Sell-Side Analysts' Valuation Model Choice: A Case Study

Jari Huikku and Aino-Maria Pöyhiä

Abstract

This study investigates the valuation model choices of sell-side analysts, an area largely overlooked by the prior literature. Specifically, we focus on the drivers that influence the choice of the primary valuation model that analysts use to derive a target price. The research was conducted as a multiple case study by drawing on interviews with sell-side analysts and their valuation reports of a major energy sector firm. We find that valuation target–specific aspects such as lack of peer comparability, lack of history, and extreme uncertainty about forecasting cash flows can play a dominant role in valuation model choices. Our research contributes to the equity valuation literature by providing a more nuanced picture of the drivers influencing the model choices of sell-side analysts, and specifically, it brings forth the need to pay sufficient attention to valuation target–specific factors as the choice drivers.

Keywords:

Sell-side Analyst, Valuation Model, Valuation Method, Target Price, Model Choice

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1. Introduction

Sell-side analysts[1] (hereinafter called analysts) play a central role in equity capital markets by communicating their analyses and recommendations to investors via research reports. Their research reports typically include three[2] major (interrelated) parts: earnings forecast, target price, and stock recommendation (e.g., Bradshaw et al., 2004; 2013; Caylor et al., 2017). We can thus say that earnings forecasts, if simplified, are converted to a target price by using a valuation model. Further, the stock recommendation (buy/hold/sell) is closely coupled with the target price being under (i.e., sell) or over (i.e., buy) the current trading price (Bradshaw, 2002).[3] Hence, providing target price forecasts is of the utmost importance to analysts' work.[4] The target price is commonly directly derived from a primary valuation model (e.g., Abhayawansa et al., 2015).[5]

Throughout the years, efforts have been made to improve the knowledge of equity markets by scrutinizing sell-side analysts' work by covering, e.g., their use of valuation models and the information utilized in valuations (see, e.g., Ramnath et al., 2008; Brown et al., 2015). However, the analysts' valuation task is still considered a kind of "black box" that needs further unpacking (Bradshaw, 2009; Caylor, 2017; Lo, 2012). Specifically, few studies have addressed analysts' choices of primary valuation models on which the target prices are based. Notable exceptions are Demirakos et al. (2004; 2010), and Flöstrand (2006), who have covered these aspects in their content analysis of analysts' reports, and Imam et al. (2008), who combined content analysis and interviews of sell-side analysts. By utilizing qualitative data, Imam et al. (2008) explicitly addressed the question of why analysts have chosen a particular primary valuation model. The other studies drawing merely on statistical analysis were rather able to find associations between the valuation models and potential reasons for choosing them, but they did not explicitly address the reasons *per se* for these associations. All these studies suggest that a valuation model choice is related to the industry. In addition, Imam et al. (2008) provided empirical evidence that client preferences, technical limitations of the models, changes in the popularity of models, the market cycle, and familiarity with the models all affect the choice.

In addressing the reasons influencing the analysts' valuation model choices, prior literature has investigated analysts that simultaneously value many different companies, and it has provided only a rather aggregated, general picture of their reasons. Hence, we still know little about why analysts select a valuation model for a particular company and, consequently, whether potential valuation target–specific aspects (rather than industry-specific, for example) influence their valuation model choices. Accordingly, in our study, we investigate which aspects affect sell-side analysts' valuation model choices, and we use a particular company as

[1] Sell-side analysts cover publicly traded companies, constructing reports by analysing the past and future performance of these companies to provide stock recommendations. Sell-side analysts work for brokerage companies, and their reports are consumed by investors' trading of publicly listed securities, whereas buy-side analysts are often employed by institutional investors (Barker et al., 2012; Fogarty and Rogers, 2005). Ramnath et al. (2008) offer a holistic presentation of the sell-side analysts' operating environment, including aspects that affect the work of analysts (e.g., regulatory/institutional, incentive, customer and organisation, expertise, and information availability).

