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The Valuation Approach From An Investment Bank Analyst: A Case Study on the IPO Valuation of DB ML.

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ABSTRACT

This paper presents results on the use of finance methods by investment bank analysts through analyzing six IPO prospect reports on a large German multidivisional company. The results indicate the analysts always rely on more than one method in order to estimate a valuation, with each report making use of both a DCF analysis and trading multiples. Furthermore, the results indicate the use of a sum-of-the-part analysis when a company has multiple divisions with different business descriptions and risk profiles. The results also indicate consistency with the evidence from Bruner, Eades & Higgins (1998) with regard to the estimation of the cost of capital, where the CAPM is still the most popular model for the cost of equity. Furthermore, the paper shows results on the appropriate trading multiples, the method of cost estimation, the use of sensitivity & scenario analysis and the use of strategic analyses.

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Chapter 1. Introduction

The purpose of this paper is to get insights into the practices of investment bank analysts in the use of finance methods, with special emphasis on the DCF components (e.g. cost of capital / explicit forecast period). We already have evidence of these topics from papers like Bruner, Eades and Higgins (1998) and Graham & Harvey (1999), but these are results from surveys among finance professionals, which are both related and unrelated to finance companies. I have chosen an approach where I can directly observe an investment bank analyst's inputs, namely through investigating six prospect reports on a German rail and logistics firm going public. The reason why I've used IPO reports is because these are traditional more transparent than otherwise would be the case. In addition, it can be expected that the results from these reports represent the best practices in the field of finance, since the analysts responsible for these reports work at well-respected investment banks and deal with high finance deals on a daily basis. Moreover, the stakes (read: incentives) for an investment bank with regards to assure proper valuations for an IPO are high. On these incentives Ritter (1998) quotes: "*investment bankers rarely compete for business on the basis of offering lower underwriting discount (or gross spreads)*". Moreover, "*There are substantial economies of scale in underwriting costs. In spite of these economies of scale, the majority of IPOs raising between $20 million and $80 million have gross spreads of exactly 7,0%*".

Furthermore, besides observing practices on estimating a proper cost of capital, the IPO reports also provide an opportunity to investigate what valuation methods and assumptions are used in order to value a private firm going public. This will be interesting since the evidence on this subject shows that investment bankers are able to create additional value in their development of an offer price. In a study conducted by Kim and Ritter (1999) on valuing IPOs they quote: "*investment bankers apparently are able to do superior fundamental analysis. In addition, investment bankers are able to achieve additional valuation accuracy by canvassing market demand before setting a final offer price*". Furthermore: "*Our results demonstrate the value added by investment bankers in pricing issues*". In addition I've also conducted my own valuation (Appendix.1) for this particular company, following the best practices as described by Koller, Goedhart & Wessels (2005), in order to indicate differences between textbook recommendations and the practitioners' approach.

The thesis is organized as followed: First I will explain in some more detail what an IPO is about and what process has to be followed, the role of the investment bank, and evidence on issues related to IPO pricing. Thereafter I will explain the methodology and data of this paper, which is followed with the first issue at hand, namely the valuation methods.

Chapter 2 An Introduction to IPOs:

One of this paper's objectives is finding out what methods are used in order to value and price an IPO. Before I will present results on this topics, I will explain the process of an IPO followed with well-known IPO pricing phenomena. These phenomena are relevant in the sense they explain the behavior of the firms going public, and with them their underwriting team of investment banks, on the pricing issues. They indicate that IPOs are conducted in times when markets reach their peak at a discount, which on average leads to long-term stock price underperformance.

2.1 The IPO Process in Europe

Companies thinking about going public in a European market have two legally defined ways to access the capital market. This can be via EU regulated markets and via markets regulated by the stock exchanges.

IPO team

Once a company decides to go through with the IPO it will hire a team consisting of a lead investment bank, accounting firm and a law firm. The company issuing stock needs assistance from the banking syndicate, a combination of several banks and/or financial service providers, who jointly place the public offering with investors. The lead investment bank organizes and manages the IPO process. The criteria for selecting the lead investment bank and other banks/financial companies include underwriting experience, sectors knowledge and a wide network with potential investors.

Prospectus

When this team is at place, one of the most time consuming tasks this team faces is assembling the prospectus. This prospectus is a document, which can best be described as a brochure for the issuing company. This document includes everything from historical financial statements, the company's management and an analysis of the market where the company is active in with competitors, growth figures and strategies. To summarize it's all the information a potential investor needs to make a decision on whether to invest or not.

Marketing (Road Show)

The road show is an important part of the marketing of the IPO. It's a tour visiting multiple cities around the world where the company and bank representatives present the business plan to potential investors. These potential investors include institutional investors and large-scale investors. During these meetings, the underwriter has the opportunity to measure the level of interest in the IPO, which helps the underwriters in determining the offer price.

Pricing and allocating the IPO

When the road show is over and enough information is gathered concerning expected demand the company and underwriters meet to set the initial price for the shares issued. The objective from the investment bank's side is to balance between the company's desire to maximize the IPO proceeds and the investors who aspire to profit from taking on risk in investing in a company with no public track record. Every bank in the team gets a certain amount of shares to allocate to its clients.

2.2 The Timing of IPOs and Hot Markets

The firm undertaking the IPO decided late 2008, due to difficult market circumstances, to postpone its issue of stock. This isn't a decision that is particular rare with IPOs, as will be discussed in this section.

A recurring phenomenon surrounding IPOs is that of the so called "hot issue markets". Illustrated in graph 1 are the monthly numbers of IPOs issued in the U.S., and it can be seen the IPO activity varies over time. Not only is the IPO volume time varying but often occurs in waves. Moreover, these waves are often disproportional populated with firms in particular industries. A typical explanation for these waves is a behavioral one, where private firms issue stock in an overvalued market to maximize IPO proceeds. This would require that private firms understand that the market is overvalued and (institutional) investors do not.

Graph 1. IPO activity in the U.S. 1960-2006
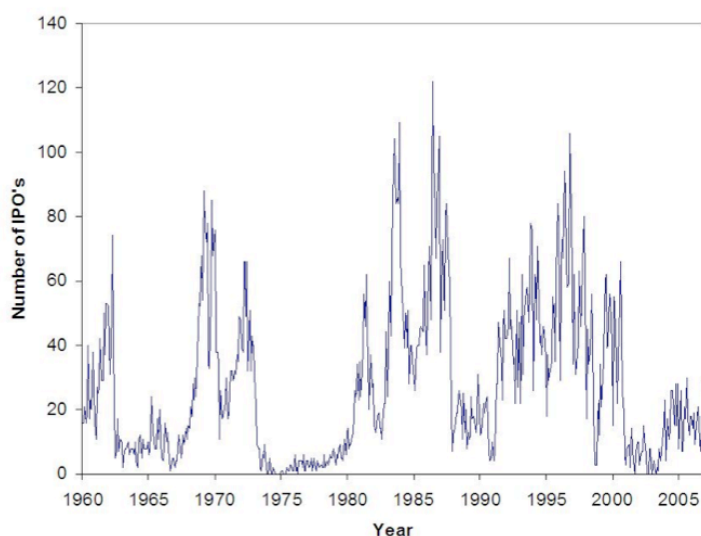
Besides the explanation of an inefficient market there are several theories with empirical support on the subject of "timing" and "hot issue markets".

Benninga, Helmantel & Sarig (2005) suggest an entrepreneur who has the ability to time the decision to go public or private. This decision depends on a tradeoff between the costs and benefits of being private or public. Since the conditions under which firms operate changes, so do the incentives to stay private or go public. The owner takes the firm public because outside investors, being more diversified, are willing to pay a higher price for the firm's cash flows than the owner's own valuation of these cash flows.

Their model predicts that firms go public when their cash flows are sufficiently high. When macroeconomic conditions change this affects multiple industries and companies their cash flows and profitability. When economic conditions get better this has a positive effect on companies profitability and cash flows. Due to the correlation between firms in profitability and cash flow, other firms will also find it optimal to issue stock, resulting in IPO waves. Furthermore, since correlation between firms in particular industries is likely to be greater than that of correlation between firms at large, their results are consistent with the industry concentration that characterizes an IPO wave. The good economic conditions affect cash flows of both public and private firms. Hence, the waves in IPOs, which occur during times when the cash flows of issuing firms are high, happen when the cash flows of publicly traded firms are high as well. Thus, IPO waves occur with times of relatively high share prices.

Another paper on this subject is from Lowry and Schwert (2002). They conclude that the cycles reflect two factors. First, similar types of firms choose to go public at about the same time and second, and more important, the information about the value of an IPO firm that becomes available during the registration period has an effect on the prices and offering decision for other firms.

Lowry and Schwert (2002) high initial returns provide positive information about the market's valuation of IPOs, then more private companies should file IPOs after periods of high initial returns. Thus, initial returns should be positively correlated with the number of subsequent filings. In contrast, they expect initial returns to be negatively correlated to the number of subsequent cancellations. Empirical findings are consistent with the previous mentioned relations. They find that the information learned during the registration period that is positively related to future IPO volume.

Another theory, proposed by Pastor & Veronesi (2005), suggests IPO volume fluctuates due to time variation in market conditions. The market conditions are defined as having three dimensions: expected market return, expected aggregate profitability and prior uncertainty about post IPO average profitability in excess of market profitability. The model assumes an entrepreneur, called inventor, who has an idea that is patented and has the potential to create abnormal returns. The entrepreneur starts a private firm and obtains a real option to take the firm public. He chooses to issue equity, instead of borrowing, because he has a strong incentive to diversify.

When market conditions would be constant over time, it would be optimal to go public as soon as the patent is obtained. When market conditions vary over time, as they do, the inventor has the possibility to postpone the IPO and wait for market conditions to improve. The optimal time to go public, according to Pastor & Veronesi (2005), is when the expected market return is low, expected aggregate profitability is high and prior uncertainty is high. According to Pastor & Veronesi (2005) this means *"IPO waves should be preceded by high market returns, followed by low market returns and accompanied by increase in aggregate profitability. In addition, IPO waves should be preceded by an increased disparity between new firms and old firms in terms of their valuations and return volatilities. IPO volume should be related to changes in stock prices, but less so to their levels."*

When these conditions have changed sufficiently many inventors choose to exercise their option to go public, resulting in a clustering op IPOs. This happens because most of the time there is a backlog of private firms, who are waiting for market conditions to improve before going public. The resulting IPO wave typically lasts several months, as all private firms rarely go public at exactly the same time (firm specific factors).

In their paper Pastor & Veronesi (2005) also give an answer a question from Ritter and Welch on why issuing volume drops so precipitously following stock market drops. The answer, they say, is simple: *"when market conditions worsen, stock prices drop and IPO volume declines because private firms choose to wait for more favorable market conditions before going public."*

Some of the implications of this model are also consistent with the behavioral view where firms go public due to market overvaluation. However, this could also be partly because IPO timing is endogenous and partly due to prior uncertainty about the average future profitability of IPOs. On the aspect of prior uncertainty Pastor & Veronesi (2005) conclude; *"Instead of assuming that prior uncertainty is the same for all firms, we can assume that this uncertainty is more similar for firms in the same industry. Average excess profitability is also likely to be more correlated across firms in the same industry. Increases in industry-specific prior uncertainty or industry-specific excess profitability can lead to IPO waves concentrated in the given industry, without triggering IPOs in other industries."*

2.3 The Underpricing of IPOs.

Another well-known phenomenon that exists is the underpricing of IPOs. This is the returning pattern of high average initial returns investors can acquire on investing in IPOs, based on the price change measured from the offer price set by the firms' underwriters to the market price on the first day of trading. There have been several studies on this subject showing the distribution of the initial returns being highly skewed, with a positive mean and a median zero. This phenomenon has been documented to exist globally.

An overview of equally weighted average initial returns over time and cross-countries on IPOs is presented in table 1. Selected are 9 countries that represent large exchanges in the world such as the United States, Germany and China, and smaller exchanges such as the Netherlands & Sweden. The returns on IPOs in China are from "A shares", which are restricted to Chinese residents.

Table 1; Average initial returns for 9 countries

Country	Source	Sample Size	Time Period	Avg. Initial Return
Australia	Lee, Taylor & Walter; Woo	381	1976-1995	12,1%
China	Datar & Mao; Gu and Qin (A shares)	432	1990-2000	256,9%
Germany	Ljungqvist; Rocholl	545	1978-2001	31,1%
Japan	Fukuda; Dawson & Hiraki; Hebner & Hiraki; Pettway & Kaneko; Hamao, Packer, & Rittner; Kaneko & Pettway	1,689	1970-2001	28,4%
Netherlands	Wessels; Eijgenhuijsen & Buijs; Jenkinson, Ljungqvist, & Wilhelm	143	1982-1999	10,2%
Singapore	Lee, Taylor & Walter; Dawson	441	1973-2001	29,6%
Sweden	Rydgvist; Schuster	332	1980-1998	30,5%
United Kingdom	Dimson; Levis; Ljungqvist	3.122	1959-2001	17,4%
United States	Ibbotson, Sindelar & Ritter; Ritter	15.333	1960-2005	18,1%

Source: Table 1 of the article published in June 1994 *Pacific-Basin Finance Journal* Vol. 2, pp. 165-199 Updated January 26, 2006

There are several explanations with empirical evidence for the underpricing phenomenon. I will shortly outline the ones mentioned by Ritter (1998).

The winner's curse hypothesis

This basically comes down to a disparity in information between investors. With information asymmetry existing among investors, there are some (the less informed investors) who will be worse off than others. When an issue is underpriced, the amount of excess demand will be higher when there is more underpricing. This results in investors being allocated only a fraction of the shares of the most desirable IPOs, while they will be allocated all the shares of the least desirable IPOs they ask for. This is because they face a winner's curse, where they receive all these shares from the least desirable IPOs because the more informed investors don't want these. Faced with this adverse selection the less informed investors are only willing to submit purchase orders if, on average, IPOs are underpriced sufficiently to compensate them for the bias in the allocation of new issues.

The market feedback hypothesis

This is explained as investment bankers purposely underpricing IPOs to trigger investors to reveal information about their valuation during the pre-selling period. They use the underpricing as a compensation for the honesty of the investors in showing their real valuation. Furthermore, when

the final offer price is set, for those IPOs where the offer price is revised upwards they are more underpriced than for those where the offer price is revised downwards.

The bandwagon hypothesis

It could happen that investors' choice on purchasing shares could not only depend on their own information about an IPO, but also if other investors are wiling to buy. In preventing this from happening an issuer may decide to underprice the share to trigger the first potential investors in moving in on the shares, and induce a bandwagon where all subsequent investors want to purchase irrelevant of their own information.

The investment banker's monopsony power hypothesis

This explanation suggests investment bankers underprice IPOs because of superior market knowledge. They underprice IPOs in order to spend less effort on marketing, and trigger buying-side clients.

The signaling hypothesis

This explains the underpricing as part of a signaling strategy. Firms issue shares with a discount to leave investors with a good feeling, allowing them to sell future offerings at a higher price than they would otherwise be able to. However, there are also empirical studies showing that this relation doesn't exist.

The ownership dispersion hypothesis

Firms purposely underprice their share in order to create an excess demand, what subsequently has to lead to a large number of small shareholders. This dispersion in ownership will create a liquid market and make it more difficult for shareholders to challenge the management.

As quoted by Ritter on these explanations; "*Many of the above explanations for the underpricing phenomenon can be criticized on the grounds of either the extreme assumptions that are mode or the unnecessarily convoluted stories involved. On the other hand, most of the explanations have some element of truth to them. Furthermore, the underpricing phenomenon has persisted for decades with no sign of its imminent demise*".

2.4 The Underperformance of IPOs

The third phenomenon regarding the IPO pricing is the long run poor stock price performance of IPOs. The poor stock price performance after the IPO has been processed is partly reflected by the pattern of high IPO volume when markets reach their peaks (high market-to-book multiples). Companies that are older more established firms going public (the case of DB ML) including "reverse LBOS", and those that went public in light-volume years do not seem to show long-run underperformance. International evidence as reported in the paper by Ritter (1998) is presented in table 2. Note that the total abnormal return is calculated as 100% minus the ratio of the average three-year buy-and-hold gross return divided by the average three-year buy-and-hold gross return on the benchmark. In essence this means the total abnormal return of -12,1% for Germany is the loss in wealth would you have invested for three years in a portfolio consisting purely of IPOs, benchmarked against a portfolio of non issuing firms.

Table 2; Ritter (1998)

Table 4
International Evidence on Long-Run IPO Overpricing

Country	Author(s)	Number of IPOs	Issuing years	Total abnormal return
Australia	Lee, Taylor & Walter	266	1976-89	-46.5%
Austria	Aussenegg	57	1965-93	-27.3%
Brazil	Aggarwal, Leal & Hernandez	62	1980-90	-47.0%
Canada	Jog and Srivistava	216	1972-93	-17.9%
Chile	Aggarwal, Leal & Hernandez	28	1982-90	-23.7%
Finland	Keloharju	79	1984-89	-21.1%
Germany	Ljungqvist	145	1970-90	-12.1%
Japan	Cai & Wei	172	1971-90	-27.0%
Korea	Kim, Krinsky & Lee	99	1985-88	+2.0%
Singapore	Hin & Mahmood	45	1976-84	-9.2%
Sweden	Loughran, Ritter & Rydqvist	162	1980-90	+1.2%
U.K.	Levis	712	1980-88	-8.1%
U.S.	Loughran & Ritter	4,753	1970-90	-20.0%

Notes: Total abnormal returns are measured as $100 \cdot [(1+R_{ipo,T})/(1+R_{m,T})] - 100$, where $R_{ipo,T}$ is the average total return (where a 50% return is measured as 0.5) on the IPOs from the market price shortly after trading commences until the earlier of the delisting date or 3 years; $R_{m,T}$ is the average of either the market return or matching-firm returns over the same interval. This is an updated version of Table 7 in Loughran, Ritter, and Rydqvist (1994). The Canadian numbers have been supplied by Vijay Jog of Carleton University.

There are three theories on the phenomenon of long-run underperformance of IPOs.

The divergence of opinion hypothesis

The most optimistic investors concerning the IPO will subsequently become the buyers. However, this is in world where there is a high level of uncertainty. As time goes by, and more and more information about the firms becomes available, the divergence of opinion between the optimistic and pessimistic investors will decline and subsequently will lead to a drop in stock price.

The impresario hypothesis

The impresario hypothesis is based on the assumption that investment bankers (*the impresarios)* intentionally underprice IPOs in order to create an excess demand for the stock. This excess demands subsequently leads to high initial returns. Following these assumptions the hypothesis predicts that the companies with the highest initial returns should accordingly follow with the lowest long run returns.

The windows of opportunity hypothesis

This hypothesis is based on companies timing their IPO when market circumstances are favorable, hence the window of opportunity. The companies that time their IPO, when volumes are high, are more likely to be overvalued than other IPOs. This leads to companies undertaking their IPOs in high-volume periods subsequently will have the lowest long run returns.

