Report on the final project valuation of H&M, EUS – SEM.2. (2016)

Principles of company valuation

A comprehensive guide

Final project in Corporate Finance

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Executive summary

This report has been done with the objective of providing students in the subject of Corporate Finance with a real example, in which to apply the contents learned during the course.

The paper essentially focuses on company valuation, presenting three chapters where different valuation methodologies are both described and implemented. Hennes & Mauritz AB is chosen as the company being evaluated, but all procedures are perfectly reproducible in other firms. Each valuation method in this work uses real financial data from the firm together with external economic data for determining the company's theoretical value and, afterwards, compare the value obtained with what the market says.

In short, valuation techniques presented are a powerful tool for financial analysts to detect potential over or undervalued businesses and use this information to improve their decision-making.

Keywords: Valuation, capital structure, WACC, Dividend Discount Model, comparables, free cash flow, net present value, sensitivity analysis.

Resumen ejecutivo

Este trabajo ha sido realizado con el objetivo de mostrar a los estudiantes de la asignatura de Finanzas Corporativas un ejemplo real en dónde aplicar los conocimientos adquiridos a lo largo del curso.

El proyecto está enfocado a la valoración de sociedades, presentando tres capítulos en los cuales se describen e implementan diferentes metodologías de valoración financiera. Se ha seleccionado para analizar la empresa Hennes & Mauritz AB, aunque todos los procedimientos utilizados son perfectamente reproducibles en otras firmas. Cada método de valoración se sirve de datos, tanto de la misma firma como económicos, para determinar el valor teórico de la compañía y, lo que es más interesante, comparar este valor teórico con lo que dicta el mercado.

En resumen, las técnicas de valoración financiera empleadas proporcionan a los analistas una potente herramienta para la detección de posibles compañías sobrevaloradas o infravaloradas y, de este modo, ayudar a los profesionales en la toma de decisiones.

Palabras clave: Valoración, estructura de capital, WACC, Modelo de Descuento de Dividendos, comparables, flujos de caja, valor actual neto, análisis de sensibilidad.

All R codes and scripts used are found at:
https://github.com/aleixfiblasalgado/FA_HyM

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PART I: Introduction

Introduction to Corporate Finance

"A cynic knows de price of everything and the value of nothing"

Oscar Wilde

Corporate finance concerns financial decisions made by corporations. These financial decisions are mainly grouped into two major categories: investment decisions and financing decisions.

Regarding the first ones, needless to say that firms need assets to carry on their operations. There are many different types of assets both tangible, like a factory, and intangible, like patents and trademarks. Despite its nature, assets have a cost but, at the same time, provide firms with an opportunity to earn revenue streams. Which specific assets to purchase and which price will make them profitable for the company, are some of the major investing decisions faced by corporations.

On the other hand, financing decisions are concerned with how to raise the required money to meet the firm's investment policy. Companies have both internal and external financing opportunities depending on whether they use their own resources, or they borrow from third parties. How to raise the cash required for investments and which is the most effective combination of financing resources, are answers financing decisions must give.

Both investment and financing decisions must together maximize the value of the business in the long run. Consequently, financial managers are required to develop analytical tools in order to assess the appropriateness of their actions, bearing in mind the objective of enhancing stakeholders' wealth.

The bottom line is to manage both investment and financing resources properly, evaluating expected profitability of capital invested and potential costs. On most workdays, financial managers value investment projects but the methodology they use could also be extrapolated to value the whole business unit. A firm is, essentially, a perpetual investment project and the procedures shown in this report are commonly used in corporate valuation with the objective of finding undervalued firms to invest.

All procedures are based on real financial information from the Swedish firm Hennes & Mauritz AB (hereafter H&M). Before starting with the subject, it is recommended to introduce the company, its strategy, the market where operates, etc.; aiming to create a context supporting financial calculations. Additionally, it is also useful have a look at the company's financial indicators over, at least, the last 5 years to get an overview of past performance and start getting in touch with the firm's financial figures.

Company overview

H&M is one of the world's leading fashion companies. It started in 1947, in the Swedish city of Västerås, and now the company has more than 4.393 stores in 65 different markets. Despite its global nature, the firm still has a great presence in Europe and Nordic countries, with European sales accounting for more than 70% of the total.

The current strategy of H&M is low-cost oriented, even though it centers on providing "fashion and quality at the best price". The company offers its products to a wide variety of customer groups through its different brands: H&M, COS, Weekday, Cheap Monday, Monki and & Other Stories.

Rather than owning its stores, H&M makes use of lease arrangements. The firm has an own design and buying department, which creates the collections centrally and then, uses a big and high developed distribution network to allocate its products according to the observed demand in each market.

The firm purchases its raw materials from 700 independent suppliers located in four different continents where the company has its production centers.

Regarding the global apparel market, according to Passport database (2010) it had an RSP value of 1,527 billion USD. The euratex database estimates a future annual growth rate of 4,9%, on average, but only a 1% increase in mature markets. This situation represents a big threat for H&M, bringing the necessity to increase its presence in emerging economies.

Despite facing low bargaining power of both suppliers and customers, recent increases in information availability and low switching costs are forcing H&M to start building a differentiation strategy, essentially focused on design. This strategic movement is noticed, for instance, in the firm's new collections where famous designers come up with a very particular fashion concept.

H&M is also putting an effort into the CSR, emphasizing the importance of sustainable practices, for instance, by increasing its cotton from sustainable sources and reducing greenhouse gas emissions.

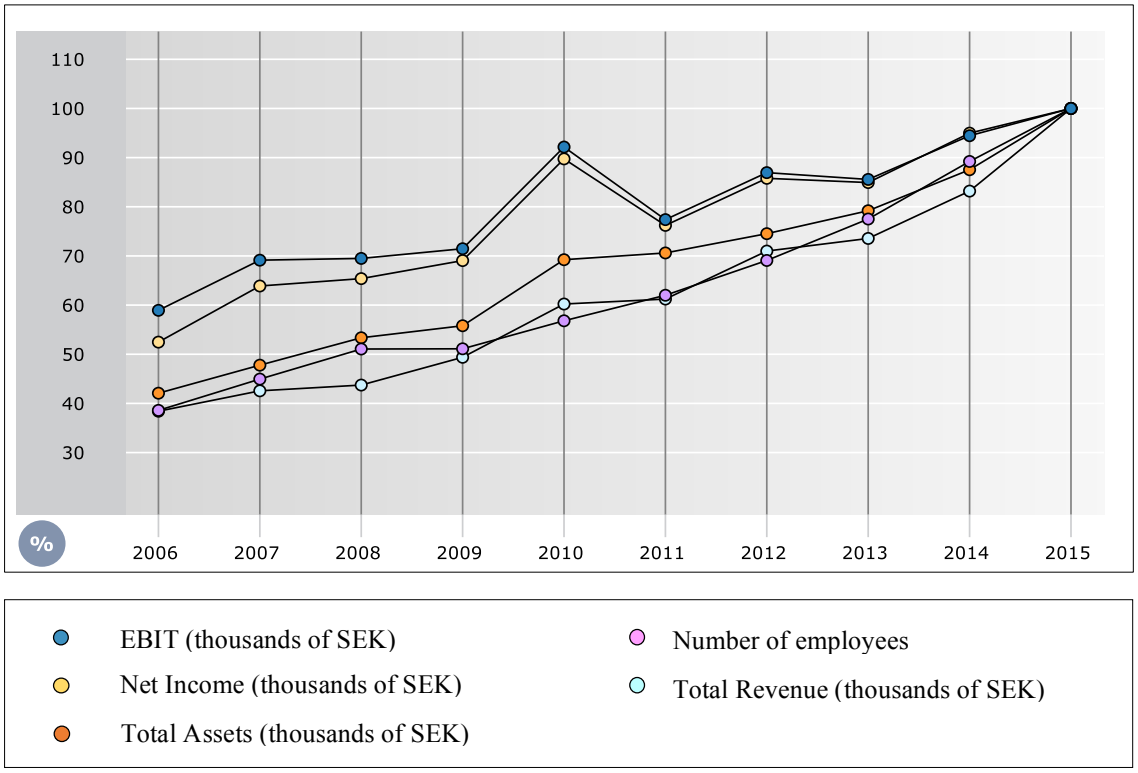
Turning again to the firm's sector, the Internet has been a great impact in the apparel retail market. E-commerce is increasing its presence and has become a big threat for traditional retailers. H&M is joining this e-commerce trend and it currently has an online presence in 23 of the 61 markets where the company operates. However, the objective in the middle term is to expand this online presence to all markets.

Finally, regarding competition, the Spanish firm Inditex is identified as the main competitor of H&M in the global market due to similarities in size and international presence. Inditex possesses a more diversified product portfolio and its cost effectiveness is slightly higher. However, the Spanish firm is highly vertically-integrated, a great disadvantage in front of the flexible-value chain of H&M, the one able to serve the market faster.

H&M key financial indicators

As it is mentioned in the first section, developing a brief summary of key financial figures over previous years is a good benchmark for any valuation project. Among several indicators, five variables (hereafter key variables) have been considered crucial for understanding both the current situation and future tendency of the firm. There is no consensus on which are the most important variables that need to be selected when developing this kind of initial analysis. Depending on the project's objective, the analyst has to decide which are the determinants that might provide more useful information.

Figure 1. Evolution of key variables



Source: Amadeus

In this case, the key variables selected are the ones shown in Figure 1, a line plot displaying the evolution, in indexes, of H&M's EBIT, Net Income, Total Assets, Number of Employees and Total Revenue over the previous 10 years.

Indexes are a good instrument for year over year comparisons as they measure percentage variations. The main conclusion for the whole period of analysis is that H&M is growing and expanding its business becoming bigger year after year. However, numbers also show that H&M had a negative percentage variation for both EBIT and Net Income in 2010 while Total Revenue remained constant. This bad performance might come from the 2010 strong devaluation of the Euro with respect to the SEK. Remember most of H&M's revenue streams come from the Eurozone but, as the company is listed in Stockholm, its annual accounts are presented in SEK.

Together with the evolution of key variables, it is advised to have a look at the firm's financial ratios and their evolution over a selected time period[1]. Again, there is a huge variety of them and the selection is totally up to the analyst.

Nonetheless, gathering only internal data is, to some extent, useless. H&M financial ratios need something to compare them with. Even though there is sometimes a criterion behind each ratio that intends to assess its adequateness, the same criterion might differ a lot from one industry to another. As an example, think about the market of electric vehicles and compare it with the clothing sector. The intensity of capital investment is higher in growing markets and the strategy adopted by firms in these markets, such as electric vehicles, is very different from the ones facing a mature market. For this reason, a good option is to compare financial indicators from your targeted firm with the ones from other firms in the market. Up to this point, the next upcoming question is, how can the market be defined?

Unfortunately, there is no right answer for it. Depending on the targeted firm the market has to be defined geographically or worldwide, the industry might be more or less accurate and, sometimes, it is just more sensible to use a stock market index.

Consequently, it is recommended to consider several benchmarks for comparisons, each one representing a different but a sensible option. For the purpose of this project three different benchmarks have been selected[2]:

- **Industry:** Apparel/Footwear Retail.
- **Sector:** Retail Trade.
- **S&P 500:** Data from the biggest 500 American companies.

Table 1 takes as variables these three benchmarks, together with H&M's internal data, while each observation represents a financial figure that could be useful in a first contact with the company.

Notice that financial indicators are classified according to the attribute they measure. Some of these figures are going to be used later in specific valuation methods, while others, like the Beta, are going to be estimated using microdata about H&M's listed price evolution.

In general, it is possible to argue, by looking at Table 1, that H&M shows profitability ratios and all returns accounting for management effectiveness (assets, investment and equity) well above the competition. However, in some growth rates the company is performing lower than other benchmarks. This phenomenon might respond to a wider scope of activity captured by these benchmarks, which might include younger companies in growth stages.

[1] In this report, the previous 5 years have been selected.

[2] Industry and Sector are based on world data.

Table 1. H&M's ratio comparison

	Company	Industry	Sector	S&P 500
Valuation Ratios				
Beta, 5 Years	0,89	0,91	0,98	1,01
Dividends				
Dividend Yield	3,64%	1,67%	2,31%	1,96%
Dividend 5-Yr Growth rate	0,52%	11,55%	6,76%	15,27%
Growth Rates				
Revenue TTM vs. TTM 1 Yr Ago	19,44%	5,46%	75,82%	6,13%
Revenue, 5-Yr Growth	13,37%	6,28%	18,09%	5,85%
EPS Percent change TTM over TTM	4,61%	102,93%	26,99%	27,23%
EPS, 5-Yr Growth	7.35%	6,03%	4,24%	11,82%
Capital Spending, 5-Yr Growth	23,73%	8,62%	19,45%	10,08%
Profitability Ratios				
Gross Margin, 5-Yr Average	58,92%	46,88%	27,44%	45,49%
Operating Margin, 5-Yr Average	17,11%	15,08%	6,78%	20,75%
Pre-Tax Margin, 5-Yr Average	17,43%	14,98%	6,69%	18,53%
Net Profit Margin, 5-Yr Average	13,28%	9,47%	4,96%	13,51%
Tax Rate, 5-Yr Average	23,75%	34,04%	25,29%	28,39%
Management Effectiveness				
Return on Average Assets, 5-Yr Average	26,24%	12,92%	4,53%	7,61%
Return on Investment, 5-Yr Average	35,27%	22,97%	7,73%	13,13%
Return on Average Equity, 5-Yr Average	38,42%	33,15%	10,75%	24,78%

Source: Factiva

It goes without saying that further research is needed in order to provide consistency and reliability to any initial belief.

The next and last stage in this initial approach to H&M concerns the second type of financial decisions mentioned in the first section, financing decisions.

H&M capital structure

To make optimal financial decisions in keeping with the major objective of the firm, that is maximizing shareholder's wealth, it is crucial to determine how borrowing influences results. Corporations have two major ways of financing: external resources or debt, and internal resources or equity.

When a firm borrows money, it promises to make a set of payments to the lender, which includes the repayment of the amount borrowed and some percentage of interest. This kind of financing has the advantage that if profits rise, debtholders will continue to receive only the accorded interest payment, but the effect is the same if profits fall. Following this reasoning, stockholders are the ones with the chance to earn more in case profits rise but also bear the greatest part of the pain in the opposite situation.

In their article, Modigliani and Miller (1963)[3] state that in a world with taxes, the value of corporations increases proportionally to the increment in their Debt-to-Equity ratio. This reasoning comes from the fact that interest paid on debt is tax deductible. The theory of leverage developed by Modigliani and Miller assumes that corporations benefit from leverage until the optimal capital structure is reached.

This idea is closely related with the WACC. The next chapter goes into detail with WACC concerns but, in roughly outlines, theory suggests that, although an increment in debt increases return on equity, it also makes investing in the firm riskier. Consequently, it makes sense that investors demand higher risk premium on the levered company stock.

Figure 2 displays the capital structure of H&M in the last fiscal year. The firm presents a good status of solvency; total liabilities represent only a 60,8% of current assets. This means H&M can meet all company's liabilities only with that percentage of its current assets.

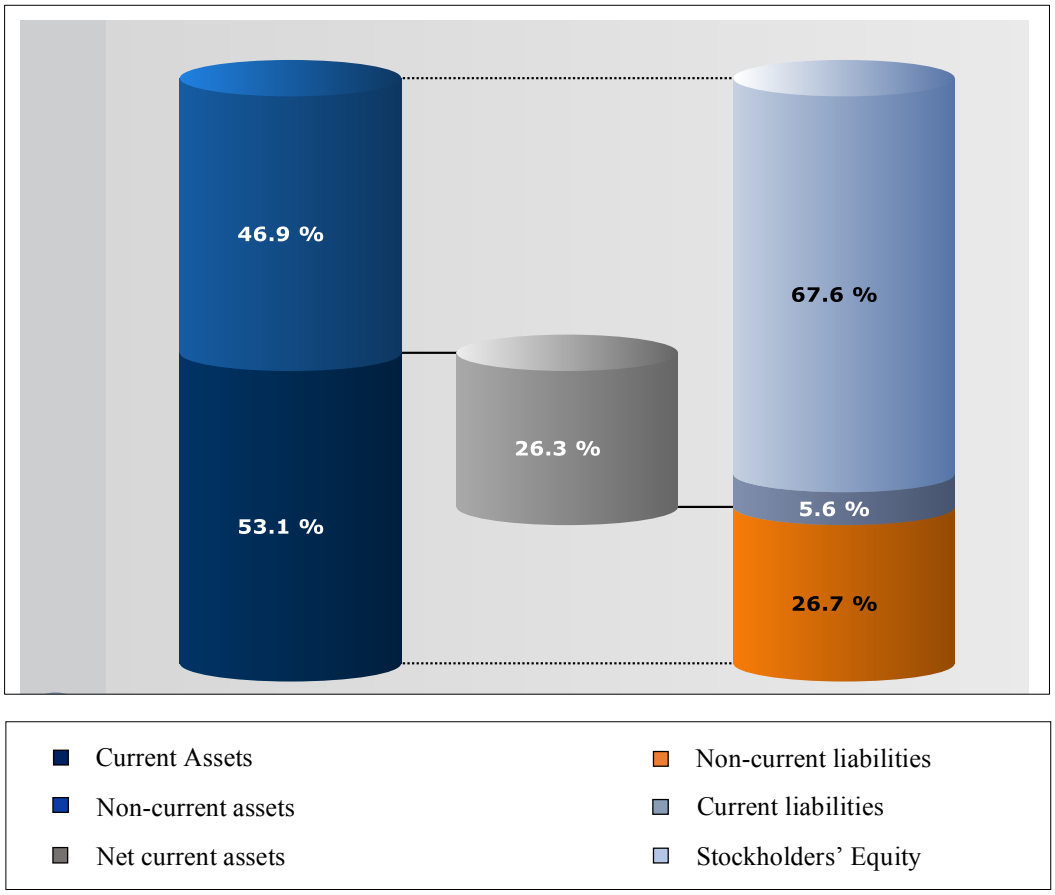
In addition, Figure 3 provides evidence that H&M has no debt outstanding, investments are financed with internal resources. The firm does not benefit from the leverage effect and therefore it is sensible to think of a higher tax burden than levered competitors. This absence of debt has two major consequences regarding the procedures applied in this report.