[2] "Description of a firm's prospects" has been presented as the fourth output (e.g., Ramnath et al., 2008), but it can also be considered a more qualitative part of earnings forecasts.

[3] Nevertheless, buy recommendations by sell-side analysts have been reported to be much fewer than sell and hold recommendations (e.g., Hand et al., 2017).

[4] It is also suggested, however, that a great deal of sell-side analysts' work lies in the rich contextual information they provide to buy-side analysts (e.g., Imam and Spence, 2016).

[5] Target price can also be derived from a combination of several models, e.g., P/E 50% and DCF 50% (e.g., Hand et al., 2017; Prusak, 2017).

the valuation target for all the analysts investigated. In our case, the valuation target is Neste Oyj, a publicly listed energy sector firm that operates in the traditional fossil fuels sector, and in renewable fuels. Our data gathering is primarily based on interviews with sell-side analysts that cover Neste, but in addition, reviews of their recent research reports have been utilized as auxiliary material. By adopting a qualitative, multiple-case study approach about the valuation model choices of various analysts focusing on a particular company, we expect that valuation target–specific aspects of their choices could potentially be revealed. This study is also motivated by the calls of prior literature (e.g., Bradshaw, 2009; Caylor, 2017), which urged further research to unpack the analysts' valuation work.

Our research contributes in many ways to the equity valuation literature by shedding light on the primary valuation model choice drivers of sell-side analysts. We provide a more nuanced discussion of these drivers and their importance. First, we extend the literature by showing that valuation target–specific aspects such as lack of comparability to peers, lack of history, and uncertainty about forecasting cash flows may play a much greater role in the final choice than we have anticipated. Nevertheless, it seems that the valuation model choice is often a matter of the analyst's subjective preference. Second, we contribute by corroborating the findings suggested by the prior literature, and presenting empirical data, adding nuance to them. Specifically, client preferences and industry-specific aspects appear to have the potential to influence the model choice. Third, we add to the literature by finding some signs that theoretically suggested factors such as the availability of appropriate information and cost-benefit thinking have an influence on the model choice. The cost-benefit thinking aspect became particularly apparent in cases where the analyst had inherited the valuation model and had continued valuing companies with it.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature for the study, and the methodology of the study including case company description is then introduced in Section 3. The findings of this research are presented in Section 4 and, finally, discussion and conclusions are offered in Section 5.

2. Literature Review

First, we review the prior empirical findings on valuation models that have been utilized by sell-side analysts. Then, we present the prior studies on the aspects that influenced their valuation model choices.

2.1. Analysts' Use of Valuation Models

There are different ways to group models used for valuation. Asquith et al. (2005) delineate them into three major categories: DCF models, earnings multiples (e.g., price-to-earnings and EBITDA multiples), and asset multiples (e.g., price-to-book and EVA). Valuation models can also be simplified and housed under only two categories: cash flow (e.g., DCF, DY, DDM) and accrual-based (e.g., multiples) models. Further, it is also possible to categorise models based on their sophistication. Sophisticated models, such as DCF, EVA, DDM, and CFROI, aim to value a firm without any direct comparison to its peers, whereas unsophisticated models (relative valuation models) will use single periods to calculate company value and offer a direct peer group comparison (Gleason et al., 2013; Imam et al., 2008). See Appendix 1 for categorisation and definitions of the valuation models (hereinafter the abbreviations of the models will be used). In our literature section, we focus on reviewing DCF and P/E because they have been reported as the two dominant valuation models in the prior literature, and the discussion of valuation

model choices in prior literature is also predominantly related to the choice between these two models. Target prices can also be derived from a combination of several valuation models by averaging their results (e.g., DCF 50% and P/E 50%; see Hand et al., 2017; Prusak, 2017).

