**291.69**	**728.91**	**732.15**	**909.52**	**1,150.04**	**1,467.78**	**11,899.73**
Unlever FCF growth rate			-250.25%	-516.49%	-72.49%	149.89%	0.44%	24.23%	26.44%	27.63%	
Discounted to the present FCF (million $)						617.98	526.25	554.25	594.16	642.91	5,212.24

Appendix 91. Post-crisis - PHM – RIV

Rf	2.40%		Intrinsic Value per share		3.93					
RM	18.75%		Share price		33.25					
Beta	1.6527				**Overvalued**					
Cost of Equity	29.421 %									
Shares Outstanding (million)	306.81									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Equity per Share ($)	13.237	16.947	19.215	22.140	25.252	26.500	27.940	29.596	31.496	33.668
Dividend per share ($)	0.15	0.23	0.33	0.36	0.36	0.455	0.576	0.728	0.921	1.165
Dividend per share growth rate (%)		53.333 %	43.478 %	9.091 %	0.000 %	26.48%	26.48%	26.48%	26.48%	26.48%
Earnings per share ($)	6.72	1.26	1.36	1.75	1.44	1.70	2.02	2.38	2.82	3.34
Earnings per share growth rate		-81.25%	7.94%	28.68%	-17.71%	18.31%	18.31%	18.31%	18.31%	18.31%
Residual income (million $)		-2.63	-3.63	-3.90	-5.07	-5.73	-5.78	-5.84	-5.89	-5.93
Discounted residual income						-4.42	-3.45	-2.69	-2.10	-1.63
Shareholder's equity (Million $)	4061.4	5199.7	5895.4	6793	7747.6					
								Terminal growth rate		Terminal value
								5.00%		-7.02

Appendix 92. Post-crisis - PHM – AEG

Rf	2.40%		Intrinsic Value per share		5.18					
RM	18.75%		Share price		33.25					
Beta	1.6527				**Overvalued**					
Cost of Equity	29.421 %									
Shares Outstanding (million)	306.81									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Dividend per share ($)	0.15	0.23	0.33	0.36	0.36	0.455	0.576	0.728	0.921	1.165
Dividend per share growth rate (%)		53.333 %	43.478 %	9.091 %	0.000 %	26.48%	26.48%	26.48%	26.48%	26.48%
Earnings per share ($)	6.72	1.26	1.36	1.75	1.44	1.70	2.02	2.38	2.82	3.34
Earnings per share growth rate		-81.25%	7.94%	28.68%	-17.71%	18.31%	18.31%	18.31%	18.31%	18.31%
Abnormal earnings growth ($)						-0.05	-0.06	-0.05	-0.05	-0.04
Discounted AEG ($)							-0.15	-0.11	-0.08	-0.05
								Terminal growth rate		Terminal value
								5.00%		-0.22

Appendix 93. Post-crisis - NVR – DDM

Rf	2.40%		Average Dividend payout			81.984 %		Intrinsic value of equity per share 2007 ($)			2,998.36
RM	18.75%		Average RoE			28.632 %		Share price (31/12/2007)			3508.22
Beta	0.7001		Sustainable Growth rate			5.0000%					
Cost of Equity	13.847 %		Terminal Value of future Dividend			4275.398					
			Discounted Terminal Value			2235.503					**Overvalued**
				Forecast year		1	2	3	4	5	
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Dividend per share ($)	41.84	50.83	75.43	87.72	107.84	137.256	174.699	222.356	283.014	360.219	
Dividend per share growth rate (%)		21.482 %	48.409 %	16.293 %	22.935 %	27.28%	27.28%	27.28%	27.28%	27.28%	
Discounted future dividend ($)						120.562	134.787	150.691	168.471	188.350	
Earnings per share ($)	54.81	63.5	89.99	103.61	126.77						
Dividend payout	76.333 %	80.040 %	83.820 %	84.663 %	85.066 %						
Net income (Million $)	266.477	281.63	382.927	425.262	537.521						
Shareholder's equity (Million $)	1261.352	1124.255	1239.165	1304.441	1605.492						
Return on Equity	21.126 %	25.050 %	30.902 %	32.601 %	33.480 %						

Appendix 94. Post-crisis - NVR – DCF

Rf	2.40%		Cost of Debt	3.52%		WACC	10.65%		Intrinsic value of equity		6,274.36
RM	18.75%		After tax Cost of Debt	2.11%		Intrinsic value of entity	6,229.27		Intrinsic equity per share		1,479.80
Beta	0.7001		Market value of equity	1605.492		Total Debt	600		Share price		3508.22
Cost of Equity	13.847 %					Net Debt	-45.087				**Overvalued**
Shares Outstanding million	4.24										
					Forecast Year	1	2	3	4	5	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Revenues (million $)	4,134.5	4,375.1	5,065.2	5,709.2	6,175.5	6,831.3	7,556.7	8,359.1	9,246.8	10,228.7	
Revenue Growth rate		5.819 %	15.774 %	12.715 %	8.167 %	10.619 %	10.619 %	10.619 %	10.619 %	10.619 %	
EBIT (million $)	379.37	427.88	555.33	601.10	776.37	748.78	828.29	916.24	1,013.54	1,121.17	
EBIT Margin	9.176%	9.780%	10.964%	10.529%	12.572%	10.961%	10.961%	10.961%	10.961%	10.961%	
Depreciation & Amortization (million $)	**13.4**	**17.6**	**21.5**	**22.3**	**22.7**	**26.1**	**28.8**	**31.9**	**35.3**	**39.0**	
% to revenue	0.324%	0.403%	0.425%	0.390%	0.367%	0.382%	0.382%	0.382%	0.382%	0.382%	
NOPAT (million $)	**227.62**	**256.73**	**333.20**	**360.66**	**465.82**	**449.27**	**496.97**	**549.75**	**608.12**	**672.70**	
Cash (million $)	844.27	514.78	397.52	375.75	645.09	652.18	659.35	666.60	673.93	681.34	
Cash growth rate		-39.027%	-22.778%	-5.477%	71.681%	1.100%	1.100%	1.100%	1.100%	1.100%	
Inventories (million $)	738.57	869.5	1,006.5	1,092.1	1,246.2	1,405.60	1,585.39	1,788.18	2,016.91	2,274.90	
Inventories growth rate		17.726%	15.761%	8.502%	14.110%	12.791%	12.791%	12.791%	12.791%	12.791%	
Accounts receivable ($)	9.529	10.021	11.482	18.937	20.026	24.55	30.10	36.91	45.25	55.48	
Accounts receivable growth rate		5.163%	14.579%	64.928%	5.751%	22.605%	22.605%	22.605%	22.605%	22.605%	
Accounts payable (million $)	181.69	204.62	227.44	251.21	261.97	287.19	314.84	345.16	378.39	414.82	
Accounts payable growth rate		12.623%	11.150%	10.453%	4.284%	9.628%	9.628%	9.628%	9.628%	9.628%	
Accrued expense (million $)	316.23	289.06	304.92	337.20	341.89	349.48	357.23	365.15	373.25	381.53	
Accrued expense growth rate		-8.592%	5.488%	10.586%	1.391%	2.218%	2.218%	2.218%	2.218%	2.218%	
Notes payable (million $)	599.08	599.17	599.260	596.46	597.07	596.57	596.07	595.57	595.07	594.57	
Notes payable growth rate		0.015%	0.016%	-0.468%	0.102%	-0.084%	-0.084%	-0.084%	-0.084%	-0.084%	
Working capital (million $)	504.787	311.4	292.5	303.0	709.3	849.1	1,006.7	1,185.8	1,389.4	1,620.8	
Delta Working capital (million $)		**-193.341**	**-19.0**	**11**	**406.3**	**139.805**	**157.610**	**179.106**	**203.569**	**231.413**	
Property, plant & Equipment (million $)	32.60	46.24	44.56	45.92	43.19	47.00	51.16	55.67	60.59	65.94	
PP & E growth rate		41.851%	-3.635%	3.039%	-5.933%	8.830%	8.830%	8.830%	8.830%	8.830%	
Depreciation (million $)	13.4	17.6	21.5	22.3	22.7	26.1	28.8	31.9	35.3	39.0	
% to revenue	0.324%	0.403%	0.425%	0.390%	0.367%	0.382%	0.382%	0.382%	0.382%	0.382%	
Capital expenditure		**31.3**	**19.9**	**23.6**	**19.9**	**29.9**	**33.0**	**36.4**	**40.2**	**44.4**	
											Terminal Value
Unlevered free cash flow (million $)		**436.43**	**353.87**	**348.76**	**62.26**	**305.65**	**335.21**	**366.12**	**399.64**	**435.94**	**8,095.36**
Unlever FCF growth rate			-18.92%	-1.45%	-82.15%	390.92%	9.67%	9.22%	9.15%	9.08%	
Discounted to the present FCF (million $)						276.22	273.77	270.22	266.56	262.77	4,879.73