First, in the computation of the WACC. Taking into consideration that no debt outstanding leads to a low level of risk, the return demanded by investors on company's securities will be substantially smaller than the WACC of levered firms.

Moreover, as equity represents a big portion of H&M's funds, the firm has many stockholders demanding a share of the profits and it is reasonable to think about little earnings per share. On the other hand, H&M will not have any interest expense in its profits & loses account but, which effect dominates?

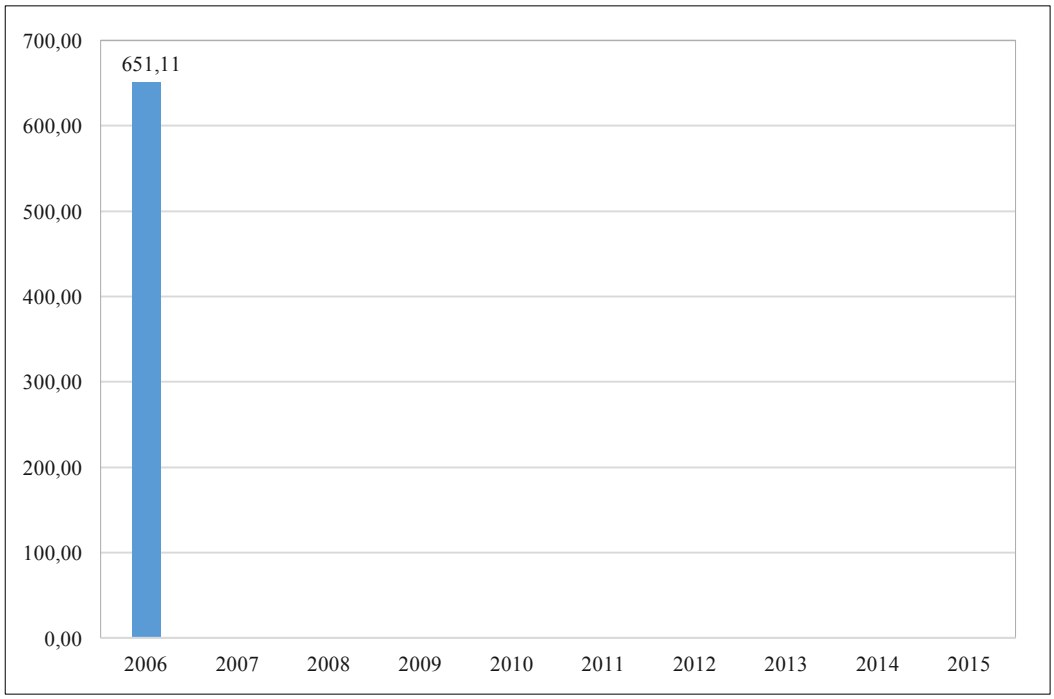
[3] Modigliani and Miller Proposition II.

Figure 2. Balance sheet structure



Source: Amadeus

Figure 3. H&M's debt evolution (in millions of SEK)



Source: Amadeus

To answer the previous question, the DuPont System[4] breaks down the formula to compute return on equity into 4 different factors:

$$\text{ROE} = \frac{net\ income}{equity} =$$

$$= \underbrace{\frac{assets}{equity}}_{\text{leverage ratio}} \cdot \underbrace{\frac{sales}{assets}}_{\text{asset turnover}} \cdot \underbrace{\frac{after\ tax\ interest + net\ income}{sales}}_{\text{operating profit margin}} \cdot \underbrace{\frac{net\ income}{after\ tax\ interest + net\ income}}_{\text{“debt burden”}}$$

Notice that the product between asset turnover and operating profit margin is the return on assets (ROA). Return on assets does not depend directly on capital structure, it is more related to management effectiveness and has to do with being competitive in the market. On the other hand, the leverage ratio and “debt burden” measure, respectively, how levered the firm is, and the proportion by which interest expense reduces net income.

This DuPont methodology supports Modigliani and Miller assumptions. Observe that the leverage ratio could also be expressed as:

$$\frac{(equity + liabilities)}{equity} = 1 + total\ debt - to - equity\ ratio$$

Then, as liabilities increase, the total debt-to-equity ratio will do so and, finally, lead to an increment in return on equity.

Next step, now that H&M is being presented, deals with the valuation of the firm under different methodologies. To do so, it is crucial to have available H&M’s financial statements and other data that will be introduced in further chapters.

Chapter two begins with the computation of H&M’s weighted average cost of capital or WACC, a figure that constitutes one of the bases of valuation analysis and will be used in every method presented.

[4] The formula got that name after being popularized by the famous chemical company.

PART II: WACC Estimation

Investors require a minimum rate of return on an investment to compensate them for the level of perceived risk associated with that investment. Accordingly, the rate of return required, must be at least equal to the rate of return they can get from other investments exhibiting the same level of risk. For a more detailed description of investment principles see Gitman (2008).

Regarding enterprise valuation, the functioning is exactly the same, investors require a return correlated with the company's perceived risk. However, as firms conduct projects with different levels of risk, this return should, somehow, integrate them all.

To do so, the cost of capital is defined as the expected return on a portfolio of all the company's existing securities. This return could also be viewed as an opportunity cost because it represents the rate of return investors could get by investing in portfolios of comparable risk.

This hypothetical company portfolio usually includes some percentage of debt, as well as some percentage of equity. Thus, the cost of capital will have to combine the cost of debt (interest rate) and the cost of equity, which is the expected return on company's stock. Generally, the cost of equity is higher because it is not a direct claim on company's cash flows, it stands behind debt and has to wait until all other expenses are paid.

This blended measure of the company cost of capital is called the WACC (weighted average cost of capital) because it takes the relative weight of both cost of equity and cost of debt:

$$WACC = r_0 = r_d \frac{D}{D+E} + r_e \frac{E}{D+E}$$

The weights are the relative market values of the firm's debt and equity; they both reflect, respectively, the firm's targeted capital structure. Market values instead of book values are used because the WACC is measured with data gathered from bonds, debt, securities, etc.; all of them issued at market prices.

In the case of H&M, these weights are equal to D/V[5] = 0% and E/V[6] = 100%. Recall H&M has no debt outstanding and due to this lack of indebtedness, the company's WACC will be equal to the expected return on its stock (cost of equity).

Then, next step is to estimate the cost of equity.

[5] Debt-to-value.

[6] Equity-to-value.

Factor Models

Factor models are used in many financial applications, such as identifying the determinants of a security's return as well as in cost of capital calculations. The simplest factor model is one based on a single factor and, among them, the Capital Asset Pricing Model (hereafter CAPM) is the most popular. The CAPM is based on a series of assumptions, which are detailed in any recent corporate finance or investment textbook[7]. However, the model does not perform well in empirical testing, there is strong evidence that beta is not the only reason why expected returns differ.

Since CAPM measures some stock's risk only relative to the overall market, while ignoring return on assets other than stocks, some analysts prefer to use multifactor models. Such models adjust the CAPM by adding other variables as risk factors that determine asset returns, for instance, firm size, the bond term structure, inflation, etc.

For the purpose of this report and according to the course content, results are based on the cost of capital obtained with the CAPM. However, there are several models based on more factors that could be applied. An alternative methodology is presented in Appendix 2 together with an explanation of the Arbitrage Pricing Theory, which provides the bases for new models developing.

Using the CAPM model to estimate the cost of equity

To calculate the weighted-average cost of capital for H&M, an estimate of its cost of equity is needed. The cost of equity is, basically, the return demanded by investors to purchase H&M stock. This return can be obtained using the CAPM, which measures the relationship between expected risk and expected return. Precisely, the model states that the expected stock return is equal to a risk-free rate of return plus a risk premium:

$$Expected\ stock\ return = r_f + \beta(r_m - r_f)$$

This formula is taken as the starting point of many cost of capital calculations although adjustments may be to account for the size premium, country risk premium, etc. In the formula above r_f is the return on the risk-free asset, r_m is the return on the market proxy and β is the sensitivity of the firm to the overall market.

That was the traditional equation behind CAPM. Nevertheless, empirical tests of the CAPM typically convert the formula into its excess return form:

$$r_i - r_f = \alpha + \beta(r_m - r_f)$$

Recall that Factiva provided a beta in Table 1. There is nothing wrong in working with this number but, in order to explain the procedure to obtain it, both alpha and beta have been estimated using a regression.

[7] Brealey Myers & Allen, Principles of Corporate Finance 11th Edition (2014). Chapter 8: Portfolio Theory and the Capital Asset Pricing Model, pages 190-217.

i) Estimating alpha and beta

In principle, the objective is to calculate the future beta of the company's stock but, lacking a crystal ball, it is necessary to turn to historical evidence. There are three decisions that analysts face in this stage (i) the length of the estimation period, (ii) the frequency of the returns data, and (iii) the risk-free rate used in the calculation.[8]

Different choices concerning the three decisions mentioned could lead to different results although variations among them should not be excessively large. Furthermore, it is recommended to contrast results obtained with the numbers available in databases (Table 1).

In this paper, five years have been chosen as the estimation period, considering monthly aggregated returns and a risk-free rate coming from 10Y Swedish Bonds' average yield within the chosen estimation period.

Additionally, a set of data representing market returns is also needed. The most common approach is to use a market index or to follow experts' beliefs.

Based on a survey results of 510 finance and economics professors, Welch (2001) estimates a market premium $(r_m - r_f)$ over a 30-year horizon of 5,5 percent. Using data provided by Dimson, March and Staunton (2002), the market risk premium relative to bonds during the period from 1900 to 2002, calculated as a simple average of geometric and arithmetic means, was 5,75 percent in the United States and 4,9 percent for a 16-country average.

Other experts consider that market premium is unstable, lower during periods of prosperity and higher during economic turndowns (Claus and Thomas, 1998; Easton et al., 2002).

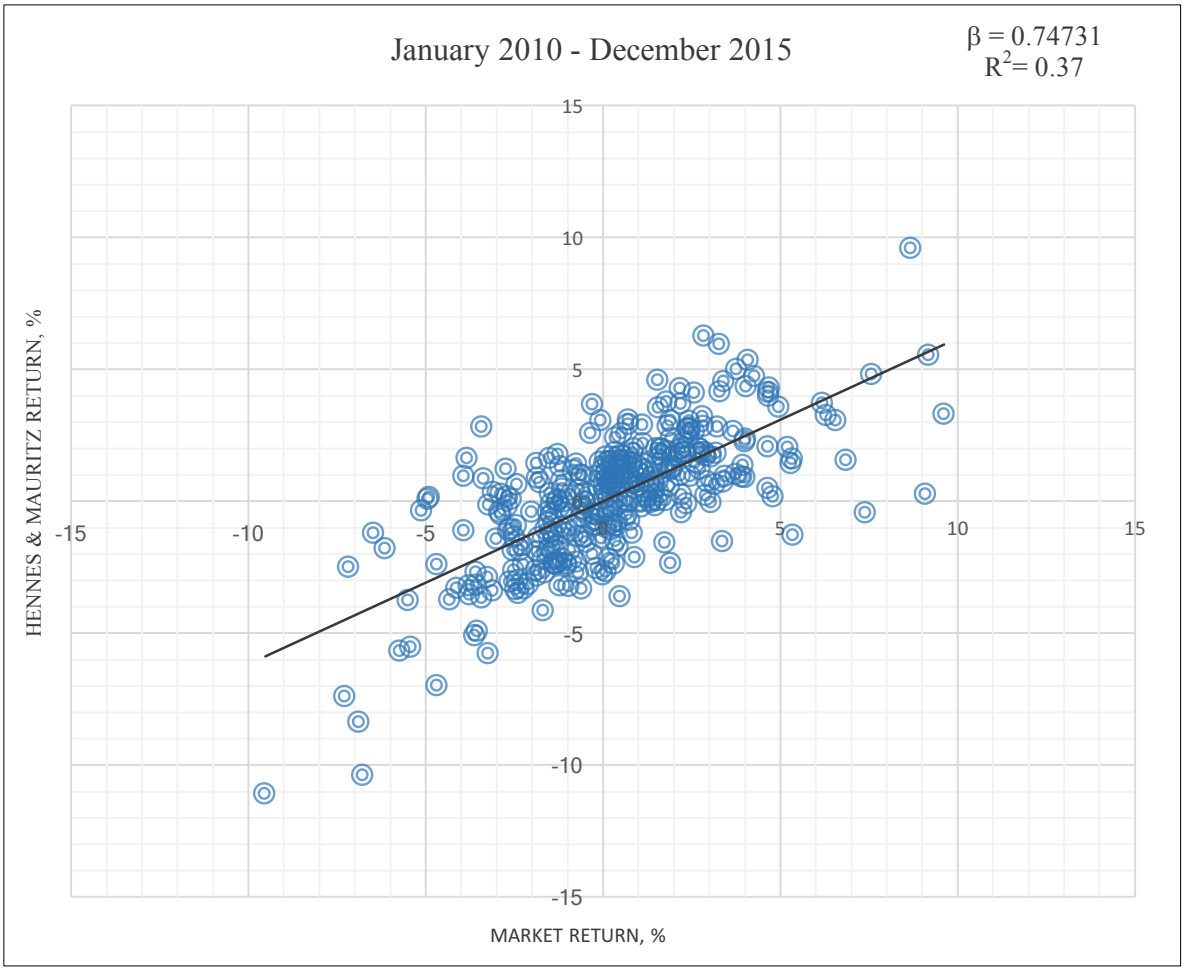
In any case, this work captures returns on OMX 30 index, the principal in Stockholm stock exchange, to be used in market premium calculations

In Figure 4, each dot represents the return on H&M stock and the market return (OMX 30) for each day within the period of analysis. The slope tells how much, on average, the stock price changed when the market return was 1% higher or lower.

Another point worth mentioning is the fact that adjusted close prices must be used in calculations. Returns on a firm are compounded from price appreciation but also net cash received from dividends. The closing price is not adjusted for neither dividend payments nor stock splits. Consequently, looking at the closing price alone may not be sufficient to make inferences from the data.

[8] All data used in calculations has been obtained from Yahoo Finance.

Figure 4. Regressing H&M returns on market returns



Source: Own elaboration

Once all data is properly aggregated to get the same frequency of returns for the market index, the risk-free asset and the company itself, a regression has to be applied[9] on it to obtain estimators for the slope (β) and the intercept (α). Table 2 is a summary of results obtained in R.

Table 2. Summary of regression coefficients[10]

	Estimate	Std. Error	t value	Pr(>|t|)
α	0,00398	0,00487	0,82	0,42
β	0,74731	0,11751	6,36	0,0000000019***

Source: Own elaboration

[9] R has been used in data processing.

[10] Signif. Codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1.

Next step is to get the expected value for r_f and r_m. A good option, not to get into complex modelling, is to take the average of monthly returns over the whole period of analysis.

Consequently, the final cost of equity for H&M will be:

$$Expected\ stock\ return = r_f + \beta(r_m - r_f) = 2{,}0904 + 0{,}74731(5.998) = 6{,}7678\ \%$$

Replacing estimators in the excess return formula leads to the same result.

It is also important to consider that only a small portion of each stock total risk comes from movements in the market. The rest is firm-specific, diversifiable risk, which shows up in the scatter of points around the fitted lines in Figure 4. In order to determine this market influence, the fitted regression in R returns, together with the estimates, other statistical figures which have a financial interpretation.

R-squared (R^2) measures the proportion of total variance in stock returns that can be explained by market movements. In the regression of H&M's stock returns against market returns, this statistic is given a value of 0,37. In other words, this means that 37% of H&M's risk was market risk and the remaining 63% was diversifiable risk.

ii) Interpretation of estimates

CAPM Alpha: When making investments into a fund, investors often consider the contribution of the fund manager to the performance of the fund. As such, it is necessary to measure whether a firm manager provided value that goes beyond simply investing in the index. To answer this question, the alpha estimate measures this outer performance. The regression controls for the sensitivity of the portfolio's returns to its benchmark. Therefore, any return that is not captured by the market can be attributed to manager. In the case of H&M the alpha is 0,00398 but not statistically significant Pr (> |t|) = 0,42. This means there is not enough evidence to judge the manager performance, further research is required.

CAPM Beta: The beta measures how sensitive is the portfolio to the movement of the overall market. Therefore, beta accounts for what is called systematic risk or market risk. Systematic risk is the portion of a security's risk that cannot be diversified away and, as such, it is commonly thought of as the level of risk that investors are compensated from taking on. The results of the CAPM on H&M show that beta is equal to 0,74731. This means that if the market goes up by 1%, H&M's portfolio on all its existing securities will only go up by 0,74731%. A beta less than one is consistent with betas of defensive stocks, as these stocks are less affected by market movements.

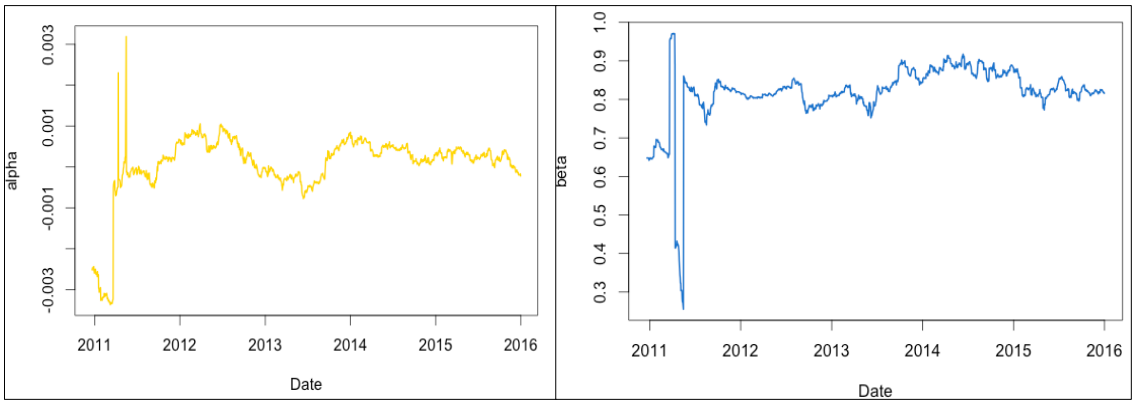
iii) Rolling window regression

The estimates for alpha and beta are sensible to the time period considered. Indeed, they both suffer variations over time and a good exercise is to represent their evolution, in order to find patterns and enable some modelling.