The normative literature advocates the use of "theoretically correct", multi-period discounted cash flow models (e.g., Copeland et al., 2000; Penman, 2001). The most obvious challenges of the more sophisticated net present value–based valuation models are related to the uncertainty of future outlooks and thus to forecasting accuracy (Imam et al., 2008). On the other hand, relative valuation models can be seen as problematic from the perspective that a firm's valuation is always seen in terms of its peers, which is also the case for every other company in the peer group (De Franco et al., 2015). The choice of measure used in any multiple valuation influences the result, and it is not always a simple task to find eligible peers of a company (Penman, 2001). Yin et al. (2018) found that analysts use three different types of benchmarks to determine P/E multiples: comparable firms, a firm's historical market, and a market index. Regardless of the valuation model choice, in addition to valuing the firm as a single entity, valuation can be done by summing the valuations of a firm's segments (the sum-of-the-parts approach) (Imam et al., 2008).

The empirical research has witnessed the continuing use of less sophisticated valuation models, e.g., multiples (e.g., Demirakos et al., 2004; Imam et al., 2008; Brown et al., 2015, Prusak, 2017). In Demirakos et al.'s (2004) study of international investment bank analyst reports, the primary model chosen was either a P/E or DCF model. Their findings of remarkable DCF model usage contrasted with the prior research and suggested a change in these analysts' valuation behaviors. Imam et al.'s (2008) research supports Demirakos et al.'s (2004) findings on increasingly popular DCF model utilization (see also Glaum and Friedrich, 2006). Imam et al. (2008) report that cash flow–based models as the primaries are even more prevalent than accrual-based ones (e.g., P/E), but these models are often combined to support decisions on stock recommendations and to derive a target price for the stock. Interestingly, however, when a multiple was used as the primary valuation model, DCF tended to not be considered (Imam et al., 2008). They assert that the use of valuation model combinations appears to be driven by the opportunity to gain different views through both multi-period and short-term forecasts. Further, they suggest that analysts often run a secondary model to derive the target price when there seem to be largely varying results between models and that the dominance of P/E as a valuation multiple appears to be challenged by EV/EBITDA. Recently, Brown et al. (2015) reported continued wide use of the P/E and cash flow models. In addition, they found that P/E growth models were used to support analysts' buy or sell recommendations, whereas the use of dividend discount models, models based on earnings momentum or surprises, EVA models, residual income models, and models based on stock prices and volume patterns are rarely used. Prusak (2017) found that, in Poland, about nine out of ten sell-side analysts used a combination of the DCF and multiples models (mainly P/E) to derive their target prices. To summarise, the findings of the valuation model research show the continuous importance of P/E and the increasing popularity of the DCF models.

2.2. Valuation Model Choices

Although there are abundant studies about the analysts' use of different valuation models, there has been surprisingly scarce research about the factors associated with the choice of the models, specifically about why analysts choose certain valuation models to derive the target price for a particular stock. Demirakos et al. (2004; 2010), Flöstrand (2006), and Sayed (2017) have investigated these factors using content analysis of the analysts' reports, but they do not explicitly address the reasons for the associations *per se*. Nevertheless, Imam et al. (2008) used both an extensive content analysis of the analysts' reports and interviews to study what valuation models analysts use and how. Most interestingly for us, drawing predominantly on the interview data, they also addressed why analysts chose a particular primary model. Their interview data consist of 35 interviews with sell-side analysts in ten investment banks covering various companies in six industries. They discuss the drivers of valuation model choices in general and by industry, but they do not address target-specific aspects behind the choices (see Table 1 for a summary of the above-mentioned studies).