Chapter 3. METHODOLOGY AND DATA

The purpose of this paper is to determine investment bank analysts' inputs for financial methods, with the emphasis on the valuation methodology for an initial public offering. The data used for this research consists of a unique sample of six IPO prospect reports for a large German rail and logistics company called DB Mobility Logistics. The inputs (variables) that are being analyzed consist of what Koller et al. (2005) consider to be the frameworks for valuation. In addition, after having viewed one of the IPO reports I have adjusted/added inputs.

The variables that are being analyzed are the following:

1) *Valuation Methods*
2) *Discounted Cash Flow Components (Cost of Capital)*
3) *Trading Multiples*
4) *Cost estimations and Margins*
5) *Sensitivity and Scenario Analysis*
6) *Risk Factors*
7) *Strategic Analyses*

The design of the paper is as followed. For every input I will first explain its content and importance for the valuation track. Furthermore I will present earlier evidence on the subject from papers that were published in finance journals. After this I will present the results and indicate if they are consistent with earlier findings and textbook recommendations. In addition I've also conducted my own valuation of DB ML and presented my own methods and assumptions with the results (colored in red).

Chapter 4. VALUATION METHODS

4.1 Valuation methods overview

There are several methods in order to estimate a company valuation. However, these methods contain different perceptions and can also differ in outcome of value estimation. From a study by Deloof et al. (2002) where they examine the accuracy of valuation methods as used by investment banks for Belgian IPOs they report; "*We find that for each IPO several valuation methods are used, of which Discounted Free Cash Flow is the most popular, the DFCF model is used to value all IPOs in the sample*".

The following valuation methods are explained:

- Discounted Cash Flow
- Trading Comparables
- Transaction Comparables
- Sum-of-the-Parts
- EVA
- Real Options

Discounted Cash Flow Analysis

A popular and recommended method for the calculation of a company's value is the discounted cash flow method. This method is a means of determining the "true" (intrinsic) value of a company. The DCF method depends on the flows in and out of the company and a discount rate. This model not only relies on a firm theory, but it is also a very flexible method in the sense that the model depends on certain assumptions made.

Valuation with the DCF method is primarily based on:
- Identifying key value drivers
- Forecasting future free cash flows
- Estimate proper WACC
- Selecting the appropriate continuing value methodology.

For an accurate forecast of a firm's future free cash flows it is important to understand what drives the value of a firm. This is both from the external perspective (key industry trends) as from the internal firm perspective (i.e. relationship between sales and earnings). A proper DCF model depends on a thorough understanding of the company. The value using a DCF equals the sum of the net present value of the projected free cash flows and the projected continuing value. The free cash flows are generally forecasted for 5 to 10 years into the future. After this the DCF method makes use of a continuing value (terminal value), since it is expected the firm will continue its operations after the forecast period. A significant important assumption in a DCF analysis is the choice of the discount rate (WACC), which I will discuss further on under the section of assumptions.

Trading comparables

This valuation method is based on comparing the company being valued to companies with similar characteristics using multiples. Besides this method giving a rough valuation it is also a method that assesses whether the value calculated using the DCF analysis is in line with comparables traded in the market.

To apply multiples properly there are four best practices as described by Koller et al (2005);

1. Choose comparables with similar prospects for ROIC and growth.
2. Use multiples based on forward-looking estimates.
3. Use enterprise-value multiples based on EBITA to mitigate problems with capital structure and one-time gains and losses.
4. Adjust the enterprise-value multiple for non-operating items.

The identification of comparable firms that trade publicly should be based on several characteristics. The companies selected should preferably come from the same industry with a similar risk profile, similar operating characteristics (e.g. sales volume/profitability/growth) similar financial characteristics (e.g. capital structure/dividend policy), and similar size.

For the multiple analysis to be more accurate it's recommended to make use of forward-looking multiples. Since valuations are based on future performances, this should also be the case when using multiples. Empirical evidence shows forward-looking multiples are indeed more accurate in predicting value. As stated in the article by Kim and Ritter (1999) on valuing IPOs, *"Comparing the regressions using, respectively historical earnings, the current year's forecasted earnings, and the next year's forecasted earnings, the average absolute prediction errors fall from 55,0% to 43,7% to only 28,5%, and the percentage of firms that are valued within 15% of the actual multiple increases."*

There are several valuation multiples that can be used to compare companies.

- *Earnings Multiples* (e.g. P/E – EV/EBITDA – EV/EBITA / EV/EBIT)
- *Sales Multiples* (e.g. P/SALES – EV/SALES)
- *Market to Book Multiples* (e.g. P/BOOK – EV/Operating Capital)
- *Industry Multiples* (e.g. EV/Barrels of Oil – EV/Hectoliters – EV/Number of Subscribers)

As part of the best practices, as described by Koller et al (2005), it is recommended to use enterprise-value multiples. This is because the enterprise-value multiples are less dependent on capital structure than P/E ratios are. The P/E ratio uses net income, which is calculated after non-operating gains and losses, since a non-operating loss could cause the P/E ratio to be artificially high. The enterprise-value depends on a lesser extent to capital structure. However is also affected, be it to a lesser extent, since enterprise-value depends on assumptions made on growth, the cost of capital and ROIC. Moreover, the enterprise-value, as well as EBITA, should be adjusted for non-operating items, such as excess cash and operating leases, to improve the accuracy of the valuation.

Furthermore, there are several alternative multiples such as sales multiples and industry multiples. Sales multiples are generally speaking not accurate value predictors, as they impose an extra restriction in a manner that they require similar operating margins. Industry multiples relate the enterprise value of a company to some industry metric, such as barrels of oil. The industry multiple also has its shortfalls, since it doesn't take the profitability of a firm into account.

Transaction comparables

A valuation method based on comparing the value of a company to prices being paid for similar companies. This analysis is performed with multiples such as the earnings multiples mentioned earlier. Besides that the chosen comparable companies should be similar in a manner like the ones for trading comparables there are a few extra points of attention. First, the takeover price could contain a control premium, and second the transactions may include strategic value with different synergy rationale.

Sum-of-the-Parts

A sum-of-the-parts analysis values components (divisions) of a company as if it were separate businesses. Enabling to determine the valuation of a component as if it was to be broken up and spun off, or acquired by another larger firm. It is very well possible for the sum-of-the-parts analysis to estimate a higher valuation of the business divisions on a stand-alone basis than for the company as a whole.

Economic Value Added (Economic Profit)

The EVA is a measure of surplus value that is created via investments. In contrast to the discounted cash flow analysis, the EVA shows how and when a firm creates (shareholder) value, and leads to a valuation that is identical to that of the DCF analysis. The economic profit is defined as following;

- *Economic Profit = Invested Capital x (ROIC – WACC)*
- *Economic Profit = NOPLAT – (Invested Capital x WACC)*

The drivers of EVA are the return on invested capital (ROIC) and the cost of capital (WACC). The advantage of the EVA is best seen when looked on a year-to-year basis. When a company doesn't find a way to sustain or improve its economic spread (difference between ROIC & WACC) its EVA will drop. This economic spread is influenced by all of the decisions that are taken by a firm's management, such as decisions on dividend policy and financing decisions. It is also affected by changing market conditions, such as increasing competition that increases pressure on prices, which affects a firm's return on invested capital (ROIC).

Real Option Valuation

One method that is gaining in popularity due to its flexibility is real option valuation. Though not regarded as traditional model for a company valuation I will shortly outline its purpose. A traditional DCF method assumes a fixed path of investments over time where no change of action is made. The investments projected are a now or never decision, where uncertainty is regarded as negative. However, in reality it is somewhat different, where there isn't a fixed path of investments and uncertainty also means opportunity (higher risk will yield higher returns). Neglected in the traditional NPV-methods is the value of managerial flexibility to respond to uncertain future developments. A good and proactive management has and will use the ability to abandon investments that turn out bad to cut their downside loss, but will respond when opportunities present themselves. The two factors that are important for identifying the most valuable real options are uncertainty and the ability to respond, as shown in figure 1. The option value is greatest when uncertainty is high and it is very likely to receive information time, and the ability to respond is great and managers take the appropriate action to benefit from this information.

Figure 1. Overview Real Option Valuation

Managers can apply the flexibility in different forms of options. The several options he/she may apply are the option to defer, expand, contract, abandon, or switch projects on and off. In the case of

usefulness in the valuation of a business Koller et al. (2005) quote: "*In valuing an entire company, flexibility is relevant only in special cases, such as in the case of companies with a single product, companies in a commodity-industry, or companies in (or near) distress.*"

4.2 Results valuation methods

Presented below in graph 2 are the results for the choice on valuation methods by investment bank analysts in determining the IPO valuation of DB ML.

Graph 2. Results on valuation methods
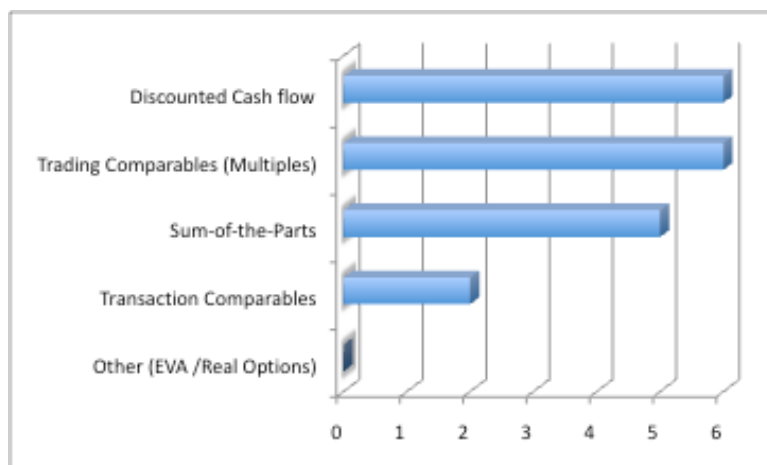
For the valuation of DB ML each analyst report has used a DCF, which is consistent with Deloof et al (2002), and trading comparables. The results are also consistent with the findings from Bruner et al (1998), where 100% of the financial advisers indicated they relied on a DCF and comparable companies multiples to evaluate investment opportunities. Furthermore 5 out of 6 make use of a sum-of-the-parts analysis, either through a DCF or with trading multiples. This is also consistent with the findings from Bruner et al (1998), where (with some more support) 100% of the respondents said to value the individual divisions from a multidivisional company. Only 2 reports used transaction comparables, where one commented it was solely used as a benchmark. Each analyst makes use of two or more methods in order to estimate the valuation of DB ML, which is consistent with the findings from Bruner et al (1998), where 80% indicated to weight the approaches. Illustrated in table 3 are the methods as used by each report and an indication (if provided for) which method is preferred in order to estimate the most accurate value.

Table 3 Details on valuation methods.

Reports	Methods	Preferred	Comments
R.1	DCF / Trading Comp. / Transaction Comp.	N/A	N/A
R.2	DCF / SoTP using trading comp.	SoTP (Trading Comp.)	
R.3	DCF / Trading Comp. / SoTP using trading comp.	Trading Comparables	DCF used to cross-reference
R.4	DCF / SoTP using trading comp. / Transaction Comp.	DCF	DCF better captures long-term
R.5	DCF (SoTP) / Trading Comp.	SoTP using DCF	Trading comparables used as benchmark against DCF.
R.6	DCF / SoTP using trading comp.	N/A	N/A
R.A	DCF / Trading Comparables	DCF	N/A

From table 3 we see the results on the primary valuation method are mixed. Three analysts indicate trading comparables as their primary method (either SoTP or on group level) and only two reports indicated the DCF (either SoTP or group level) to be their primary method. A possible explanation for

the choice on the preferred valuation methodology could be to justify a higher estimation. I have therefore provided the estimated equity value range and the belonging valuation models to the lower and upper range in table 4.

Table 4; Estimated value range

Report	Estimated Equity Value	Lower Range	Upper range
R.1	N/A	N/A	N/A
R.2	EUR 18.7-23.6 bn	DCF	SoTP (Trading Comp.)
R.3	N/A	N/A	N/A
R.4	EUR 18.9 - 22.6 bn	SoTP (Trading Comp.)	DCF
R.5	EUR 18 - 21 bn	SoTP (Trading Comp.)	SoTP (Trading Comp.)
R.6	EUR 22 - 25 bn	SoTP (Trading Comp.)	DCF

Considering report 6 indicated no preference for valuation methodology, but stated the DCF shows the fair equity value, would imply that for 3 out of 4 reports that provide an estimated equity value have a preference for the model that provides the highest estimated equity value. Only the analysts from report 5 didn't apply their estimated valuation from their preferred model, which actually estimated an even higher estimated equity value.

Since all analysts are/or may be acting as underwriter it could well be that the valuation is biased. This is because the objectiveness from affiliated underwriters is questioned. From Michaely and Womack (1999) on the biased opinion of investment banks when there is a relation with an IPO firm; *"Our evidence suggests that underwriters' recommendations are biased and, in the long run, inferior to recommendations by non-underwriters. We have argued that the bias has its roots in an investment bank's agency relationship with the IPO firm from which it receives sizeable underwriting fees."*.

The results also suggest the possibility of a concept called anchoring. Anchoring draws on the tendency to attach or *"anchor"* thoughts to a reference point, even though it may not be logical given the data at hand. The reference point in this case would be the estimated equity value. As will become clear with the results for the estimated enterprise value using a DCF or trading multiples, the estimated equity values are closer in line with each other than the estimated enterprise values are.

Table 5: Results on estimated enterprise value using DCF and trading multiples.

Report	Estimated Enterprise Value DCF	Estimated Enterprise Value Multiples
R.1	N/A	N/A
R.2	EUR 25.067	EUR 27.371 - 29.530
R.3	N/A	N/A
R.4	EUR 28.924	EUR 25.152
R.5	EUR 29.062 - 32.159	EUR 25.305 29.152
R.6	EUR 33.200	EUR 29.082
R.A	EUR 22.970	EUR 25.716

Illustrated in table 5 are the results for the estimated enterprise value using the discounted cash flow analysis and trading multiples. From the results we see much wider spreads between estimated enterprise values than we did for the estimated equity values. For example, the difference in percentage between report 2 and 6 for the DCF analysis is 32,44% using the DCF, about 2% using trading multiples, and 6% regarding the estimated equity value. It therefore seems that although estimated enterprise values can differ among the reports, eventually the estimated equity value is similar among the reports, which suggests anchoring.

5. DISCOUNTED CASH FLOW ANALYSIS

In this chapter the popular DCF model and its components are explained, followed by the results with regard to the application of this model by the investment bank analysts.

5.1 Overview DCF Components

5.1.1 Cost of Capital

As mentioned earlier, research by Deloof et al. (2002), pointed out that the DFCF is the most used method by underwriters in valuing IPOs for the Belgium market. In research done by Bruner et al. (1998) where they document their findings from a survey on what financially sophisticated companies and financial advisers use to estimate cost of capital, they too find the DCF to be the dominant investment-evaluation technique.

An important and significant assumption in the DCF analysis is the choice of the discount rate, or cost of capital. The cost of capital represent the required rate of return given the risks inherent in the business and industry, the uncertainty regarding the company's future cash flows (volatility) and the assumed capital structure of the business.

A cost of capital is always forward looking. As investors contribute capital with the expectation that the risk of future cash flows will be offset by an appropriate return. The cost of capital is typically estimated by studying the cost of capital of existing business with similar characteristics.

The most popular method in calculating the cost of capital is the Weighted Average Cost of Capital, or WACC (presented in figure2). This formula blends the required rates of return for both debt and equity holders.

Figure 2: Formula Weighted Average Cost of Capital

$$WACC = k_e \frac{E}{D+E} + k_d(1-Tc)\frac{D}{D+E}$$

5.1.1.a Cost of Debt

The debt providers require a return (Kd) that is tax deductable from the corporate perspective, and that is usually equal to the yield on a government bond plus a credit spread. The credit spread depends on the creditworthiness of a company that is often resembled by a credit rating, which is received by rating agencies such as Moody's or Standard & Poor's. Therefore, I will also check if the analysts report a credit rating and subsequently make assumptions on the ability of the firm to fulfill its obligations, with for example interest cover ratios. A lot of companies have activities in a variety of countries and are faced with multiple tax rates. For the cost of debt it is important to measure the appropriate marginal tax rate as accurate as possible. Since the company being valued creates substantial revenue outside there home country, I will also report what assumptions are made on the marginal tax rate

5.1.1.b Cost of Equity

The equity providers' required return depends on the risk associated with the operations of the company and the level of debt financing. The required return (Ke) is often calculated using the Capital Asset Pricing Model (CAPM). From a survey conducted among some of the most financially sophisticated companies and financial advisers by Bruner et al. (1998) they document the CAPM to be the dominant model for estimating the cost of equity. Next to the CAPM, the average stock

returns and a multibeta CAPM are the most popular. The CAPM depends on multiple assumptions, which are the risk-free rate, beta (risk relative to the market) and an expected return of the market (market risk premium). These underlying assumptions that have to be made are often subject of discussion.

For example on the choice of the risk-free rate Bruner et al. (1998) document: *"Our survey results reveal a strong preference on the part of practitioners for long-term bond yields. Of both corporations and financial advisers, 70% use Treasury bond yields maturities of ten years or greater. In contrast, 43% of the books advocated the T-bill yield, while only 29% used long-term Treasury yields."*

They report even more disparity on choices on market risk premium; *"Choice of an equity market risk premium is the subject of considerable controversy both as to its value and method of estimation. Most of our best-practice companies use a premium of 6% or lower while many texts and financial advisers use higher figures."* The disparity is confirmed by Koller et al. (2005) who quoted the following: *"sizing the market risk premium, the difference between the market's expected return and the risk-free rate, is arguably the most debated issue in finance"*.

5.1.1.c Capital Structure

Another important assumption made for the valuation process is the assumptions for the capital structure of a firm. From the formula for calculating the WACC you can see the capital structure is a key determinant for the cost of capital. Since the cost of capital should rely on target weights, rather than current weights, I will provide the assumptions made by the investment bank analysts on estimating a sustainable capital structure.

5.1.2 Continuing Value

The estimation of total enterprise-value consists of the present value of the cash flows during the forecast period and the present value of cash flows after the forecast period, the so-called continuing value. The assumptions made in calculating this value are important, since the continuing value often accounts for a large percentage of a firm's total value.

When using the enterprise DCF analysis the continuing value is calculated using the normalized level of NOPLAT in the first year after the forecast period, the expected growth rate in NOPLAT in perpetuity, the expected rate of return on new invested capital (RONIC) and the WACC.

The choices on these figures are very important and should be chosen thoughtfully. An error in judgment, for example on the choice for the growth rate in perpetuity, can have substantial influences on the estimation of the continuing value. For the RONIC it is expected, consistent with economic theory, competition will eventually eliminate any abnormal returns and the RONIC will equal the WACC. On the growth rate in perpetuity it is expected that a firm can't sustain to grow faster than the economy for long periods.

5.2 Results DCF Analysis

5.2.1 Forecast Period

For the forecast period Koller et al. (2005) recommend to choose an explicit forecast period that has a duration of about 10 to 15 years before estimating the continuing value. This timeframe is chosen because the forecast period should be long enough for the business to reach a steady state, meaning a constant growth rate and return on capital. Illustrated in table 6 are the results for the choice of the forecast period.