In this section, a regression is computed over a rolling window. Then, it is possible to calculate alphas and betas for H&M over multiple periods. Here, the period width considered is 252 observations.

Figure 5 depicts an alpha and a beta for each day, within the period of analysis, by regressing daily H&M stock returns on OMX 30 index returns, in both cases taking into consideration the previous 252 days.

Figure 5. H&M's alpha and beta using rolling 252-Day Window and Daily Returns from 2010 to 2015



Source: Own elaboration

Recall the alpha obtained in the regression was not significant, meaning that the estimator is not precise (notice that in the graph values are closer, on average, to 0,001). Concerning the beta, the result of 0,74731 is substantially influenced by huge variations in the first half of 2011. It seems that the average value for beta is slightly higher, around 0,8. Outliers are enemies of any analysis and may lead to biased results (even though is possible to adjust the dataset and run the regression again). Nevertheless, taking into consideration that the variation is not huge and 0, 74731 is quite close to the beta provided by Factiva in Table 1, it appears sensible to keep in track with the number obtained.

Calculating the WACC

As it is said previously, H&M does not have any debt outstanding along the whole period of analysis. Accordingly, its weighted-average cost of capital is equal to the company's cost of equity.

WACC = cost of equity = 6.7678 %

PART III: Valuation by Expected Dividends Model & Comparables

This chapter gets into the subject of enterprise valuation by introducing the two first methods, valuation by expected dividends and valuation by multiples or comparables.

The role of dividends in enterprise valuation

To get the net present value in classical investment analysis, future cash streams are discounted to the present, considering some interest rate.

The same approach could be applied in the valuation of common stock. The value of a share is given by the dividend discount model as a simple function of future dividends, in practise, the future cash streams perceived by shareholders. Then:

$$PV(share\ of\ stock) = PV(expected\ future\ dividends\ per\ share)$$

Someone may argue that to find the present value of a share, it is also necessary to take into consideration future price appreciations. Brealey, Myers and Allen (2014) demonstrate that the previous statement is not true for a perpetual stream of dividend payments, and the price of a share at moment 0 is obtained through discounting those upcoming dividends.

$$P_0 = \sum_{t=1}^{\infty} \frac{DIV_t}{(1 + r_e)^t}$$

where:

$P_0 = share\ price\ at\ time\ 0$
$DIV_t = dividend\ paid\ at\ year\ t$
$r_e = cost\ of\ capital\ equity$[11]

The basic idea behind their argument is that, as time horizon recedes, the present value of future price declines but the present value of the stream of dividends increases. At each point in time, all securities in equivalent risk portfolios are priced to offer the same expected return. Then, what really adds value to investors are payoffs coming from the firm's dividend policy.

Thenceforth, the main concern is to estimate the future dividends that H&M will pay to shareholders and provide a valid theoretical share price[12]. There are several ways to proceed.

[11] In the case of H&M r_e is equal to WACC, recall the firm has no debt outstanding.

[12] As H&M has no debt outstanding, the value of its shares (common stock) is also used as the value of the whole company.

Initially, it is recommended to look at the company's annual reports and find out if the firm commits to a minimum dividend growth percentage. In case it does not, like H&M, another possibility is to use historical evidence to predict the dividend growth rate.

This method is particularly useful in valuing preferred stock because, unlike common equity, preferred stocks pay a fixed dividend. Oppositely, the method proved to be slightly inconsistent in valuing common equity, basically due to the difficulty of forecasting future dividend payments.

i) Dividend Discount Model with constant growth

$$P_o = \sum \frac{DIV_t}{(1 + r_e)^t} = \frac{DIV_1}{r_e - g}$$

This section presents the first of two possible assumptions in valuation by expected dividends. Gordon and Shapiro developed a simplified version of the dividend discount model (1956) by considering a constant growth of dividends at some annual expected rate. In this case DIV_1 is the amount paid the year immediately after last data record, and it grows constantly at rate g on a perpetual basis.[13]

The determination of the dividend growth rate (g) is the most critical step in this model. As it is said before, the estimate of g is, to some extent, subjective. Owing to the absence of official information provided by the firm about its future dividend policy, we have taken the simple average of the increase in dividend payments as an estimate of g[14].

The formula above can only be used when g, the anticipated growth rate, is less than r, the discount rate or opportunity cost of equity. As g approaches r, the stock price becomes infinite. Obviously, r must be greater than g if growth is really a perpetual. However, the problem when applying this model is that g is typically estimated using a sample of data, which might provide a value larger than the r. Consequently, this g would not be reliable on the long run and the formula turns useless, as the value of stock becomes infinite.

Table 3. Evolution of the dividend payment of H&M

	2009	2010	2011	2012	2013	2014	2015
Dividend payment	8,00	9,50	9,50	9,50	9,50	9,75	9,75
% increment		18,75%	0,00%	0,00%	0,00%	2,63%	0,00%

Source: Own elaboration

[13] Remember firms are considered investment projects with an infinite lifespan.

[14] The sample period considered is the same used in previous sections, previous five years.

The simple average of increments is equal to 3,5636%.

Accordingly, it is possible to determine the present value of the firm using the constant growth formula because H&M's dividend growth rate is less than its opportunity cost of equity, remember 6,7678%.

Nevertheless, in the hypothetical case that was impossible to obtain a suitable and reliable anticipated dividend growth rate using historical data, this paper purposes an alternative methodology to estimate g. The alternative consists on taking the plowback ratio[15] of the firm, in this case H&M, and multiply it by its return on equity.

The easiest way to get the plowback ratio is by looking at the firm's payback policy[16]. It is possible to use last year's payback ratio but a better alternative is to, somehow, estimate the future payback of the firm. Then, to predict the expected value of future payback, the simplest way is to take the average of available data records, that is the average payback ratio within the period of analysis:

$$Plowback\ ratio = (1 - avg(payout\ ratio)) = 18{,}69\%$$

Similarly, it is possible to obtain the future expected ROE through the averages over the previous 5 years.

$$5 - year\ average\ ROE = \frac{avg(EPS)}{avg(book\ equity\ per\ share)} = 38{,}42\%$$ [17]

Then, the dividend growth rate (g) is equal to: plowback ratio x ROE = 7,1807%.

For H&M, using this second procedure to estimate the dividend growth rate is not effective as g exceeds the opportunity cost of capital (WACC) and makes impossible to calculate the present value of equity.

Finally, last stage in the assumption of dividends' constant growth consists on calculating the theoretical price of equity by discounting perpetual dividend payments:

$$P_o = \sum \frac{DIV_t}{(1 + r_e)^t} = \frac{DIV_1}{r_e - g} = \frac{10{,}0947}{0{,}067478 - 0{,}0356} = 317{,}024\ SEK$$

As the firm has no debt outstanding, 317,024 SEK turns to be the theoretical price for H&M shares.

Even though historical data is an option in this particular case, if neither of both ways end in a suitable estimate for g, the alternative would be to use a multistage model.

[15] The plowback ratio is equal to (1 – payback ratio).

[16] The payback ratio represents the amount of dividends paid to investors over that year's net income.

[17] The 5-Y average ROE also appears in Table 1.

ii) Multi–stage Dividend Discount Model

Contrary to the constant growth methodology, in the multi-stage it is assumed that the estimate for dividends' growth rate is only reliable for a short period of time. This reasoning relies on the assumption that since the g is obtained using a sample, the sampling error is unavoidable. Curiously, this belief enables analysts to solve the problem of having a g greater than the opportunity cost of equity.

The multi-stage dividend discount model uses the g obtained to calculate the immediate future dividends after the last data record.

This last record of dividends' payment must be capitalized at g for some future years. The number of years in which to apply this capitalization depends on how reliable is the g available. In front of a very consistent estimator of g, a high number of periods can be selected and vice versa.

The last cash stream is computed by discounting, on a perpetual basis, the years remaining at a rate coming from the opportunity cost of equity minus the expected real GDP growth rate. For this second timespan, the g estimated is assumed to be useless. Therefore, the conjecture is that, on the long run, the increase in dividends payment will be close, on average, to the increase in real GDP[18].

In the case of H&M, the perpetuity is applied after a period of 5 years and the anticipated growth of dividends considered is 7,1807%[19]. It is more recommended to use the second method for estimating g, because H&M's yearly dividend growth rate is strongly influenced by an outlier in the growth from 2009 to 2010 (averages might be biased).

Table 4. Estimation of future dividends from 2015 to 2020 (5 years)

Multi-stage growth model	2016	2017	2018	2019	2020
2015 (Y_0)	Y_1	Y_2	Y_3	Y_4	Y_5
9,75	10,45	11,20	12,00	12,87	13,79

Source: Own elaboration

Table 4 depicts the expectations for upcoming years in dividend policy matters. Next step in the calculation of H&M's theoretical value of equity deals with the discount of this stream of payments to the present, combining the five years above and the perpetual growth.

[18] Predictions about real GDP growth rate are found at Appendix 3.

[19] Value obtained when multiplying the plowback ratio by return on equity.

$$P_0 = \frac{DIV_{2016}}{(1+r_e)^1} + \frac{DIV_{2017}}{(1+r_e)^2} + \frac{DIV_{2018}}{(1+r_e)^3} + \frac{DIV_{2019}}{(1+r_e)^4} + \frac{DIV_{2020}}{(1+r_e)^5} + \frac{P_H}{(1+r_e)^5} =$$

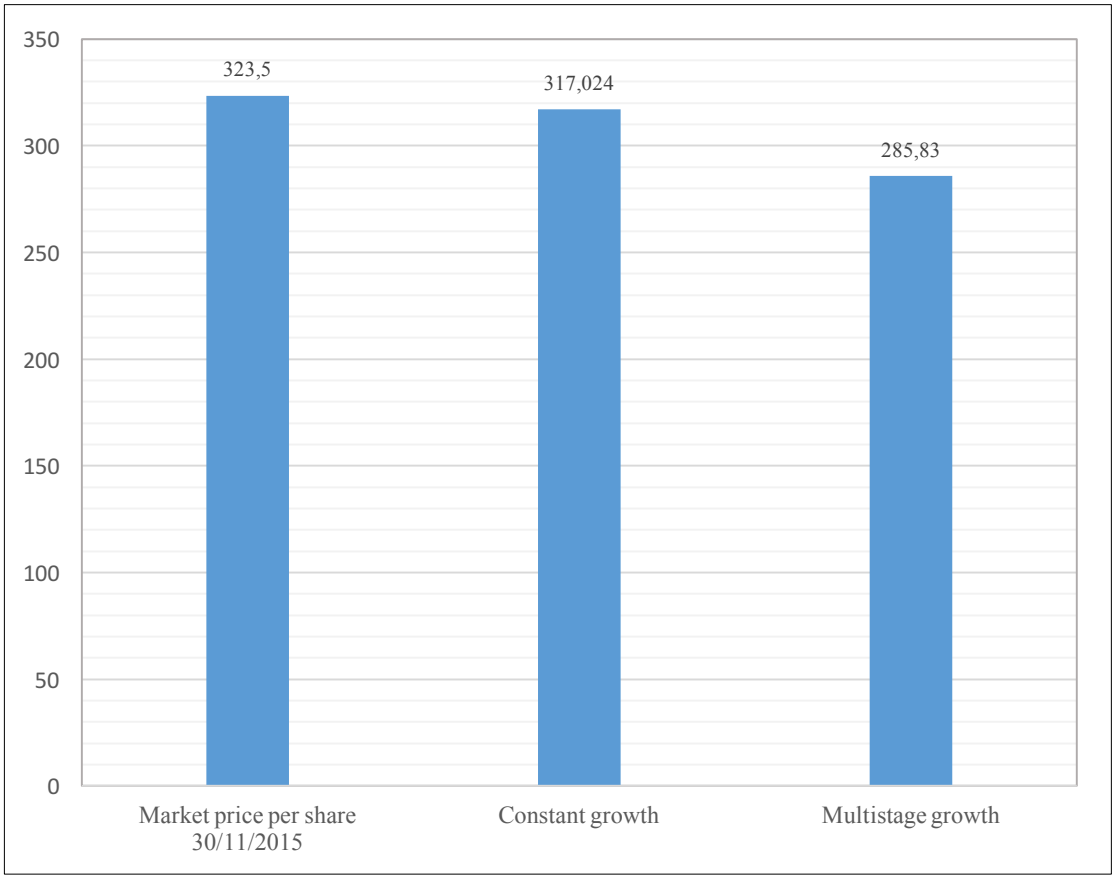
$$= \frac{10{,}45}{(1+0{,}067678)^1} + \frac{11{,}20}{(1+0{,}067678)^2} + \frac{12{,}00}{(1+0{,}067678)^3} + \frac{12{,}87}{(1+0{,}067678)^4}$$

$$+ \frac{13{,}79}{(1+0{,}067678)^5} + \frac{\left(\frac{13{,}79 \cdot 1{,}0718}{0{,}067678 - 0{,}0189}\right)}{(1+0{,}067678)^5} = 285{,}83\ SEK$$

The price per share obtained with this second methodology is slightly lower than the value obtained through the constant growth formula. There is neither one correct nor other incorrect, an uncertainty factor is always present in future predictions.

However, it is possible to stablish an approximated value for H&M's market price per share taking into consideration the results obtained. Figure 5 displays a comparison between H&M's market price per share at 30/11/2015[20] and theoretical prices from the dividend discount model.

Figure 6. Comparison between market price per share and valuation under the dividend discount model (in SEK)



Source: Own elaboration

[20] Date of 2015 Annual Accounts.

Valuation by comparables

Comparables or multiples are ratios calculated on performances by firms which are similar to the one being evaluated, in this case H&M. They are widely used in enterprise valuation because ratios considered are a good combination of risk, plans, strategic orientation and financial accounts of similar companies.

Meitner (2006) describes three different methodologies applied in the framework of company comparable valuation (hereafter CCV): immediate CCV, single-factor CCV and multi-factor CCV.

The first one assigns value to a company based on perfect substitutes. Due to the lack of totally equal or almost equal companies, this method has little relevance in practical valuation settings.

Single-factor CCV uses a linking factor that settles minor differences between the comparable companies and the targeted firm. It proceeds in two steps. First, the average value of a set of comparable companies must be expressed as a multiple of a certain number of bases of reference (EBITDA, sales, cash-flows…) in which firms compared differ. Then, the multiple derived is applied on the bases of the target company[21].

Lastly, the multi-factor CCV reproduces the methodology of the single-factor CVV but considering more than one link between different bases of reference.

In this report and, taking into consideration the complexity of those three methods and its correlation with the course contents, only the single-factor CCV has been used in assessing H&M's value.

Before going into detail with valuation procedures, it is needed to select the common list of comparable companies which are going to be evaluated. This step is extremely important as these models assume that, via the adjustment of aggregated market prices, a perfect substitute of those firms is created and it could be sold in the market for the same price. Consequently, it is essential to find a "peer group" that resembles H&M in terms of volume, requirements, structure, etc.

Nevertheless, determining the right comparables is not one of the purposes of this paper and the selection is based on external sources of information.

The common procedure is to stablish a search criterion based on some financial or business figure such as sales volume, number of employees or market capitalization. Then, several databases (Factiva, Amadeus, etc.) are capable to look for the most similar comparable companies, within the same industry, in terms of the search criterion selected.

Factiva has provided the following list when asking for H&M's comparable companies in terms of sales revenue:

[21] This single-factor CCV is commonly known as valuation by multiples.

1. Industria de Diseño Textil SA (hereafter INDITEX)
2. Gap, Inc.
3. Nordstrom, Inc.
4. FAST RETAILING CO., LTD.
5. L Brands, Inc.
6. Next Plc
7. Burlington Stores, Inc.
8. Ascena Retail Group, Inc.
9. SHIMAMURA Co., Ltd.

Thenceforth, from the list above, only the first 4 companies will be included in the analysis with the objective to shorten the chapter and because they ought to be the most similar to H&M[22].

i) Single-factor CVV

Single-factor models use relative differences in a typical financial figure (earnings per share, EBITDA, book value, etc.) between a target company and a set of comparable firms. The model extrapolates these differences to adjust the market price of the targeted one. According to the assumption of perfect substitutes, the following equation must hold (see Peemöller, Meister and Beckman, 2002:197-198; Böcking and Nowak, 1999: 170; Ballwieser, 1991:52; Nowak, 2000:165; Wagner, 2005: 5-6):

$$V_{it} = V_{jt} \cdot \left[BR_{i\tau} \cdot \left(BR_{j\tau}\right)^{-1}\right] = \left[V_{jt} \cdot \left(BR_{j\tau}\right)^{-1}\right] \cdot BR_{i\tau}$$

where:

$V = value$
$BR = bases\ of\ reference,$

with subscript i indicating the "target company" and subscript j indicating the "comparable company/companies".

The term $\left[V_{jt} \cdot \left(BR_{j\tau}\right)^{-1}\right]$ is the multiple by which the bases of reference of the target firm must be multiplied to yield its overall value.

Another point worth mentioning is that, as more variables are selected, in describing the relation between the target firm and comparable companies, the selection of comparables

[22] Sometimes it is better to shorten the list of comparables because firms in last positions might be excessively different from the one being evaluated.

becomes less strict. Accordingly, a selection in single-factor CVV will be less strict than in immediate CVV but more than in multi-factor CVV.

When composing the models, it is important to define both the numerator and the denominator consistently, primarily in capital providers matters (i.e. if the variable in the numerator belongs only to equity capital, the variable in the denominator should belong only to equity capital as well).