YEAR	AUTHOR	PURPOSE AND FINDINGS	MODEL
2004	Demirakos et al.	-Studied what valuation models analysts use -Valuation practices vary systematically across the industrial sectors. Multiples (P/E) are more popular as dominant valuation models in stable industries.	Content analysis of 104 equity analysts' reports
2006	Flöstrand	-Studied why analysts use unsophisticated valuation models -Industry and brokerage firms are associated with the choice of the valuation model, whereas analysts' knowledge problem, a cost-benefit rationale, uncertainty of future outcomes, and relative price levels were not explaining analysts' choices.	Content analysis of 260 equity analysts' reports
2008	Imam et al.	-Studied what valuation models analysts use, and why and how -Perceived limitations of the technical applicability of DCF (i.e., forecasting uncertain future outcomes) cause analysts to rely on multiples. Client preferences appear to cause analysts to choose DCF. Industrial factors are associated with the use of DCF.	Interviews of 42 analysts and content analysis of 98 equity analysts' reports
2010	Demirakos et al.	-The main focus was to compare target price accuracy of P/E and DCF models, but also addressed factors related to the choice of these models. -It was found that analysts choose DCF more frequently than P/E to value loss-making firms, small firms, high-risk firms, firms with extreme negative and positive sales growth, firms with a limited number of peers, and firms in the bear market, whereas P/E usage appears to be associated more with bull markets.	Content analysis of 490 equity analysts' reports
2017	Sayed	-Studied whether analysts prefer P/E or DCF models in emerging markets with lower corporate governance standards and accuracy of target price estimates -Lower regulatory and reporting standards do not have a significant bearing on analysts' choice of valuation model.	Content analysis of 502 equity analysts' reports

Table 1. Prior empirical studies on the analysts' valuation model choice

In the following, we first review the prior literature regarding the empirically supported factors influencing the valuation model choice, then we briefly cover empirically tested but not supported factors, and, finally, we present the theoretical suggestions from the literature.

Imam et al. (2008) noticed that analysts, when asked about the rationale for their model choice, generally focused first on technical motivations. Hence, analysts discussed their own preferences about the different fundamental properties of valuation models, i.e., whether they employ cash flow or accruals, use short-term or long-term forecast periods, or are simple or difficult to use. With regard to other reasons for the choice, Imam et al. (2008) found evidence that client-related aspects may be influential. Hence, the ease of communicating P/E and other multiples in comparison to DCF to clients, for example, appears to play a role in model selection. In addition, an analyst's model choice does not necessarily represent his or her own vision or opinion; for example, a cash flow–based model can be decided upon to acknowledge a client's focus on cash flow models (Imam et al., 2008).

The industry of the firm under evaluation has been reported to affect the model choice. In their survey of equity valuation practices of CFA members, Pinto et al. (2015) report that 68% of analysts confirmed that their valuation model choices depend on the industry of the firm being valued. Demirakos et al. (2004) found that P/E multiples are more popular as a dominant valuation model for valuating more stable industries, such as the beverages sector over the pharmaceuticals and electronics sectors. According to Flöstrand (2006), more sophisticated models (e.g., DCF) were used more frequently for telecommunication than for health care valuation. Imam et al. (2008) found that DCF is more commonly used to value higher growth technology and media stocks. They also report that DCF and P/E are the only two models that are frequently used to analyze all sectors.

Furthermore, Imam et al. (2008) provide evidence that valuation model choices can be related to trends. Hence, if a model is perceived as increasingly used and accepted by the analyst community, then analysts are also more likely to use it. Additionally, the model choice may be influenced by market cycles and sentiment (Imam et al., 2008). Hence, when the firm is on top of the market cycle, analysts tend to rely on valuation models that focus on long-term forecasts and outlooks (e.g., PEG, Price/earnings-to-growth), whereas at the bottom of the cycle, the dividend yield (the ability to monetize the business) raises its importance as investors become ever more cautious. Flöstrand (2006) found that valuation model choices were associated with brokerage firms, but he did not address why firms prefer to use certain models. Moreover, Imam et al. (2008) suggest that difficulties forecasting uncertain future outcomes cause analysts to prefer multiples, whereas Flöstrand (2006), in his statistical analysis, did not find support to maintain that uncertainties of future outcomes were associated with the choice of valuation models.