Table 6 Results on forecast period

Report	Forecast period	Comments
R.1	3 Years	*However, indicate long-term is preferred*
R.2	15 years	*Whereof detailed forecast of 3 years*
R.3	5 Years	*N/A*
R.4	11 Years	*Whereof detailed forecast of 5 years*
R.5	10 Years	*For services+subsidiaries forecasted 3 years*
R.6	5 Years	*N/A*
R.A	7 Years	*N/A*

The results indicate three analyst reports using the so-called three-stage forecasting model, which is in line with textbook recommendations (R.2 / R.4 / R.5). The first stage lasts about 1-5 years, where all items are forecasted in detail for the profit and loss account, as well as the balance sheet. Thereafter the forecasted period for 5 to 10 years consist of forecasting key operating items, this allows the return on invested capital and growth to reach steady state levels. The third stage consists of estimating the continuing value.

Concerning my own valuation (*R.A*) I have used a forecast period of no longer than 7 years. This choice is related to the steady state the firm reaches in my valuation after 4/5 years. Looking at appendix 1 you can see the margins are similar for the last three years of my valuation.

5.2.2 Cost of Capital

As explained earlier on, an essential factor for a DCF analysis is the estimation of the opportunity costs for investors. The benchmark for this opportunity costs is the cost of capital, or WACC. Determinants of the WACC are the cost of equity, cost of debt, marginal tax rate and the capital structure. The underlying assumptions of the WACC are often subject of discussion, which if applied differently can lead to differences in the cost of capital and therefore to the ultimate valuation outcome. Presented below in table 6 are the results for the WACC.

Table 7 Results on WACC

Report	WACC	Comments
R.1	7,90%	*N/A*
R.2	8,80%	*N/A*
R.3	N/A	*would depend on gearing (debt)*
R.4	8,44%	*N/A*
R.5	8,0-8,5%	*8,0% for passenger / 8,5% for freight*
R.6	6,55%	*N/A*
R.A	7,60%	*N/A*

From table 7 we can see the lowest WACC is for report 6, which is at 6,55%, and the highest WACC is for report 2, which gets as high 8,8%. You can imagine tremendous value estimation disparities when using these different WACCs for the same cash flow. To illustrate, I have discounted a hypothetical continuing value of EUR 1.000 against the WACCs as used by the analysts to indicate the differences in value estimations using these different discount rates.

Graph 3 Results on hypothetical continuing value using analysts' WACC.
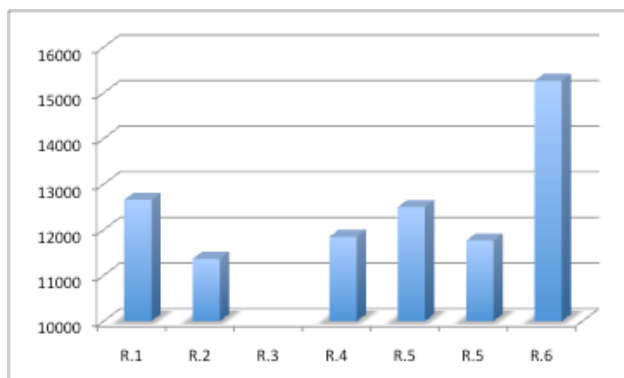
On the x-axis are the WACC rates as illustrated above in table 6, and on the y-axis are the results for the hypothetical continuing value. With a simple calculation you can see that between report 6 (WACC of 6,55%) and report 2 (WACC of 8,8%) there is an estimated value difference of a stunning 34,35%, which can also be seen back in the estimated enterprise value in table 5.

On another note, for each but one report the WACC is estimated through an estimated cost of equity and cost of debt. Only report 5 estimated a WACC that isn't related to a cost of equity or debt.

Concerning the WACC I've used for my valuation, this is slightly below the average of the IB analysts' WACC due to a lower risk-free rate (resulting in a lower cost of debt) and a somewhat higher D/E ratio. More detailed information about this WACC can be found below in tables 8-13 and appendix 1.

5.2.2.a Cost of Debt

To estimate a proper cost of debt Koller et al. (2005) recommend to use the yield to maturity of a company's long-term option-free bond. For companies without these long-term bonds they recommend to determine the company's credit rating and add the appropriate credit spread to the risk-free rate. The estimated cost of debt, as illustrated below, is a pre-tax cost of debt. Since interest payments are, from a corporate perspective, tax deductable the marginal tax rate is of importance for the WACC and therefore noted. Illustrated below in table 8 are the results for the cost of debt as estimated by the IB analysts.

Table 8: Results for the cost of debt.

Report	Cost of Debt	Determinant	Tax rate
R.1	6%	*100 basis points above risk-free rate*	*30,50%*
R.2	5,60%	*50 basis points above 6month EURIBOR*	*30,00%*
R.3	c. 5%	*50 basis points above 10-year bund*	*30,00%*
R.4	6,57%	N/A	30,50%
R.5	N/A	N/A	30,00%
R.6	N/A	N/A	30,00%
R.A	4,95%	*120 basis points above 10 year German bond*	*30,50%*

The results show a disparity in the cost of debt among the analyst reports that runs up to as much as 1,57%. Three analysts clarified on their choice for the cost of debt. For all three analysts it was of great importance that the major shareholder of DB ML is the 100% state owned company DB. The first report indicated a credit rating for DB of Aa1 (Moody's), which in effect leads to a 100bp extra above the risk-free rate. The second reports' analyst reported an additional credit spread of 50 basis points above the 6-month EURIBOR, related to the creditworthiness of DB ML's major shareholder DB. Report 3 also indicated a credit yield of 50bp, which is added to the 10-year rate on German government bonds.

Overall despite the lack of results it can be said that, without a company bond yield, the appointed credit rating and subsequently its belonging credit spread is a good determination for the cost of debt. For my estimation of the cost of debt I have also used the credit rating of the mother company DB AG (Table 8 and Appendix 1).

5.2.2.b Cost of Equity

As mentioned earlier evidence pointed out that the cost of equity is usually estimated using the CAPM or a modified CAPM. Illustrated below in table 9 are the results for the cost of equity and the model used to estimate this percentage.

Table 9; Results on Cost of Equity.

Report	Cost of Equity	Determinant
R.1	10,30%	CAPM
R.2	10,10%	CAPM
R.3	5,4 - 7,75%	CAPM
R.4	9,16%	CAPM
R.5	N/A	N/A
R.6	7,80%	CAPM
R.A	10,20%	CAPM

For all estimated required returns on equity, with the exception of one due to lack of information, the CAPM has been used. None of the reports indicated use of a multi-beta CAPM. The results for the cost of equity model are in line with the results from Bruner et al (1998), where 80% of the financial advisers indicated to use the CAPM in order to estimate the cost of equity, and the results are also consistent with the results from Graham & Harvey (1999) where 73,5% of CFOs surveyed indicated to use of CAPM for the cost of equity. It is no surprise the CAPM remains the favorite model for practitioners to estimate the cost of equity. As quoted by Koller et al (2005) on the theory regarding the cost of equity: "*It takes a better theory to kill an existing theory, and we have yet to see the better theory. Therefore, we continue to use the CAPM while keeping a watchful eye on new research in the area*".

Risk-free rate

Usually the choice for the risk-free rate is related to government default-free bonds. Although these don't necessarily are risk-free, the longer-term government bonds from the U.S. and Western Europe have relatively low risk. From the survey conducted by Bruner et al. (1998) they found the choice on the risk-free rate to be typically between the 90-day Treasury bill yield and a long-term Treasury bond yield. In that same survey, 70% of the financial advisers indicated to use yields on 10 years or longer maturities on treasuries. Koller et al. (2005) recommend a government bond that best matches the entire cash flow being valued. Illustrated below in table 10 are the results for the risk-free rates.

Table 10; Results on choice of risk-free rate

Report	Risk-free rate	Determinant
R.1	5%	N/A
R.2	4,50%	10-year yield on German government bond (september-08)
R.3	4,25%	10-year yield on German government bond (september-08)
R.4	4,16%	N/A
R.5	N/A	N/A
R.6	4,08%	N/A
R.A	3,75%	10-year yield on German government bond (march-09)

From the results in table 10 we can see a spread between report 1 and 6 of almost 100bp. However, only two reports indicated a determination for the choice on the risk-free rate, what makes it difficult to point out why these differences occur. Not surprisingly the determinants that are explained are the yields on 10-year German government bonds. This result is consistent with the recommendations and expectations when looking at previous evidence from for example Bruner et al. (1998). Regarding my risk-free rate I have used the 10-year yield on German government bonds, consistent with textbook recommendations and evidence from earlier papers on the subject. The disparity between my risk-free rate and those of R.2 and R.3 is due to interest rate cuts in the period from September-2008 to March-2009.

Beta

An estimation of the beta for a firm undertaking an IPO is a more complex method than for a regular publicly listed company, moreover when divisions within the company have different risk profiles. Illustrated below in table 11 are the levered betas for DB ML, and if provided on what basis the betas are determined.

Table 11; Results for estimating beta

Report	Beta	Determination
R.1	1,33	Based on industry comparables.
R.2	1	N/A
R.3	0,7-1,0	Relatively defensive transport company
R.4	1	N/A
R.5	N/A	N/A
R.6	N/A	N/A
R.A	1,29	Based on going betas for comparables (march-09)

The results indicate four reports providing an estimated beta, of which only two indicated an explanation. The betas presented are assumed to be equity betas, although only two reports stated the betas to be equity betas. The most extensive research is from report 1. In this report the betas for each division's comparables are estimated (equity and asset beta). The final group's beta is a weighted average of each of those divisional betas. The assumption from report 3 on a beta of 0,7-1,0 is explained with the assumption that DB ML is a relatively defensive transport company.

The beta I've estimated is related to going equity betas for comparable firms (see Appendix 1), which were unlevered and subsequently re-levered against the assumed capital structure and tax rate for DB ML.

Market risk premium

As indicated earlier, the most debated item of the CAPM is the market risk premium. In the survey by Bruner et al. (1998) they found the largest disparity in responses regarding the market risk premium. This difference was mainly between the use of arithmetic versus geometric average historical return, and the choice on realized returns of either T-bills or T-bonds to proxy the return on riskless assets. Illustrated below in table 12 are the results regarding the market risk premium and, if provided, the determinant of this premium

Table 12 Results on choice market risk premium

Report	Market risk premium	Determinant
R.1	4%	N/A
R.2	5,60%	Average return on European equity
R.3	3,50%	Banks' forecast on European equity premium
R.4	4,16%	N/A
R.5	5%	N/A
R.6	N.A	N/A
R.A	5,00%	Based on Koller et al best practices

The results for the market risk premiums, as expected when looking at previous evidence, are mixed and show a large disparity. The spread between the premiums runs up to as much as 2,1%, which in turn affects the outcome of the estimated cost of equity. Only two analysts, who both differ in their approach for estimating the risk premium, report the determinant on their choice. The first analyst uses a historical average return on European equity, which leads to 5,6% (the highest premium of all analysts). The second analyst uses the banks' forecasted European equity premium, which leads to 3,5% (the lowest premium). The market premium used for my valuation is related to what textbook recommendations ought to be a justified premium.

5.2.3 Capital Structure

Since the capital structure used for calculating the WACC is based on market values, the estimation for a private firm is somewhat more complex than for publicly listed firms. Illustrated below are the targeted weights and determinants for the analysts' capital structures.

Table 13 Results on capital structure.

Report	Target Weight (D/E)	Comments
R.1	40/60	*Based on net-debt to EBITDA of 1,7-2,0*
R.2	21/79	*Based on 3-year average net debt/assumed market cap.*
R.3	N/A	*Will depend on relative degree of gearing.*
R.4	16/84	*Based on 1,25* net debt/EBITDA*
R.5	N/A	*N/A*
R.6	N/A	*N/A*
R.A	39/61	*Based on estimated enterprise-value and current debt level*

The limited number of results (3) makes it difficult to obtain information on the appropriate way for estimating the capital structure by investment bank analysts. From the results present there are differences in the targeted capital structure between the reports R.1/R.2 and R.4. This is mainly due the assumption of a lower net debt/EBITDA ratio from R.4.

The assumed capital-structure for my valuation is related to estimating the enterprise value using trading multiples and subsequently using current market value of debt (see Appendix 1).

5.2.4 Continuing Value

After the explicit forecast period the continuing value of the firm is calculated. The continuing value creates a credible forecast for the long run based on fundamentals. Presented in table 14 are the results for the terminal growth assumption made to estimate the continuing value.

Table 14 Results on determining continuing value.

Report	Terminal growth rate	Comments
R.1	N/A	N/A
R.2	2%	In line with inflation
R.3	1-3%	Anything higher would be offset by inflation
R.4	2,50%	N/A
R.5	2%	N/A
R.6	1%	N/A
R.A	2%	In line with expected inflation figure EU

Consistent with recommendations from literature the terminal growth rates are set low (in line with inflation figure), not outpacing the growth of the economy for the longer-term. As will be shown later on, with a sensitivity analysis, analysts will be able to show what impact a higher/lower terminal growth rate will have on the estimated value.

As mentioned earlier on, the assumptions underlying the continuing value need to be as accurate as possible, since the terminal value often accounts for a large percentage of total estimated value. To illustrate this, I have provided some more detailed information on the estimated terminal value in table 15. For the reports that provided the necessary information I have documented the absolute terminal value, and the percentage of the estimated terminal value relative to the estimated enterprise value. The results on the terminal value indicate the importance of estimating an as accurate as possible terminal value. From table 14 we see that the lowest percentage of terminal value relative to enterprise value already accounts for 51,88% of enterprise value and for report 5 gets as high as 71,30%.

Table 15 Results on absolute terminal value and terminal value relative to EV.

Report	Absolute terminal value	Terminal Value / Enterprise Value
R.1	N/A	N/A
R.2	N/A	N/A
R.3	N/A	N/A
R.4	EUR 15.002	51,88%
R.5	EUR 20.799	71,30%
R.6	EUR 21.800	65,66%
R.A	EUR 16.647	72,47%

6. TRADING MULTIPLES

As described earlier on in chapter 4 there are several best practices for the use of trading multiples. In this chapter I will present the results on which multiples have been used and how the analysts apply them (in compliance with best practices), in order to value DB ML.

6.1 Results trading multiples

Illustrated below in graph 4 are the results on the choice of trading multiples. The analysts either used earnings or sales multiples in order to estimate a valuation. In compliance with the best practices all analysts used forward-looking earnings multiples.

Graph 4: Type of multiples.
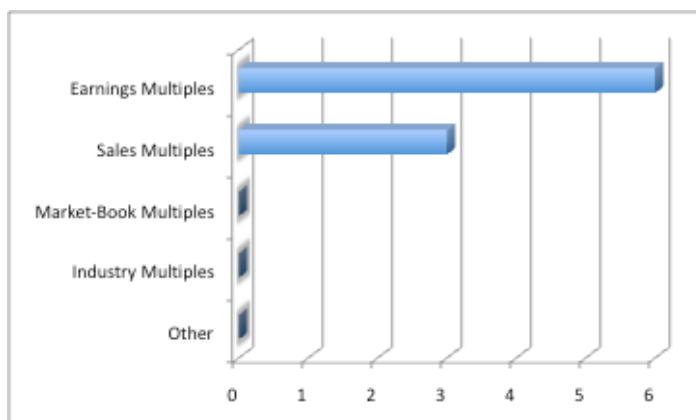
Since the trading multiples used for the valuation of DB ML were limited to earnings and sales multiples I have provided a more detailed description for the multiples used, which are illustrated in graph 5.

Graph 5: Earnings/Sales multiples as used by analysts.
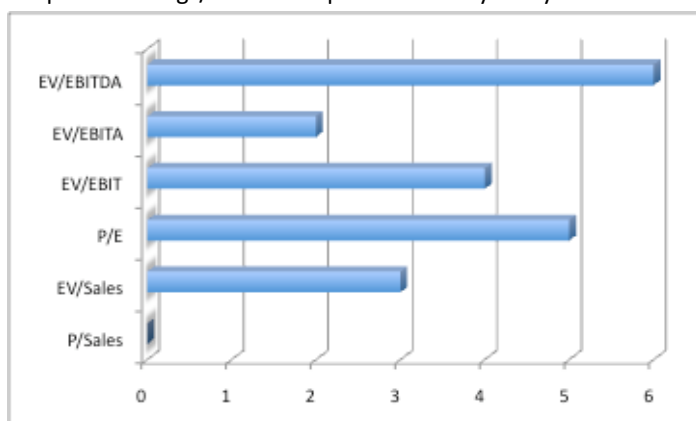
From graph 5 it notices that the EV/EBITDA (6x) and P/E multiple (5x) are the most popular among the analysts. Furthermore, all analysts indicated that between these two multiples they prefer the use of the EV/EBITDA multiple for the valuation of DB ML. This choice depends on the enterprise-value multiples being the least dependent on capital structure, unlike the P/E multiple. Moreover, the firm has to cope with high levels of depreciation, and this makes the EBITDA the most sensible measure for valuing DB ML.

An equally important part for an accurate multiples analysis is the choice on comparables. For this choice all analysts, obviously, used peers with similar business descriptions. However, some analysts also stated they looked at similar historical financial performance (margins), market opportunities and risk profiles that best matched DB ML's divisions. The peer groups from the analyst reports are more or less similar in the use of firms (for a detailed overview of peers used by the reports I refer to table 17 on the next page), but what notices is report 1 has the largest amount of peers. When ignoring the extensive use of peers by report 1 the comparables are more or less similar between the reports (Table 17). However, there are disparities among the estimated multiples due to the use of different peers. Moreover, there is another factor that leads to differences in estimated multiples among the reports. These differences occur due to the different approach in the use of the multiples. First off, some analysts combined comparable firms to value multiple divisions simultaneously, instead of valuing the division separately. Second, the analyst's subjective judgment about the company's prospects (risk profile/ability to out- or underperform competition) resulted in allocating a premium or discount to the multiple.

The differences between the estimated multiples can lead up to differences as much as 2x EBITDA (e.g. Logistics divisions), which subsequently can have substantial valuation differences. Illustrated in table 16 are the multiples as estimated by the investment bank analysts.

Table 16 Results on EV/EBITDA multiple (average/median/used). Note: some reports combined passenger rail divisions, therefore these are aggregated in section PASSENGER. When more than one multiple is accounted for this is related to a low and upside case (e.g. Report 5).

EV/EBITDA	R.1	R.2	R.3	R.4	R.5	R.6
	2009e	2009e	2009e	2009e	2009e	2009e
LD						
average	7,5	7,9	7,5	7,6		
median	7	8,1				
used		7,9			7,0/7,6	
Regional						
average	7,5	6,6	7,1	6,3		
median	7	6,7				
used		7,8			6,3/7,0	
Urban						
average	7,5	6,6	7,1	6,3		
median	7	6,7				
used		7,8			6,3/7,0	
PASSENGER						
average	7,5				6,4	7,3
median	7					7,7
used						7,7
Rail Freight						
average	7,1	7,2	7,8	6,8	7,6	7,6
median	7,8	7,2				7,6
used		6,6/7,2			6,7/8,0	7,6
Logistics						
average	9,7	6,3	7	6,8	9,3	6
median	8,9	7,3				6,3
used		6,3			6,7/8,3	6,3

Table 17: Results on peers as used by IB analysts.