H&M presents an additional problem, which is its lack of debt, in contrast with competitor's capital structure. For this reason, the selection of multiples is more oriented towards figures involving equity.

ii) Selection of multiples and bases of reference

Table 5 displays the selection of multiples, together with their respective bases of reference, that have been considered in the valuation of H&M.

As previously mentioned, the use of enterprise bases of references, the ones appearing in financial statements before accounting for the capital structure of the firm (EBITDA, EBIT or total assets), require building multiples that relate the variable to the whole value of the firm. On the contrary, equity bases of reference (net income, book values, etc.) require relations to stock price.

Table 5. Peer group and selected multiples[23]

Peers of H&M:	P/sales	P/CF	P/tang. BV	EV/sales	EV/EBITDA
INDITEX	4,43	20,88	8,93	4,2	18,68
GAP INC	0,49	19,89	4,33	0,51	3,67
Nordstrom Inc	0,48	3,81	19,58	0,64	5,37
Fast Retailing Co., LTD	1,76	37,26	7,36	1,49	12,24

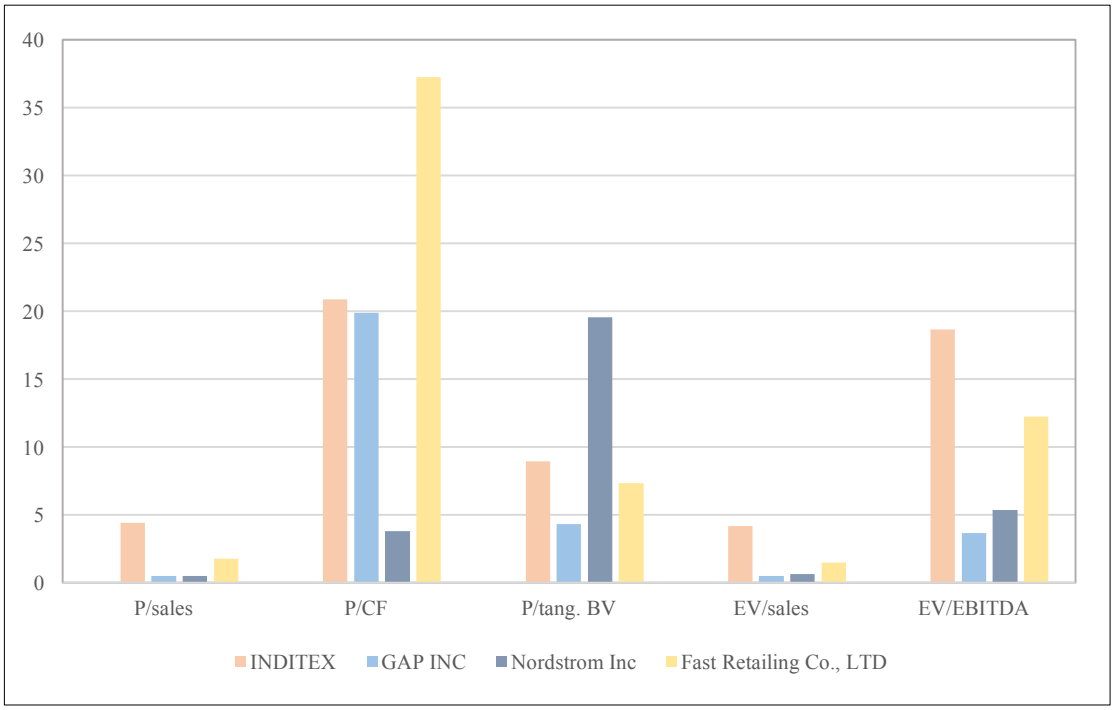
Source: Factiva

- *Price to sales (P/Sales):* A valuation ratio that compares some company stock price with its revenue. It is an indicator of the value placed on each monetary unit of the company's sales revenue and can be calculated taking the market capitalization of the firm and dividing it by total sales revenue over a one-year period.

[23] The financial figures in denominators are the bases of reference.

- *Price to cash flow (P/CF):* The price-to-cash-flow is the ratio of a firm's stock price to its cash flow per share. It is an indicator of a stock's valuation. Although there is no single criterion to denote an optimal price-to-cash-flow, a ratio in the low single digits may indicate an undervalued stock while a higher ratio may suggest potential overvaluation.
- *Price to tangible book value*: The tangible book value per share (TBVPS) is a method of valuing a company on a per-share basis by measuring its equity after removing any intangible assets. A company's tangible book value looks at what common shareholders can expect to receive if the firm goes bankrupt and all its assets are liquidated at their book values.
- *EV/ sales:* Compares the enterprise value of a company to the company's sales. This ratio provides investors with the idea of how expensive is to buy the company's sales. This measure is an expansion of the price-to-sales ratio, which uses market capitalization instead of enterprise value.
- *EV/ EBITDA:* Compares the enterprise value with the company's EBITDA. It is also used to assess the value of the company.

Figure 7. Multiples of each peer



Source: Own elaboration

iii) Aggregation of the peer group results

Next step in single-factor CCV concerns the aggregation of the peer group multiples in a value representing the four comparable companies selected. There are typically four

different ways of putting together the data from comparables: (1) arithmetic mean, (2) median of the multiples, (3) harmonic mean or (4) through a regression.

The first method consists on a simple addition of the multiples of each peer, divided by the number of comparable companies.

The second one, takes the median instead of the simple average for aggregating the value of all comparable companies.

The harmonic mean is computed as the reciprocal of the average of the reciprocals from the multiples.

Lastly, it is also possible to build a regression to adjust all data points for a multiple.

Meitner (2006) developed three equations to represent mathematically the procedure corresponding to the first three aggregation methods:

i. Simple average:

$$[V \cdot (BR)^{-1}]_{aggregate} = \sum_{x=1}^{m} [V_x \cdot (BR_x)^{-1}] \cdot m^{-1}$$

ii. Median:

$$[V \cdot (BR)^{-1}]_{aggregate} = \begin{cases} \left(V \cdot (BR^{-1})\right)_{(m+1)/2} & for\ uneven\ m \\ \dfrac{\left[\left(V \cdot (BR^{-1})\right)_{\frac{m}{2}} + \left(V \cdot (BR^{-1})\right)_{\frac{m}{2}+1}\right]}{2} & for\ even\ m \end{cases}$$

iii. Harmonic Mean:

$$[V \cdot (BR)^{-1}]_{aggregate} = m \cdot \left(\sum_{x=1}^{m} [V_x \cdot (BR_x)^{-1}]^{-1} \right)^{-1}$$

When aggregating the multiples through a regression, the point is to obtain the beta of regressing the comparable company's value V_{jt} (numerator of the multiple) on the corresponding bases of reference. The computation is done by applying the classical simple regression formula:

$$\hat{\beta} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^{n}(x_i - \bar{x})^2} = \frac{Cov[x, y]}{Var[x]}$$

Nonetheless, the aggregation of multiples through a regression is reasonable only if the sample of comparables is largely enough to allow an acceptable level of accuracy. Additionally, because of its complexity, it is generally used only in cases where the intercept is intentionally not restricted to zero.

Table 6 provides a summary of the aggregation results for each multiple under the four different methods. Additionally, Appendix 5 details how to apply the regression approach.

Table 6. Multiples' aggregation for H&M

Aggregation method	P/sales	P/CF	P/tang. BV	EV/sales	EV/EBITDA
Simple average	1,79	20,46	10,5	1,71	9,99
Median	1,12	20,38	8,14	1,06	8,8
Harmonic Mean	0,81	10,32	7,55	0,9	6,73
Regression	14,54	26,13	9,01	12,05	20,70

Source: Own elaboration

iv) Valuation process

Final step in this valuation of H&M using comparables consists on selecting a result from some aggregation method and apply it to the corresponding bases of reference from the firm.

The most used aggregation method is the arithmetic mean, in part due to its simplicity. It is suitable for scenarios where the multiples are not very dispersed, or if this dispersion follows a normal distribution. While the first condition is easily verified by a quick glance at Figure 7, the normal distribution is harder to assume due to the small sample selected. In general, a small sample cannot allow to benefit from the central limit theorem and assume normality on data. Therefore, if the sample is very small (made of four or less companies), analysts tend to use the median.

In this case, only four companies have been selected to be used as comparables, thus the median should be taken for the valuation process.

Although multiples are computed from historical data, it is recommended to develop estimators for next year's bases of reference. Accordingly, as in previous sections, it is possible to get an estimator of future financial figures by taking average increments over the previous years.

The mathematics are very simple. The median aggregated values from Table 6 must be multiplied by the estimated bases of reference, following the equation in this chapter's section one.

The bases of reference might be expressed in global units or its equivalent value per share. Although this decision has no influence in final results, the aim here is to end up with

H&M's share price thus, starting with per share values will reduce the number of operations needed[24].

Table 7. Enterprise value for different multiples

H&M	P/sales	P/CF	P/tang. BV	EV/sales (millions of SEK)	EV/EBITDA (millions of SEK)
Estimated BR (2016)	122,93	15,48	33,77	205.036,54	36.364,91
Estimated enterprise value				217.338,73	320.011,21
Estimated value per share	137,68	315,48	274,88	131,32	193,35

Source: Own elaboration

Table 7 displays the estimated value per share obtained with the five multiples.

Dispersion is considerably high among the results obtained. The range of values goes from 131,32 to 315,48 SEK per share. This controversy is probably a consequence of structural differences between H&M and the comparable companies, which results in some inaccurate multiples.

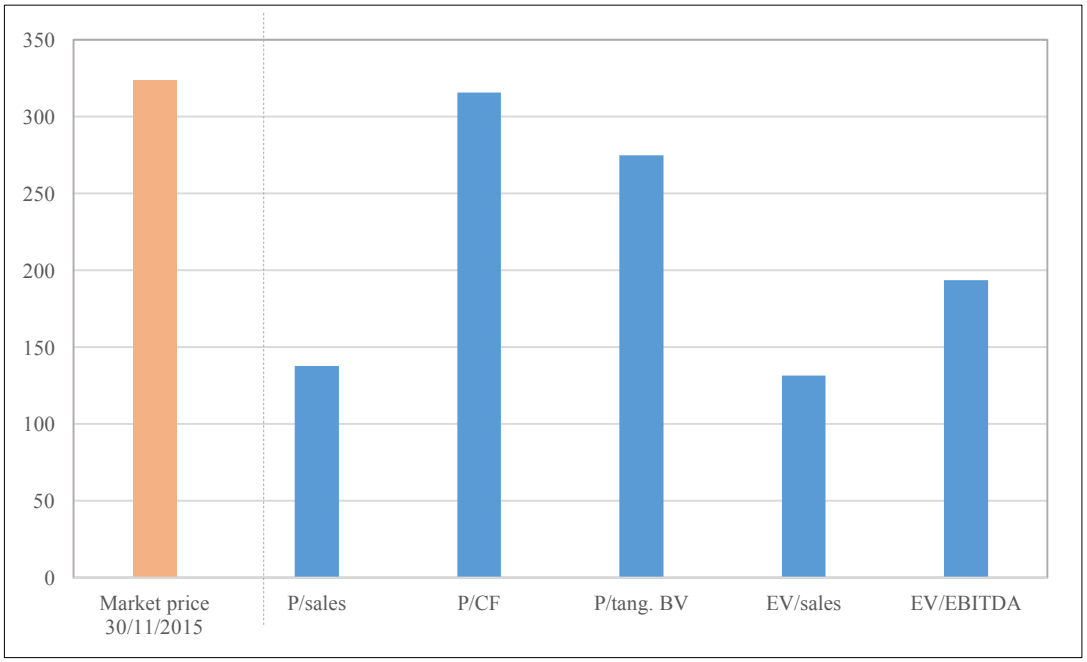
Moreover, H&M has an atypical capital structure that might have a great impact on some financial figures. As an evidence of it, notice that the highest value comes from the multiple "CF per share". This result might be a consequence of the fact that H&M can offer higher dividends than comparable companies because its only investors are equity holders. On the other hand, all firms in the peer group must also meet their obligations with banks or other debtholders. The positive aspect is that these companies with higher degrees of leverage are supposed to have higher revenues with respect to money invested than H&M.

Conclusively, it is necessary to provide a single estimated value per share for H&M's stock to make the comparison with market price. Up to this point, it is reasonable to select the value coming from the multiple with the highest degree of similarity between comparables and the firm being evaluated. In the case of H&M this multiple is not clear, there are differences among all of them. Therefore, a solution could be to build an average with results from all multiples involved in the process.

The final result, taking the average value for all multiples is 210,54 SEK/share, considerably undervalued if compared with the market price at 30/11/2015 of 323,5 SEK/share.

[24] If the multiples are applied to bases of reference in enterprise units, results obtained will have to be divided by the number of shares outstanding.

Figure 8. Valuation by multiples vs. market price



Source: Own elaboration

Even though the analysis is not consistent due to several limitations, such as the reduced number of multiples selected or disparities between H&M and the peer group, all multiples provide an estimate below the market price of the firm. This datum might be a more solid argument to conclude that H&M's stock is overvalued and it will fall in forthcoming periods.

PART IV: Valuation by Discounted Cash Flows

The valuation by discounted free cash flows (hereafter DCF) is considered the most robust and reliable method for valuing enterprises.

The idea behind this method is to consider the firm as if it was one big project. The goal is to forecast the company's free cash flows (the hardest part of this section) and discount them back to the present. In doing so, three points must be taken into account:

1. If you discount at WACC, cash flows must be projected just as you would for a capital investment project, interest should not be deducted. In addition, taxes should be calculated as if the company was all equity-financed (this is not a problem for H&M as it is in fact all equity-financed).
2. Companies are potentially immortal. A terminal value should be added after projections to a medium-horizon.
3. Discounting at WACC values assets and operations. If the objective is to value the company's equity, it is required to subtract the value of the firm's outstanding debt.

The procedure begins with a forecast of each year's free cash flow out to a valuation horizon (H), followed by an estimation of the business value at the horizon (PV_H). The cash flows (predicted) and the horizon value are discounted back to the present by applying the following formula:

$$PV = \frac{FCF_1}{1+WACC} + \frac{FCF_2}{(1+WACC)^2} + \frac{FCF_3}{(1+WACC)^3} + \frac{FCF_4}{(1+WACC)^4} + \frac{FCF_5}{(1+WACC)^5} + \frac{PV_H}{(1+WACC)^5}$$

Forecasting free cash flows

Free cash flow (hereafter FCF) is the amount of cash that the firm can pay out to investors after making all investments necessary for growth. Discounting the free cash flows at the after-tax WACC returns the total value of the firm.

Determining the future free cash flows is the most tedious part of this valuation approach and results are strongly influenced by predictions' goodness. Whereas this paper presents a simplistic methodology to estimate FCF, more sophisticated modelling can be used for improving forecasts' accuracy.

The general formula applied in FCF calculations is the following one:

$$FCF = (Revenue - Cost - Depreciation) * (1 - t_c) + depreciation - net\ capital\ expenditures - net\ change\ in\ working\ capital$$

To compute each component in the formula, it is possible to lay out different drivers, which have an important effect on them, and use these drivers for predictions. Appendix 4 describes the procedures and drivers used in the forecast of the different financial figures appearing in the FCF formula above.

The objective, after conducting all required operations, is to culminate in a predicted income statement adapted for FCF calculations.

Table 8. Incremental earnings forecast (millions of SEK)

	YEARS (t_0 = 2015)					
	0	1	2	3	4	5
Sales		193.061,48	206.084,97	219.986,99	234.826,82	250.667,71
COGS[25]		(82.947,78)	(89.390,97)	(96.334,66)	(103.817,71)	(111.882,03)
Gross Profit		110.113,7	116.694	123.652,34	131.009,11	138.785,67
SG&A		(75.346,72)	(80.468,44)	(85.938,3)	(91.779,98)	(98.018,75)
EBITDA		34.766,98	36.225,56	37.714,04	39.229,13	40.766,92
Depreciation		(2.984,17)	(3.692,31)	(4.568,5)	(5.652,6)	(6.993,97)
EBIT		31.782,81	32.533,25	33.145,54	33.576,52	33.772,95
Taxes (23,75%)		(7.548,42)	(7.726,65)	(7.872,06)	(7.974,42)	(8.021,08)
NOPAT		24.234,39	24.806,6	25.273,47	25.602,1	25.751,88
Net Project Capex		(4.512,6)	(5.583,19)	(6.908,08)	(8.547,37)	(6.225,95)
Change in Net Working Capital		(5.729,38)	(3.159,97)	(3.391,2)	(3.639,42)	(3.905,9)
FCF		16.976,58	19.755,76	19.542,69	19.067,91	22.614,0

Source: Own elaboration

In this chapter, ratios and figures from Table 1 come into play. Some of them are 5-Y averages of different financial figures, with a big role in several forecasts. It is a good help to have available these mentioned magnitudes when building the predicted income statement.

[25] COGS excluding depreciation.

Estimating Horizon Value

Table 8 displays the forecasted cash flows for the five years following the last data record. After this period, predictions ought to be less consistent and the model attaches H&M's FCF to a stable long term growth, starting at year 2020. Usually, to estimate this perpetual growth rate, the expected growth in real GDP is taken.

Besides future uncertainty, the main limitation in getting an estimate for real GDP growth is the geographic boundary. As H&M mainly operates in Europe, the real GDP considered is the one within the Eurozone.

Appendix 3 handles an economic analysis where real GDP historical trend is presented, together with a forecast for years 2013-2018. This forecast is used as an estimate for the economy's growth rate on the long-run and, therefore, applied in the model when calculating H&M's perpetual growth.

Next step then, is to find the present value of the cash flows from 2020 onwards. As FCF's growth is assumed to be constant, it is possible to discount them back to the present by applying the present value formula of perpetuities.

$$PV_H = \frac{FCF_{H+1}}{WACC - g}$$

This expression is the value at year 2020 of all company's future cash flows, often called horizon value.