Demirakos et al. (2010) found that analysts choose the DCF more frequently for firms in the bear market and the P/E for those in bull markets. They also studied whether valuation model choices between the P/E and DCF models vary across firms with different characteristics. They show that analysts choose the DCF more frequently than the P/E as a primary valuation model for loss-making firms, small firms, high-risk firms, firms with extremely negative and positive sales growth, and firms with a limited number of peers. Nevertheless, in their content analysis of analysts' reports, they do not address the reasons behind these associations.

In addition to the empirically supported aspects presented above, other factors that potentially influence the model choice have been studied, but no significant associations have been found. Sayed (2017) studied whether lower regulatory and reporting standards in Asian

countries affect the choice of valuation model (P/E vs. DCF) to derive the target price, but he did not find significant associations between them. The cost-benefit ratio has also been used as an argument to explain analyst behavior (see Flöstrand, 2006); it recognizes the difference needed in time and effort to build valuation models for relative and present value-based techniques. Especially regarding the use of theoretically inferior multiples, a prediction suggests that their result is sufficient when compared to the consumption of resources needed to perform the valuation (Bhojraj and Lee, 2002). Further, the relative price argument has been suggested to be related to the model choice. This argument springs from the idea that analysts can opportunistically choose a valuation model according to their preference for high or low valuations, first by deciding on a target price and then by choosing a model to support it. Moreover, Pike et al. (1993) proposed that analysts cannot embrace (and choose) new, more sophisticated models if they lack knowledge about them. Flöstrand (2006) investigated the role of cost-benefit aspects, relative price arguments, and analysts' lack of knowledge for valuation model choices, but he did not find associations. In addition, the availability of information needed to construct a valuation model (Palepu et al., 2000) and incentive systems (Imam et al., 2008; Schipper, 1991) have been suggested (without empirical evidence or testing) to influence the valuation model choice.

In sum, a lot of factors that may affect the analysts' primary valuation model choices have been suggested. These factors can be divided into three categories: (1) empirically supported, (2) empirically tested but not supported, and (3) theoretical suggestions. With regard to empirically supported factors, it appears that industry, client preferences, technical properties of the models, market cycle/sentiment, and general trends in using different models may potentially play major roles in this choice (Imam et al., 2008). Some valuation target–specific evidence has also been presented by Demirakos et al. (2010) to maintain that the DCF is more popular than the P/E in valuing small firms, high-risk firms, firms with extremely negative and positive sales growth, and firms with a limited number of peers. They did not, however, address in more detail the reasons behind these associations. In addition, efforts have been made to test the influence of the cost-benefit ratio, relative price argument, lack of knowledge about the models, and low regulatory/reporting standards on the valuation model choice, but no significant associations have been found. It has also theoretically been suggested that data availability and incentive systems may influence the valuation model choice.

Despite the studies outlined above, our understanding of the drivers influencing analysts' valuation model choices is still limited. With the notable exception of Imam et al. (2008), prior studies have merely used data from analysts' reports to address this issue, and they are consequently most likely not in a favorable position to provide in-depth insights about analysts' reasoning, as can be anticipated through their interviews. Typically, analysts' reports do not include comprehensive—if any—elaboration on the drivers that have influenced the model choice. In addition to making content analysis, Imam et al. (2008) have conducted interviews to investigate why sell-side analysts use the models they use. Nevertheless, they interviewed analysts from 10 investment banks covering various companies in six industries. Although they greatly contribute to the literature by presenting empirical data about the drivers, they do not address potential valuation target–specific aspects behind analysts' choices. As also indicated by Demirakos et al. (2010), it is plausible to think that valuation model choices can also be related to the characteristics of the company in question, not merely to industry-specific characteristics, for example. Accordingly, we will investigate the research question, "*Which aspects affect sell-side analysts' valuation model choices*?", and in doing this address the aspects affecting

the choices in one particular company (within an industry) to shed light on the research gap related to valuation target–specific issues. We focus specifically on the primary valuation models, i.e., those directly linked to a firm's target price.