Appendix 95. Post-crisis - NVR – RIV

Rf	2.40%		Intrinsic Value per share		2741.66					
RM	18.75%		Share price		3508.22					
Beta	0.7001				**Overvalued**					
Cost of Equity	13.847 %									
Shares Outstanding (million)	4.24									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Equity per Share ($)	297.489	265.154	292.256	307.651	378.654	423.901	475.978	535.436	602.666	677.782
Dividend per share ($)	41.84	50.83	75.43	87.72	107.84	111.649	142.106	180.873	230.214	293.016
Dividend per share growth rate (%)		21.482 %	48.409 %	16.293 %	22.935 %	27.28%	27.28%	27.28%	27.28%	27.28%
Earnings per share ($)	54.81	63.5	89.99	103.61	126.77	156.90	194.18	240.33	297.44	368.13
Earnings per share growth rate		15.85%	41.72%	15.14%	22.35%	23.76%	23.76%	23.76%	23.76%	23.76%
Residual income (million $)		22.31	53.27	63.14	84.17	104.47	135.49	174.42	223.30	284.68
Discounted residual income						91.76	104.53	118.21	132.93	148.85
Shareholder's equity (Million $)	1261.352	1124.255	1239.165	1304.441	1605.492					
								Terminal growth rate		Terminal value
								5.00%		1766.73

Appendix 96. Post-crisis - NVR – AEG

Rf	2.40%		Intrinsic Value per share		5181.77					
RM	18.75%		Share price		3508.22					
Beta	0.7001				**Undervalued**					
Cost of Equity	13.847 %									
Shares Outstanding (million)	4.24									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Dividend per share ($)	41.84	50.83	75.43	87.72	107.84	111.649	142.106	180.873	230.214	293.016
Dividend per share growth rate (%)		21.482 %	48.409 %	16.293 %	22.935 %	27.28%	27.28%	27.28%	27.28%	27.28%
Earnings per share ($)	54.81	63.5	89.99	103.61	126.77	156.90	194.18	240.33	297.44	368.13
Earnings per share growth rate		15.85%	41.72%	15.14%	22.35%	23.76%	23.76%	23.76%	23.76%	23.76%
Abnormal earnings growth ($)						27.51	31.02	38.94	48.88	61.38
Discounted AEG ($)							196.78	216.96	239.24	263.87
								Terminal growth rate		Terminal value
								5.00%		3131.82

Appendix 97. Post-crisis - TOL – DDM

Rf	2.40%		Average Dividend payout			37.971 %		Intrinsic value of equity per share 2007 ($)			31.63
RM	18.75%		Average RoE			8.679 %		Share price (31/12/2007)			48.02
Beta	1.2287		Sustainable Growth rate			5.0000%					
Cost of Equity	22.489 %		Terminal Value of future Dividend			51.940					
			Discounted Terminal Value			18.837					**Overvalued**
				Forecast year		1	2	3	4	5	
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Dividend per share ($)	0.02	0.80	0.82	0.97	1.83	2.495	3.405	4.646	6.340	8.651	
Dividend per share growth rate (%)		3443.518 %	3.461 %	18.039 %	87.858 %	36.45%	36.45%	36.45%	36.45%	36.45%	
Discounted future dividend ($)						2.037	2.270	2.528	2.816	3.138	
Earnings per share ($)	0.97	1.84	1.97	2.18	3.17						
Dividend payout	2.319 %	43.323 %	41.865 %	44.657 %	57.692 %						
Net income (Million $)	170.606	340.032	363.167	382.095	535.495						
Shareholder's equity (Million $)	3332.987	3854.376	4222.557	4229.292	4531.194						
Return on Equity	5.119 %	8.822 %	8.601 %	9.034 %	11.818 %						

Appendix 98. Post-crisis - TOL – DCF

Rf	2.40%		Cost of Debt	3.52%		WACC	14.02%		Intrinsic value of equity		4,817.79
RM	18.75%		After tax Cost of Debt	2.11%		Intrinsic value of entity	7,325.16		Intrinsic equity per share		28.43
Beta	1.2287		Market value of equity	4531.194		Total Debt	3220.194		Share price		48.02
Cost of Equity	22.489 %					Net Debt	2507.365				**Overvalued**
Shares Outstanding million	169.49										
					Forecast Year	1	2	3	4	5	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Revenues (million $)	2,674.3	3,911.6	4,171.2	5,169.5	5,815.1	7,113.6	8,702.2	10,645.4	13,022.7	15,930.7	
Revenue Growth rate		46.266 %	6.638 %	23.932 %	12.488 %	22.331 %	22.331 %	22.331 %	22.331 %	22.331 %	
EBIT (million $)	267.70	504.58	535.56	589.03	814.31	909.42	1,112.50	1,360.93	1,664.84	2,036.62	
EBIT Margin	10.010%	12.900%	12.839%	11.394%	14.003%	12.784%	12.784%	12.784%	12.784%	12.784%	
Depreciation & Amortization (million $)	**25.2**	**23.0**	**23.6**	**23.1**	**25.4**	**42.4**	**51.8**	**63.4**	**77.6**	**94.9**	
% to revenue	0.943%	0.588%	0.565%	0.447%	0.436%	0.596%	0.596%	0.596%	0.596%	0.596%	
NOPAT (million $)	**160.62**	**302.75**	**321.34**	**353.42**	**488.59**	**545.65**	**667.50**	**816.56**	**998.90**	**1,221.97**	
Cash (million $)	825.48	598.34	928.99	633.72	712.83	727.88	743.25	758.94	774.96	791.32	
Cash growth rate		-27.516%	55.262%	-31.785%	12.484%	2.111%	2.111%	2.111%	2.111%	2.111%	
Inventories (million $)	4,650.41	6,490.3	6,997.5	7,354.0	7,281.5	7,570.83	7,871.71	8,184.55	8,509.81	8,848.01	
Inventories growth rate		39.564%	7.815%	5.094%	-0.986%	3.974%	3.974%	3.974%	3.974%	3.974%	
Accounts receivable ($)	229.295	233.127	284.13	582.758	542.217	707.18	922.33	1202.94	1568.91	2046.24	
Accounts receivable growth rate		1.671%	21.878%	105.103%	-6.957%	30.424%	30.424%	30.424%	30.424%	30.424%	
Accounts payable (million $)	167.79	225.35	236.95	281.96	275.22	313.80	357.77	407.92	465.09	530.27	
Accounts payable growth rate		34.305%	5.150%	18.992%	-2.388%	14.015%	14.015%	14.015%	14.015%	14.015%	
Accrued expense (million $)	522.99	581.48	608.07	1,072.30	959.35	1,154.99	1,390.52	1,674.08	2,015.46	2,426.46	
Accrued expense growth rate		11.184%	4.573%	76.346%	-10.533%	20.392%	20.392%	20.392%	20.392%	20.392%	
Notes payable (million $)	2,305.77	2,638.24	2,689.801	2,694.46	2,462.46	2,511.32	2,561.15	2,611.97	2,663.80	2,716.65	
Notes payable growth rate		14.419%	1.954%	0.173%	-8.610%	1.984%	1.984%	1.984%	1.984%	1.984%	
Working capital (million $)	3,062.111	4,185.8	4,933.9	4,481.2	4,880.0	5,025.8	5,227.8	5,452.5	5,709.4	6,012.2	
Delta Working capital (million $)		**1,123.703**	**748.1**	**-453**	**398.8**	**145.783**	**202.060**	**224.616**	**256.891**	**302.844**	
Property, plant & Equipment (million $)	131.32	143.01	136.76	169.58	189.55	208.65	229.67	252.81	278.29	306.33	
PP & E growth rate		8.902%	-4.374%	24.000%	11.777%	10.076%	10.076%	10.076%	10.076%	10.076%	
Depreciation (million $)	25.2	23.0	23.6	23.1	25.4	42.4	51.8	63.4	77.6	94.9	
% to revenue	0.943%	0.588%	0.565%	0.447%	0.436%	0.596%	0.596%	0.596%	0.596%	0.596%	
Capital expenditure		**34.7**	**17.3**	**55.9**	**45.3**	**61.5**	**72.9**	**86.6**	**103.1**	**122.9**	
											Terminal Value
Unlevered free cash flow (million $)		**-832.64**	**-420.50**	**773.32**	**69.80**	**380.77**	**444.42**	**568.80**	**716.54**	**891.09**	**10,368.58**
Unlever FCF growth rate			-49.50%	-283.90%	-90.97%	445.55%	16.72%	27.99%	25.97%	24.36%	
Discounted to the present FCF (million $)						333.94	341.82	383.68	423.89	462.32	5,379.50