Regarding the formula above, all elements are available except for FCF_{H+1}, which can be easily computed by applying the real GDP growth rate to the last forecasted FCF in Table 8.

$$FCF_{H+1} = FCF_H * (1 + g) = 22.614 \cdot (1 + 0{,}0189) = 23.041{,}4 \ \ millions\ of\ SEK$$

$$PV_H = \frac{FCF_{H+1}}{WACC - g} = \frac{23.041,,72}{0{,}067678 - 0{,}0189} = 473.372{,}82\ millions\ of\ SEK$$

Calculating enterprise value and theoretical share price

Final step in this valuation approach concerns discounting to the present both the forecasted FCF and the horizon value by applying the formula purposed in the beginning of the chapter:

$$PV = \frac{16.976{,}58}{1 + 0{,}067} + \frac{19.755{,}76}{(1 + 0{,}067)^2} + \frac{19.542{,}69}{(1 + 0{,}067)^3} + \frac{19.067{,}91}{(1 + 0{,}067)^4} + \frac{22.614}{(1 + 0{,}067)^5} + \frac{473.372{,}82}{(1 + 0{,}067)^5} = 423.690{,}22 \text{ millions of SEK}$$

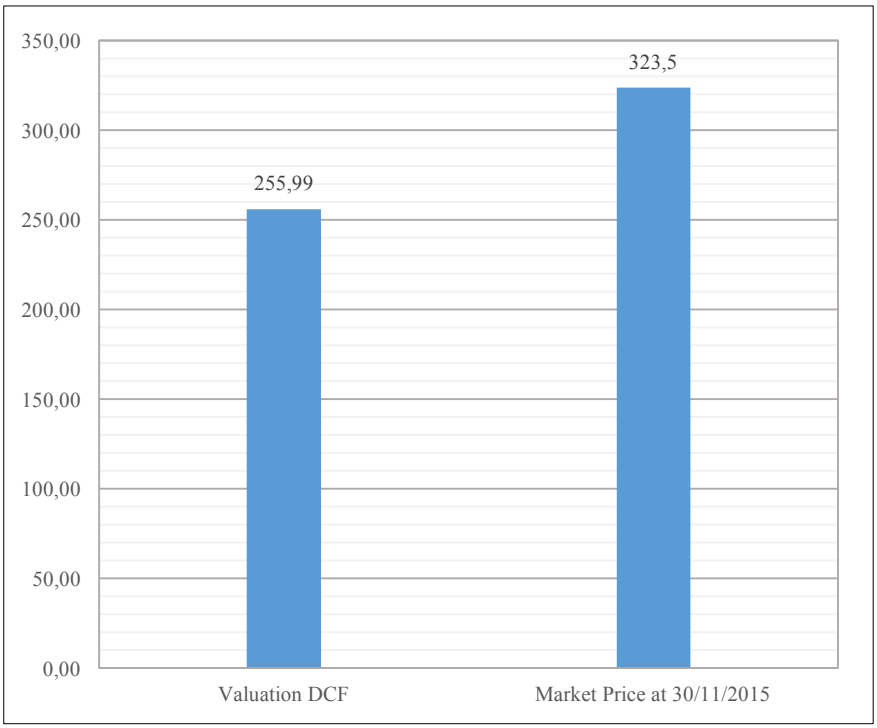
This result reflects H&M's total value (EV). Taking into consideration that the company has no debt outstanding, it could be also taken as the equity value.

Then, for making comparisons between the result obtained with the valuation process and market prices, it is more practical to calculate the theoretical value of one H&M share according to DCF valuation. H&M's annual report states that the total number of shares outstanding is equal to 1.655.072.000, which leads to a theoretical share price of 255,99 SEK.

$$Theoretical\ share\ price = \frac{423.690,22}{1655,072} = 255,99\ SEK$$

The result obtained reinforces the argument of an overvalued stock at November 30th, 2015.

Figure 9. DCF valuation vs. market price



Source: Own elaboration

Sensitivity analysis

Whenever being confronted with a cash flow forecast, there is always some uncertainty involved.

In front of the impossibility to make predictions with total certainty about what is going to happen, analysts tend to attach to DCF valuation a sensitivity analysis, in which they build different expected future scenarios. The traditional approach is to adjust calculations for an optimistic, a realistic and a pessimistic scenario by adapting market growth rate,

market size, etc. Then, it is possible to end up in three different estimates for H&M's enterprise value corresponding to the three situations previously mentioned.

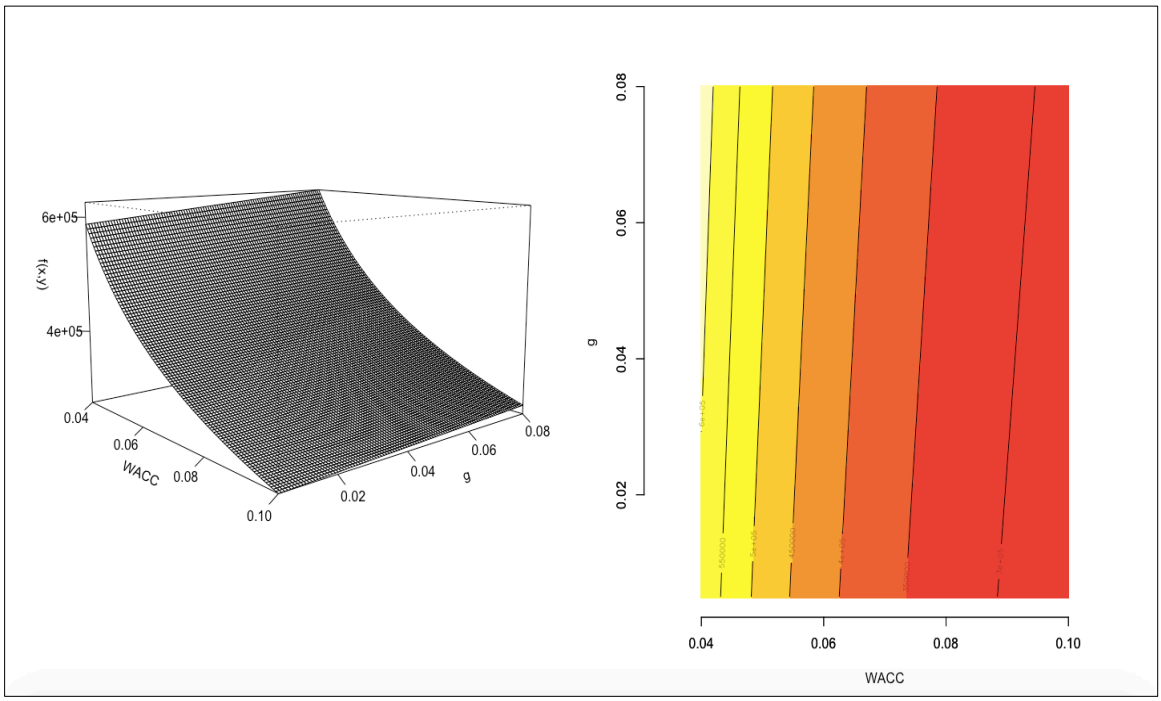
Nevertheless, in this paper a new approach is laid out concerning sensitivity analysis. Instead of postulating only three values, a function $f\ (WACC, g)$ is built with the aim of providing an image for each pair $(WACC, g)$.

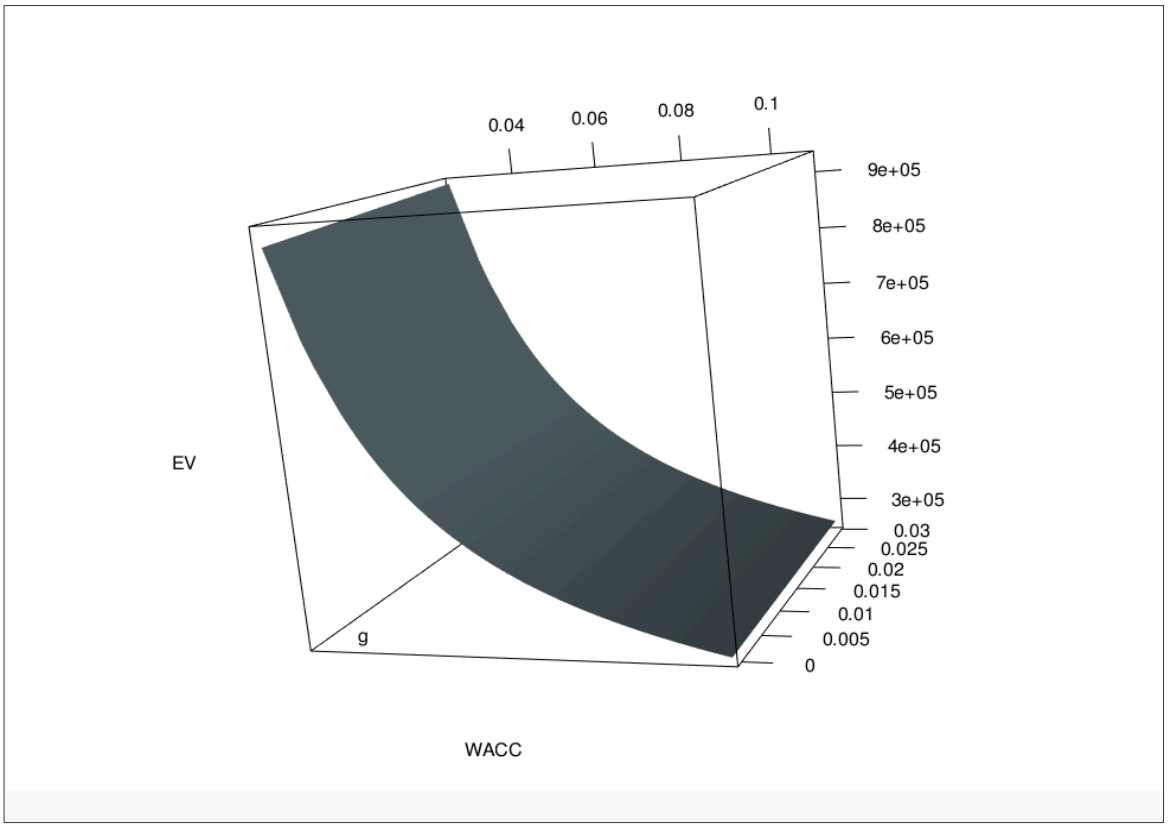
There are other more sophisticated ways of modelling FCF, which enable the computation of better estimates. Furthermore, it is also possible to include more variables in function f, for instance FCF predictions. However, taking into consideration the course contents and the difficulty of representing graphically a function with more variables, this basic setting is used to build a three-dimensional graph with a possible range of values for both the WACC and the g. The objective is to analyze how variations in both magnitudes impact enterprise value.

To make this analysis simpler, normality has been assumed in the probability distribution of variables WACC and g.

Setting our previous estimates as expected values and a standard deviation based on historical dispersion, it is possible to generate a dataset reflecting a reasonable range of values for both variables.

Figure 10. Effect of WACC and g on Enterprise Value





Source: Own elaboration

Notice this procedure contemplates constant FCF. Again, it is up to the analyst to consider FCF as random variables, fit them in a model or, like in this report, keep them constant.

This section provides evidence that, at least for H&M, the dispersion concerning WACC is higher and more determinant in overall firm's value. As WACC decreases, EV goes up exponentially, while the relation is linear and smoother regarding the growth in real GDP.

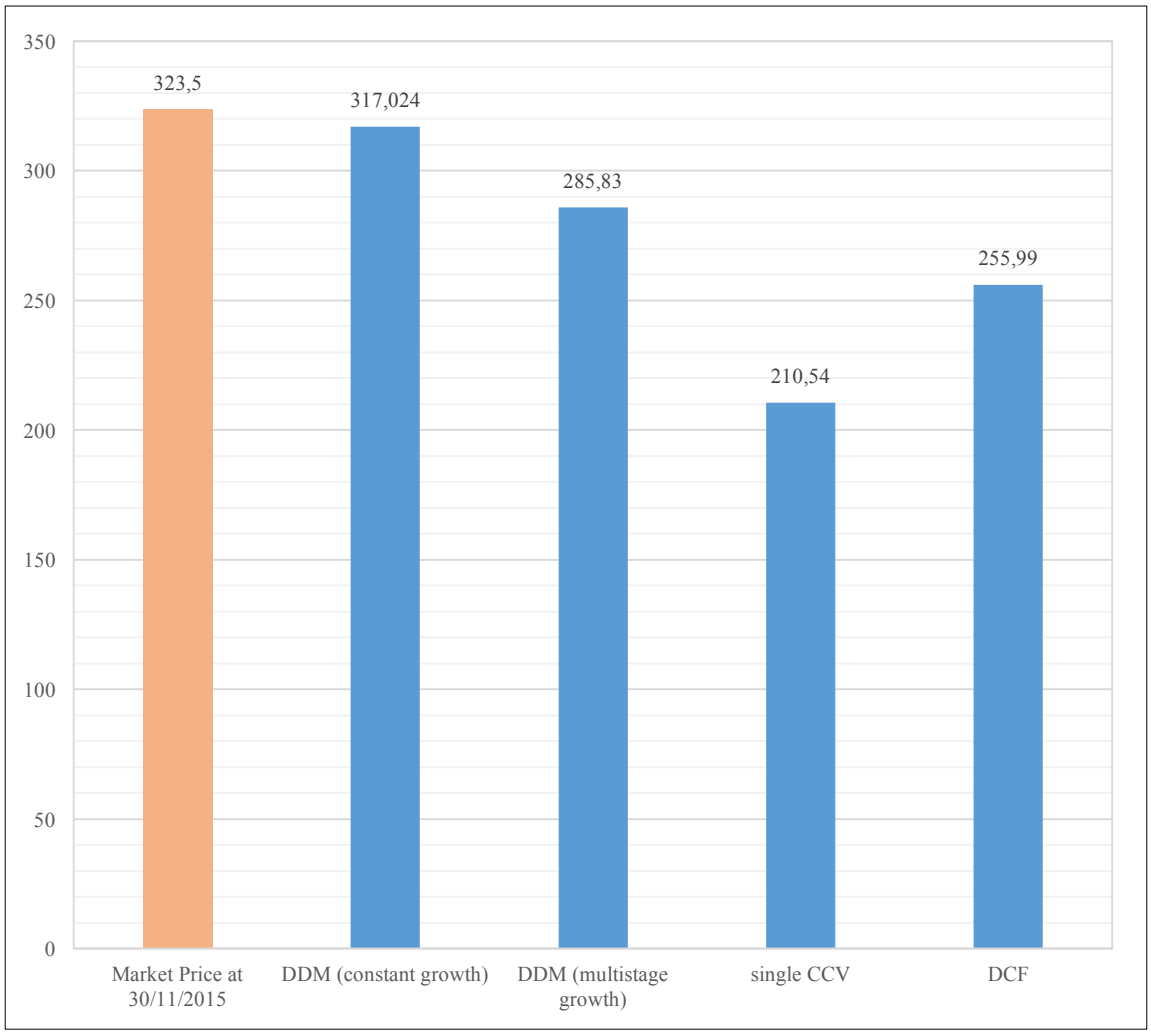
PART V: Conclusions

Different valuation methods presented have remarkable differences when providing the final estimate for H&M's stock price.

Due to some randomness in each of them, it is tedious to find the most accurate or the one which reflects reality better. Contrary to an absolute truth, results obtained should be considered together as indicators of tendency that provide an approximate idea about how stock prices will evolve.

This grouping of valuation methods is summarized in Figure 11, in which estimates for the share price of H&M are displayed together and compared with market price at 30/11/2015.

Figure 11. Comparison between market price at 30/11/2015 and results from all valuation methods



Source: Own elaboration

An interesting remark in this particular example of H&M, is that all valuation methods provide a theoretical share price below the current market price.

This difference is higher depending on the valuation procedure but the same conclusion works for all of them, H&M stock is overvalued.

In front of disparities among conclusions under different valuation methods, extra analysis should be conducted. Nonetheless, this picture of having all estimates below current market price is a strong argument for concluding that H&M's shares are overvalued.

Accordingly, it is sensible to imagine that in next periods H&M's market price will decrease and adjust to its expected value.

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Appendix 1: Introduction to technical analysis

There are two major schools of thought in financial markets, technical analysts and fundamentalists.

Technical analysis concerns the use of quantitative methods to develop a set of charts that help to study stock prices and volume data, with the aim of forecasting future trends. On the other hand, fundamental analysis gets into economic factors, known as fundamentals.

At the most basic level, technical analysts focus on mathematic theory to study stock price evolution, while fundamentalists look at financial statements.

The valuation methodology presented in this work is closer to a fundamental approach. In return, Appendix 1 seeks to introduce the reader to the other side of the coin, that is technical analysis.

Major assumption for the ones who follow technical analysis is that stock price and volume data can be used as indicators of both the supply and demand of the stock. Accordingly, a rising stock indicates that demand exceeds supply and vice versa. To succeed in financial markets, analysts must be able to identify trends and catch early stages of those trends.

In order to do so, they serve from different technical indicators, broadly grouped into three categories: (i) trend indicators, (ii) volatility indicators and (iii) momentum indicators.

Before going into detail with each category, a brief summary of H&M's share price evolution is presented[26], together with an extra chart, in which H&M's stock performance is compared with its closest competitor, INDITEX.

Figure 12 shows H&M's stock price evolution over the period of analysis. Some interesting remarks from the chart are the general and powerful increase in H&M's share price despite a period of instability arising between the year 2010 and 2011.

The subsequent graph displays the evolution of a hypothetical 1€ invested in H&M, and then makes the comparison of investing the same euro in INDITEX.

In general terms, it is possible to argue that the investment in INDITEX is more successful. However, while H&M shows a stable growth, INDITEX had a great fall in middle 2014 and the stock is, in general, more volatile.

This difference might come from the fact that H&M has no debt outstanding which probably has a negative effect on return on equity[27] but, on the other hand, it helps in having a safer security.