3. Methodology

This study seeks to extend our knowledge of the analysts' decision processes. In particular, the primary focus of this study is to contribute to the research on their valuation model choices by providing a more nuanced picture of the drivers influencing this choice. In contrast to prior studies, we focused on the valuation of one particular company, Neste. Thus, we are able to eliminate aspects related to different industries and organizations. With regard to generalization, our study does not aim to offer transferable findings to other contexts, i.e., we do not claim that findings and interpretations here apply directly to other companies. In line with Imam et al. (2008), our data collection comes from semi-structured interviews with analysts and reviews of their valuation reports. Nevertheless, in our paper, the interview data play a primary role, and reviewing the valuation reports about the models used by the analysts has helped us clarify what valuation models they do use, and this has facilitated us to better prepare for the interviews and pose more intriguing questions during them. In practice, these reports did not directly include material about the drivers influencing a particular analyst's choice of valuation model, which is the core interest of our paper. In addition to analysts' reports of Neste, we reviewed their reports of other companies within and beyond their industrial sector to clarify whether they used the same valuation model or a different one.

By choosing a qualitative approach, we can expect to see the underlying factors that affect the decision-making of analysts better than if only a content analysis of their reports had been addressed, as in Demirakos et al. (2004; 2010), Flöstrand (2006), and Sayed (2017). In addition, scholars suggest that semi-structured interviews can provide richer, more complex insights into analysts' views than questionnaires (Holland, 1998) or an analysis of the analysts' reports (Imam and Spence, 2016). The chosen methodology, which focuses on the semi-structured interview data, helps structure the interviews and gears them towards relevant topics, yet leaves room for individual interviewees to elaborate on topics on which they have more to say; they may possibly even bring up components that are not included in the interview protocol (Vaivio, 2008).

The data gathered consisted of interviews with analysts who were covering Neste and their latest valuation reports. Neste was a suitable object of valuation for this study; it is a publicly listed, major company that is followed by multiple analysts. Neste recognized 18 analysts in the investor relations section of its website, where it lists the leading analysts' names, their contact information, and the names of brokerage firms, including both international and Nordic institutions. All 18 analysts were first contacted via a standardized email and then by phone. The purpose of the study was explained by briefly presenting its focus points and objectives. Ten different brokerage firms agreed to an interview; two were not currently covering Neste (retirement and maternity leave), one declined due to the firm's policy, and five were not interested in participating in this study. The interviewees were all lead analysts covering Neste (see Appendix 2). Their time range for covering Neste varied considerably, from less than one year to several years. Most of the lead analysts interviewed had lengthy backgrounds as analysts in brokerage firms. The group included both generalists (eight analysts) and oil and gas sector specialists (two analysts). The firms were alphabetically referenced using the letters A to J, as the analysts reference their individual brokerage firms.

The interviews were conducted both face-to-face and by phone for the interviewees' convenience. All interviews were recorded and transcribed. To encourage analysts to discuss the topics as openly as possible, they were told that they and their brokerage companies would remain anonymous in research reports. The interviews were conducted between January 2017 and May 2018 and lasted for approximately 1 hour each. One interviewee (Analyst G) provided written answers to the themed protocol in advance. Thus, this conversation relied on pre-submitted answers and was developed from there. At one brokerage firm, two analysts were interviewed simultaneously; one had more experience covering Neste as the lead analyst (B1), whereas the other (B2) had covered Neste for a shorter period of time. The analysts also complemented each other's answers.

The interviewees were provided in advance with an indicative interview protocol that presented the main themes to be discussed. They were asked to send their most recent analyst reports, which were analyzed by the researchers before the interviews took place. This procedure enabled more in-depth discussions with the analysts and helped triangulate the data between different data sources about the use of valuation models (Creswell, 2014). Further, although the adopted interview model restricted the statistical power and generalization of our results, it enhanced the validity and reliability of our data by facilitating the clarification of the questions, proposing further questions, and returning to earlier questions and answers (McKinnon, 1988; Vaivio, 2008).