Company	Report.1	Report.2	Report.3	Report.4	Report.5	Report.6
Passenger Transport						
Arriva	Green	Green	Green	Green	Green	Green
FirstGroup	Green	Green	Green	Green	Green	Hatched
Go-Ahead	Green	Green	Green	Green	Green	Hatched
National Express	Green	Green	Green	Green	Green	Green
Stagecoach	Green	Green	Green	Green	Green	Green
Central Japan Railway	Green	Green	Green	Green	Green	Green
ComfortDelGro	Green	Hatched	Hatched	Hatched	Hatched	Hatched
East Japan Railway	Green	Green	Green	Green	Hatched	Green
MTR Corp Ltd.	Green	Hatched	Hatched	Hatched	Hatched	Hatched
SMRT Corp.	Green	Hatched	Hatched	Hatched	Hatched	Hatched
West Japan Rail way	Green	Green	Green	Green	White	Green
Freight Transport						
Burlington Northern	Green	Green	Green	Hatched	Green	Green
Canadian National	Green	Green	Green	Hatched	Green	Green
Canadian Pacific	Green	Green	Green	Hatched	Green	Green
CSX Corporation	Green	Green	Green	Hatched	Green	Green
Norfolk Southern	Green	Green	Green	Hatched	Green	Green
Union Pacific	Green	Green	Green	Hatched	Green	Green
Genesee & Wyoming	Green	Hatched	White	Hatched	Hatched	Hatched
Kansas City Southern	Green	Hatched	Green	Hatched	Green	Hatched
America Latina	Green	Hatched	Hatched	Hatched	Green	Hatched
Container Corp India	Green	Hatched	Hatched	Hatched	Hatched	Hatched
China Railways	Green	Hatched	Hatched	Hatched	Hatched	Hatched
Daqin	Green	Green	Hatched	Hatched	Hatched	Hatched
Globaltrans	Green	Green	Hatched	Hatched	Hatched	Hatched
Guangshen Railway	Green	Green	Hatched	Hatched	Hatched	Hatched
VTG Group	Green	Hatched	Hatched	Hatched	Hatched	Hatched
Asciano	White	Hatched	Hatched	Hatched	Green	Hatched
JB Hunt	White	Hatched	Hatched	Hatched	Green	Hatched
Pacer	Green	Hatched	Hatched	Hatched	Green	Hatched
Logsitics						
CH Robinson	Green	Hatched	Hatched	Hatched	Green	Hatched
DSV	Green	Green	Green	Hatched	Green	Green
Expeditors	Green	Hatched	Hatched	Hatched	Green	Hatched
Forward Air	Green	Hatched	Hatched	Hatched	Hatched	Hatched
Kuehne + Nagel	Green	Green	Green	Green	Green	Green
Panalpina	Green	Green	Green	Green	Green	Green
Uti Worldwide	Green	Hatched	Hatched	Hatched	Hatched	Hatched

7. GROWTH, COST ESTIMATIONS AND MARGINS

To get a good overview of the performance of a company the firm's margins are often compared with industry comparables. From the reports it becomes clear that the best margin for this firm is the EBITDA margin. I will therefore compare the development of this margin for each report. Besides the EBITDA margin I will also compare the net income margins, since these are of importance to future shareholders. Since the EBITDA margin is in essence the operating cash flow, I will present growth figures and assumptions made for revenue and costs.

7.1 Results for growth, cost estimations and margins.

7.1.1 Growth

Presented in table 18 are the results of CAGR for revenue.

Table 18: Results on growth.

Report	CAGR 1-3 years	CAGR 1-5 years
R.1	4%	N/A
R.2	4,90%	N/A
R.3	4,70%	4,55%
R.4	6,80%	5,40%
R.5	4,20%	N/A
R.6	5,70%	5,50%
R.A	2,40%	3,30%

The results indicate deviations among the revenue growth figures. For example, between report 4 and 5 there's a difference in the revenue CAGR of 2,6%, which in absolute terms means a difference in revenue of EUR 2.6 billion. However, the difference in revenue growth isn't sufficient to explain any potential differences in valuation outcome.

Related to my valuation: the growth rates are substantially lower than those of the investment bank analysts. This is mainly related to the heavily slowing of the economy in the period September-2008 till March-2009. For more details see Appendix 1.

7.1.2 Cost Estimations

The second item from the profit and loss account that is essential in estimating the EBITDA margin, are the expenses. In table 19 are the results on the method for cost estimation.

Table 19 Results on methodology on costs and expenses estimation.

Report	Costs
R.1	Bottom-up / Margins
R.2	Margins
R.3	Margins
R.4	Margins
R.5	Margins
R.6	Margins
R.A	Margins

The results from table 17 indicate that all analysts make use of margins in order to estimate the costs, where one report also made use of bottom-up estimations for several divisions. It may seem as a simplified method, but each analyst report backed these margins with their view on the company's ability to control costs, and forecasted any increases/declines in cost components of DB ML.

7.1.3. Margins

Since the EBITDA margin is seen as the best multiple to estimate the value of DB ML, I have presented the results for this margin in table 20.

Table 20 Results on EBITDA margin.

Report	EBITDA margin 2010	EBITDA CAGR (2007-2010)	EBITDA margin 2012	EBITDA CAGR (2007-2012)
R.1	11,40%	9%		
R.2	11,10%	9,10%		
R.3	11,50%	9,40%	11,60%	5,60%
R.4	11,10%	7,00%	11,40%	7,00%
R.5	12,10%	7,20%		
R.6	11,20%	9,60%	11,10%	6,00%
R.A	9,87%	4%	10,45%	5,20%

The results for the EBITDA margin show little discrepancy. Most margins are within the range of 11,1-11,5 percent. These results are consistent with the estimation of the costs, which are related to margins. To clarify: Report 4 had the highest growth rate in revenue for the first three years of about 6,8% (CAGR). However, they reported the lowest growth rate in EBITDA of 7% (CAGR) of all reports, resulting in an EBITDA margin that is close to those of other reports. The only "outlier" and subsequently most optimistic margin is related to report 5.

Table 21 Results on Net Income margin.

Report	Net Income 2010	CAGR 2007-2012	Net Income 2012	CAGR 2007-2012
R.1	3,90%	11%		
R.2	4,00%	11,20%		
R.3	4,10%	13,00%	4,72%	12,00%
R.4	4,00%	12,80%	4,47%	13,60%
R.5	4,60%	16,00%		
R.6	4,00%	12,60%	4,50%	12,00%
R.A	3,00%	0%	3,50%	5,20%

Consistent with the results on the EBITDA margin, the results for the net income margin show little discrepancy among the analysts' estimations. Again, most reports indicate the margin between 3,9-4,1%, where only report 5 can be considered an "outlier" with a net income margin of 4,6%.

On another note, I've mentioned earlier on the suggestion for the possibility of anchoring, related to the estimated equity value. When observing the EBITDA and net income margins the analysts assume for DB ML, the suggestion of anchoring is supported since these are all quite similar.

8. SENSITIVITY & SCENARIO ANALYSIS

An important part for the valuation of a firm is identifying key value drivers. To determine these so-called value drivers there is a technique that is called the sensitivity analysis. When the value drivers are identified these factors are forecasted with high caution. However, often these forecasts are based on a single path outcome, but a fixed path is artificial. At any moment in time lots of uncertainties exist and therefore numerous potential outcomes. In this section I will first present a description of the sensitivity and scenario analysis and subsequently present the results on the use of these methods in the reports.

8.1 Description of a sensitivity and scenario analysis

Sensitivity analysis;

The sensitivity analysis is a technique that determines the impact on a dependent variable when an independent variable changes. There are several advantages using such an analysis, as well as disadvantages. The advantages are that it determines the most important drivers and analyses impact on the cash flow and/or value. Furthermore it helps the management to focus their attention to monitor and manage those factors that are considered to be the most important value drivers. Disadvantages are that the analysis can possibly neglect interdependencies among value drivers, when not explicitly modeled. It can also neglect the likeliness, or effort that has to be put in, to change a value driver. Moreover, it can scare managers away from potential investment opportunities because of high sensitivities.

Scenario analysis;

The scenario analysis is a useful tool to evaluate different outcomes for a firm's prospects if a situation turns. Certainly during difficult times when uncertainty dominates, like the one during the writing of this paper (beginning 2009), a multiple scenario analysis is a must have. To give an illustration; when a firm has good prospects and increases its revenue, it is most of the time able to grow its earnings by a greater amount (consider the economies of scale). However, when a firm is in difficulties and subsequently has to cope with a sharp decline in revenue, it would also have to cut down costs, which isn't always doable. You can imagine a large spread between the value of a firm if the upside scenario takes place or the more bearish scenario occurs. Therefore, considering multiple scenarios allows a potential investor to assign his on weight on each potential outcome and gives him a valuation spread.

8.2 Results on sensitivity and scenario analysis

Illustrated below in table 22 are the results on the use of a sensitivity and/or scenario analysis. From the results it shows that four analysts apply the sensitivity method related to the estimated equity value. They measure the sensitivity for the equity value when changes occur in assumptions made on the weighted averaged cost of capital and the terminal growth rate. Two analyst reports also measured sensitivities regarding divisional related issues. This includes for example the sensitivity on revenue, EBITDA or EBIT if DB ML could increase its tariffs for passenger rail travel by a percentage point or if they could increase their concession revenues with one or more percentage points. This divisional-based sensitivity analysis is very useful in assessing division specific value drivers.

Concerning the scenario analysis, there are three reports that have applied multiple scenarios for value estimation. These consist of a lower case, base case and upside case scenario. The upside scenario, for example, is estimated using multiples with a premium or against a peer group that

consists of firms that have better prospects and showed a superior financial performance and therefore trade at higher multiples.

Table 22 Results on sensitivity and scenario analysis.

Report	Sensitivity Analysis	Scenario Analysis
R.1	Yes, EBITDA sensitivities to changes in volume, yield and market share.	N/A
R.2	Yes, sensitivities on equity value from changes in terminal growth & WACC	Yes, a low case (DCF), base case (SoTP) and an upside case (SoTP)
R.3	N/A\	N/A
R.4	Yes, sensitivities on equity value from changes in terminal growth & WACC	Yes, a low case (SoTP) and an upside case (DCF)
R.5	Yes, sensitivities on equity value from changes in terminal growth & WACC, as well as sensitivities on divisional basis (e.g. Changes related to passengers or freight carried).	Yes, a low case (DCF+SoTP) and an upside case(DCF+SoTP).
R.6	Yes, sensitivities on equity value from changes in terminal growth & WACC	N/A
R.A	N/A	N/A

9. RISK FACTORS

As Graham & Harvey (1999) mention in their paper there are other risks to a company than market risk (beta). Accordingly I check if the analysts consider any specific pre-determined risk factors to be of a high degree of influence to their valuation, be it in a multibeta CAPM or affecting forecasted variables. The selection of pre-determined risk factors is primarily based on what Graham & Harvey (1999) consider to be the most important additional risk factors. As they quote: "*Overall, the most important additional risk factors are interest rate risk, exchange rate risk, business cycle risk, and inflation risk.*" Besides these factors mentioned I also check for commodity price risk, with special attention to the oil price. However, note this doesn't imply the company being valued is exposed solely to these pre-determined risk factors.

9.1 Results on risk factors

In the section regarding the cost of equity methodology we already saw that none of the analysts used a multibeta model with additional risk factors. However, I have checked if any of the pre-determined risk factors are considered by the analysts to possibly affect the valuation of DB ML. From graph 6 we can see all analysts consider the GDP and commodity price (in this case the oil price) to be of consideration to the valuation process. Other noticeable risk factors are the exchange rate and the inflation figure. Although mentioned as possible risk factors, there isn't a clear judgment on the degree of influence to the valuation process, since this is a subjective opinion of the analyst. For my own valuation I have considered the GDP to be of significant influence to the estimated valuation.

Graph 6: Results risk factors.
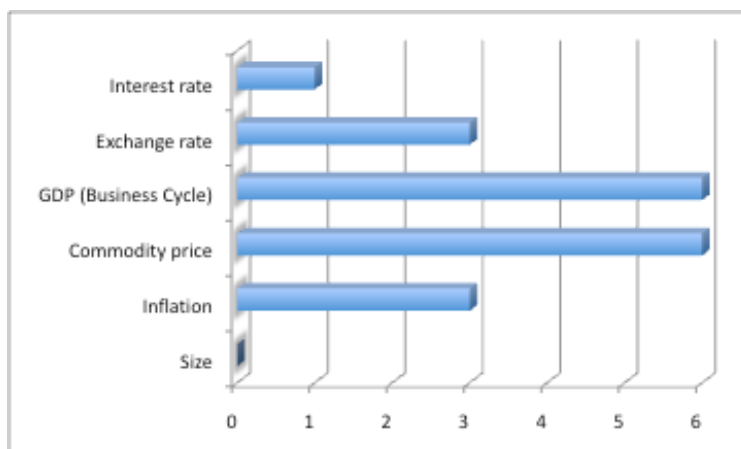
10. STRATEGIC ANALYSIS

The ultimate valuation judgment should not only be based on calculus but also qualitative aspects. To get an as accurate valuation as possible it is important to get a thorough understanding of the industry dynamics, the long-term industry attractiveness, the competitive position of the firm, the firm's long-term strategy and the quality of the management. This involves analyzing key industry trends, and developing a view on the development of these trends. It includes assessing the company's competitive environment and evaluating the company's strengths and weaknesses. There are two familiar and commonly used models to conduct a strategic analysis namely, Porter's 5 forces (external view) and the SWOT analysis (internal view). Therefore, I will also document in to what extent these models are being used, or elements thereof. Furthermore, I will also document if the report includes a review of the firm's management.

10.1 Overview strategic analyses

Porter's 5 Forces

Porter's 5 Forces analysis framework considers the following 5 forces:
1) Competitive rivalry within an industry
2) Bargaining power of suppliers
3) Bargaining power of customers
4) Threat of new entrants
5) Threat of Substitute products

SWOT Analysis

The SWOT analysis is a method to evaluate the **S**trengths that attribute to help the business, **W**eaknesses that attribute to harm the business, **O**pportunities that are helpful for achieving the business's objective and **T**hreats that could damage the business's performance.

10.2 Results on use of strategic analysis frameworks

Table 23; Results on strategic analysis

Report	5 Forces	SWOT	Management Review
R.1	Elements are used	No	No
R.2	Elements are used	No	Yes
R.3	Elements are used	No	Yes
R.4	Elements are used	Partly used (O&T)	Yes
R.5	Elements are used	No	Yes
R.6	Elements are used	Yes	Yes
R.A	Elements are used	Yes	No

Although the use of a specific model is limited, the strategic analysis of the firm is one the most important part, if not the most important part, of the valuation process. It is in effect the subjective judgment of the analyst on the (long-term) industry attractiveness and the ability of the company to perform in this industry that leads to the estimated valuation. The fields the analysts cover in order to estimate a proper analysis are, among others, the business activities, key industry trends, management quality, competitive advantages, customer description and the firms' (long-term) strategy.

11. CONCLUSION/DISCUSSION

My research objective was to find out the best practices for finance methods, as used by investment bank analysts. Through having reviewed six IPO reports I've got a detailed insight in how finance methods are applied. In the following section I'll summarize my results for each subject.

Valuation Methods

The results indicate a 100% use of both trading multiples and a DCF analysis in order to estimate fair value. Furthermore, the results indicate the use of a sum-of-the-part analysis when the company has multiple divisions. The results are inconclusive with regards to which method is the most appropriate to value an IPO. In my view they are both necessary in order to come up with a fair valuation.

DCF Components

Consistent with previous evidence the WACC is still the basis for setting the proper discount rate in order to value a firm. Moreover, as part of the WACC the CAPM is still, after many years, the preferred model for the estimation of the cost of equity. To go into some more detail with regards to the CAPM the results indicate the following. The risk-free rate should be based on a long-term (10 years or more) government bond rate. Where the bond should match the country the firm is situated. The results are inconclusive with respect to the estimation of a beta. In my view a re-levered beta that is estimated using comparable beta seems to be the most appropriate method. On the market risk premium the results are similar to those of previous papers. Among the analysts are differences in rates (4 - 5,6 percent) and determinants (historical and forecasted). It is my believe that the market risk premium will remain one of the most debated topics in the field of finance.

The cost of debt, even though the results are slim, should be estimated (when long-term option-free bonds are absent) using the long-term risk-free rate plus an appropriate credit spread based on the firm's credit rating.

Trading Multiples

The results for trading multiples indicate consistency with best practices as described in the textbook by Koller et al. (2005). The preferred trading multiples, as indicated by the analysts, are forward-looking enterprise-value multiple (EV/EBIT(D)A). This is because enterprise-value multiples are unaffected by capital structure and forward-looking earnings are better forecasters than current earnings. The results also indicate an analyst's subjective judgment with regards to the multiples. When prospects are better than for the comparables the multiples are adjusted with a premium and vice versa.

Growth, Cost Estimations and Margins

The results regarding the developments of margins and cost estimation indicate the forecasting of margins rather than forecasting each line item of the P&L account. This seems to be a simplified method, but is due to the lack of divisional financial statements (divisions are consolidated) justifiable. Moreover, for each division the analysts give a plausible explanation for their choice on margins.

Sensitivity and Scenario Analysis

The results indicate a "wide" use among the analysts (5 out of 6) of a sensitivity analysis. The sensitivity analysis is mostly used to measure the sensitivity of the estimated group equity value to changes in the long-term growth rate or cost of capital. One report also measured divisional-based sensitivities, where for example changes in number of passengers affected revenue and EBITDA on a divisional basis. Concerning the scenario analysis, the results indicate three reports having used multiple valuation outcomes. The scenarios consist of a low case, base case and upper case. When the company would prosper more than expected the estimated valuation outcome would be higher and vice versa. The results are inconclusive with regard to which model should be used for the low, base or upper case, as can be seen in table 20.

Risk factors

The intentional motivation to investigate risk factors was the possibility of a multibeta CAPM in compliance with Graham & Harvey (1999). However, since a multibeta CAPM hasn't been used I have checked which of the pre-determined variables are considered to possible affect the company being valued. Considering the company isn't limited to the risk factors that were pre-determined the GDP and oil price are the largest risk factors (6 out of 6) for the business of DB ML.

Strategic analysis

The results indicate hardly any use of a specified strategic model. Only 1 out 6 reports directly used the SWOT analysis. However, though not directly used the 5 forces from Porter's model, and some of the elements from the SWOT, are covered by each analyst albeit in some other form. Although the results don't indicate any direct use of strategic analysis doesn't imply this isn't important. In the contrary, the strategic assessment of a firm is the most important aspect of a valuation.

Having that said, the valuation of a company should be focused on business forecasting, and the modeling is just a requirement to generate a robust value. When a firm has been thoroughly researched by an analyst he can develop a strategic view on the industry and the company's performance, and subsequently translate this into a forecast. This is the essence of a valuation and the activity that creates true insight.