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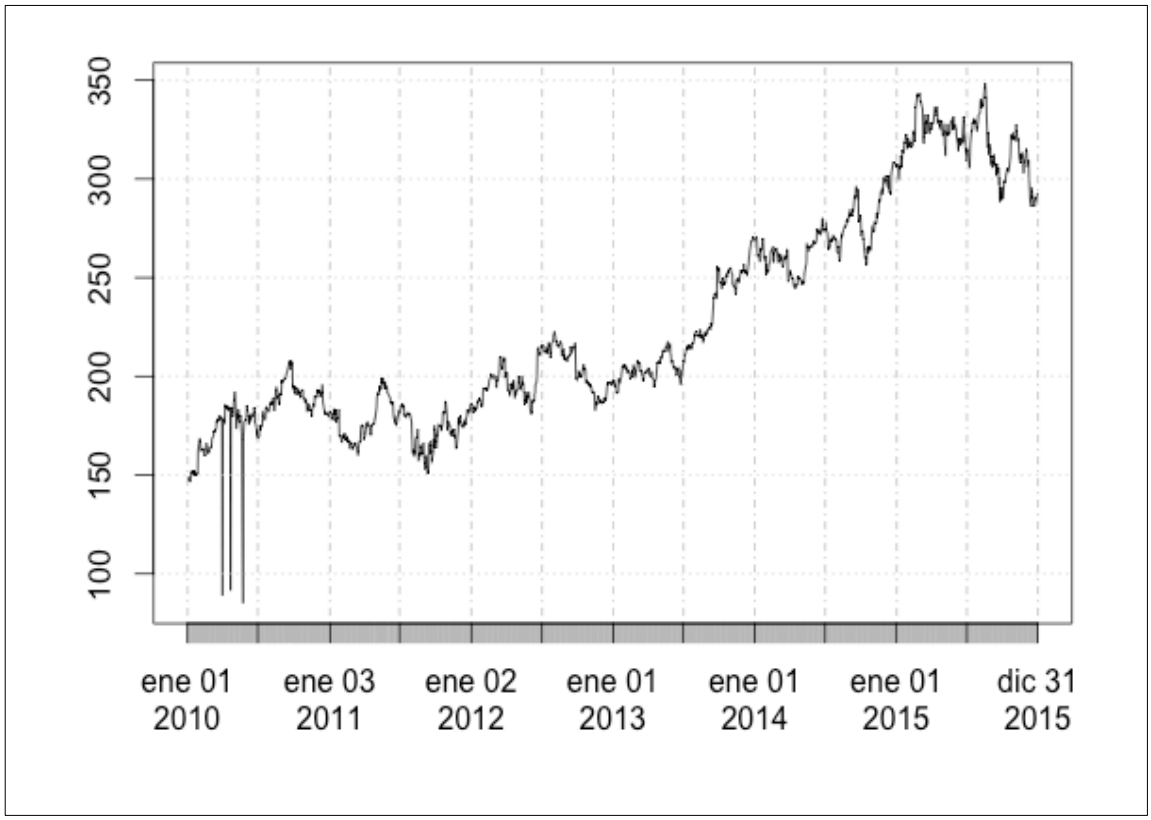
[26] Period of analysis 2010-2015.

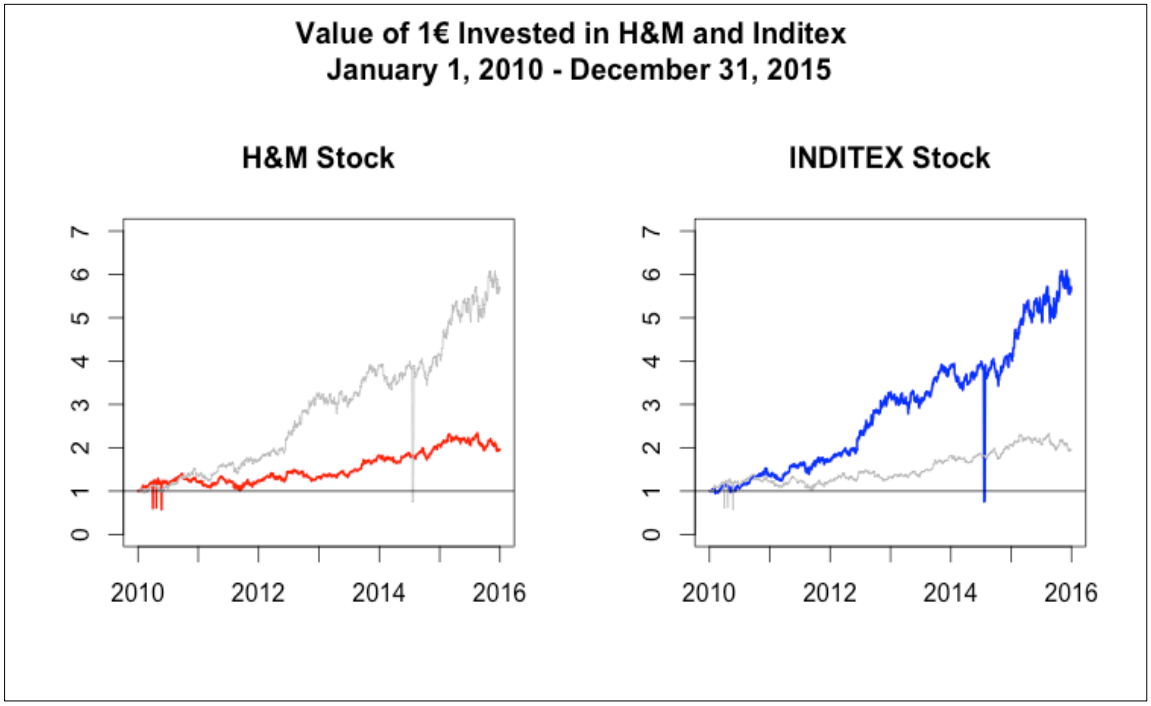
[27] Chapter 1, Du-Pont methodology.

Figure 12. H&M's share price evolution



Source: Own elaboration

Figure 13. Investment comparison between H&M and INDITEX



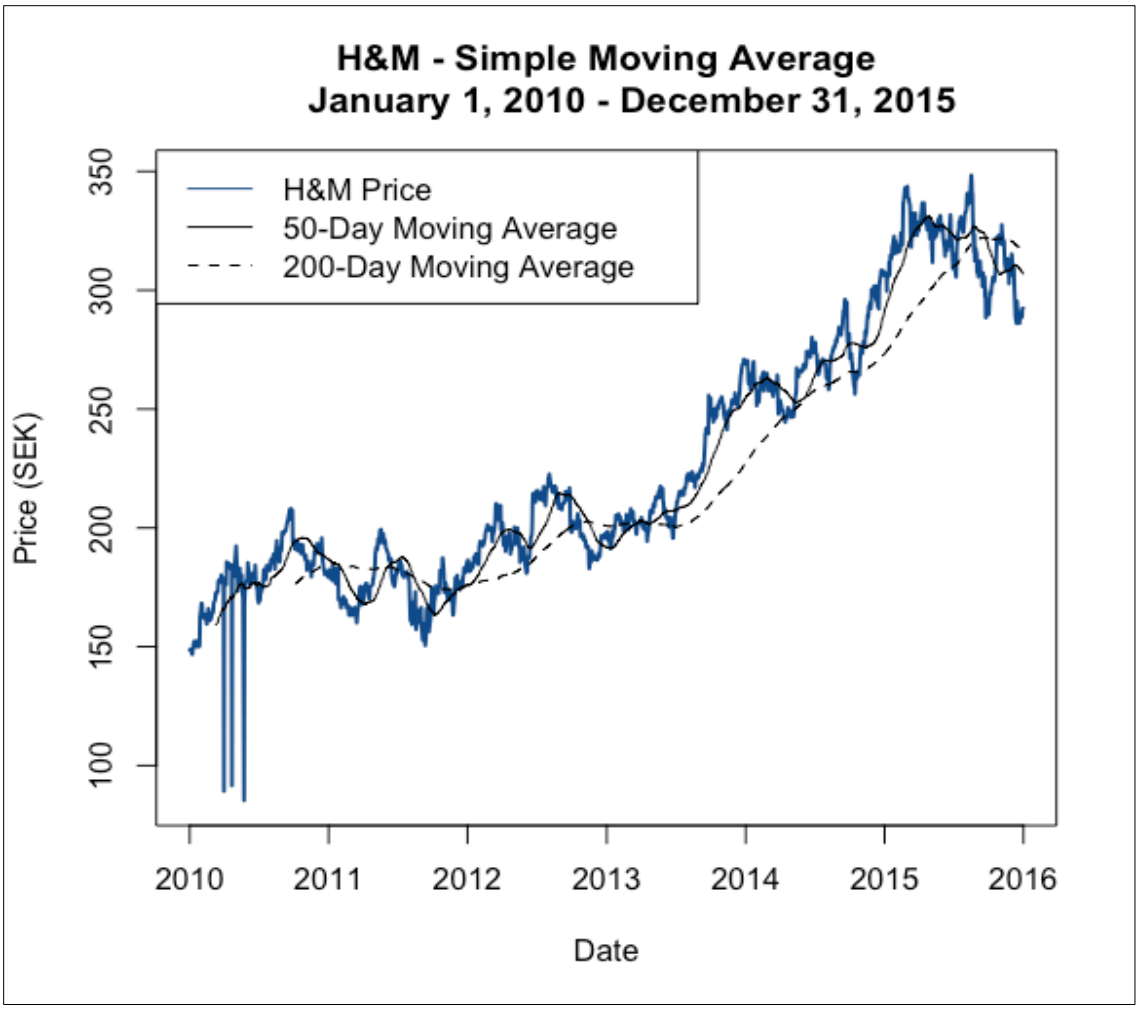
Source: Own elaboration

Trend indicator: Simple Moving Average

A common indicator for the trend, in technical analysis, is the Simple Moving Average (SMA). It is calculated by taking the average of stock prices over some certain previous periods. The "crossover" of SMA uses two lines, a shorter-term and a longer-term, and make trading decisions when both lines cross.

Figure 14 uses an average over 50 daily registers for the short-term line, and another over 200 for the longer-term one.

Figure 14. H&M Simple Moving Average



Source: Own elaboration

Theory suggests that if 50-day moving average cross above the 200-day moving average, this is a bullish crossover and is interpreted as a sign to buy the stock. On the contrary, if the 50-day moving average crosses below the 200-day moving average, this is a bearish crossover and is a sign to sell the stock.

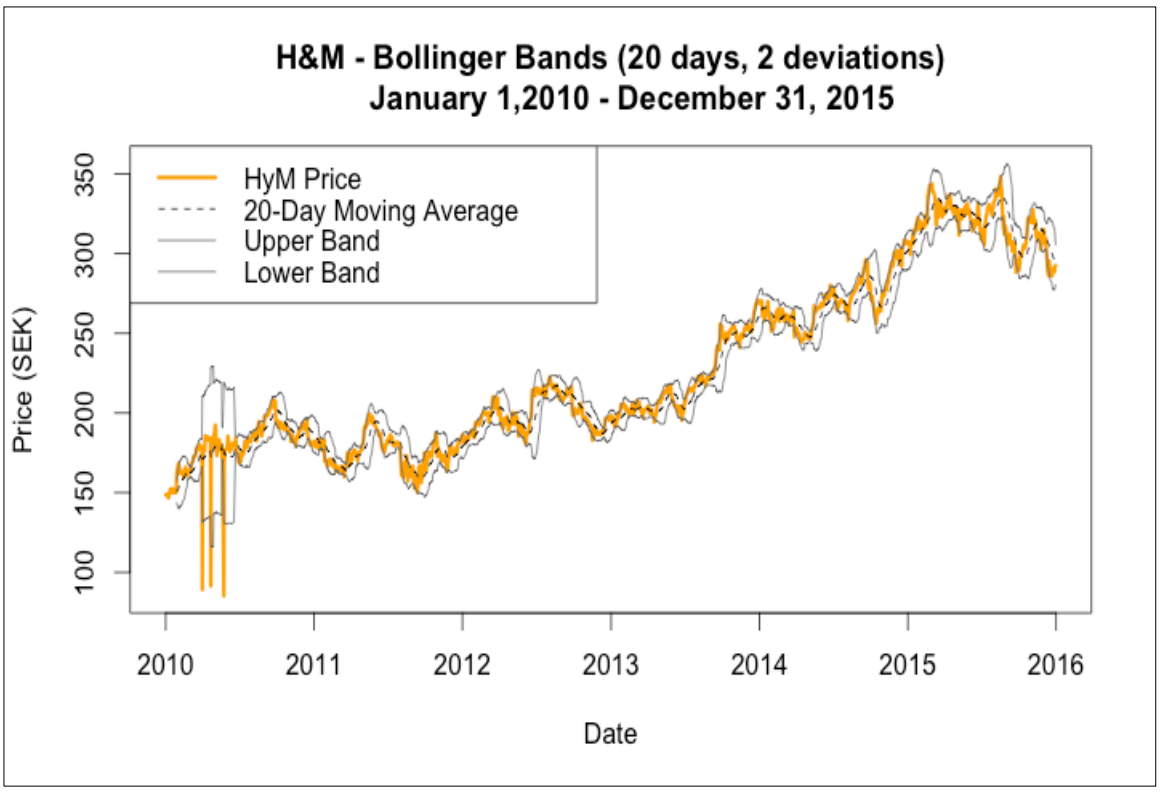
Volatility: Bollinger Bands

The most popular indicator of volatility are Bollinger Bands. This tool has three basic components. The first one is a 20-period SMA[28]. Then, the second one is an upper band, made of two standard deviations above the 20-period SMA line. Finally, the third component is a lower band, two standard deviations below the 20-period SMA line.

The bands are used as indicators of volatility because they widen (narrow) with more (less) volatility in the stock.

Figure 15 suggests a stable stock, with a short period of high volatility between 2010 and 2011.

Figure 15. H&M Bollinger Bands



Source: Own elaboration

Momentum: Relative Strength Index

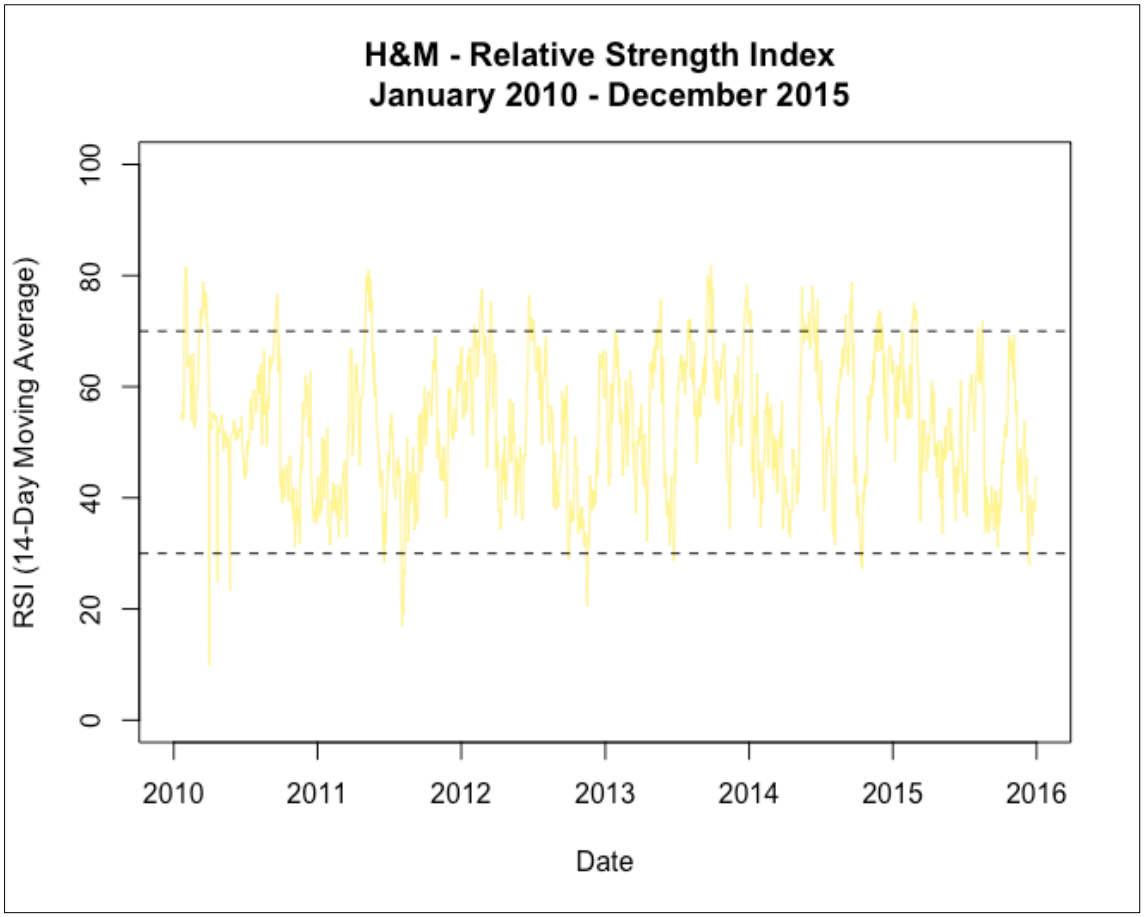
The Relative Strength Index (RSI) is a popular momentum indicator, used to determine if the market is bullish or bearish. The typical calculation uses a 14-day period and it is calculated as:

$$RSI = 100 - \frac{100}{1 + RS}$$

[28] The number of periods used for the SMA could vary depending on the analyst's preferences.

RS is equal to the up average divided by the down average with averages coming from a Wilder Exponential Moving Average[29]. The RSI is used in conjunction with two lines: an overbought line typically set a level of 70, and an oversold line typically set at a level of 30. Then, a buy signal arises when the RSI line rises from below the oversold line and crosses it. On the contrary, a sell signal occurs when the RSI line falls from above the overbought line and crosses it down.

Figure 16. H&M RSI index



Source: Own elaboration

[29] The number of periods used in the Wilder Exponential Moving Average might vary depending on the analyst's preferences.

Appendix 2: Arbitrage Pricing Theory and the Fama-French Three Factor Model

CAPM methodology has not performed well in empirical testing. The model rest on several assumptions that are inconsistent in the real world. Many of them are not crucial but, the major problem behind this model is that assumes investors are content to invest their money in a limited number of benchmark portfolios representing the market return.