The interview protocol included the following themes: 1) interviewee background, 2) information used in valuations, 3) ESG information, 4) current valuation model use, 5) why the primary models were chosen, and 6) other valuation-related aspects (see Appendix 3).[6] Three sources were utilized to compile the protocol. First, knowledge was obtained from prior research in the subject areas. Second, the themes were discussed with Neste's representatives, who were in contact with the analysts. Third, the interviewees' latest reports on Neste were analyzed, bringing greater depth to the protocol and also to the interviews. The interview protocol ensured a consistent approach across all interviews, therefore enhancing the comparability of the responses.

The data analysis focused on interview transcriptions, but it also considered the analysts' research reports of Neste (and other companies they followed) as complementary material to identify the valuation models used. After each interview and without delay, the material was transcribed and preliminarily analyzed to obtain useful feedback for the coming interviews and analysis. Thereafter, the content of the interview transcripts was analyzed qualitatively. The data were divided according to themes and sub-themes, and the most relevant were chosen for further analysis in this research (Creswell, 2014). In the first phase, the information was divided into six main themes (see above) and, subsequently, into sub-themes. Such categorization enables a systematic and consistent approach to analyzing data (Saunders et al., 2007, p. 479). In our data analysis, we focused primarily on two of the six themes: current valuation model use and, specifically, reasons influencing the valuation model choice. During the interview process, the material was continuously read and re-read; numerous versions of spreadsheet tables on the findings were compiled and updated; within- and cross-case patterns between the brokerage firms were analyzed, and the findings were contrasted to prior theory. Finally, after the whole interview process had been conducted, the coding and analysis of data continued—mainly based on the thematic approach—and the first versions of the research paper were written (Eisenhardt, 1989).

[7] Environmental, social, and governance (ESG) information–related aspects have not been included in this paper.

Our thematic analysis approach was a rather theoretical one informed by the prior literature about the reasons behind the valuation model choice, i.e., we coded the data primarily based on pre-existing codes related to the specific questions (Boyatzis, 1998; Braun and Clarke, 2006). In our case, we feel that this engagement enhanced our data gathering and analysis by sensitizing us to more subtle features of the data (Tuckett, 2005). Nevertheless, we were open to emergent aspects not directly fitting this coding frame, and we let the codebook develop and change based on the information we learned during the data analysis (Creswell, 2014).[7] We continuously gathered to share our views and discuss our independently-derived interpretations of the data. Hence, the findings and their interpretations presented here were reached through our collective interpretation, which also included numerous iterations and reinterpretations (Creswell, 2014).

In summary, our research is a multiple case study analyzing the valuation practices of various analysts (Yin, 2003), and it aims at theory refinement (Keating, 1995). This study has exploratory and explanatory case study characteristics (Scapens, 1990). On the one hand, it explores reasons for the valuation model choices, and on the other hand, it also makes an effort to explain the antecedents behind these.

The target company

Neste is a publicly listed, Finnish-based energy sector firm that operates in the traditional fossil fuels and renewable fuels sectors. Its net sales are about 13 billion euros, the operating profit 1.1 billion euros, and the number of employees about 5000 (as of 2017). It is quoted on the NASDAQ OMX Helsinki Stock Exchange. The company pays a lot of attention to sustainability issues, and it has continuously been included on the Corporate Knights' Global 100 list of the world's most sustainable corporations; longer than any other energy company in the world. It has three main divisions: oil products (net sales 8.5 billion euros and operating profit 0.5 billion euros as of 2017), oil retail (3.9 and 0.1), and renewable products (3.2 and 0.6). The oil products division refines oil in its two refineries and sells products to oil companies and to other companies marketing oil, fuels, lubricants, and other special products. It has a leading position in the Baltic Sea wholesale markets. The oil retail division has a network of over 1000 service stations in the Baltic Sea region and is the key marketing channel for Neste's products.