Appendix 99. Post-crisis - TOL – RIV

Rf	2.40%		Intrinsic Value per share		39.63					
RM	18.75%		Share price		48.02					
Beta	1.2287				**Overvalued**					
Cost of Equity	22.489 %									
Shares Outstanding (million)	169.49									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Equity per Share ($)	19.665	22.741	24.914	24.953	26.735	29.788	34.030	39.925	48.116	59.496
Dividend per share ($)	0.02	0.80	0.82	0.97	1.83	1.328	1.813	2.473	3.375	4.605
Dividend per share growth rate (%)		3443.518 %	3.461 %	18.039 %	87.858 %	36.45%	36.45%	36.45%	36.45%	36.45%
Earnings per share ($)	0.97	1.84	1.97	2.18	3.17	4.38	6.06	8.37	11.57	15.98
Earnings per share growth rate		89.69%	7.07%	10.66%	45.41%	38.21%	38.21%	38.21%	38.21%	38.21%
Residual income (million $)		-2.58	-3.14	-3.42	-2.44	-1.63	-0.64	0.72	2.59	5.16
Discounted residual income						-1.33	-0.43	0.39	1.15	1.87
Shareholder's equity (Million $)	3332.987	3854.376	4222.557	4229.292	4531.194					
								Terminal growth rate		Terminal value
								5.00%		11.24

Appendix 100. Post-crisis - TOL – AEG

Rf	2.40%		Intrinsic Value per share		67.27					
RM	18.75%		Share price		48.02					
Beta	1.2287				**Undervalued**					
Cost of Equity	22.489 %									
Shares Outstanding (million)	169.49									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Dividend per share ($)	0.02	0.80	0.82	0.97	1.83	1.328	1.813	2.473	3.375	4.605
Dividend per share growth rate (%)		3443.518 %	3.461 %	18.039 %	87.858 %	36.45%	36.45%	36.45%	36.45%	36.45%
Earnings per share ($)	0.97	1.84	1.97	2.18	3.17	4.38	6.06	8.37	11.57	15.98
Earnings per share growth rate		89.69%	7.07%	10.66%	45.41%	38.21%	38.21%	38.21%	38.21%	38.21%
Abnormal earnings growth ($)						0.91	0.99	1.36	1.87	2.58
Discounted AEG ($)							3.58	4.03	4.53	5.09
								Terminal growth rate		Terminal value
								5.00%		30.56

Appendix 101. Post-crisis - KBH – DDM

Rf	2.40%		Average Dividend payout			9.784 %		Intrinsic value of equity per share 2007 ($)			0.56
RM	18.75%		Average RoE			17.011 %		Share price (31/12/2017)			31.95
Beta	1.4952		Sustainable Growth rate			15.3471%					
Cost of Equity	26.847 %		Terminal Value of future Dividend			1.003					
			Discounted Terminal Value			0.305					**Overvalued**
				Forecast year		1	2	3	4	5	
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Dividend per share ($)	0.1	0.1	0.1	0.1	0.1	0.100	0.100	0.100	0.100	0.100	
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%	
Discounted future dividend ($)						0.079	0.062	0.049	0.039	0.030	
Earnings per share ($)	0.46	9.25	0.85	1.12	1.85						
Dividend payout	21.739 %	1.081 %	11.765 %	8.929 %	5.405 %						
Net income (Million $)	39.85	915.66	84.34	105.06	179.42						
Shareholder's equity (Million $)	536.09	1600	1690	1720	1930						
Return on Equity	7.433 %	57.229 %	4.991 %	6.108 %	9.296 %						