Stephen Ross developed an alternative methodology known as the arbitrage pricing theory (hereafter APT), which comes from an entirely different family. APT assumes that the beta is not enough to explain differences between stock and market returns. Thus, it starts considering that each stock returns depend on a set of economic influences or "factors", and some "noise" representing variables that remain unexplained.

Therefore, the equation postulated by Ross is the following:

$$Expected\ stock\ return = \alpha + \beta_1\left(r_{factor\ 1}\right) + \beta_2\left(r_{factor\ 2}\right) + \beta_3\left(r_{factor\ 3}\right) + \cdots + noise$$

However, the theory does not say what are the factors in the model. The return on market portfolio (CAPM) must serve as a factor, but the rest must be based on analysts' beliefs, who have to be creative enough to build a personal and efficient multi factor model.

One model that has become popular is the Fama-French Three Factor Model (FF). Subsequently, this model is going to be used to estimate the cost of equity for H&M and, afterwards, results are going to be compared with the ones obtained in the CAPM.

Fama-French with Three Factors

The Fama-French picks up risk factors that are left out the CAPM, but there is some evidence that they are, somehow, related to the company's profitability.

$$r - r_f = \beta_{market}\left(r_{market\ factor}\right) + \beta_{size}\left(r_{size\ factor}\right) + \beta_{book-to-market}\left(r_{book-to-market\ factor}\right)$$

If investors do demand an extra return for taking exposure to these factors, the assumption fits the APT and it is possible to calculate expected returns by applying a multiple regression:

$$r_i = r_f + \beta_i\left(r_m - r_f\right) + hHML + sSMB,$$

where HML is the difference in the returns of portfolios with high B/M ratios and low B/M ratios, and SMB is the difference in returns of portfolios of small company stocks and big company stocks. The rest of variables are defined the same way as in the CAPM model.

The data needed to implement the Fama-French Model can be downloaded from Professor Kenneth French's Data Library.[30] Notice the website has also available datasets with more research factors and information from different types of portfolios. The files are regularly updated so downloading the data at a later date involves getting extra observations. It is possible to recycle the numbers and utilities already applied in the second chapter because the first factor in the model comes from the CAPM. Additionally, new Fama-French Data retrieved from Ken French's website must be imported.

There are no restrictions regarding data frequency (daily, weekly, monthly, etc.). However, as some numbers are retrieved from the CAPM, monthly aggregated returns are considered again in order to avoid making unnecessary modifications on the data already available.

Once new information concerning HML and SMB is obtained, next step is to build an array with these figures: the r_f, the firm's excess return (r_i - r_f) and the market excess return (r_m - r_f). Table 9 provides a list with the entire set of observations included in the analysis.

Table 9. Fama French Model

Dates	SMB	HML	exmkt	Rf	exret
2010-02	0,0157	0,0201	-0,0094	0,0028	0,081932192
2010-03	0,0492	0,0312	0,0736	0,0027	0,056980011
2010-04	-0,0009	-0,0232	0,0309	0,0026	-0,04500099
2010-05	-0,0215	-0,0427	-0,0721	0,0026	-0,03260639
2010-06	0,0024	0,0004	0,0236	0,0022	0,052580679
2010-07	-0,0303	-0,0151	0,0389	0,0021	0,06110223
2010-08	0,0384	-0,0294	-0,0362	0,0022	0,007495026
2010-09	0,0101	-0,0223	0,0731	0,0020	0,037725285
2010-10	0,0369	-0,0058	-0,0006	0,0021	0,006320314
2010-11	0,0085	0,0347	0,0141	0,0022	0,058796118
2010-12	-0,0240	0,0068	0,0415	0,0024	0,057995915
2011-01	0,0162	0,0173	-0,0099	0,0026	0,024431187
2011-02	0,0268	-0,0116	-0,0189	0,0027	0,009763419
2011-03	-0,0034	-0,0215	0,0027	0,0028	0,061162114
2011-04	-0,0068	-0,0212	0,0219	0,0027	0,071292003
2011-05	-0,0014	-0,0026	-0,0126	0,0027	0,051315664
2011-06	-0,0144	-0,0118	-0,0339	0,0025	0,016132643
2011-07	-0,0330	-0,0158	-0,0465	0,0024	0,083619005
2011-08	-0,0372	-0,0098	-0,1067	0,0023	0,044259729
2011-09	0,0358	-0,0096	-0,0484	0,0018	0,042996622
2011-10	-0,0024	-0,0018	0,0867	0,0015	0,010370206
2011-11	-0,0055	0,0157	-0,0128	0,0016	0,032714512
2011-12	0,0251	-0,0214	0,0073	0,0014	0,004937865
2012-01	-0,0165	0,0001	0,0477	0,0014	0,066397416
2012-02	-0,0027	-0,0006	0,0617	0,0014	0,005166393
2012-03	-0,0063	-0,0020	-0,0263	0,0016	0,037118195
2012-04	-0,0011	0,0008	-0,0154	0,0016	0,028293111
2012-05	0,0081	0,0054	-0,0804	0,0015	0,145177933

[30] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

2012-06	-0,0260	0,0001	0,0429	0,0012	0,016182089
2012-07	0,0069	0,0060	0,0470	0,0012	0,049173644
2012-08	0,0050	0,0156	-0,0238	0,0011	0,048773087
2012-09	-0,0107	0,0416	0,0261	0,0012	0,017462905
2012-10	0,0068	-0,0112	-0,0202	0,0012	0,039580289
2012-11	0,0161	0,0326	0,0308	0,0013	0,038623116
2012-12	0,0050	0,0134	0,0162	0,0012	0,041956348
2013-01	-0,0040	0,0028	0,0571	0,0012	0,010455562
2013-02	0,0088	-0,0007	0,0244	0,0015	-0,00122115
2013-03	-0,0240	0,0035	-0,0002	0,0017	0,025826006
2013-04	0,0200	0,0133	-0,0034	0,0016	0,004867453
2013-05	0,0118	-0,0040	0,0118	0,0014	0,034813383
2013-06	0,0188	0,0071	-0,0540	0,0015	0,099938483
2013-07	0,0024	-0,0248	0,0705	0,0017	0,00110239
2013-08	0,0286	-0,0157	-0,0178	0,0018	0,144270759
2013-09	-0,0155	0,0136	0,0353	0,0019	0,001082553
2013-10	0,0133	-0,0038	0,0168	0,0021	0,009153715
2013-11	-0,0043	-0,0020	0,0168	0,0020	0,063571679
2013-12	0,0083	-0,0188	0,0174	0,0019	0,048561961
2014-01	0,0032	-0,0049	-0,0234	0,0020	0,022127531
2014-02	-0,0181	0,0460	0,0476	0,0020	0,047483692
2014-03	-0,0417	0,0162	-0,0049	0,0018	0,007967306
2014-04	-0,0184	-0,0038	-0,0022	0,0018	0,066274647
2014-05	0,0294	-0,0060	0,0259	0,0017	0,030977849
2014-06	-0,0425	0,0004	-0,0196	0,0016	0,032651745
2014-07	0,0050	-0,0076	0,0007	0,0015	0,049577374
2014-08	-0,0380	-0,0168	0,0052	0,0013	0,006095439
2014-09	0,0428	-0,0181	0,0089	0,0013	0,020617899
2014-10	-0,0208	-0,0337	0,0058	0,0012	0,086429358
2014-11	0,0260	0,0156	0,0333	0,0011	0,01846468
2014-12	-0,0062	-0,0306	0,0013	0,0009	0,046460627
2015-01	0,0047	-0,0216	0,0736	0,0008	0,066214989
2015-02	0,0314	-0,0073	0,0740	0,0006	0,039822346
2015-03	-0,0303	0,0213	-0,0143	0,0005	0,022044018
2015-04	0,0095	-0,0190	-0,0243	0,0005	0,00999407
2015-05	0,0284	-0,0104	0,0087	0,0017	0,052309046
2015-06	-0,0417	-0,0449	-0,0646	0,0017	0,073445279
2015-07	0,0043	0,0288	0,0462	0,0017	0,052442744
2015-08	-0,0271	0,0073	-0,0727	0,0017	0,063436634
2015-09	-0,0186	-0,0032	-0,0578	0,0017	0,085272166
2015-10	0,0355	-0,0123	0,0564	0,0017	0,028225797
2015-11	-0,0299	-0,0207	0,0228	0,0017	0,067892837
2015-12	-0,0366	0,0313	-0,0598	0,0017	0,014193252

Source: Own elaboration

With the tidy dataset already available, a regression is run to estimate H&M's sensitivities (betas) to the three factors presented in the model.

The beta obtained changes a little with respect to the CAPM, as now the excess return (exret) is regressed on the market premium (exmkt), but also two more factors (SMB and HML) are included in the model. In this way, beta also captures the effects of these two important differentials in the economy.

Table 10 displays the results summary from R and Table 11 compares the beta obtained in this Appendix with the one from the CAPM.

Table 10. Regression summary[31]

	Estimate	Std. Error	t value	Pr(>|t|)
α	0,00483	0,00484	1,00	0,321
β	0,73503	0,12044	6,10	5.8705e-08
h	0,27697	0,21657	1,28	0,205
s	-0,43498	0,25411	-1,71	0,092

Source: Own elaboration

The beta is equal to 0,7350, similar to the one obtained with the CAPM. Notice that the Goodness of Fit is slightly higher as more variables are introduced in the model and, therefore, the "noise" decreases.

The parameters (h, s) represent H&M's elasticities with respect to size and book-to-market factors. An interesting point is that HML has a positive elasticity, which suggests that if the difference in returns between small and big companies increases, H&M's stock returns will increase too.

Δ HML → Δ r_{size} (H&M is a big company)

On the other hand, recall H&M has a capital structure exclusively composed by equity. An increase in the differential between firms with high B/M ratios and firms with low B/M ratios may suggest that indebted firms are obtaining greater market values than firms mostly financed with equity (leverage effect dominates).

Thus, if SMB increases, the returns on H&M's stock will immediately drop. A consistent proof of it is that the estimate for s is negative.

Δ SMB → ∇ $r_{book\text{-}to\text{-}market}$ (H&M is mostly financed with equity)

Table 11. Beta comparison

	Beta	p-Value	Adj. R-squared
Fama-French	0,73503	5.8705e-08	0.38220
CAPM	0,74515[32]	2.0923e-08	0.35851

Source: Own elaboration

[31] Signif. Codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1

[32] This result is slightly different than the one in chapter II, because in this section weekly instead of daily returns have been considered.

Cost of equity with the FF Model

Information from Table 10 enables the computation of the cost of equity by applying the FF formula at the beginning of the section. Simple averages have been used as estimators for market premium, return on risk-free assets, HML and SMB.

$$r_i = 0{,}021 + 0{,}735(0{,}0599) + 0{,}27697(-0{,}0022) + -0{,}43498(-0{,}00023) = 0{,}0645$$

H&M's cost of equity = 6,45 %

The Fama-French model suggests a cost of equity slightly lower than the one obtained with the CAPM; a result that leads, ultimately, to a higher theoretical enterprise value for H&M.

Appendix 3: Economic analysis

When making investments, understanding the economic situation is essential to the success of any investment strategy. For instance, when the interest rate rise, demand for fixed income securities may increase and vice versa.

There is a huge number of economic figures that might, to some extent, contribute to valuation analysis. Indicators such as inflation, unemployment, demand for funds, etc. help analysts to develop more precise methodologies.

However, taking into consideration the valuation methods presented in this work and their requirements in terms of economic information, only one estimate of a certain economic magnitude has been computed.

The previously referred magnitude is the growth in real GDP, a value which is used a lot in valuation analysis, specially for long-term predictions.

Real GDP

Real GDP is a strength indicator of the economy. Most securities tend to move harmoniously with the overall economy and the growth in real GDP could be a good estimator for their expected future trend. Furthermore, when the economy does poorly, securities' prices tend to decrease, as such, it is important to know the relative position in the economic cycle to determine the best investments.

Several databases and institutions are constantly updating information about real GDP and its forecasted evolution. This information is extremely useful for the valuation analysis presented in this paper, as the expected growth in real GDP is used repeatedly in almost all procedures.

Figure 17 displays a bar chart of historical and projected Real GDP growth, with data retrieved from the IMF website. The data form used is the version from April 2016 World Economic Outlook[33].

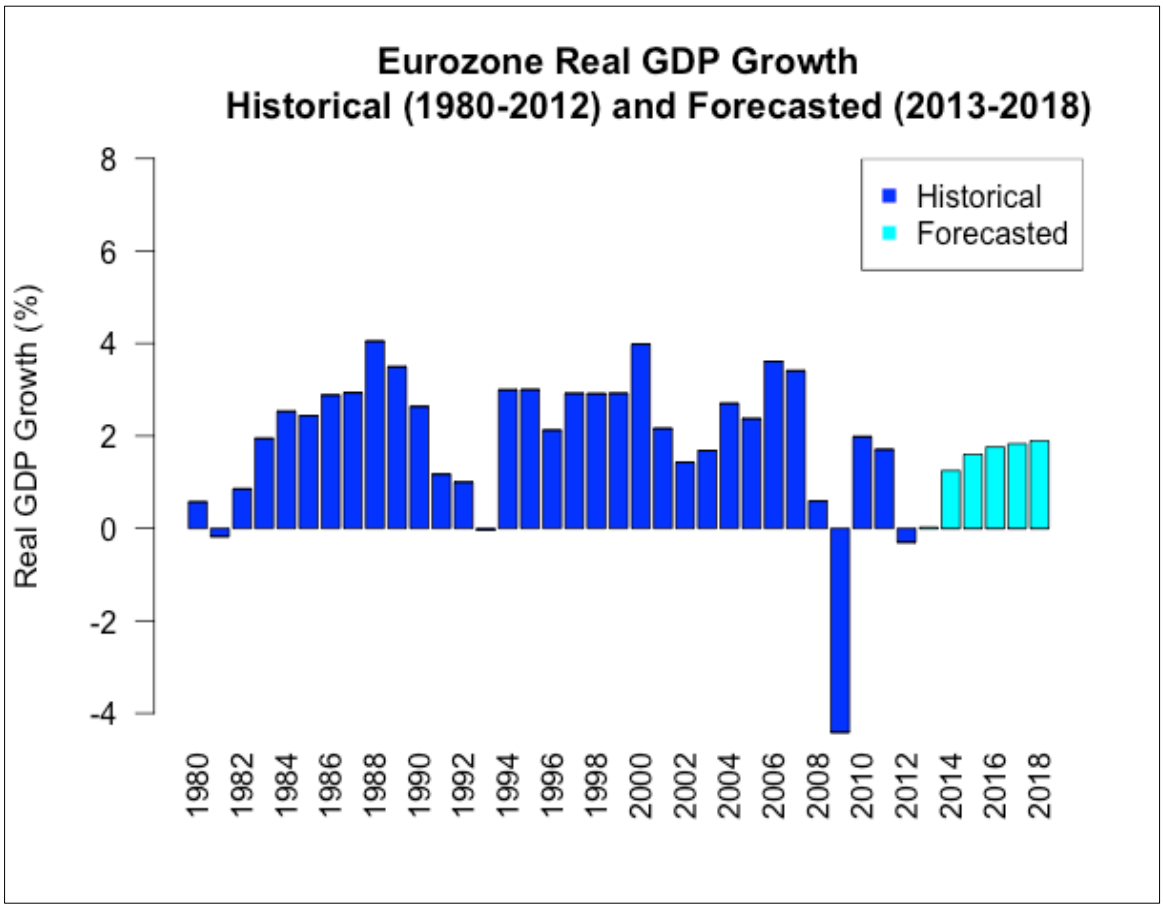
This database contains a lot of information and is particularly useful as an economic data source. Predictions start in 2014 in order to test the efficiency of the data by comparing the predicted values for 2015 with the real ones. Subsequently, predictions are posted up to 2018.

The geographic area considered is the Eurozone, the space where H&M's influence is stronger. Regarding geographic matters, sometimes is better to focus in the most relevant areas. Even though some countries where H&M operates are excluded if only the Eurozone is selected, using worldwide GDP data entails the inclusion of other nations that might be irrelevant for the firm and could introduce bias to the desired results.

[33] http://www.imf.org/external/pubs/ft/weo/2016/01/weodata/index.aspx

Notice the data presents an increasing trend for future GDP growth rate, almost reaching a 2%.

Figure 17. Historical and forecasted growth in Real GDP



Source: Own elaboration

Appendix 4: Future Cash Flows

Each component in Table's 8 predicted income statement is influenced by several economic drivers which help analysts in developing forecasts. Drivers are no more than a set of internal or external magnitudes related to elements in the income statement, but with the feature that it is considerably easier to forecast them or, at least, more information is available.

Appendix 4 describes these drivers and their relationship with each component in the income statement. Despite this section describes a well-accepted methodology for FCF forecast, in the end, it is more an art than a science. Analysts might develop their own methodology for obtaining future FCF with more drivers or a higher degree of complexity in calculations.

Notwithstanding the procedure used, first step involves predictions through the development of a quasi-income statement, in this case for years 2016-2020. Then the formula presented in chapter 4 is applied to obtain the SEK-based free cash flow values over the 5-year horizon.

$$FCF = (Revenue - Cost - Depreciation) * (1 - t_c) + depreciation - net\ capital\ expenditures - net\ change\ in\ working\ capital$$

Revenue

First item in income statement, and the first component of the FCF formula, is revenue. Future SEK revenues for H&M are forecasted according to revenue drivers. As it is said before, analysts may develop their own creative ways of forecasting revenue with their chosen drivers but, in this case, we have considered revenue as the product of the size of the market where the firm operates and its market share.

This approach treats the market size as the total revenue generated in the company's sector (clothing), and this number is multiplied by the amount H&M is able to capture, that is its market share.