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APPENDIX 1: VALUATION REPORT

PART I; INTRODUCTION

I will first present a short introduction on the company undertaking the IPO, namely DB Mobility Logistics AG. The company is a subsidiary of Deutsche Bahn AG, which is owned by the Federal Republic of Germany. Deutsche Bahn AG also owns DB Netze (Track, Stations and Energy) that together form Germany's rail infrastructure.

DB Mobility Logistics provides rail transport services for transporting freight and passengers, all types of logistics services, and in particular transport, freight forwarding, freight and storage services, as well as all types of consultancy and general services, particularly in the field of transport, logistics, information technology and telecommunications.

The group consists of 6 business units, for which I will separately give a short business overview.

Long Distance
Owns and operates Germany's long distance rail passenger transport (ICE). This is a high-speed rail service that transports passengers not only within Germany, but also to 13 other countries within Europe.

Regional
This division carries passengers for regional rail transports within Germany. It is also active within the United Kingdom.

Urban
This division comprises the urban transport systems in Berlin and Hamburg, as well as urban bus activities. Most of these transport services are provided in Germany. Worth noticing, the urban bus market is still for 80% run by local transport authorities.

Schenker Rail
This division provides rail freight transport services. It operates primarily in Germany, Denmark, the Netherlands and Italy.

Schenker Logistics
This division generates the largest revenue stream within the DB Mobility Logistics group. They provide logistics services with global activities involving freight, transport, and other services in commodity and product transport via ground, air and sea.

Services
This division provides all types of services, mainly in the fields of transport, logistics, information technology, and telecommunications. Generated revenue largely via services rendered to division within DB ML and DB AG.

PART II: ANALYSIS

A note beforehand, since the company is still a private firm and therefore not obligated to provide its financial statements it is difficult to obtain a broad historical analysis. The company has provided a financial report for the years 2005-2007 in light of its plans to go public. I will first start with an external analysis on the industry where DB ML is active and an economic outlook, which is followed with a company analysis.

II.A EXTERNAL (MARKET) ANALYSIS

For the external analysis I will first present some industry trends for railroad transport of passenger and freight. Second, I will present key economic indicators that affect the firm's business for its passenger and freight transport. Thereafter I will present some financial highlights and compare these against those of DB ML's competitors.

Rail Transport

When looking at data for the use of rail as transportation mode there, has been a structural declining trend in the use of rail. Especially in the market for European rail freight, where the market share dropped from 32,6% in 1970 to only 16,7% in 2006. In absolute terms of goods carried, rail freight transport declined by about 1% between 1970 and 2006. On the other hand, freight transport by road tripled in the same period. When looking at the market for passenger transport there has also been a decline in the period 1970-2006 for rail transport. In 1970 rail's share was about 10% in the EU, but has fallen to a steady 6,9% in 2006.

Now for the past two years there seems to be a reversal in trend. Rail freight volumes have stopped deteriorating and the decline in rail's market share for freight has slowed. This is largely due to initiatives and goals set by the EU for the European transportation market. The transport policy of the EU is to achieve an internal market for transport services, and the revitalization of clean modes of transport, such as inland waterways and railways. In the EU, transport causes around 25% of all EU CO_2 emissions. More than 90% of total domestic transport emissions are caused by road transport. Rail transport only accounts for 0,6% for diesel emissions and for less than 2% including emissions for electricity production, see figure 3.

Figure 3 CO2 emission for lorry, train and inland waterway.[1]
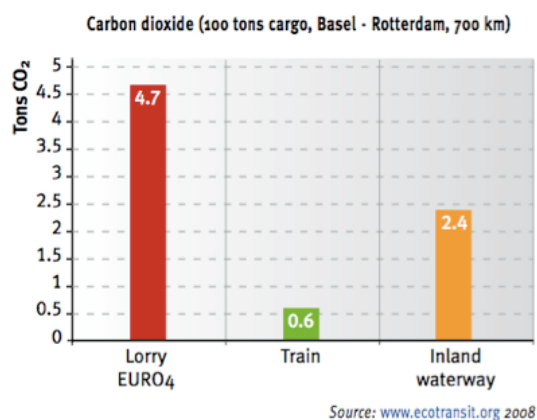
[1] EcoTransit. (2008). *Rail Transport and Environment.* Available: http://www.ecotransit.org. Last accessed 20 February 2009.

Rail transportation has other advantages opposed to road transport, besides being more environmental friendly. Rail transportation is a safe means of transportation, and has a substantial advantage compared to road transport considering the increasing road congestions, which is a large incentive for especially commuters to shift to rail traveling. Moreover, in some market segments rail traveling is faster and cheaper than other modes of transportation.

The revitalization of rail freight transport, as EU goal, implies improvements in its performance, competitiveness and capacity. To improve the quality of rail freight transport and to ensure it has sufficient capacity, the European Commission considers that two main elements should be developed and/or improved:

- Fair competition in the provision of rail services
- Good, reliable (at the requested time) and adequate paths available for freight transport.

Fair competition makes a more efficient and customer responsive industry. The EU rail legislation has consistently encouraged fair competition and market opening on European level, with the first real implication of a major law in 1991. This legislation ensures the distinction between the infrastructure management, who runs the rail network and the railway companies who use it for transporting purposes. To ensure this act is applied properly EU member states must have a regulatory body that monitors the market and acts upon an appeal if a railway company has been treated unfairly.

Opening up markets for Europe has commenced since the start of 2007, when the rail freight transport market was completely liberalized in the EU. This in turn means that any licensed railway company with the appropriate certificates has the ability to request access, and offer freight transport services on national and international level throughout the EU. The same process is going to be applied for the international passenger rail transport market. The EU will liberalize the market starting January 2010. However, the market for purely national passenger transport services is not yet opened up to cross-border competition.

Regarding rail infrastructure the EU aims to upgrade important freight routes in Europe by 2012-15. Next to increasing freight routes within Europe the EU also aims to expand its routes to connecting countries. Another important aspect for the infrastructure of railways is the compatibility between countries. In the past few years a lot of difficulties and costs were associated with differences in electrification standards and safety and signaling systems. Through EU legislation interoperability is promoted to overcome such difficulties.

These above mentioned legislations considerably contribute to growth for the rail freight market. With the growing containerization and longer distances that need to be covered, rail freight will surely benefit from the upgraded rail network, faster trains and improved infrastructure. Competition from road transport will also be damped due to the increasing road congestions, increasing costs for road transportation (oil), and the growing awareness of being environmental friendly.

The international passenger rail market will also benefit from the implications of these actions. By opening up markets within Europe, especially the long distance segment will benefit. Since trains are able to travel faster and further the trains competitive position will increase substantially to road and air traveling. Illustrated in figure 4 are million passenger-kilometers traveled with high-speed rail transport in Germany. The number of passenger-kilometers rose from 8,85 million in 1996 to 21,64 million in 2006 (244% increase in 10 years), indicating the increasing trend of using high-speed rail transport by passengers in Germany.

Figure 4 million passenger-kilometers for high-speed rail transport '96-'06
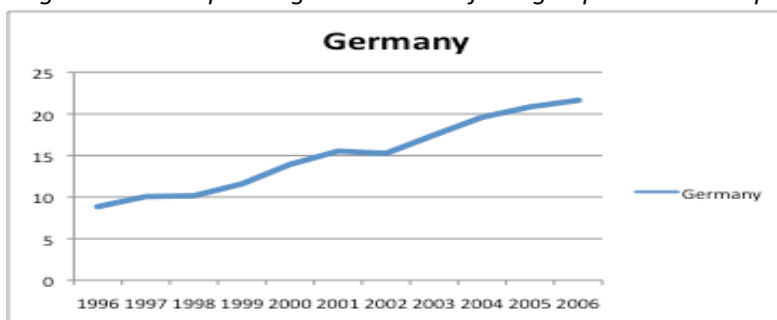
For the whole of the EU this number increased substantially over the past 10 years. In 1996 the passenger kilometers in the EU were 37,5 million, and in 2006 this increased to 89,9 million kilometers.

Figure 5 million passenger-kilometers high-speed rail transport '96-'06
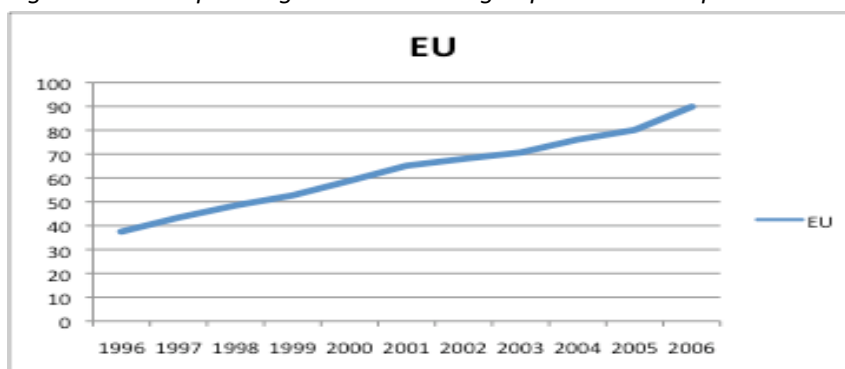
Furthermore, besides the positive developments in the rail transport market itself, rail transport can also benefit from an increase of efficiency in inter-modality, which means using two or more modes of transport (e.g. road and rail) as an integrated transport chain. Inter-modality will help build an efficient and sustainable transport system for passengers and freight using the optimal combination of transport modes. An increase of inter-modality is also part of the European Commission's logistical plan for freight transport.

II.B ECONOMIC INDICATORS

For the year 2009 the global economic outlook is grim and the first signs of a deep recession are already present. Illustrated in figure 6 are projections on global GDP growth by the IMF. The IMF quotes on its projections; "*World growth is projected to fall ½ percent in 2009, its lowest rate since World War II*".

Figure 6 GDP Growth projections, source: IMF
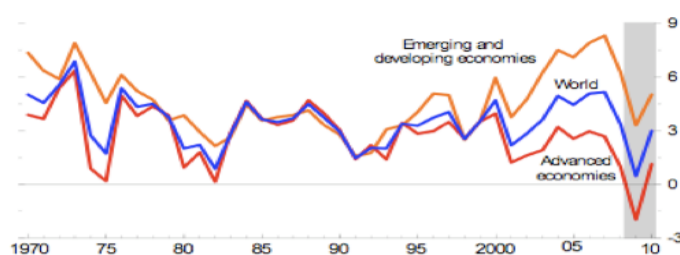
The outlook for 2010 is highly uncertain, however the IMF reports a modest recovery is possible, which depends on strong policy actions. The economic woes have consequences for short-term economic indicators such as; the unemployment rate and industrial production, which in turn have an effect on the performance of the DB ML group. For my analysis I will present these economic indicators that affect each division separately.

Unemployment rate

The unemployment rate, as illustrated below in figure 7, has an influence on the numbers of people traveling. Since a large part of passengers DB ML (mainly Regional & Urban) serves are commuters, an increase in the unemployment rate will affect the numbers of passengers transported by these two divisions due a decrease in commuters.

Figure 7 Unemployment rate Germany[2]
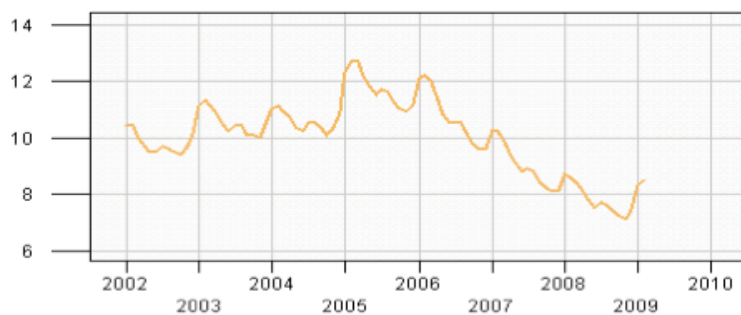
Illustrated in figure 7 is the Germany unemployment rate where there can already be observed a rise in the unemployment rate. The projections for the German unemployment rate for 2009 are unfavorable and an increase is unavoidable.

Industrial Production & Merchandise Trade

The industrial production figure is an indicator for changes in output for the industrial sector of an economy. This includes manufacturing, mining and utilities. Merchandise trade figure represents products traded globally. These two figures are indicators for the amount of transport business, which is important for the analysis of DB ML, since its biggest piece of the pie is related to freight transportation (Logistics).

Figure 8 Industrial Production as reported by the IMF.
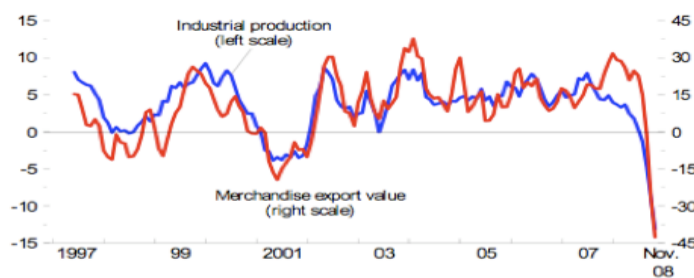
Sources: Haver Analytics; and IMF staff estimates.

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[2] Federal Statistical Office Germany; DESTATIS.de

The core industries DB ML serves in the freight transportation are: automotive (Rail & Logistics), steel, coal (Rail), consumer products, electronics, aerospace and healthcare (Logistics). When zooming in on these industries there are massive declines in volumes produced and traded. For example in the European automotive sector where new passenger car registrations fell by 7,8%, which is the sharpest decline since 1993[3], and in the steel industry, where worldwide crude steel production fell 24% in January 2009[4]. This presents the difficulties faced during these troubling economic circumstances.

II.C COMPANY ANALYSIS

In this section I will present historical financial data for DB ML's divisions and compare these against those of comparable firms. I will also elaborate on some recent developments for each division.

DB Passenger Transport (Long-Distance, Regional and Urban)

For Passenger Transport I have combined the three divisions, which are compared to the companies Arriva and First Group.

Figure 9 Financial DB and Comparables for Passenger Transport.

Company Name					
year	2004	2005	2006	2007	2008
DB ML Passenger					
Revenue		11.970	12.297	12.404	N/A
Growth (%)		N/A	2,73%	0,87%	N/A
EBITDA		1.878	2.175	1.864	N/A
margin (%)		13,18%	15,05%	12,55%	N/A
Capital Expenditures		648	691	608	N/A
Growth (%)		N/A	6,64%	-12,01%	N/A
As % of revenue		5,75%	6,00%	5,20%	N/A
Arriva *(GBP)*					
Revenue	1.759	1.626,80	1.729	2.000	3.042
Growth (%)	N/A	-7,52%	6,28%	15,67%	52,10%
EBITDA	234	211	232	249	330
margin (%)	12,90%	12,97%	13,47%	12,46%	10,85%
Capital Expenditures	124,6	195,6	92,5	145,2	244,8
Growth (%)	N/A	56,98%	-52,71%	56,97%	68,60%
As % of revenue		12,00%	5,40%	7,20%	8,05%
First Group *(GBP)*					
Revenue	2.479	2.693	3.030	3.708	4.707
Growth (%)	N/A	8,63%	12,51%	22,38%	26,94%
EBITDA	307	319	352	398	561
margin (%)	12,40%	11,85%	11,61%	10,73%	11,92%
Capital Expenditures	164,7	135,3	209,1	321,6	310,4
Growth (%)	N/A	-17,85%	54,55%	53,80%	-3,48%
As % of revenue	6,60%	5,02%	6,90%	8,67%	6,59%

By looking at the historical growth figures pay special attention to the EBITDA margin and capital expenditures. Since the rail transport business is capital intensive, think of the train fleet that has to be invested in, the EBITDA margin is a good means for comparing the companies. As can be seen the overall EBITDA margins have seen some small declines, but are overall steady for the three companies, with DB ML outperforming Arriva and First Group by having the highest EBITDA margin.

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[3] EC. (2008). *Car registrations.* Available: http://ec.europa.eu. Last accessed February 2009.
[4] WSA. (2009). *Steel Production.* Available: www.worldsteel.org. Last accessed March 2009

Long Distance

Considering the liberalization of the European market for rail transportation of passengers and the huge growth potential in high-speed long distance traveling, this division has the potential to show additional organic growth. Worth noticing is its market share of 99% in Germany, where the market is deregulated for over 14 years. It seems it is especially difficult for additional companies to enter the market, due to high capital investments that have to be made.

Regional

This division generates the largest revenue for the segment passenger transport within DB ML. Worth noticing for this division is that they rely for a large part (63%) on revenues that are generated through awarded tenders. These awarded tenders have been declining for the regional division for a while now, losing 10% market share since 2002. When excluding the S-Bahn, the regional division has a market share of 77% in Germany, which they expect to decline and keep sustainable at 70%.

Urban

Are also, but to a lesser extent than the regional division, depended on awarded tenders (33%). Only 20% liberalized of this market is liberalized in Germany, of which they obtain almost half of that in market share at 9%. Like the other passenger transport modes this is a capital-intensive business, with a large fleet of busses.

DB Schenker (Rail Freight & Logistics)

In this section the historical performance of DB Schenker Rail Freight is presented and compared against those of comparables. Thereafter this is repeated for Schenker Logistics.

Figure 10 DB Schenker Rail Freight

Company name					
year	**2004**	**2005**	**2006**	**2007**	**2008**
DB Schenker Rail					
Revenue		3.731	4.168	4.244	
Growth (%)		N/A	11,71%	1,82%	
EBITDA		320	545	563	
margin (%)		8,58%	13,08%	13,27%	
Capital Expenditures		250	153	186	
Growth (%)		N/A	-38,80%	21,57%	
As % of revenue		6,70%	3,67%	4,38%	
Union Pacific					
Revenue	12.215	13.578,00	15.578	16.283	17.970
Growth (%)	N/A	11,16%	14,73%	4,53%	10,36%
EBITDA	2.406	2.970	4.166	4.696	5.462
margin (%)	19,70%	21,87%	26,74%	28,84%	30,40%
Capital Expenditures	1.876	2.169	2.242	3.100	3.100
Growth (%)	N/A	15,62%	3,37%	38,27%	0,00%
As % of revenue	19,70%	15,97%	14,39%	19,04%	17,25%
CSX					
Revenue	8.020	8.618	9.566	10.030	11.255
Growth (%)	N/A	7,46%	11,00%	4,85%	12,21%
EBITDA	1.695	2.367	2.982	3.133	3.672
margin (%)	21,13%	27,47%	31,17%	31,24%	32,63%
Capital Expenditures	960	1.097	1.600	1.700	1.700
Growth (%)	N/A	14,27%	45,85%	6,25%	0,00%
As % of revenue	11,97%	12,73%	16,73%	16,95%	15,10%

What is noticeable from this figure is the large spread between the EBITDA margins of the comparable firms Union Pacific and CSX Corporation to that of DB Schenker Rail. Part of this spread

in margin can be explained by the large price increases the rail freight companies in the United States have implemented. These price increases aren't observed in the European markets. Although the difference can thus be partly explained by these pricing differences, this isn't sufficient to explain the entire spread. It therefore seems reasonable to assume Schenker Rail underperforms. Besides the difference in EBITDA margins, the amount of capital expenditures also differs substantially. Where the U.S. firms have a ratio of capex/revenue of about 16%, for Schenker Rail this ratio is at an average of 5%.