Appendix 102. Post-crisis - KBH – DCF

Rf	2.40%		Cost of Debt	3.52%		WACC	13.34%		Intrinsic value of equity		639.77
RM	18.75%		After tax Cost of Debt	2.11%		Intrinsic value of entity	2,238.98		Intrinsic equity per share		7.35
Beta	1.4952		Market value of equity	1930		Total Debt	2320.07		Share price		31.95
Cost of Equity	26.847 %					Net Debt	1599.21				**Overvalued**
Shares Outstanding million	87.03										
					Forecast Year	1	2	3	4	5	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Revenues (million $)	2,100.0	2,400.0	3,030.0	3,590.0	4,370.0	5,252.1	6,312.3	7,586.6	9,118.0	10,958.6	
Revenue Growth rate		14.286 %	26.250 %	18.482 %	21.727 %	20.186 %	20.186 %	20.186 %	20.186 %	20.186 %	
EBIT (million $)	103.95	-695.89	148.90	155.22	301.99	277.03	332.95	400.16	480.94	578.02	
EBIT Margin	4.950%	-28.995%	4.914%	4.324%	6.911%	5.275%	5.275%	5.275%	5.275%	5.275%	
Depreciation & Amortization (million $)	**14.4**	**15.0**	**15.3**	**18.2**	**19.0**	**29.0**	**34.8**	**41.8**	**50.3**	**60.4**	
% to revenue	0.686%	0.625%	0.505%	0.507%	0.435%	0.551%	0.551%	0.551%	0.551%	0.551%	
NOPAT (million $)	**62.37**	**-417.53**	**89.34**	**93.13**	**181.19**	**166.22**	**199.77**	**240.10**	**288.56**	**346.81**	
Cash (million $)	574.43	386.00	569.68	593.00	720.86	793.73	873.98	962.33	1,059.62	1,166.74	
Cash growth rate		-32.803%	47.585%	4.094%	21.562%	10.109%	10.109%	10.109%	10.109%	10.109%	
Inventories (million $)	2,300.00	3,220.0	3,310.0	3,400.0	3,260.0	3,275.17	3,290.42	3,305.74	3,321.12	3,336.58	
Inventories growth rate		40.000%	2.795%	2.719%	-4.118%	0.465%	0.465%	0.465%	0.465%	0.465%	
Accounts receivable ($)	77.83	127.23	250.24	233.43	245.94	324.09	427.07	562.77	741.58	977.22	
Accounts receivable growth rate		63.472%	96.683%	-6.718%	5.359%	31.775%	31.775%	31.775%	31.775%	31.775%	
Accounts payable (million $)	150.88	175.23	185.59	217.33	214.43	234.70	256.89	281.18	307.77	336.87	
Accounts payable growth rate		16.139%	5.912%	17.102%	-1.334%	9.455%	9.455%	9.455%	9.455%	9.455%	
Accrued expense (million $)	8.80	8.80	298.23	330.86	310.07	317.29	324.68	332.24	339.98	347.90	
Accrued expense growth rate		0.000%	3288.977%	10.941%	-6.284%	2.329%	2.329%	2.329%	2.329%	2.329%	
Notes payable (million $)	256.84	263.77	481.250	410.31	421.79	520.92	643.35	794.56	981.30	1,211.93	
Notes payable growth rate		2.698%	82.451%	-14.741%	2.798%	23.503%	23.503%	23.503%	23.503%	23.503%	
Working capital (million $)	2,691.340	3,404.1	3,160.6	3,280.4	3,268.0	3,320.1	3,366.5	3,422.9	3,493.3	3,583.9	
Delta Working capital (million $)		**712.800**	**-243.6**	**120**	**-12.4**	**52.080**	**46.456**	**56.316**	**70.428**	**90.572**	
Property, plant & Equipment (million $)	8.46	11.83	13.10	14.24	19.52	24.22	30.06	37.30	46.28	57.43	
PP & E growth rate		39.835%	10.735%	8.702%	37.079%	24.088%	24.088%	24.088%	24.088%	24.088%	
Depreciation (million $)	14.4	15.0	15.3	18.2	19.0	29.0	34.8	41.8	50.3	60.4	
% to revenue	0.686%	0.625%	0.505%	0.507%	0.435%	0.551%	0.551%	0.551%	0.551%	0.551%	
Capital expenditure		**18.4**	**16.6**	**19.3**	**24.3**	**33.7**	**40.6**	**49.1**	**59.3**	**71.6**	
											Terminal Value
Unlevered free cash flow (million $)		**-1,133.70**	**331.66**	**-27.90**	**188.35**	**109.44**	**147.48**	**176.54**	**209.15**	**245.09**	**3,084.09**
Unlever FCF growth rate			-129.25%	-108.41%	-775.15%	-41.90%	34.76%	19.70%	18.47%	17.18%	
Discounted to the present FCF (million $)						96.55	114.80	121.24	126.72	131.02	1,648.65

Appendix 103. Post-crisis - KBH – RIV

Rf	2.40%		Intrinsic Value per share		19.97					
RM	18.75%		Share price		31.95					
Beta	1.4952				**Overvalued**					
Cost of Equity	26.847 %									
Shares Outstanding (million)	87.03									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Equity per Share ($)	6.160	18.384	19.419	19.763	22.176	24.823	28.801	34.756	43.646	56.893
Dividend per share ($)	0.10	0.10	0.10	0.10	0.10	0.100	0.100	0.100	0.100	0.100
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	0.46	9.25	0.85	1.12	1.85	2.75	4.08	6.05	8.99	13.35
Earnings per share growth rate		1910.87%	-90.81%	31.76%	65.18%	48.47%	48.47%	48.47%	48.47%	48.47%
Residual income (million $)		7.60	-4.09	-4.09	-3.46	-3.21	-2.59	-1.68	-0.34	1.63
Discounted residual income						-2.53	-1.61	-0.82	-0.13	0.50
Shareholder's equity (Million $)	536.09	1600	1690	1720	1930					
								Terminal growth rate		Terminal value
								5.00%		2.39

Appendix 104. Post-crisis - KBH – AEG

Rf	2.40%		Intrinsic Value per share		33.06					
RM	18.75%		Share price		31.95					
Beta	1.4952				**Undervalued**					
Cost of Equity	26.847 %									
Shares Outstanding (million)	87.03									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Dividend per share ($)	0.10	0.10	0.10	0.10	0.10	0.100	0.100	0.100	0.100	0.100
Dividend per share growth rate (%)		0.000 %	0.000 %	0.000 %	0.000 %	0.00%	0.00%	0.00%	0.00%	0.00%
Earnings per share ($)	0.46	9.25	0.85	1.12	1.85	2.75	4.08	6.05	8.99	13.35
Earnings per share growth rate		1910.87%	-90.81%	31.76%	65.18%	48.47%	48.47%	48.47%	48.47%	48.47%
Abnormal earnings growth ($)						0.43	0.62	0.91	1.34	1.97
Discounted AEG ($)							1.82	2.10	2.44	2.84
								Terminal growth rate		Terminal value
								5.00%		13.63

Appendix 105. Post-crisis - MTH – DDM

Rf	2.40%		Average Dividend payout			55.148 %		Intrinsic value of equity per share 2007 ($)			12.52
RM	18.75%		Average RoE			11.489 %		Share price (31/12/2007)			51.20
Beta	1.3797		Sustainable Growth rate			5.0000%					
Cost of Equity	24.959 %		Terminal Value of future Dividend			18.422					
			Discounted Terminal Value			6.047					**Overvalued**
				Forecast year		1	2	3	4	5	
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Dividend per share ($)	2.15	2.11	1.58	1.86	1.53	1.809	2.133	2.517	2.969	3.502	
Dividend per share growth rate (%)		-1.901 %	-25.180 %	17.959 %	-17.686 %	17.96%	17.96%	17.96%	17.96%	17.96%	
Discounted future dividend ($)						1.447	1.366	1.290	1.218	1.149	
Earnings per share ($)	3.25	3.46	3.09	3.55	3.41						
Dividend payout	66.199 %	61.000 %	51.105 %	52.471 %	44.964 %						
Net income (Million $)	124.464	142.241	128.738	149.541	143.255						
Shareholder's equity (Million $)	841.392	1109.489	1258.937	1421.495	1576.825						
Return on Equity	14.793 %	12.820 %	10.226 %	10.520 %	9.085 %						