Table 12 summarizes the process of obtaining the forecasted sales for the next five years after the last data record by applying the formula:

$$Revenue = market\ size \cdot market\ share$$

The market size comes from the total volume of operations in SEK during 2015 within the clothing/apparel sector in Europe[34]. Its projected growth rate is taken from expert's opinion in official external sources of information.[35]

[34] https://www.statista.com/statistics/279757/apparel-market-size-projections-by-region/

[35] http://euratex.eu/fileadmin/user_upload/documents/key_data/Euratex_Keyfigures_-_2015.pdf

The market share of H&M represents the proportion of the market size belonging to the firm's operations. Similarly to market size, H&M's market share will also evolve over the analysed time horizon according to the firm's strategy and market perceptions. For determining the increase/decrease in market share it is possible to rely on past performance to calculate an expected market share growth rate for the firm.

Thus, for year 1 the revenue forecast is going to be year's 1 initial market size (3.095.889,22million SEK) times H&M's share (1, 76%).

Table 12. Forecasted revenue streams

	Year					
Project Assumptions	0 (F2015)	1	2	3	4	5
Revenue Forecasts						
Market Forecasts						
Initial Market Size (M of SEK)	2.951.276,67					
Market Growth Rate		4,90%				
Market Size (M of SEK)		3.095.889,22	3.247.587,8	3.406.719,6	3.573.648,86	3.748.757,65
H&M Market Share						
Initial Market Share	6,128%					
Market Share Annual Growth Rate		1,76%				
Market Share		6,236%	6,346%	6,457%	6,571%	6,687%
Incremental earnings forecasts						
Sales		**193.061,48**	**206.085,97**	**219.987,99**	**234.826,82**	**250.667,71**

Source: Own elaboration

Costs

Next unknown quantity concerns costs. In general, company's costs are mainly grouped into two different categories: cost of goods sold (COGS) and other expenses, usually under the denomination of selling and administrative expenses (S&A).

COGS only encompass variable costs associated with the product then, when subtracted from sales revenue, the firm gets its gross profit. Gross profit assesses a company's efficiency at using labor and supplies. On the other side, S&A expenses usually refer to all company's fixed cost absorbed by each product unit.

Both magnitudes are cost drivers and, likewise is done in the revenue section, predictions are necessary for estimating future cash flows. As they can be expressed as a percentage of sales revenue and, assuming the company will not make meaningful changes in its cost structure, some portion of future sales revenue is assigned to COGS and S&A expenses.

Therefore, first step is to compute 5-year averages of the ratios COGS/Sales and S&A Expenses/Sales. It is possible to adjust results by including an average increment of them, also taking historical data as an indicator for those averages.

Introducing or not this increment is totally up to the analyst. It makes sense if percentage variation is not too big, because an increment in sales revenue usually triggers some changes in variable costs structure and may appeal to higher selling expenses.

Afterwards, these values are applied to the previously calculated forecast for sales revenue. Thus, in year one the 42,56% of sales are assumed to be COGS and the same happens with S&A expenses, representing the 39% of revenue.

Theory suggests that R&D expenses must be also considered in this "Cost" for the FCF. However, H&M had no investment in R&D within the period of analysis. As no investments in R&D are mentioned in annual accounts, it is assumed that the firm will continue with the same policy and no R&D investment will take place in the next five years.

Table 13. Forecasted costs

	Year					
Project assumptions	0 (F2015)	1	2	3	4	5
Operating expenses:						
COGS (M of SEK)[36]	76.969					
COGS / Sales (% Sales)	42,56%	42,96%	43,38%	43,79%	44,21%	44,63%
Average annual increment	0,957%					
SG & A (M of SEK)	70.551					
% of 2015 Company SG & A	39,008%	39,027%	39,046%	39,065%	39,084%	39,103%
Average annual increment	0,048%					
R&D		0	0	0	0	0
R&D Upfront ($mil)		0	0	0	0	0
R$D for Versioning ($mil)		0	0	0	0	0
Incremental Earnings Forecast						
Sales (M of SEK)		193.061,48	206.085,97	219.987,99	234.826,82	250.667,71
COGS (M of SEK)		**82.947,78**	**89.390,97**	**96.334,66**	**103.817,71**	**111.882,03**
SG & A (M of SEK)		**75.346,72**	**80.468,44**	**85.938,30**	**91.779,98**	**98.018,75**

Source: Own elaboration

An important appointment about costs concerns depreciation expenses. In this case, the value of COGS is considered excluding depreciation thus, if both COGS (excluding

[36] COGS excluding depreciation

depreciation) and S&A expenses are subtracted from sales revenue the result is the company's EBITDA.

If the value of COGS includes depreciation expenses then, this operation leads to the EBIT or operating profit. Once EBIT is available, EBITDA can be easily obtained by subtracting depreciation.

EBITDA (M of SEK)	19.325,81	21.616,59	24.175,23	27.032,50	30.222,65

Capital expenditures (CAPEX)

Capital Expenditures are funds used by the company to acquire or upgrade physical assets such as land, property, buildings, etc.

H&M posted, in 2015 financial statements, a CAPEX investment equal to 12.059 million SEK. This amount is going to be used as the upfront investment and a 23,73%[37] from the total will be added each year during the asset's life. It goes without saying that annual accounts will not provide a detailed explanation of the assets purchased with CAPEX money. Moreover, this amount is probably spent in different assets each one with a different lifespan. To fix this problem a standard of 5 years is selected as the assets' life.

All additions to the fixed assets purchased, such as upgrades or improvements, must be also added as capital expenditures. For estimating these extra investment, it is possible to use the 5-year average additions to fixed assets in H&M's cash flow statement.

Another important driver of Capital Expenditures is depreciation. There are different legal considerations about depreciation but, to make it simpler, in almost every valuation case straight line depreciation is contemplated. There are two things that must be depreciated, the initial investment over the assets' lifespan, but also each year additions on these fixed assets. Thus, in order to make things easier, it is recommended to create an additional statement with the accumulated project CAPEX (initial investment + additions).

After the fifth year, the physical capital coming from capex investments does not evaporate. The firm could sell it or redeploy it for another purpose and it is necessary to recognize that, otherwise cash flows will be undervalued.

Therefore, the accumulated depreciation at year 5 has to be subtracted from the accumulated CAPEX at the same year. The result (11.078,10 million SEK) reflects the book value of assets purchased, at year 5.

It is usually not possible to sell this physical capital on a dollar for dollar basis, rather it has to be sold at discount. The value at which the company finally sells this physical capital is known as the liquidation value. It could be estimated using positive cash flows coming from investments in previous years.

[37] Estimation based on previous 5-year cash outflow from capital expenditures

By taking the average of net cash received from investments, we determine that at the end of year 5 the firm will get 2.160,23 million SEK, a cash inflow considerably below assets' book value.

Next driver to deal with are taxes, precisely taxes on capital gains. It is important to bear in mind that an asset worth 11.078,10 M SEK is sold for 2.160,23 M SEK thus, the firm falls into a loss. This loss, multiplied by the corresponding tax rate implies a tax shield for H&M of 4.166,75 M SEK which has to be deducted from year's 5 capital expenditure.

Table 14. Forecasted Capital Expenditures

	Year						
Project Assumptions		0 (F2015)	1	2	3	4	5
Capital Expenditures & PP&E Information:							
Initial investment (M of SEK)		12.059					
Future investment (% of initial investment)			23,73%				
Future investment (Annual Growth)				23,73%	23,73%	23,73%	23,73%
Capital expenditures Forecasts:							
Project CAPEX (M of SEK)		12.059	2.861,85	3.540,72	4.380,93	5.420,53	6.706,82
Average additions to fixed assets	11,06%		1.650,75	2.042,47	2.527,15	3.126,85	3.868,85
Accumulated Project CAPEX			14.920,85	18.461,57	22.842,5	28.263,02	34.969,84
Depreciation			2.984,17	3.692,31	4.568,5	5.652,6	6.993,97
Book Value of CAPEX							11.078,28
Liquidation Value (LV)							2.273,72
Average capex recovering	20,52%						
After-tax proceeds							4.349,71
Net Project CAPEX[38]		**12.059**	**4.512,6**	**5.583,19**	**6.908,08**	**8.547,37**	**6.225,95**

Source: Own Elaboration

Change in Net Working Capital

Last element in the FCF formula is net working capital, precisely the change in this magnitude.

Net working capital is:

$$NetWc = Cash + Inventory + Accounts\ Receivable - Accounts\ Payable$$

Cash, inventory, accounts receivable and accounts payable are good drivers to estimate company's working capital. For computing these statements, a good method is to use the

[38] Net Project Capex is computed by adding the Project CAPEX + Average additions to fixed assets

corresponding turnover ratios for each of them and assume they will be stable over future years.

Starting by cash requirements, historical data shows that H&M is likely to require 19,55% (5-year average) of SG&A in cash[39]. It is possible to use another base of reference different from S&A expenses but bear in mind that the objective is to select stable magnitudes. Then, H&M's cash requirements are the forecasted S&A expenses for the corresponding year, multiplied by the ratio of cash requirements.

Turning to inventory, the driver lays out the average inventory days for the forecasted cost of goods sold in the corresponding year. The calculation is the following:

$$Inventory\ requirements = \frac{(avg.days\ in\ inventory) * COGS\ (estimated)}{365}$$

Moving to accounts receivable, the operation is very similar. The average collection period in days is computed for the forecasted sales of the corresponding year.

$$Accounts\ receivable\ requirements = \frac{(avg.collection\ period) * SALES\ (estimated)}{365}$$

Finally, accounts payable requirements are, again, computed in the same manner:

$$Accounts\ payable\ requirements = \frac{(avg.paymeny\ period) * COGS\ (estimated)}{365}$$

Afterwards, all calculations are placed together in Table 15 to compute net working capital for each year applying the formula at the beginning of the section.

Once net working capital is available for all years, the difference between each year gives the change in net working capital needed for the FCF formula.

Table 15. Change in net working capital forecast

	Year					
Project assumptions	0 (F2015)	1	2	3	4	5
Working Capital Assumptions						
Cash Requirements (AVERAGE) % of SG&A	19,94%					
Inventory: Inventory Days (365 x Inventory /COGS) Excess Inventory liquidation value	115,97	115,973	115,973	115,973	115,973	115,973
Accounts Receivable: Days Receivable (365 x Accounts Receivable/Sales)	11,84	11,844	11,844	11,844	11,844	11,844

[39] This percentage comes from the ratio Cash/S&A expenses

Accounts Payable:						
Days Payable (365 x Accounts Payable/COGS)	32,64	32,641	32,641	32,641	32,641	32,641
Cash requirements - SG&A Funding (M of SEK)		15.025,11	16.046,44	17.137,2	18.302,11	19.546,2
Inventory requirements (M of SEK)		26.355,27	28.402,48	30.608,72	32.986,34	35.548,64
Accounts Receivable Requirements (M of SEK)		6.264,91	6.687,53	7.138,66	7.620,22	8.134,26
Accounts Payable Requirements (M of SEK)		4.263,82	4.595,03	4.951,96	5.336,62	5.751,15
Net Working Capital (M of SEK)	37.652,08	43.381,46	46.541,43	49.932,62	53.572,05	57.477,95
Change in Net Working Capital		5.729,38	3.159,97	3.391,2	3.639,42	3.905,9

Source: Own Elaboration

Incremental Earnings Forecast

With the change in net working capital, all the estimates needed to complete the predicted free cash flows are available.

Table 8 in chapter 4 aggregates the results in a simplified version of a predicted income statement.

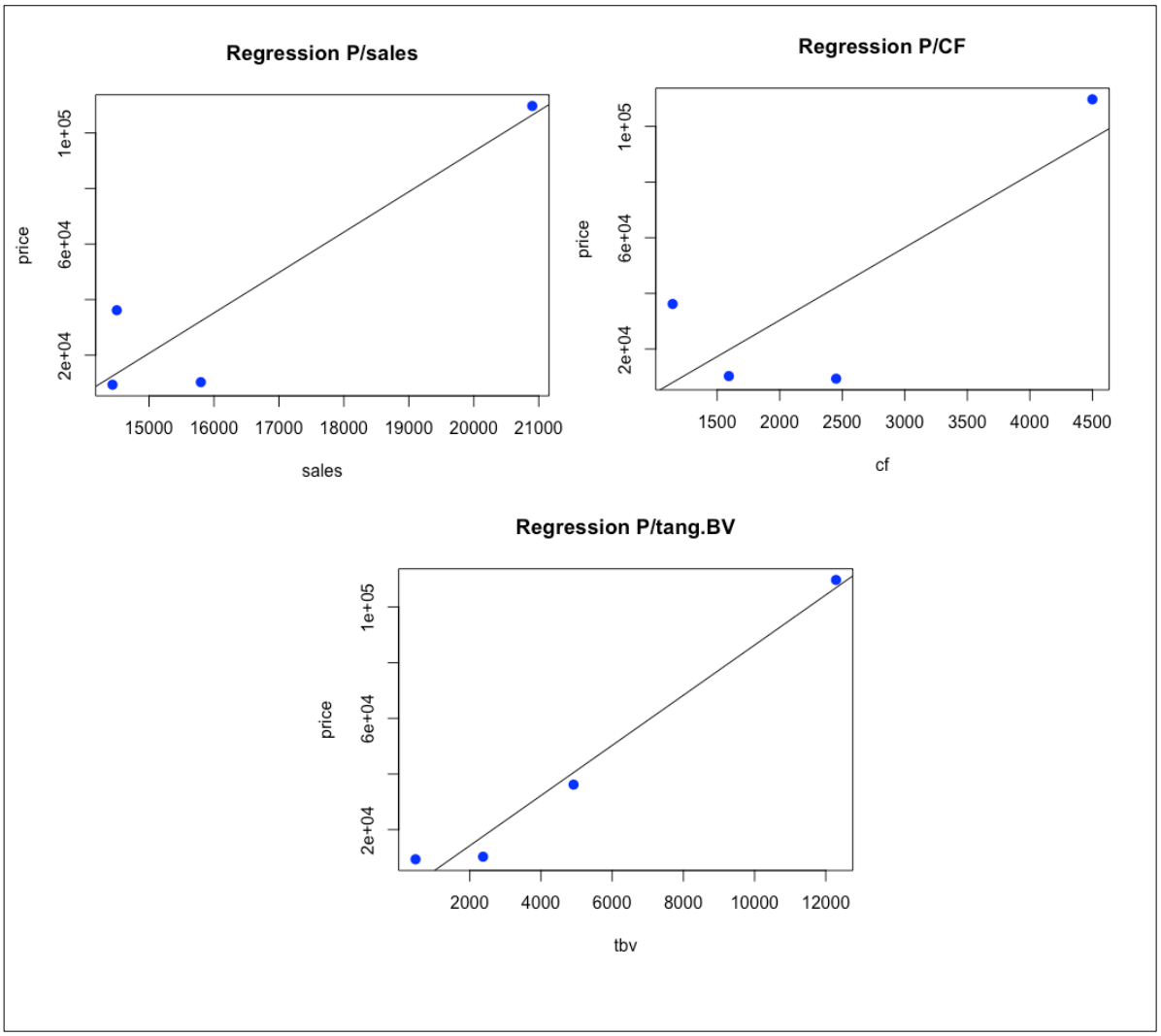
Appendix 5: Regression to aggregate multiples

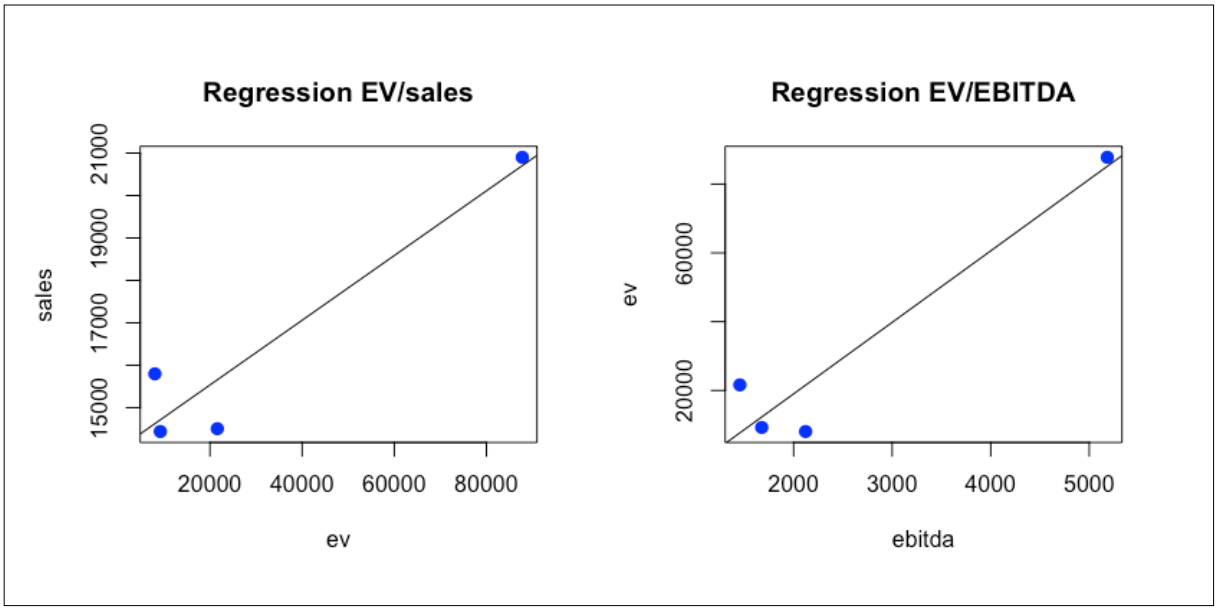
The regression approach aggregates the multiples by determining a line of best fit. This line is such that it minimizes the squares of the residuals of all observations. An advantage of the regression approach is that it allows a reasonable calculation of corporate values if the basis of reference is zero, or even negative. On the other hand, this method usually fails to estimate the aggregated value for a multiple when the sample of comparable companies is not large enough to apply the central limit theorem and assume normality in the data.

Appendix 5 presents the graphics of results in Table 6

Aggregation method	P/sales	P/CF	P/tang. BV	EV/sales	EV/EBITDA
Regression	14,54	26,13	9,01	12,05	20,70

Figure 18. Multiples aggregation trough regression line





Source: Own Elaboration