Figure 11 Schenker Logistics and comparables

Company name					
year	2004	2005	2006	2007	2008
DB Schenker Logistics *(EUR)*					
Revenue		9.444	13.728	14.536	
Growth (%)		N/A	45,36%	5,89%	
EBITDA		382	547	627	
margin (%)		4,04%	3,98%	4,31%	
Capital Expenditures		141	228	229	
Growth (%)		N/A	161,70%	100,44%	
As % of revenue		1,49%	1,66%	1,58%	
Kuehne + Nagel *(CHF)*					
Revenue	11.563	14.049	18.194	20.975	21.599
Growth (%)	N/A	21,50%	29,50%	15,29%	2,97%
EBITDA	478	575	857	1.019	1.020
margin (%)	4,13%	4,09%	4,71%	4,86%	4,72%
Capital Expenditures	107	190	246	231	245
Growth (%)	N/A	77,57%	29,47%	-6,10%	6,06%
As % of revenue	0,93%	1,35%	1,35%	1,10%	1,13%
CH Robinson *(USD)*					
Revenue	4.341	5.688	6.556	7.316	
Growth (%)	N/A	31,03%	15,26%	11,59%	
EBITDA	233	339	434	527	
margin (%)	5,37%	5,96%	6,61%	7,20%	
Capital Expenditures	34,7	87	81	56	
Growth (%)	N/A	149,86%	-6,34%	-31,40%	
As % of revenue	0,80%	1,52%	1,24%	0,76%	

What stands out from this figure are the low margins and low capital expenditure levels that occur in the logistics business. The best comparable firm for Schenker Logistics is Kuehne+Nagel, which is active in the same business and located in the same geographical area as DB Schenker Logistics is. It appears that these two companies have almost the same EBITDA margin and capital expenditure levels, although those of Kuehne+Nagel are slightly better.

DB Schenker

The DB Schenker division generates the most revenue for the DB ML group. The division, with rail freight in particular, has lots of growth opportunities that have been outlined earlier on. One of these opportunities exists in the emerging markets China and Russia. Benefitting from high growth potentials in emerging markets is essential. DB Schenker has already begun positioning themselves in these markets. The DB Mobility Logistics' vice-president Business Development China Jurgen Rogner says that a project on the horizon is a railway infrastructure joint venture between three parties. The parties include DB Mobility Logistics, China Railway and the Russian Railway, who have initiated a project that is near its completion. The project covers a service that is called the Trans EurAsia Express and will operate one train a week through China, Russia and Europe and will take approximately need 19 days for a door-to-door delivery. This service has substantial cost advantages against air transportation and time advantages against sea transportation. This network will also create possibilities for deliveries in Central and Eastern Europe, which are also potential high growth markets.

II.C.B SWOT

Strengths	Weaknesses
• Experience, positioning (Europe/Global) • Sustainable large market-share in Germans passenger rail transport. • Link to DB AG, which controls the rail network in Germany.	• Low margins in rail freight • Capital-intensive business. • High fixed-costs level
Opportunities	**Threats**
• Growth opportunities due to liberalizing market in Europe. • Growth opportunities emerging markets (joint-venture with China Railway and Russia Railway) • Cost efficiency in Rail Freight. • Shift from road to rail; "rail renaissance"	• Increased competition due to liberalizing market. (Margins) • Long and deep recession. (Low oil price) • Competition in emerging markets.

PART III: FORECAST

The forecast period endures 7 years and is based on the external and internal analysis made. Also used are financial and forward-looking statements from the interim report of 2008.

In line with projections from the IMF, I will take into account a recession for 2009 and a modest recovery for 2010. For the year 2011 I'll expect a strong recovery with substantial global economic growth.

III.A REVENUE FORECAST

In this section the revenue forecast is outlined. The estimations are based on the market and economic analysis provided earlier on. A total overview can be found in attachment 1. Because DB ML generates substantial revenue within the firm itself the revenue is adjusted for, as presented in attachment 2.

DB Long Distance
The LD division can already benefit from the liberalizing of the international rail passenger market in Europe. It has expanded its routes within Europe and plans on to do so even more. Therefore the LD division has the ability to attract new customers and provide more services for its current customers. Keeping in mind the structural increasing trend in passenger-kilometers for international rail transport this will provide LD with lots of growth potential.

Figure 12 Revenue forecast DB Long Distance

Long Distance							
year	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenues	3.567	3.603	3.711	3.896	4.091	4.295	4.510
Other operating income	215	217	224	235	247	259	272
Total segment revenue	**3.782**	**3.820**	**3.935**	**4.131**	**4.338**	**4.555**	**4.782**
Revenue growth %	5,00%	1,00%	3,00%	5,00%	5,00%	5,00%	5,00%

Of course the coming two years (2009,2010) will be especially difficult. A weakening economy will also have its effect on consumer spending, whereas the clientele of LD is mostly leisure based and therefore subject to consumer spending. The growth figures are adjusted for 2009 and 2010. After these two years I assume a CAGR of 5,0%

DB Regional

Though the regional division is losing market-share due to less awarded tenders, they have still been able to increase numbers of passengers transported. I expect a negative growth rate for 2009, due to increasing unemployment and cutback in consumer spending. For the years 2010-2014 I expect a CAGR of 0,5%, based on the shift from road to rail, which will offset losses in awarded tenders.

Figure 13 Revenue forecast DB Regional

Regional							
year	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenues	6.647	6.581	6.613	6.646	6.680	6.713	6.747
Other operating income	163	161	162	163	164	165	165
Total segment revenue	**6.810**	**6.742**	**6.776**	**6.809**	**6.844**	**6.878**	**6.912**
Revenue growth %	0,50%	-1,00%	0,50%	0,50%	0,50%	0,50%	0,50%

DB Urban

Although the intensity of competition in tenders and award procedures within the bus transport industry are high, DB Urban is able to sustain its shares of awarded tenders. From the interim report for 2008 they've reported an increase in passengers for rail of 7,1% and for bus of 0,5%. I will assume a business-as-usual scenario for this division and show, a part from the recession of 2009, a CAGR of 3,0% for 2011-204.

Figure 14 Revenue forecast DB Urban

Urban							
year	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenues	1.970	1.951	1.990	2.050	2.111	2.174	2.240
Other operating income	127	125	128	131	135	139	144
Total segment revenue	**2.097**	**2.076**	**2.118**	**2.181**	**2.247**	**2.314**	**2.383**
Revenue growth %	3,50%	-1,00%	2,00%	3,00%	3,00%	3,00%	3,00%

DB Schenker Rail

Considering the changes for the rail freight market in Europe and pending joint ventures with companies in emerging countries such as China and Russia, Schenker Rail is very well positioned to benefit from growth in the rail freight industry. However, they will have go through a difficult year in 2009 where I expect, due to very disappointing indicators for trade end 2008 and early 2009, a negative growth rate of 4%. After 2010, a year with modest growth, I expect the "rail renaissance" to set through and lead to a CAGR of 6,5% for 2011-2014.

Figure 15 Schenker Rail Revenue Forecast

Schenker Rail							
year	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenues	5.308	5.096	5.275	5.618	5.983	6.372	6.786
Other operating income	209	201	207	220	234	250	266
Total segment revenue	**5.517**	**5.296**	**5.482**	**5.838**	**6.217**	**6.622**	**7.052**
Revenue growth %	30%	-4%	3,50%	6,50%	6,50%	6,50%	6,50%

DB Schenker Logistics

The logistics division still sees growth in its air, sea and ground transportation. For the first half of 2008 they reported an increase in revenues of 4,7% due to increases in volumes. However, with globally deteriorating volumes in trade the logistics division will also have to suffer a loss in revenue for the year 2009. As for 2010, I will assume the logistics division will pick up and show some modest growth. For the years 2012-2014 I expect a CAGR of 5,0%.

Figure 16 Schenker Logistics Revenue Forecast

Schenker Logistics							
year	**2008e**	**2009e**	**2010e**	**2011e**	**2012e**	**2013e**	**2014e**
Total revenues	15.066	14.388	14.892	15.860	16.653	17.485	18.359
Other operating income	124	118	123	131	137	144	151
Total segment revenue	**15.190**	**14.506**	**15.014**	**15.990**	**16.790**	**17.629**	**18.511**
Revenue growth %	4,50%	-4,50%	3,50%	6,50%	5,00%	5,00%	5,00%

DB Services

The revenue growth assumptions for DB Services are based on a weighted average growth rate of the DB ML group, since most services are provided for within the group itself.

Figure 17 DB Services Revenue Forecast

Schenker Logistics							
year	**2008e**	**2009e**	**2010e**	**2011e**	**2012e**	**2013e**	**2014e**
Total revenues	1.213	1.176	1.206	1.248	1.292	1.337	1.384
Other operating income	1.819	1.765	1.809	1.872	1.938	2.005	2.076
Total segment revenue	**3.032**	**2.941**	**3.015**	**3.120**	**3.229**	**3.342**	**3.459**
Revenue growth %	-5,00%	-3%	2,50%	3,50%	3,50%	3,50%	3,50%

DB Mobility Logistics

All in all these division consolidated lead to the following group revenue growth rates:

Figure 18 DB Mobility Revenue Forecast

DB Mobility Logistics							
year	**2008e**	**2009e**	**2010e**	**2011e**	**2012e**	**2013e**	**2014e**
Total revenues	34.058	33.082	33.974	35.605	37.097	38.665	40.313
Other operating income	3.267	3.198	3.262	3.362	3.465	3.572	3.684
Total cons. Revenue	**37.325**	**36.280**	**37.236**	**38.968**	**40.562**	**42.237**	**43.997**
Revenue growth %	4,68%	-2,80%	2,64%	4,65%	4,09%	4,13%	4,17%

After the recession of 2009 and modest recovery in 2010 my estimations suggest a strong growth for 2011 of 4,65% and a CAGR of about 4% for 2012-2014.

III.B FORECAST INCOME STATEMENT

With revenue forecast in place it is now possible to forecast the entire income statement with important figures such as expenses and depreciation. I will try to forecast the items in line with best practices as described by Koller[5] (2005), but as I will show this isn't entirely possible due to restrictions of information.

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[5] Koller, Tim; Goedhart, Marc and David Wessels (2005). *Valuation*. New Jersey: John Wiley & Sons. p240-246.

After the forecasts for income statement are complete I will adjust the statements in order to calculate and estimate NOPLAT. An overview of these calculations is presented in attachment 3.

Operating expenses

The operating expenses for the DB ML group consist of; cost of materials, personnel expenses and other operating expenses. Because each division has its own cost structure and forecast I will have to calculate these costs for each division separately. However, the costs aren't specified for each division in the reported annual earnings reports. Therefore I have calculated total operating expenses for each division via reported total income and operating cash flow. The forecast for each division's total expenses and group total operating expenses is provided in attachment 2 and is based on historical figures and DB ML's statements on costs expectations.

Depreciation

In forecasting depreciation, according to best practices, I would have to forecast depreciation as a percentage of net PP&E for each division separately. However, the amount of PP&E reported is a consolidated figure. I have therefore forecasted depreciation against net PP&E for consolidated statement of the DB ML group.

Nonoperating income

For DB ML the results from investments using the equity method are kept at the return reported in the previous year against investments that are kept fixed at the level reported in the interim report from 2008.

Interest expense and interest income

The net interest income is based on historical statements on interest payments received and paid. The interest income received is kept constant at previous year's income. For interest payments, I've checked for the interest rate paid on financial debt, retirement obligations and financial leases. As part of best practices I should compute interest expense as a function of the previous year's debt load. However, as is stated in the interim report for 2008 the financial debt increased and thus also the interest expenses. I've adjusted these expenses with the average interest paid on financial debt. For the years after 2008 I keep debt and interest expenses constant, with exception of interest paid on retirement obligations that increases over the years.

Taxes

For the tax percentage I will use the marginal tax rate as reported in DB ML's annual earnings report of 30,5%. A note to the taxes for 2008, a EUR 446 million one-off deferred tax income is included, related to a change in DB AG's shareholding.

Margins

By finishing the forecasted income statement I provide an overview of margin development for the entire DB ML group. In attachment 3 I have provided a divisional overview of EBITDA development.

Figure 19 Margin development DB ML group.
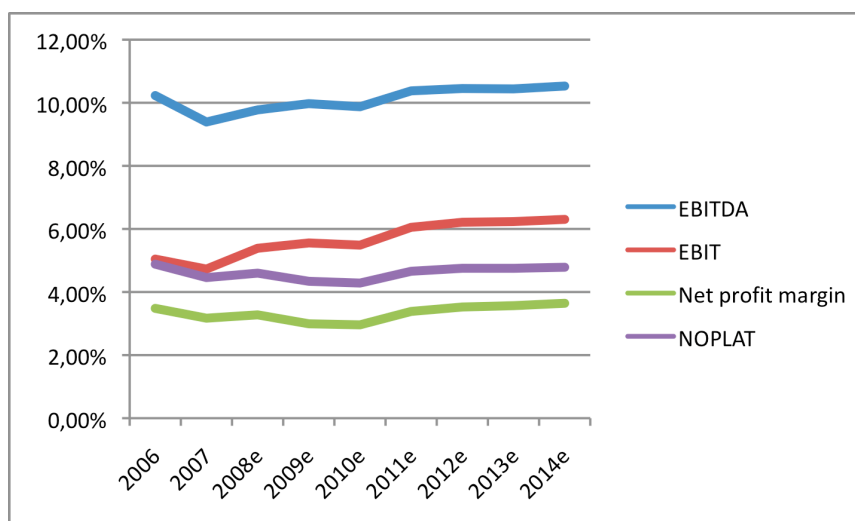
III.C FORECAST BALANCE SHEET

In forecasting the balance sheet there are certain items that are difficult to forecast, such as sources of financing (debt & equity) and goodwill. I will therefore keep these items fixed at previous year's level or as reported in the interim report of 2008.

The items I have made estimations for, including operating working capital items, are estimated using the historical percentage versus revenue. I could have estimated trade liabilities and inventories against operating expenses. However, as a practical matter, I have forecasted each item using revenue. Net PP&E are forecasted against revenue, and depreciation is forecasted against net PP&E, due to lumpy capital expenditures. For a detailed overview I refer to attachment 4 that includes the forecasted balance sheet and invested capital.

CHATPER IV: COST OF CAPITAL

To calculate the cost of capital I will use the widely used and recommended weighted average cost of capital, as described earlier on.

IV.A COST OF EQUITY

The cost of equity is calculated using the Capital Asset Pricing Model that is estimated using the risk-free rate, stock's sensitivity to the market and a market risk premium. *Formula: E(R) = Rf + β*(E(Rm) – Rf)*

With the assumptions made on the risk-free rate, market risk premium and beta as described below, I am able to estimate the required return on equity for
DB ML.

3,75% + 1,29 * 5% = **10,2%**
IV.A.A RISK-FREE RATE

For the calculation of the risk-free rate I use the 10-year German Eurobond, as recommended by literature for a European (German) firm by Koller et al. (2005). As reported by Bloomberg the rate on 10-year German government bonds is **3,75%** (March 18, 2009).

IV.A.B BETA

The beta measures how much the stock from the firm and market move together. Usually the beta is estimated using a regression, where the most common regression is the market model. In this model the stock's return is regressed against the market return. However, since the company is still an unlisted private firm there isn't any stock performance. In calculating a reliable beta I will use publicized betas from comparable firms by Bloomberg.

The company has several divisions each serving a different clientele in different sectors. In my view it is important to select several comparable firms for each division, selected on best practices described earlier on (overview of peer group in appendix). With the selected companies I will use betas as reported against the DAX index (German stock exchange) and against the stock exchange from the country where the firm is based. I will equally weigh these betas to come to a weighted beta by index. Subsequently I will weigh these betas with those of other firms to eventually come to a beta by industry. The industry betas are then weighted for each division (based on revenue size) to calculate weighted average company beta, as illustrated below in figure 20.

Figure 20

Beta Weighted By Industry	
Industry & Company	*Averaged beta*
Passenger	
Arriva	0,7385
First Group	0,8205
National Express	0,944
	0,834333333
Freight	
Union	0,99
Burlington	0,927
CSX	1,0595
Guangshen Railway	1,016
	0,998125
Logistics	
Kuehne	0,8585
CH Robinson	0,902
Expeditors	0,791
DSV	1,02
	0,892875
WEIGHTED AVERAGE COMPANY BETA	**0,89250125**

The calculation of the weighted average company beta is an unlevered beta. Using the tax rate, and capital structure I am able to calculate the beta appropriate for DB ML.

Formula for the levered beta is as followed:

Beta levered = Beta unlevered * (1+ ((1-t) D/E)

Levered beta: 0,8925 * (1 + ((1-0,305) * 10/15,7)) = **1,29**

IV.A.C MARKET PREMIUM

The market premium is one of the most debated issues in finance. Historical estimates find numbers near 8 percent, which in my opinion is, certainly during these times, too high. As quoted by Koller et al. (2005): "*we believe 4,5 to 5,5 percent is an appropriate range*". My choice for market risk premium is going to be in the middle of this range at 5,0%.

IV.B COST OF DEBT

To determine the cost of debt I will use the indirect method by adding a credit spread to the risk-free rate related to the credit rating. Since DB ML doesn't have a credit rating but its mother company (DB AG) does, I will use their rating. Credit rating for DB AG is Aa1, which implies a default spread of 70 basis points for the credit rating above the risk-free rate. However, DB ML finances itself through DBAG treasury that adds another 50 basis points, putting total credit spread to 120 basis points.

This results in a total cost of debt of: *3,75% + 0,70% + 0,50% =* **4,95%**

IV.C CAPITAL STRUCTURE

The capital structure is an essential aspect in order to calculate the appropriate WACC. The cost of capital should rely on target weights of debt and equity rather than current weights. As is shown from the 2008 interim report's balance sheet, DB ML recently acquired additional debt summing total debt (*Debt + Debt Equivalents*) up to EUR 10 billion. I will assume this debt level to stay fixed for my forecast period.

In calculating the equity value I again stumble upon the problem of DB ML not being a listed firm such that the equity price isn't readily observable. To solve this problem I will calculate the enterprise value of DB ML using multiples against traded comparable firms and adjust it for debt. Since DB ML has different divisions I will have to calculate several enterprise-values using each division's EBITDA and peer group.

Since some divisions of DB ML are capital intensive and subsequently deal with high values of depreciation, the *EV/EBITDA* multiple therefore works best for estimation of total enterprise value.

From attachment (?) it is shown that the enterprise-value for DB ML equals EUR 25.716 million. Therefore:

Enterprise Value (EUR 25,7 billion) – Market Value of Debt (EUR 10 billion) =

Equity Value (EUR 15,7 billion)

Therefore the following capital structure is applied:

E/V = (15,7/25,7)
D/V = (10/25,7)
D/E = (10/15,7)

V.D WEIGHTED AVERAGE COST OF CAPITAL

Using the assumptions made above I'm able to estimate the proper WACC for DB ML using the following formula:

*Re * (E/V) + Rd * (1-t) * (D/V)*

This leads to a WACC of:

10,2 * (15,7 / 25,7) + 4,95 * (1-0,305) * (10/25,7) → 6,23 + 1,34 = **7,567**

The percentage 7,567 is now used as discount factor for the free cash flow of
DB ML.