Appendix 106. Post-crisis - MTH – DCF

Rf	2.40%		Cost of Debt	3.52%		WACC	14.70%		Intrinsic value of equity		1,139.68
RM	18.75%		After tax Cost of Debt	2.11%		Intrinsic value of entity	2,253.86		Intrinsic equity per share		28.29
Beta	1.3797		Market value of equity	1576.825		Total Debt	1284.93		Share price		51.20
Cost of Equity	24.959 %					Net Debt	1114.18				**Overvalued**
Shares Outstanding million	40.29										
					Forecast Year	1	2	3	4	5	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Revenues (million $)	1,814.7	2,169.6	2,568.1	3,029.2	3,226.8	3,730.2	4,312.1	4,984.9	5,762.6	6,661.6	
Revenue Growth rate		19.562 %	18.364 %	17.957 %	6.521 %	15.601 %	15.601 %	15.601 %	15.601 %	15.601 %	
EBIT (million $)	177.67	208.42	189.46	218.06	247.52	310.68	359.15	415.18	479.95	554.83	
EBIT Margin	9.791%	9.606%	7.378%	7.199%	7.671%	8.329%	8.329%	8.329%	8.329%	8.329%	
Depreciation & Amortization (million $)	**9.9**	**11.6**	**14.2**	**16.0**	**16.7**	**20.0**	**23.1**	**26.7**	**30.9**	**35.7**	
% to revenue	0.547%	0.535%	0.555%	0.527%	0.518%	0.536%	0.536%	0.536%	0.536%	0.536%	
NOPAT (million $)	**106.60**	**125.05**	**113.68**	**130.84**	**148.51**	**186.41**	**215.49**	**249.11**	**287.97**	**332.90**	
Cash (million $)	363.82	103.33	262.21	131.70	170.75	153.56	138.11	124.21	111.71	100.47	
Cash growth rate		-71.598%	153.750%	-49.772%	29.646%	-10.063%	-10.063%	-10.063%	-10.063%	-10.063%	
Inventories (million $)	1,450.30	1,877.7	2,098.3	2,422.1	2,731.4	3,052.31	3,410.94	3,811.71	4,259.57	4,760.05	
Inventories growth rate		29.469%	11.750%	15.430%	12.771%	11.750%	11.750%	11.750%	11.750%	11.750%	
Accounts receivable ($)	38.983	56.763	57.296	70.355	79.317	88.96	99.77	111.90	125.51	140.76	
Accounts receivable growth rate		45.610%	0.939%	22.792%	12.738%	12.156%	12.156%	12.156%	12.156%	12.156%	
Accounts payable (million $)	68.02	83.62	106.44	140.68	140.52	179.11	228.31	291.01	370.94	472.82	
Accounts payable growth rate		22.937%	27.292%	32.170%	-0.118%	27.466%	27.466%	27.466%	27.466%	27.466%	
Accrued expense (million $)	166.61	151.14	161.16	170.85	181.08	192.32	204.26	216.94	230.41	244.71	
Accrued expense growth rate		-9.283%	6.629%	6.012%	5.984%	6.208%	6.208%	6.208%	6.208%	6.208%	
Notes payable (million $)	905.06	904.49	1,103.918	1,095.12	1,266.45	1,464.59	1,693.72	1,958.70	2,265.14	2,619.52	
Notes payable growth rate		-0.063%	22.049%	-0.797%	15.645%	15.645%	15.645%	15.645%	15.645%	15.645%	
Working capital (million $)	744.793	921.1	1,068.3	1,226.4	1,384.4	1,458.8	1,522.5	1,581.2	1,630.3	1,664.2	
Delta Working capital (million $)		**176.290**	**147.2**	**158**	**158.0**	**74.376**	**63.726**	**58.633**	**49.128**	**33.930**	
Property, plant & Equipment (million $)	22.10	32.40	33.97	33.20	33.63	34.06	34.50	34.95	35.40	35.86	
PP & E growth rate		46.627%	4.836%	-2.261%	1.292%	1.289%	1.289%	1.289%	1.289%	1.289%	
Depreciation (million $)	9.9	11.6	14.2	16.0	16.7	20.0	23.1	26.7	30.9	35.7	
% to revenue	0.547%	0.535%	0.555%	0.527%	0.518%	0.536%	0.536%	0.536%	0.536%	0.536%	
Capital expenditure		**21.9**	**15.8**	**15.2**	**17.1**	**20.4**	**23.6**	**27.2**	**31.4**	**36.2**	
											Terminal Value
Unlevered free cash flow (million $)		**-61.54**	**-35.11**	**-26.52**	**-9.93**	**111.60**	**151.32**	**190.03**	**238.39**	**298.51**	**3,231.13**
Unlever FCF growth rate			-42.95%	-24.47%	-62.56%	-1224.12%	35.60%	25.58%	25.45%	25.22%	
Discounted to the present FCF (million $)						97.29	115.02	125.93	137.73	150.36	1,627.52

Appendix 107. Post-crisis - MTH – RIV

Rf	2.40%		Intrinsic Value per share		11.29					
RM	18.75%		Share price		51.07					
Beta	1.3797				**Overvalued**					
Cost of Equity	24.959 %									
Shares Outstanding (million)	40.29									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Equity per Share ($)	20.885	27.540	31.249	35.284	39.140	40.550	41.776	42.757	43.423	43.690
Dividend per share ($)	2.15	2.11	1.58	1.86	1.53	2.197	2.592	3.057	3.606	4.254
Dividend per share growth rate (%)		-1.901 %	-25.180 %	17.959 %	-17.686 %	17.96%	17.96%	17.96%	17.96%	17.96%
Earnings per share ($)	3.25	3.46	3.09	3.55	3.41	3.61	3.82	4.04	4.27	4.52
Earnings per share growth rate		6.46%	-10.69%	14.89%	-3.94%	5.80%	5.80%	5.80%	5.80%	5.80%
Residual income (million $)		-1.75	-3.78	-4.25	-5.40	-6.16	-6.30	-6.39	-6.40	-6.32
Discounted residual income						-4.93	-4.04	-3.27	-2.62	-2.07
Shareholder's equity (Million $)	841.392	1109.489	1258.937	1421.495	1576.825					
								Terminal growth rate		Terminal value
								5.00%		-10.91

Appendix 108. Post-crisis - MTH – AEG

Rf	2.40%		Intrinsic Value per share		14.60					
RM	18.75%		Share price		51.07					
Beta	1.3797				**Overvalued**					
Cost of Equity	24.959 %									
Shares Outstanding (million)	40.29									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Dividend per share ($)	2.15	2.11	1.58	1.86	1.53	2.197	2.592	3.057	3.606	4.254
Dividend per share growth rate (%)		-1.901 %	-25.180 %	17.959 %	-17.686 %	17.96%	17.96%	17.96%	17.96%	17.96%
Earnings per share ($)	3.25	3.46	3.09	3.55	3.41	3.61	3.82	4.04	4.27	4.52
Earnings per share growth rate		6.46%	-10.69%	14.89%	-3.94%	5.80%	5.80%	5.80%	5.80%	5.80%
Abnormal earnings growth ($)						-0.27	-0.14	-0.08	-0.01	0.08
Discounted AEG ($)							-0.46	-0.22	-0.02	0.13
								Terminal growth rate		Terminal value
								5.00%		0.71

Appendix 109. Post-crisis - HOV – DDM

Rf	2.40%		Average Dividend payout			59.313 %		Intrinsic value of equity per share 2007 ($)				0.79
RM	18.75%		Average RoE			-36.207 %		Share price (31/12/2007)				3.35
Beta	1.6750		Sustainable Growth rate			5.0000%						
Cost of Equity	29.786 %		Terminal Value of future Dividend			1.687						
			Discounted Terminal Value			0.458						**Overvalued**
				Forecast year		1	2	3	4	5		
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**		
Dividend per share ($)	0.37	2.09	-0.07	0.03	-2.09	0.044	0.077	0.133	0.230	0.398		
Dividend per share growth rate (%)		461.261 %	-103.171 %	-138.600 %	-8289.342 %	73.16%	73.16%	73.16%	73.16%	73.16%		
Discounted future dividend ($)						0.034	0.046	0.061	0.081	0.108		
Earnings per share ($)	0.22	2.05	-0.11	-0.02	-2.25							
Dividend payout	169.206 %	101.918 %	60.224 %	-127.855 %	93.071 %							
Net income (Million $)	31.3	307.14	-16.1	-2.82	-332.19							
Shareholder's equity (Million $)	-433.23	-117.8	-128.08	-128.51	-460.37							
Return on Equity	-7.225 %	-260.730 %	12.570 %	2.194 %	72.157 %							

Appendix 110. Post-crisis - HOV – DCF

Rf	2.40%		Cost of Debt	3.52%		WACC	-7.71%		Intrinsic value of equity			-1,159.35
RM	18.75%		After tax Cost of Debt	2.11%		Intrinsic value of entity	128.53		Intrinsic equity per share			-7.86
Beta	1.6750		Market value of equity	-460.37		Total Debt	1757.2		Share price			3.35
Cost of Equity	29.786 %					Net Debt	1287.88					**Overvalued**
Shares Outstanding million	147.59											
					Forecast Year	1	2	3	4	5		5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**		
Revenues (million $)	1,851.3	2,063.4	2,148.5	2,752.3	2,451.7	2,652.5	2,869.8	3,104.8	3,359.1	3,634.3		
Revenue Growth rate		11.459 %	4.124 %	28.102 %	-10.921 %	8.191 %	8.191 %	8.191 %	8.191 %	8.191 %		
EBIT (million $)	130.30	128.28	97.87	134.89	91.45	128.67	139.21	150.61	162.95	176.29		
EBIT Margin	7.038%	6.217%	4.555%	4.901%	3.730%	4.851%	4.851%	4.851%	4.851%	4.851%		
Depreciation & Amortization (million $)	**4.7**	**3.4**	**3.4**	**3.6**	**4.3**	**4.7**	**5.1**	**5.5**	**5.9**	**6.4**		
% to revenue	0.254%	0.166%	0.158%	0.130%	0.173%	0.176%	0.176%	0.176%	0.176%	0.176%		
NOPAT (million $)	**78.18**	**76.97**	**58.72**	**80.93**	**54.87**	**77.20**	**83.52**	**90.37**	**97.77**	**105.78**		
Cash (million $)	329.20	261.90	253.75	339.77	469.32	526.19	589.96	661.45	741.61	831.48		
Cash growth rate		-20.443%	-3.112%	33.900%	38.129%	12.118%	12.118%	12.118%	12.118%	12.118%		
Inventories (million $)	1,078.76	1,344.3	1,644.6	1,283.1	1,009.8	1,019.11	1,028.47	1,037.92	1,047.45	1,057.08		
Inventories growth rate		24.616%	22.336%	-21.981%	-21.296%	0.919%	0.919%	0.919%	0.919%	0.919%		
Accounts receivable ($)	45.09	92.55	70.35	49.73	58.15	68.16	79.90	93.67	109.80	128.71		
Accounts receivable growth rate		105.256%	-23.987%	-29.311%	16.931%	17.222%	17.222%	17.222%	17.222%	17.222%		
Accounts payable (million $)	131.46	141.94	172.64	160.92	128.84	129.77	130.70	131.64	132.59	133.54		
Accounts payable growth rate		7.972%	21.629%	-6.789%	-19.935%	0.719%	0.719%	0.719%	0.719%	0.719%		
Accrued expense (million $)	94.42	92.40	96.02	62.63	60.11	54.55	49.50	44.92	40.76	36.99		
Accrued expense growth rate		-2.139%	3.918%	-34.774%	-4.024%	-9.255%	-9.255%	-9.255%	-9.255%	-9.255%		
Notes payable (million $)	33.42	34.97	44.220	37.43	36.00	37.07	38.18	39.31	40.48	41.69		
Notes payable growth rate		4.638%	26.451%	-15.355%	-3.820%	2.978%	2.978%	2.978%	2.978%	2.978%		
Working capital (million $)	1,198.390	1,395.1	1,643.6	1,420.0	1,303.9	1,392.1	1,480.0	1,577.2	1,685.0	1,805.0		
Delta Working capital (million $)		**196.660**	**248.6**	**-224**	**-116.1**	**88.150**	**87.878**	**97.207**	**107.863**	**120.016**		
Property, plant & Equipment (million $)	46.21	46.74	45.54	50.30	52.92	54.80	56.76	58.78	60.87	63.04		
PP & E growth rate		1.147%	-2.567%	10.452%	5.209%	3.560%	3.560%	3.560%	3.560%	3.560%		
Depreciation (million $)	4.7	3.4	3.4	3.6	4.3	4.7	5.1	5.5	5.9	6.4		
% to revenue	0.254%	0.166%	0.158%	0.130%	0.173%	0.176%	0.176%	0.176%	0.176%	0.176%		
Capital expenditure		**4.0**	**2.2**	**8.3**	**6.9**	**6.6**	**7.0**	**7.5**	**8.0**	**8.6**		
												Terminal Value
Unlevered free cash flow (million $)		**-120.22**	**-188.63**	**299.75**	**168.34**	**-12.83**	**-6.30**	**-8.86**	**-12.19**	**-16.41**		**135.51**
Unlever FCF growth rate			56.90%	-258.91%	-43.84%	-107.62%	-50.87%	40.54%	37.53%	34.62%		
Discounted to the present FCF (million $)						-13.91	-7.40	-11.27	-16.80	-24.51		202.42

Appendix 111. Post-crisis - HOV – RIV

Rf	2.40%		Intrinsic Value per share		1.16					
RM	18.75%		Share price		3.35					
Beta	1.6750				**Overvalued**					
Cost of Equity	29.786 %									
Shares Outstanding (million)	147.59									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Equity per Share ($)	-2.935	-0.798	-0.868	-0.871	-3.119	-2.899	-2.659	-2.410	-2.182	-2.030
Dividend per share ($)	0.37	2.09	-0.07	0.03	-2.09	0.044	0.077	0.133	0.230	0.398
Dividend per share growth rate (%)		461.261 %	-103.171 %	-138.600 %	-8289.342 %	73.16%	73.16%	73.16%	73.16%	73.16%
Earnings per share ($)	0.22	2.05	-0.11	-0.02	-2.25	0.26	0.32	0.38	0.46	0.55
Earnings per share growth rate		831.82%	-105.37%	-81.82%	11150.00%	20.12%	20.12%	20.12%	20.12%	20.12%
Residual income (million $)		2.92	0.13	0.24	-1.99	1.19	1.18	1.17	1.18	1.20
Discounted residual income						0.92	0.70	0.54	0.41	0.33
Shareholder's equity (Million $)	-433.23	-117.8	-128.08	-128.51	-460.37					
								Terminal growth rate		Terminal value
								5.00%		1.38

Appendix 112. Post-crisis - HOV – AEG

Rf	2.40%		Intrinsic Value per share		0.99					
RM	18.75%		Share price		3.35					
Beta	1.6750				**Overvalued**					
Cost of Equity	29.786 %									
Shares Outstanding (million)	147.59									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Dividend per share ($)	0.37	2.09	-0.07	0.03	-2.09	0.044	0.077	0.133	0.230	0.398
Dividend per share growth rate (%)		461.261 %	-103.171 %	-138.600 %	-8289.342 %	73.16%	73.16%	73.16%	73.16%	73.16%
Earnings per share ($)	0.22	2.05	-0.11	-0.02	-2.25	0.26	0.32	0.38	0.46	0.55
Earnings per share growth rate		831.82%	-105.37%	-81.82%	11150.00%	20.12%	20.12%	20.12%	20.12%	20.12%
Abnormal earnings growth ($)						2.56	-0.01	-0.01	0.00	0.02
Discounted AEG ($)							-0.03	-0.02	0.00	0.03
								Terminal growth rate		Terminal value
								5.00%		0.12

Appendix 113. Post-crisis - MDC – DDM

Rf	2.40%		Average Dividend payout			47.367 %		Intrinsic value of equity per share 2007 ($)			5.11
RM	18.75%		Average RoE			10.837 %		Share price (31/12/2017)			31.88
Beta	1.2276		Sustainable Growth rate			5.7040%					
Cost of Equity	22.472 %		Terminal Value of future Dividend			6.439					
			Discounted Terminal Value			2.337					**Overvalued**
				Forecast year		1	2	3	4	5	
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Dividend per share ($)	0	0.88	0.88	0.88	0.93	0.948	0.966	0.984	1.002	1.021	
Dividend per share growth rate (%)			0.000 %	0.000 %	5.682 %	1.89%	1.89%	1.89%	1.89%	1.89%	
Discounted future dividend ($)						0.774	0.644	0.536	0.446	0.371	
Earnings per share ($)	5.63	1.14	1.18	1.85	2.48						
Dividend payout	0.000 %	77.193 %	74.576 %	47.568 %	37.500 %						
Net income (Million $)	314.385	63.143	65.791	103.211	141.835						
Shareholder's equity (Million $)	1213.249	1228.336	1256.292	1320.07	1407.287						
Return on Equity	25.913 %	5.141 %	5.237 %	7.819 %	10.079 %						