CHAPTER V: DISCOUNTED FREE CASH FLOW ANALYSIS

V.A DCFC

With all forecasted items in place it is now possible to acquire the present value of the free cash
flows through the discounted cash flow analysis.

From attachment 6 we get a present value of free cash flows for the period 2008-2014:

Present Value FCF = **EUR 6.260 million**

V.B CONTINUING VALUE

After the explicit forecast period I make use of the so-called continuing value, as explained earlier on.
The continuing value for the enterprise DCF model depends on assumptions made on the normalized
level of NOPLAT (NOPLAT t+1), the expected rate of return on new invested capital (RONIC),
expected growth rate in NOPLAT in perpetuity (g) and the WACC.

For the normalized level of NOPLAT I will assume 2014's figure with an increase of 5,00%, which is
the average growth rate of the past 3 years. The RONIC figure should be consistent with expected
competitive conditions. Economic theory suggests that competition will eventually eliminate any
abnormal returns. I will therefore set the RONIC equal to the estimated WACC. The growth rate for
NOPLAT in perpetuity is based on the expected inflation figure for the EU, which is targeted at 2,0%.

Continuing Value = NOPLAT t+1 * (1 – (g/RONIC)) / WACC –g

Continuing Value = **EUR 27.739 million**

PV Continuing Value using WACC = **EUR 16.647 million**

V.C ENTERPRISE & EQUITY VALUE USING DFCF

The total enterprise-value consists of the two elements estimated earlier, namely the present value
of the free cash flows and the present value of the continuing value. This comes down to summing
these two values:

PV FCF + PV Continuing Value = EUR 6.260 million + EUR 16.647 million

Enterprise-Value = **EUR 22.970 million**

From hereon we can calculate the equity value,

Enterprise Value	**22.970**
Debt & Debt Equivalents	-10.245
Minority Interest	-140
Equity Value	**12.585**

Since 25% of the shares for DB ML are going public this means the IPO should raise capital amounting 25% of EUR 12.585 million:

Market Capitalization after IPO: **EUR 3.146 million**

CHAPTER VI: MULTIPLES

As mentioned earlier on a DCF analysis is only as accurate as the forecasts it relies on. Any errors in forecasted growth rates or WACC could lead to an incorrect valuation. However, besides it is useful in the sense that it can support a DCF analysis I've used the multiple analysis for my capital structure estimation as well. I will provide two multiple analyses. The first will consist of a larger peer group, which I have also used for my capital structure. The second will be based on a smaller peer group consisting of relatively more companies from the same geographical area.

Figure 21 Multiples based on broader peer group, see attachment.

DB Mobility Logistics Multiple Analysis		
Division	**EBITDA**	**Enterprise Value**
Passenger Transport	1.864	14.120
Freight Transport	563	4.321
Logistics	627	6.621
Services	346	2.977
Subsidiaries	-301	-2.590
Consolidation	31	267
Total Group	**3.130**	**25.716**

The larger peer group calculates an enterprise-value of EUR 25.716 million. For the services and subsidiaries I have used a division average multiple.

Figure 22 Multiples based on smaller peer group

DB Mobility Logistics Multiple Analysis		
Division	**EBITDA**	**Enterprise Value**
Passenger Transport	1.864	12.613
Freight Transport	563	4.321
Logistics	627	5.674
Services	346	2.785
Subsidiaries	-301	-2.423
Consolidation	31	250
Total Group	**3.130**	**23.220**

The smaller (more geographical) based peer group provides an enterprise-value of EUR 23.220 million, which is more in line with the DCF analysis. One might say why I haven't adjusted the capital structure in line with the smaller peer group, since the EV is more in line with the DCF. Well, I have calculated the impact on total enterprise-value when using the smaller peer group and the difference in outcome is negligible (0,8%). However, for clarification, enterprise-value using DCF analysis with smaller peer group: **EUR 23.153 million**

All in all the multiple valuation using the geographical peer group gives the most satisfying outcome relating to the discounted cash flow analysis. This is no surprise, since this peer group is more comparable in view of historical and future margins.

CHAPTER VII: CONCLUSION

By analyzing market trends and impact of economic circumstances I have provided for a valuation that leads to an enterprise-value for DB Mobility Logistics near EUR 23 billion. Cutting this value down to the equity value and considering a 25% issue of shares this suggest DB ML being able to raise capital of about EUR 3.2 billion. However, with more divisional specified financial information I am certain the accuracy of a DCF analysis will improve further. Needless to say the economic outlook is highly unpredictable and therefore the valuation is subject to these uncertainties. It therefore seems, in my view, unlikely the IPO will proceed any time soon.

ATTACHMENTS

I. Revenue Forecast:

Forecasted variables DB ML segments

(note: total expenses without D&A and impairments)
(note:CapEx exclusive of investment grants received & assets from acquired companies)

Long Distance

year	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenues	3.158	3.352	3.397	3.567	3.603	3.711	3.896	4.091	4.295	4.510
Other operating income	180	188	205	215	217	224	235	247	259	272
Total segment revenue	**3.338**	**3.540**	**3.602**	**3.782**	**3.820**	**3.935**	**4.131**	**4.338**	**4.555**	**4.782**
Revenue growth %	N/A	6,00%	1,70%	5,00%	1,00%	3,00%	5,00%	5,00%	5,00%	5,00%
Total Expenses	2.849	2.995	3.048	3.168	3.199	3.275	3.408	3.579	3.758	3.946
Expenses/Revenue %	85,35%	84,60%	84,62%	83,75%	83,75%	83,25%	82,50%	82,50%	82,50%	82,50%
Depreciation and Amortisation	346	372	366	378	382	393	413	434	455	478
D&A/Revenue %	10,37%	10,51%	10,20%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%
Impairments	46	2	2	0	0	0	0	0		
Capital Expenditures	260	260	118	80	112	155	207	217	228	239
CapEx/Revenue %	7,79%	7,30%	3,30%	2,10%	3%	4%	5%	5%	5%	5%

Regional

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenue	6.542	6.577	6.614	6.647	6.581	6.614	6.647	6.680	6.713	6.747
Other operating income	203	240	162	163	161	162	163	164	164	165
Total segment revenue	**6745**	**6.817**	**6.776**	**6.810**	**6.742**	**6.775**	**6.809**	**6.843**	**6.878**	**6.912**
Revenue growth %	N/A	1,10%	-0,60%	0,50%	-1,00%	0,50%	0,50%	0,50%	0,50%	0,50%
Total Expenses (*eur million*)	5.653	5.524	5.811	5.856	5.798	5.827	5.822	5.851	5.880	5.910
Expenses/Revenue %	83,81%	81%	85,75%	86,00%	86,00%	86,00%	85,50%	85,50%	85,50%	85,50%
Depreciation and Amortisation	400	408	387	402	402	402	402	404	406	408
D&A/Revenue %	5,93%	6%	5,90%	5,90%	5,96%	5,93%	5,90%	5,90%	5,90%	5,90%
Impairments	27	83	5							
Capital Expenditures	332	353	395	392	388	390	392	393	395	397
CapEx/Revenue %	4,92%	5,20%	5,80%	5,75%	5,75%	5,75%	5,75%	5,75%	5,75%	5,75%

Urban

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenue	1.769	1.823	1.903	1.970	1.951	1.990	2.049	2.111	2.174	2.239
Other operating income	118	117	123	127	125	128	132	136	140	144
Total segment revenue	**1.887**	**1.940**	**2.026**	**2.097**	**2.076**	**2.117**	**2.181**	**2.246**	**2.314**	**2.383**
Revenue growth %	N/A	2,80%	4,40%	3,50%	-1,00%	2,00%	3,00%	3,00%	3,00%	3,00%
Total Expenses	1.590	1.603	1.681	1.751	1.733	1.763	1.816	1.865	1.920	1.978
Expenses/Revenue %	84,26%	82,60%	83%	83,50%	83,50%	83,25%	83,25%	83,00%	83,00%	83,00%
Depreciation and Amortisation	150	149	147	152	152	154	158	163	168	173
D&A/Revenue %	7,95%	7,70%	7,30%	7,25%	7,25%	7,25%	7,25%	7,25%	7,25%	7,25%
Impairments	0	2	1	0	0	0	0	0	0	0
Capital Expenditures	56	78	95	110	93	95	98	101	104	107
CapEx/Revenue %	2,97%	4,00%	4,70%	5,25%	4,50%	4,50%	4,50%	4,50%	4,50%	4,50%

Forecasted variables DB ML segments

Schenker Rail Freight

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenue	3.537	3.993	4.083	5.308	5.096	5.275	5.618	5.983	6.372	6.786
Other operating income	194	175	161	209	201	207	220	235	250	266
Total segment revenue	**3.731**	**4.168**	**4.244**	**5.517**	**5.297**	**5.482**	**5.838**	**6.218**	**6.622**	**7.052**
Revenue growth %	N/A	11,70%	1,80%	30%	-4%	3,50%	6,50%	6,50%	6,50%	6,50%
Total Expenses	3.411	3.623	3.681	4.759	4.608	4.742	5.021	5.347	5.695	6.065
Expenses/Revenue %	91,42%	87%	86,70%	86,25%	87,00%	86,50%	86,00%	86,00%	86,00%	86,00%
Depreciation and Amortisation	224	232	227	303	303	302	321	342	364	388
D&A/Revenue %	6,00%	5,60%	5,40%	5,50%	5,70%	5,50%	5,50%	5,50%	5,50%	5,50%
Impairments	9	8	3	0	0	0	0	0	0	0
Capital Expenditures	250	153	186	372	344	343	350	373	397	423
CapEx/Revenue %	6,70%	3,70%	4,40%	6,75%	6,50%	6,25%	6%	6%	6%	6%

Schenker Logistics

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenue	9.330	13.569	14.417	15.066	14.388	14.891	15.859	16.652	17.485	18.359
Other operating income	114	159	119	124	119	123	131	137	144	152
Total segment revenue	**9.444**	**13.728**	**14.536**	**15.190**	**14.507**	**15.014**	**15.990**	**16.790**	**17.629**	**18.511**
Revenue growth %	N/A	45,40%	5,90%	4,50%	-4,50%	3,50%	6,50%	5,00%	5,00%	5,00%
Total Expenses	9.062	13.181	13.909	14.583	13.963	14.414	15.271	16.034	16.836	17.631
Expenses/Revenue %	95,96%	96%	95,70%	96,00%	96,25%	96,00%	95,50%	95,50%	95,50%	95,50%
Depreciation and Amortisation	113	175	169	182	182	180	192	201	212	222
D&A/Revenue %	1,20%	1,30%	1,20%	1,20%	1,20%	1,20%	1,20%	1,20%	1,20%	1,20%
Impairments	5	1	0	0	0	0	0	0	0	0
Capital Expenditures	141	228	229	228	218	225	240	252	264	278
CapEx/Revenue %	1,49%	1,70%	1,60%	1,50%	1,50%	1,50%	1,50%	1,50%	1,50%	1,50%

Services

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenue	1.790	1.359	1.302	1.213	1.177	1.206	1.248	1.292	1.337	1.384
Other operating income	1.050	1.629	1.890	1.819	1.765	1.809	1.872	1.938	2.006	2.076
Total segment revenue	**2.840**	**2.988**	**3.192**	**3.032**	**2.941**	**3.015**	**3.120**	**3.230**	**3.343**	**3.460**
Revenue growth %		5,20%	6,80%	-5,00%	-3%	2,50%	3,50%	3,50%	3,50%	3,50%
Total Expenses	2.493	2.743	2.846	2.790	2.706	2.744	2.808	2.874	2.975	3.079
Expenses/Revenue %	87,78%	92%	89%	92%	92%	91%	90%	89%	89%	89%
Depreciation and Amortisation	189	188	200	200	200	200	200	203	211	218
D&A/Revenue %	6,65%	6,30%	6,30%	6,60%	6,80%	6,60%	6,40%	6,30%	6,30%	6,30%
Impairments	4	2	1	0	0	0	0	0	0	0
Capital Expenditures	224	240	280	295	265	271	281	291	301	311
CapEx/Revenue %	7,89%	8%	8,80%	9,70%	9%	9%	9%	9%	9%	9%

Subsidiaries

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenue	365	371	434	288	288	288	288	288	288	288
Other operating income	908	846	847	1.044	1.044	1.071	1.125	1.182	1.241	1.302
Total segment revenue	**1273**	**1.217**	**1.281**	**1.332**	**1.332**	**1.359**	**1.413**	**1.470**	**1.529**	**1.590**
Revenue growth %		-4,40%	5,25%	4%	0%	2%	4%	4%	4%	4%
Total Expenses	1.487	1.418	1.582	1.599	1.599	1.631	1.696	1.764	1.834	1.908
Expenses/Revenue %	116,81%	117%	124%	120%	120%	120%	120%	120%	120%	120%
Depreciation and Amortisation	54	35	29	33	33	34	35	37	38	40
D&A/Revenue %	4,24%	2,90%	2,30%	2,50%	2,50%	2,50%	2,50%	2,50%	2,50%	2,50%
Impairments	4	14	7	0	0	0	0	0	0	0
Capital Expenditures	26	48	30	21	21	21	21	21	21	21
CapEx/Revenue %	2,04%	4%	2,30%	2,30%	2,30%	2,30%	2,30%	2,30%	2,30%	2,30%

Total Group

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total revenue	26.491	31.044	32.150	34.058	33.082	33.974	35.605	37.097	38.665	40.313
Other operating income	2.767	3.354	3.507	3.703	3.633	3.724	3.879	4.038	4.204	4.377
Total segment revenue	**29.258**	**34.398**	**35.657**	**37.761**	**36.714**	**37.698**	**39.484**	**41.135**	**42.869**	**44.690**
Revenue growth %		17,57%	3,66	5,90	-2,77%	2,68%	4,74%	4,18%	4,22%	4,25%
Total Expenses	**26.545**	**31.087**	**32.558**	**34.505**	**33.606**	**34.395**	**35.842**	**37.314**	**38.898**	**40.517**
Expenses/Revenue %	90,73%	90,4%	91,3%	91,4%	91,5%	91,2%	90,8%	90,7%	90,7%	90,7%

II. Revenue Forecast Adjusted For Internally Generated Revenue

Forecasted variables DB ML segments adjusted for internal revenue

note; Internal generated revenue includes internal other operating income

Long Distance

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total segment revenue	3.338	3540	3602	3.782	3.820	3.935	4.131	4.338	4.555	4.782
(Internal generated revenue)	-171	-174	-184	-189	-191	-197	-207	-217	-228	-239
(Other operating income)	-116	-130	-152	151	153	157	165	174	182	191
Revenues	**3.051**	**3236**	**3266**	**3.744**	**3.782**	**3.895**	**4.090**	**4.294**	**4.509**	**4.735**
Total Expenses	2.849	2.995	3.048	3.168	3.199	3.275	3.408	3.579	3.758	3.946

Regional

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total segment revenue	6.745	6.817	6.776	6.810	6.742	6.775	6.809	6.843	6.878	6.912
(Internal generated revenue)	-130	-131	-117	-123	-121	-122	-123	-123	-124	-124
(Other operating income)	-159	-202	-123	-124	-122	-123	-124	-124	-125	-125
Revenues	**6.456**	**6.484**	**6.536**	**6.564**	**6.498**	**6.531**	**6.563**	**6.596**	**6.629**	**6.662**
Total Expenses	5.653	5.524	5.811	5.856	5.798	5.827	5.822	5.851	5.880	5.910

Urban

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total segment revenue	1.887	1.940	2.026	2.097	2.076	2.117	2.181	2.246	2.314	2.383
(Internal generated revenue)	-22	-22	-24	-23	-23	-23	-24	-25	-25	-26
(Other operating income)	-116	-112	-122	-126	-125	-127	-131	-135	-139	-143
Revenues	**1.749**	**1.806**	**1.880**	**1.948**	**1.929**	**1.967**	**2.026**	**2.087**	**2.150**	**2.214**
Total Expenses	1.590	1.603	1.681	1.751	1.733	1.763	1.816	1.865	1.920	1.978

Schenker Rail

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total segment revenue	3.731	4.168	4.244	5.517	5.297	5.482	5.838	6.218	6.622	7.052
(Internal generated revenue)	-379	-392	-440	-552	-530	-548	-584	-622	-662	-705
(Other operating income)	-156	-165	-138	-179	-172	-178	-190	-202	-215	-229
Revenues	**3.196**	**3.611**	**3.666**	**4.786**	**4.595**	**4.756**	**5.065**	**5.394**	**5.744**	**6.118**
Total Expenses	3.411	3.623	3.681	4.759	4.608	4.742	5.021	5.347	5.695	6.065

Schenker Logistics

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total segment revenue	9.444	13.728	14.536	15.190	14.507	15.014	15.990	16.790	17.629	18.511
(Internal generated revenue)	-22	-28	-33	-30	-29	-30	-32	-34	-35	-37
(Other operating income)	-110	-159	-118	-120	-117	-121	-130	-137	-144	-151
Revenues	**9.312**	**13.541**	**14.385**	**15.040**	**14.361**	**14.863**	**15.828**	**16.619**	**17.450**	**18.323**
Total Expenses	9.062	13.181	13.909	14.583	13.963	14.414	15.271	16.034	16.836	17.631

Services

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total segment revenue	2.840	2.988	3.192	3.032	2.941	3.015	3.120	3.230	3.343	3.460
(Internal generated revenue)	-1.538	-1.538	-1.669	-1.577	-1.529	-1.568	-1.623	-1.679	-1.738	-1.799
(Other operating income)	-249	-501	-660	-606	-588	-603	-624	-646	-669	-692
Revenues	**1.053**	**949**	**863**	**849**	**823**	**844**	**874**	**904**	**936**	**969**
Total Expenses	2.493	2.743	2.846	2.729	2.647	2.744	2.808	2.874	2.975	3.079

Subsidiaries

	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Total segment revenue	1.273	1.217	1.281	1.332	1.332	1.359	1.413	1.470	1.529	1.590
(Internal generated revenue)	-743	-674	-659	-666	-666	-679	-707	-735	-764	-795
(Other operating income)	-198	-184	-214	-213	-213	-217	-226	-235	-245	-254
Revenues	**332**	**359**	**408**	**453**	**453**	**462**	**481**	**500**	**520**	**540**
Total Expenses	1.487	1.418	1.582	1.599	1.599	1.631	1.696	1.764	1.834	1.908