Appendix 114. Post-crisis - MDC – DCF

Rf	2.40%		Cost of Debt	3.52%		WACC	14.08%		Intrinsic value of equity		395.33
RM	18.75%		After tax Cost of Debt	2.11%		Intrinsic value of entity	876.50		Intrinsic equity per share		6.95
Beta	1.2276		Market value of equity	1407.287		Total Debt	986.597		Share price		31.88
Cost of Equity	22.472 %					Net Debt	481.169				**Overvalued**
Shares Outstanding million	56.90										
					Forecast Year	1	2	3	4	5	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Revenues (million $)	1,680.4	1,694.6	1,909.0	2,326.8	2,577.6	2,875.1	3,206.9	3,576.9	3,989.7	4,450.1	
Revenue Growth rate		0.842 %	12.655 %	21.886 %	10.777 %	11.540 %	11.540 %	11.540 %	11.540 %	11.540 %	
EBIT (million $)	129.83	100.48	101.42	151.78	229.73	191.75	213.88	238.56	266.09	296.80	
EBIT Margin	7.726%	5.929%	5.313%	6.523%	8.913%	6.669%	6.669%	6.669%	6.669%	6.669%	
Depreciation & Amortization (million $)	**3.7**	**3.9**	**4.1**	**5.1**	**5.3**	**6.3**	**7.0**	**7.8**	**8.7**	**9.7**	
% to revenue	0.219%	0.232%	0.213%	0.221%	0.206%	0.218%	0.218%	0.218%	0.218%	0.218%	
NOPAT (million $)	**77.90**	**60.29**	**60.85**	**91.07**	**137.84**	**115.05**	**128.33**	**143.14**	**159.65**	**178.08**	
Cash (million $)	199.34	153.83	180.99	282.91	505.43	591.59	692.43	810.47	948.63	1,110.34	
Cash growth rate		-22.832%	17.658%	56.314%	78.654%	17.047%	17.047%	17.047%	17.047%	17.047%	
Inventories (million $)	1,411.66	1,668.0	1,764.0	1,758.8	1,829.7	1,887.65	1,947.41	2,009.05	2,072.64	2,138.25	
Inventories growth rate		18.156%	5.756%	-0.292%	4.032%	3.165%	3.165%	3.165%	3.165%	3.165%	
Accounts receivable ($)	23.407	28.555	23.314	42.492	53.362	58.56	64.26	70.52	77.39	84.93	
Accounts receivable growth rate		21.993%	-18.354%	82.260%	25.581%	9.740%	9.740%	9.740%	9.740%	9.740%	
Accounts payable (million $)	15.05	35.45	40.47	42.09	39.66	54.32	74.42	101.95	139.67	191.33	
Accounts payable growth rate		135.578%	14.183%	3.993%	-5.781%	36.993%	36.993%	36.993%	36.993%	36.993%	
Accrued expense (million $)	152.82	115.12	122.89	144.57	166.31	188.17	212.91	240.89	272.56	308.38	
Accrued expense growth rate		-24.672%	6.749%	17.642%	15.042%	13.144%	13.144%	13.144%	13.144%	13.144%	
Notes payable (million $)	1,089.79	839.47	840.524	841.65	986.60	1,044.09	1,104.93	1,169.32	1,237.45	1,309.56	
Notes payable growth rate		-22.970%	0.126%	0.133%	17.222%	5.827%	5.827%	5.827%	5.827%	5.827%	
Working capital (million $)	395.834	885.1	994.4	1,066.8	1,185.1	1,251.2	1,311.8	1,377.9	1,449.0	1,524.2	
Delta Working capital (million $)		**489.283**	**109.3**	**72**	**118.3**	**66.123**	**60.630**	**66.037**	**71.104**	**75.253**	
Property, plant & Equipment (million $)	31.25	30.49	28.23	28.04	26.44	25.37	24.34	23.35	22.40	21.50	
PP & E growth rate		-2.423%	-7.428%	-0.655%	-5.713%	-4.055%	-4.055%	-4.055%	-4.055%	-4.055%	
Depreciation (million $)	3.7	3.9	4.1	5.1	5.3	6.3	7.0	7.8	8.7	9.7	
% to revenue	0.219%	0.232%	0.213%	0.221%	0.206%	0.218%	0.218%	0.218%	0.218%	0.218%	
Capital expenditure		**3.2**	**1.8**	**4.9**	**3.7**	**5.2**	**6.0**	**6.8**	**7.8**	**8.8**	
											Terminal Value
Unlevered free cash flow (million $)		**-428.24**	**-46.19**	**18.90**	**21.13**	**50.00**	**68.73**	**78.09**	**89.50**	**103.73**	**1,199.44**
Unlever FCF growth rate			-89.21%	-140.91%	11.83%	136.58%	37.45%	13.62%	14.61%	15.91%	
Discounted to the present FCF (million $)						43.83	52.81	52.59	52.84	53.69	620.74

Appendix 115. Post-crisis - MDC – RIV

Rf	2.40%		Intrinsic Value per share		21.73					
RM	18.75%		Share price		31.88					
Beta	1.2276				**Overvalued**					
Cost of Equity	22.472 %									
Shares Outstanding (million)	56.90									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Equity per Share ($)	21.322	21.587	22.079	23.199	24.732	27.095	30.467	35.168	41.624	50.390
Dividend per share ($)	0.00	0.88	0.88	0.88	0.93	0.897	0.914	0.931	0.949	0.967
Dividend per share growth rate (%)			0.000 %	0.000 %	5.682 %	1.89%	1.89%	1.89%	1.89%	1.89%
Earnings per share ($)	5.63	1.14	1.18	1.85	2.48	3.26	4.29	5.63	7.40	9.73
Earnings per share growth rate		-79.75%	3.51%	56.78%	34.05%	31.45%	31.45%	31.45%	31.45%	31.45%
Residual income (million $)		-3.65	-3.67	-3.11	-2.73	-2.30	-1.80	-1.21	-0.50	0.38
Discounted residual income						-1.88	-1.20	-0.66	-0.22	0.14
Shareholder's equity (Million $)	1213.249	1228.336	1256.292	1320.07	1407.287					
								Terminal growth rate		Terminal value
								5.00%		0.83

Appendix 116. Post-crisis - MDC – AEG

Rf	2.40%		Intrinsic Value per share		31.95					
RM	18.75%		Share price		31.88					
Beta	1.2276				**Undervalued**					
Cost of Equity	22.472 %									
Shares Outstanding (million)	56.90									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Dividend per share ($)	0.00	0.88	0.88	0.88	0.93	0.897	0.914	0.931	0.949	0.967
Dividend per share growth rate (%)			0.000 %	0.000 %	5.682 %	1.89%	1.89%	1.89%	1.89%	1.89%
Earnings per share ($)	5.63	1.14	1.18	1.85	2.48	3.26	4.29	5.63	7.40	9.73
Earnings per share growth rate		-79.75%	3.51%	56.78%	34.05%	31.45%	31.45%	31.45%	31.45%	31.45%
Abnormal earnings growth ($)						0.43	0.49	0.59	0.71	0.88
Discounted AEG ($)							1.80	1.75	1.73	1.74
								Terminal growth rate		Terminal value
								5.00%		10.43

Appendix 117. Post-crisis - BZH – DDM

Rf	2.40%		Average Dividend payout			57.106 %		Intrinsic value of equity per share 2007 ($)			17.29
RM	18.75%		Average RoE			11.657 %		Share price (31/12/2007)			19.21
Beta	1.8308		Sustainable Growth rate			5.0000%					
Cost of Equity	32.333 %		Terminal Value of future Dividend			39.393					
			Discounted Terminal Value			9.707					**Overvalued**
					Forecast year	1	2	3	4	5	
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Dividend per share ($)	-0.74	0.63	6.23	0.09	0.57	1.009	1.802	3.217	5.744	10.255	
Dividend per share growth rate (%)		-184.615 %	891.818 %	-98.533 %	518.750 %	78.53%	78.53%	78.53%	78.53%	78.53%	
Discounted future dividend ($)						0.763	1.029	1.388	1.873	2.527	
Earnings per share ($)	-1.3	1.1	10.91	0.16	0.99						
Dividend payout	57.106 %	57.106 %	57.106 %	57.106 %	57.106 %						
Net income (Million $)	-33.868	34.383	344.094	4.693	31.813						
Shareholder's equity (Million $)	241	279	630	643	682						
Return on Equity	-14.053 %	12.324 %	54.618 %	0.730 %	4.665 %						

Appendix 118. Post-crisis - BZH – DCF

Rf	2.40%		Cost of Debt	3.52%		WACC	12.37%		Intrinsic value of equity		517.60
RM	18.75%		After tax Cost of Debt	2.11%		Intrinsic value of entity	1,539.60		Intrinsic equity per share		16.11
Beta	1.8308		Market value of equity	682		Total Debt	1327		Share price		19.21
Cost of Equity	32.333 %					Net Debt	1022				**Overvalued**
Shares Outstanding million	32.13										
					Forecast Year	1	2	3	4	5	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	
Revenues (million $)	1,288.0	1,464.0	1,627.0	1,822.0	1,916.0	2,116.9	2,338.9	2,584.1	2,855.1	3,154.5	
Revenue Growth rate		13.665 %	11.134 %	11.985 %	5.159 %	10.486 %	10.486 %	10.486 %	10.486 %	10.486 %	
EBIT (million $)	63.15	84.43	104.15	125.63	138.89	139.25	153.85	169.99	187.81	207.51	
EBIT Margin	4.903%	5.767%	6.402%	6.895%	7.249%	6.578%	6.578%	6.578%	6.578%	6.578%	
Depreciation & Amortization (million $)	**15.6**	**15.9**	**19.5**	**21.8**	**22.2**	**24.8**	**27.3**	**30.2**	**33.4**	**36.9**	
% to revenue	1.214%	1.084%	1.197%	1.194%	1.157%	1.169%	1.169%	1.169%	1.169%	1.169%	
NOPAT (million $)	**37.89**	**50.66**	**62.49**	**75.38**	**83.33**	**83.55**	**92.31**	**101.99**	**112.69**	**124.50**	
Cash (million $)	553.00	387.00	290.00	243.00	305.00	270.10	239.19	211.82	187.58	166.11	
Cash growth rate		-30.018%	-25.065%	-16.207%	25.514%	-11.444%	-11.444%	-11.444%	-11.444%	-11.444%	
Inventories (million $)	1,314.00	1,561.0	1,698.0	1,569.0	1,543.0	1,540.54	1,538.09	1,535.64	1,533.19	1,530.75	
Inventories growth rate		18.798%	8.776%	-7.597%	-1.657%	-0.159%	-0.159%	-0.159%	-0.159%	-0.159%	
Accounts receivable ($)	22.342	34.429	52.379	53.226	36.323	43.23	51.46	61.25	72.90	86.77	
Accounts receivable growth rate		54.100%	52.136%	1.617%	-31.757%	19.024%	19.024%	19.024%	19.024%	19.024%	
Accounts payable (million $)	83.80	106.24	113.54	104.17	103.48	109.88	116.68	123.90	131.56	139.69	
Accounts payable growth rate		26.774%	6.873%	-8.248%	-0.662%	6.184%	6.184%	6.184%	6.184%	6.184%	
Accrued expense (million $)	145.62	142.52	148.97	134.25	107.66	100.31	93.47	87.09	81.15	75.61	
Accrued expense growth rate		-2.134%	4.526%	-9.877%	-19.809%	-6.823%	-6.823%	-6.823%	-6.823%	-6.823%	
Notes payable (million $)											
Notes payable growth rate											
Working capital (million $)	1,690.803	1,735.6	1,761.8	1,609.9	1,690.1	1,643.7	1,618.6	1,597.7	1,581.0	1,568.3	
Delta Working capital (million $)		**44.767**	**26.2**	**-152**	**80.2**	**-46.408**	**-25.089**	**-20.871**	**-16.754**	**-12.638**	
Property, plant & Equipment (million $)	17.00	18.67	22.23	19.14	17.57	17.86	18.17	18.47	18.79	19.10	
PP & E growth rate		9.841%	19.049%	-13.909%	-8.214%	1.692%	1.692%	1.692%	1.692%	1.692%	
Depreciation (million $)	15.6	15.9	19.5	21.8	22.2	24.8	27.3	30.2	33.4	36.9	
% to revenue	1.214%	1.084%	1.197%	1.194%	1.157%	1.169%	1.169%	1.169%	1.169%	1.169%	
Capital expenditure		**17.5**	**23.0**	**18.7**	**20.6**	**25.0**	**27.6**	**30.5**	**33.7**	**37.2**	
											Terminal Value
Unlevered free cash flow (million $)		**4.22**	**32.69**	**230.39**	**4.72**	**129.66**	**117.10**	**122.56**	**129.13**	**136.82**	**1,948.98**
Unlever FCF growth rate			674.94%	604.84%	-97.95%	2647.67%	-9.69%	4.66%	5.36%	5.96%	
Discounted to the present FCF (million $)						115.39	92.74	86.37	80.98	76.36	1,087.75

Appendix 119. Post-crisis - BZH – RIV

Rf	2.40%		Intrinsic Value per share		24.68					
RM	18.75%		Share price		19.21					
Beta	1.8308				**Undervalued**					
Cost of Equity	32.333 %									
Shares Outstanding (million)	32.13									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Equity per Share ($)	7.501	8.683	19.608	20.012	21.226	21.984	23.338	25.754	30.069	37.771
Dividend per share ($)	-0.74	0.63	6.23	0.09	0.57	1.009	1.802	3.217	5.744	10.255
Dividend per share growth rate (%)		-184.615 %	891.818 %	-98.533 %	518.750 %	78.53%	78.53%	78.53%	78.53%	78.53%
Earnings per share ($)	-1.3	1.1	10.91	0.16	0.99	1.77	3.16	5.63	10.06	17.96
Earnings per share growth rate		-184.62%	891.82%	-98.53%	518.75%	78.53%	78.53%	78.53%	78.53%	78.53%
Residual income (million $)		-1.33	8.10	-6.18	-5.48	-5.10	-3.95	-1.91	1.73	8.23
Discounted residual income						-3.85	-2.26	-0.83	0.56	2.03
Shareholder's equity (Million $)	241	279	630	643	682					
								Terminal growth rate		Terminal value
								5.00%		7.79

Appendix 120. Post-crisis - BZH – AEG

Rf	2.40%		Intrinsic Value per share		48.36					
RM	18.75%		Share price		19.21					
Beta	1.8308				**Undervalued**					
Cost of Equity	32.333 %									
Shares Outstanding (million)	32.13									
				Forecast year		1	2	3	4	5
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Dividend per share ($)	-0.74	0.63	6.23	0.09	0.57	1.009	1.802	3.217	5.744	10.255
Dividend per share growth rate (%)		-184.615 %	891.818 %	-98.533 %	518.750 %	78.53%	78.53%	78.53%	78.53%	78.53%
Earnings per share ($)	-1.3	1.1	10.91	0.16	0.99	1.77	3.16	5.63	10.06	17.96
Earnings per share growth rate		-184.62%	891.82%	-98.53%	518.75%	78.53%	78.53%	78.53%	78.53%	78.53%
Abnormal earnings growth ($)						0.64	1.14	2.04	3.64	6.50
Discounted AEG ($)							2.67	3.60	4.86	6.56
								Terminal growth rate		Terminal value
								5.00%		25.20