Total Group

|	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Revenues	25.312	29.986	31.004	33.384	32.440	33.318	34.926	36.395	37.938	39.561
Internally produced assets	586	754	802	802	802	802	802	802	802	802
Other operating income	1.104	1453	1527	1.217	1.337	1.212	1.259	1.305	1.353	1.403
Total Sales	**27.002**	**32.193**	**33.333**	**35.403**	**34.580**	**35.332**	**36.988**	**38.502**	**40.094**	**41.766**
Total Expenses	26.545	31.087	32.558	34.505	33.606	34.395	35.842	37.314	38.898	40.517
Adjusted Consolidated expenses	-2.844	-2.997	-3.157	-3.364	-3.277	-3.354	-3.495	-3.638	-3.793	-3.950
Total Expenses	23.701	28.090	29.401	31.140	30.329	31.042	32.347	33.676	35.106	36.566
Adjust for internally produced assets	586	754	802	802	802	802	802	802	802	802
Total Expenses adjusted	**24.287**	**28.844**	**30.203**	**31.942**	**31.131**	**31.844**	**33.149**	**34.478**	**35.908**	**37.368**

III. Forecasted Income Statement + NOPLAT / Margins

Historical + Forecasted Income Statement

eur millions	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Revenues	25.312	29.986	31.004	33.384	32.440	33.318	34.926	36.395	37.938	39.561
Inventory changes / Prod. & cap. assets	586	754	802	802	802	802	802	802	802	802
Overall Performance	25.898	30.740	31.806	34.186	33.242	34.120	35.728	37.197	38.740	40.363
Other operating income	1.104	1.453	1.527	1.217	1.337	1.212	1.259	1.305	1.353	1.403
Cost of materials	-15.220	-18.795	-19.613	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Personnel expenses	-6.185	-6.848	-6.918	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Depreciation & Amortisation	-1.547	-1.671	-1.554	-1.553	-1.527	-1.550	-1.600	-1.633	-1.687	-1.765
Other operating expenses	-2.882	-3.257	-3.672	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total operating costs	-24.287	-28.900	-30.203	-31.942	-31.131	-31.844	-33.149	-34.478	-35.908	-37.368
Operating profit (EBIT)	**1.168**	**1.622**	**1.576**	**1.907**	**1.921**	**1.939**	**2.238**	**2.392**	**2.499**	**2.633**
Results investments using equity method	20	9	31	51	51	51	51	51	51	51
Net interest income	-457	-423	-416	-475	-473	-475	-478	-480	-482	-484
Other financial result	15	-1	-10	-10	-10	-10	-10	-10	-10	-10
Financial result	**-422**	**-415**	**-395**	**-434**	**-432**	**-434**	**-437**	**-439**	**-441**	**-443**
Profit before taxes on income	**746**	**1.207**	**1.181**	**1.474**	**1.489**	**1.505**	**1.801**	**1.953**	**2.058**	**2.190**
Taxes on income	-62	-86	-124	-313	-454	-459	-549	-596	-628	-668
Net profit for the year	**684**	**1.121**	**1.057**	**1.160**	**1.035**	**1.046**	**1.252**	**1.357**	**1.430**	**1.522**
Net result attr. to shareholders DB AG	670	1.106	1.042	1.145	1.020	1.031	1.237	1.342	1.415	1.507
Minority interests	14	15	15	15	15	15	15	15	15	15

Calculation NOPLAT

eur millions	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Revenues	25.312	29.986	31.004	33.384	32.440	33.318	34.926	36.395	37.938	39.561
Inventory changes / Produced & capitalized asset	586	754	802	802	802	802	802	802	802	802
Overall performance	**25.898**	**30.740**	**31.806**	**34.186**	**33.242**	**34.120**	**35.728**	**37.197**	**38.740**	**40.363**
Other operating income	1.104	1.453	1.527	1.217	1.337	1.212	1.259	1.305	1.353	1.403
Cost of materials	-15.220	-18.795	-19.613	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Personnel expenses	-6.185	-6.848	-6.918	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other operating expenses *(ex rental and leasing)*	-2.007	-2.244	-2.589	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total operating expenses *(inc rental and leasing)*	-24.287	-28.900	-30.203	-31.942	-31.131	-31.844	-33.149	-34.478	-35.908	-37.368
EBITDAR	**3.590**	**4.306**	**4.213**	**4.562**	**4.507**	**4.555**	**4.932**	**5.162**	**5.371**	**5.631**
Rental and lease expenses	-875	-1.013	-1.083	-1.102	-1.058	-1.067	-1.094	-1.138	-1.185	-1.233
EBITDA	**2.715**	**3.293**	**3.130**	**3.460**	**3.449**	**3.489**	**3.838**	**4.024**	**4.186**	**4.398**
Depreciation and impairments	-1.499	-1.590	-1.488	-1.487	-1.461	-1.484	-1.534	-1.567	-1.621	-1.699
EBITA	**1.216**	**1.703**	**1.642**	**1.973**	**1.987**	**2.005**	**2.304**	**2.458**	**2.565**	**2.699**
amortisation	-48	-79	-66	-66	-66	-66	-66	-66	-66	-66
EBIT	**1.168**	**1.624**	**1.576**	**1.907**	**1.921**	**1.939**	**2.238**	**2.392**	**2.499**	**2.633**
Less non-operating income *(note 3)*	-23	-45	-32	-32	-32	-32	-32	-32	-32	-32
Adjusted EBITA	**1.193**	**1.658**	**1.610**	**1.941**	**1.955**	**1.973**	**2.272**	**2.426**	**2.533**	**2.667**
Operating cash tax	-62	-86	-124	-313	-454	-459	-549	-596	-628	-668
NOPLAT	**1.131**	**1.572**	**1.486**	**1.628**	**1.501**	**1.514**	**1.723**	**1.830**	**1.905**	**1.999**

DB Mobility Logistics Margins

	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
EBITDA	10,23%	9,39%	9,77%	9,97%	9,87%	10,38%	10,45%	10,44%	10,53%
EBITA	5,29%	4,93%	5,57%	5,75%	5,67%	6,23%	6,38%	6,40%	6,46%
EBIT	5,04%	4,73%	5,39%	5,56%	5,49%	6,05%	6,21%	6,23%	6,30%
Net profit margin	3,48%	3,17%	3,28%	2,99%	2,96%	3,38%	3,53%	3,57%	3,64%
NOPLAT	4,88%	4,46%	4,60%	4,34%	4,28%	4,66%	4,75%	4,75%	4,79%
ROIC exc. Goodwill	15,11%	13,31%	12,90%	12,15%	12,09%	13,28%	13,82%	13,89%	13,86%
ROIC inc. Goodwill	13,11%	11,59%	11,28%	10,54%	10,46%	11,50%	11,95%	12,01%	12,01%

EBITDA Margins per Division
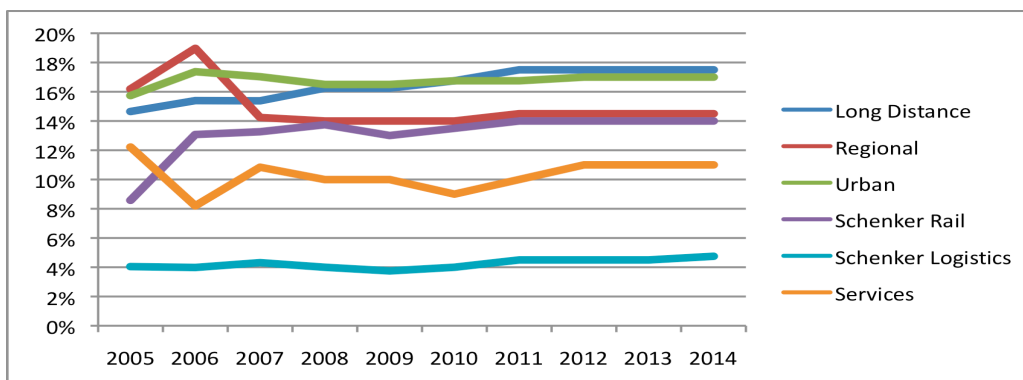
IV. Forecasted Balance Sheet + Invested Capital

Historical + Forecasted Balance Sheet										
as of dec 31 (eur millions)	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
ASSETS										
NON-CURRENT										
PP&E	13.691	13.291	13.649	14.161	13.918	14.133	14.610	14.920	15.436	16.184
Intangible assets	402	1.184	1.399	1.496	1.496	1.496	1.496	1.496	1.496	1.496
Investments accounted for using equity method	31	25	83	142	142	142	142	142	142	142
Available-for-sale financial assets	60	74	48	66	66	66	66	66	66	66
Receivables and other assets	47	55	82	98	98	98	98	98	98	98
Derivative financial instruments	0	0	0	0	0	0	0	0	0	0
Deferred tax assets	144	170	126	317	317	317	317	317	317	317
	14.375	**14.799**	**15.387**	**16.280**	**16.037**	**16.252**	**16.729**	**17.039**	**17.555**	**18.303**
CURRENT ASSETS										
Inventories	478	488	554	566	551	565	592	617	643	670
Trade receivables	2.423	2.925	3.342	3.398	3.304	3.393	3.554	3.702	3.858	4.022
Receivables and other assets	681	581	601	636	619	635	665	693	722	753
Current tax receivables	26	38	35	21	21	21	21	21	21	21
Derivative financial instruments	0	0	9	7	7	7	7	7	7	7
Cash and cash equivalents	289	282	361	502	502	502	502	502	502	502
Available-for-sale assets	20	0	0	0	0	0	0	0	0	0
	3.917	**4.314**	**4.902**	**5.131**	**5.004**	**5.123**	**5.341**	**5.542**	**5.754**	**5.975**
TOTAL ASSETS	**18.292**	**19.113**	**20.289**	**21.411**	**21.041**	**21.375**	**22.070**	**22.581**	**23.309**	**24.279**
EQUITY & LIABILITIES										
EQUITY										
Subscribed capital	200	200	200	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Reserves	934	937	942	1.523	1.523	1.523	1.523	1.523	1.523	1.523
Retained earnings	602	717	946	1.723	1.488	1.628	2.022	2.247	2.675	3.331
Equity capital of contributed companies	1.076	1.074	1.470	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Equity attributable to shareholders DB AG	**2.812**	**2.928**	**3.558**	**4.246**	**4.011**	**4.151**	**4.545**	**4.770**	**5.198**	**5.854**
Minority interests	42	56	52	140	140	140	140	140	140	140
	2.854	**2.984**	**3.610**	**4.386**	**4.151**	**4.291**	**4.685**	**4.910**	**5.338**	**5.994**
NON-CURRENT LIABILITIES										
Financial debt	6.478	6.156	6.535	6.697	6.697	6.697	6.697	6.697	6.697	6.697
Other liabilities	382	539	510	341	341	341	341	341	341	341
Derivative financial instruments	0	0	0	0	0	0	0	0	0	0
Retirement benefit obligations	925	984	1.014	1.076	1.046	1.074	1.125	1.172	1.222	1.274
Other provisions	577	583	702	859	859	859	859	859	859	859
Deferred income	63	54	50	46	46	46	46	46	46	46
Deferred tax liabilities	43	69	121	162	162	162	162	162	162	162
	8.468	**8.385**	**8.932**	**9.181**	**9.151**	**9.179**	**9.230**	**9.277**	**9.327**	**9.379**
CURRENT LIABILITIES										
Financial debt	286	491	282	1.074	1.074	1.074	1.074	1.074	1.074	1.074
Trade liabilities	3.061	3.065	3.304	3.398	3.304	3.393	3.554	3.702	3.858	4.022
Other liabilities	2.322	2.718	2.625	1.676	1.676	1.743	1.813	1.885	1.961	2.039
Current tax liabilities	40	66	90	230	230	230	230	230	230	230
Derivative financial instruments	0	0	0	0	0	0	0	0	0	0
Other provisions	936	1.031	1.058	1.058	1.058	1.058	1.058	1.058	1.058	1.058
Deferred income	309	373	388	408	397	407	426	444	463	483
Available-for-sale liabilities	16	0	0	0	0	0	0	0	0	0
	6.970	**7.744**	**7.747**	**7.844**	**7.739**	**7.905**	**8.155**	**8.394**	**8.644**	**8.906**
TOTAL ASSETS	**18.292**	**19.113**	**20.289**	**21.411**	**21.041**	**21.375**	**22.070**	**22.581**	**23.309**	**24.279**

Invested Capital Calculation										
eur millions	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
Inventories	478	488	554	566	551	565	592	617	643	670
Trade receivables	2.423	2.925	3.342	3.398	3.304	3.393	3.554	3.702	3.858	4.022
Receivables and other assets	681	581	601	636	619	635	665	693	722	753
Current tax receivables	26	38	35	21	21	21	21	21	21	21
Derivative financial instruments	0	0	9	7	7	7	7	7	7	7
Cash and cash equivalents	289	282	361	502	502	502	502	502	502	502
Operating current assets	**3.897**	**4.314**	**4.902**	**5.131**	**5.004**	**5.123**	**5.341**	**5.542**	**5.754**	**5.975**
Trade liabilities	3.061	3.065	3.304	3.398	3.304	3.393	3.554	3.702	3.858	4.022
Other liabilities	2.322	2.718	2.625	1.676	1.676	1.743	1.813	1.885	1.961	2.039
Current tax liabilities	40	66	90	230	230	230	230	230	230	230
Derivative financial instruments	0	0	0	0	0	0	0	0	0	0
Other provisions (Current)	936	1.031	1.058	1.058	1.058	1.058	1.058	1.058	1.058	1.058
Deferred income	309	373	388	408	397	407	426	444	463	483
Operating current liabilities	**6.668**	**7.253**	**7.465**	**6.770**	**6.665**	**6.831**	**7.081**	**7.320**	**7.570**	**7.832**
Operating working capital	**-2.771**	**-2.939**	**-2.563**	**-1.639**	**-1.661**	**-1.708**	**-1.740**	**-1.777**	**-1.816**	**-1.856**
PP&E	13.691	13.291	13.649	14.161	13.918	14.133	14.610	14.920	15.436	16.184
Receivables and other assets	47	55	82	98	98	98	98	98	98	98
Invested capital (excluding goodwill)	**10.967**	**10.407**	**11.168**	**12.620**	**12.355**	**12.523**	**12.968**	**13.240**	**13.718**	**14.426**
Intangible assets	402	1.184	1.399	1.496	1.496	1.496	1.496	1.496	1.496	1.496
Cumulative amorization and impairments	360	404	252	318	384	450	516	582	648	714
Invested capital (including goodwill)	**11.729**	**11.995**	**12.819**	**14.434**	**14.235**	**14.469**	**14.980**	**15.318**	**15.862**	**16.636**
Investments accounted for using equity method	31	25	83	142	142	142	142	142	142	142
Available-for-sale financial assets	80	74	48	66	66	66	66	66	66	66
Deferred tax assets	144	170	126	317	317	317	317	317	317	317
Total funds invested	**11.984**	**12.264**	**13.076**	**14.959**	**14.760**	**14.994**	**15.505**	**15.843**	**16.387**	**17.161**
Financial debt	6.764	6.647	6.817	7.771	7.771	7.771	7.771	7.771	7.771	7.771
Other liabilities	382	539	510	341	341	341	341	341	341	341
Derivative financial instruments	0	0	0	0	0	0	0	0	0	0
Retirement benefit obligations	925	984	1.014	1.076	1.046	1.074	1.125	1.172	1.222	1.274
Other provisions	577	583	702	859	859	859	859	859	859	859
Available-for-sale liabilities	16	0	0	0	0	0	0	0	0	0
Debt and debt equivalents	**8.664**	**8.753**	**9.043**	**10.047**	**10.017**	**10.045**	**10.096**	**10.143**	**10.193**	**10.245**
Subscribed capital	200	200	200	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Reserves	934	937	942	1.523	1.523	1.523	1.523	1.523	1.523	1.523
Retained earnings	602	717	946	1.723	1.488	1.628	2.022	2.247	2.675	3.331
Equity capital of contributed companies	1.076	1.074	1.470	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Minority interests	42	56	52	140	140	140	140	140	140	140
Cumulative amortization and impairments	360	404	252	318	384	450	516	582	648	714
Deferred tax liabilities	43	69	121	162	162	162	162	162	162	162
Deferred income	63	54	50	46	46	46	46	46	46	46
Equity and equity equivalents	**3.320**	**3.511**	**4.033**	**4.912**	**4.743**	**4.949**	**5.409**	**5.700**	**6.194**	**6.916**
Total funds invested	**11.984**	**12.264**	**13.076**	**14.959**	**14.760**	**14.994**	**15.505**	**15.843**	**16.387**	**17.161**

V. Free Cash Flow

Free Cash Flow										
eur millions	2005	2006	2007	2008e	2009e	2010e	2011e	2012e	2013e	2014e
NOPLAT	1.131	1.572	1.486	1.628	1.501	1.514	1.723	1.830	1.905	1.999
Depreciation	1.499	1.590	1.488	1.487	1.461	1.484	1.534	1.567	1.621	1.699
Gross cash flow	**2.630**	**3.162**	**2.974**	**3.115**	**2.962**	**2.998**	**3.257**	**3.397**	**3.526**	**3.698**
Investments in operating working capital	N/A	168	-376	-924	22	47	32	37	39	40
Net capital expenditures	-1.277	-1.190	-1.846	-1.999	-1.218	-1.699	-1.749	-1.877	-2.137	-2.447
Investments in intangibles and goodwill	-75	-826	-281	-163	-66	-66	-66	-66	-66	-66
Increase (decrease) in other operating assets	-6	-8	-27	-16	0	0	0	0	0	0
Gross investment	**-1.358**	**-1.856**	**-2.530**	**-3.102**	**-1.262**	**-1.718**	**-1.783**	**-1.906**	**-2.164**	**-2.473**
Free Cash Flow	**1.272**	**1.306**	**444**	**13**	**1.700**	**1.280**	**1.474**	**1.491**	**1.362**	**1.225**
Discount Factor				1,08	1,16	1,24	1,34	1,44	1,55	1,67
Present Value of Free Cash Flow				**12**	**1.470**	**1.028**	**1.101**	**1.035**	**879**	**735**

VI. Multiples

VI.A Peer Group

PEER Group	Passenger Transport	Schenker Rail	Schenker Logistics
	Arriva	Union Pacific	Kuehne + Nagel
	First Group	Burlington Northern	CH Robinson Worldwide
	National Express	CSX Corp	Expeditors International
		Guangshen Railway	DSV

VI.B Broad Peer Group Analysis

Estimating Enterprise-value using Multiples	EV/EBITDA
Passenger Transport	
Arriva	6,7
FirstGroup	6,4
National Express	7,2
SMRT Corporation	10
Averaged for industry	**7,575**
Freight Transport	
Union Pacific	7,8
Burlington Northern	7,6
CSX Corp	7,8
Guangshen Railway	7,5
Averaged for industry	**7,675**
Logistics	
Kuehne + Nagel	9
CH Robinson Worldwide	14,9
Expeditors International	14,3
DSV	9,1
Geodis	5,5
Averaged for industry	**10,56**

VI.C Small Peer Group Analysis

Estimating Enterprise-value using Multiples	EV/EBITDA
Passenger Transport	
Arriva	6,7
FirstGroup	6,4
National Express	7,2
Averaged for industry	**6,766667**
Freight Transport	
Union Pacific	7,8
Burlington Northern	7,6
CSX Corp	7,8
Guangshen Railway	7,5
Averaged for industry	**7,675**
Logistics	
Kuehne + Nagel	9
DSV	9,1
Averaged for industry	**9,05**