The renewable Products division offers renewable diesel, renewable jet fuels, renewable solvents, and raw materials for bioplastics for oil companies, retailers, and wholesale customers such as professional transportation companies and municipalities, airlines, and airports. Neste is the world's largest producer of renewable diesel. Its share of the world's total renewable diesel production capacity is approximately 60%, and the main market areas are Europe and North America. Neste's renewable diesel made from 100% renewable raw materials can result in 50–90% lower greenhouse gas emissions when compared with conventional fossil diesel. Renewable diesel's raw material includes waste and residues from food processing industries (e.g., animal fat, fish fat, and vegetable oils) and vegetable oils (palm oil, rapeseed oil, and soybean oil).

The renewables business is Neste's newest venture. The first two renewable diesel plants

[8] Thematically constructed data matrices in Excel played a major role in aiding the data analysis. The main principle was to display observations per theme/question under scrutiny in all the firms to detect and quantify the prevalence of observations and the incidence of patterns (Eisenhardt, 1989). The matrices were constructed to present all the firms studied as columns and the themes/questions as rows. The use of data matrices enhanced completeness in assessing the presence/absence of constructs and relations in the firms.

were commissioned in Porvoo (Finland) in 2007 and 2009. Soon after that, in 2010, Neste opened the world's largest biodiesel plant in Singapore, and the fourth plant was brought on stream in Rotterdam in 2011. The growth of the business has been rapid and profitable during recent years, but it still does not have a long track record, and to some extent, it is unestablished, making forecasting and valuation challenging for analysts. Specifically, new biofuel legislation and taxation on imported goods in the EU and the USA cause lots of uncertainties for the business.

4. Findings

This section presents the findings of the research. In Section 4.1., we will first briefly review the valuation models used by the analysts and then present the factors affecting primary valuation model choices. Next, in Section 4.2., we will provide a synthesis of the empirical findings. To elaborate on the potential company-specificity of the valuation model choice, we also briefly address the primary valuation models used by the analysts for other companies within and beyond Neste's industry.

All analysts except B and C exercised valuation as a sole analyst. For brokerage firm B, the ideology involved more than one analyst so as to have a second opinion. Analyst B2 had recently become the lead analyst. Analyst B1 had built the model and was still participating in the process. Hence, Analyst B2 inherited the model from Analyst B1. Analysts E, G, and J also inherited the models. It appears that working with valuation models is an iterative process wherein analysts improve their models over time and apply developments at the covered firm.

Analyst C was the lead, taking ownership of the company analysis (stock recommendation and target price). Supporting tasks performed by other analysts included updating the model actuals, keeping track of databases, helping with comments, and doing client requests.

4.1. The Primary Valuation Models and Factors Affecting Their Use

The analysts used seven different methods to derive the target price. See Table 2, which summarises the models used in the valuation. Five analysts used specific earnings-based enterprise value multiples (EV/EBITDA: D, G, and H or EV/EBIT: E and F) for Neste's three different businesses and continued by conducting a sum-of-the-parts calculation. In addition, one analyst (C) used a similar approach, but they used EV/EBITDA multiples only to value renewables and retail segments, whereas for oil products, it was replaced by the DCF. Interestingly, four analysts did not explicitly use the sum-of-the-parts approach, even though Neste consists of very different businesses. Of these, one used the P/E (A), one used the DCF (J), and two (B and I) used a valuation basket weighting several models to derive the target price. In brokerage house B, EV/EBITDA was one of the three multiples in the valuation basket. Hence, enterprise value multiples were used, at least to some extent, by seven analysts.

In addition to the primary model leading to the target price, analysts typically used secondary models to support their valuations. Although only one of the analysts used the DCF as a single model to derive the target price, all except one (I) calculated it to support their valuation.

ANALYST	TARGET PRICE MODEL	SUM OF THE PARTS AS A CONSTRUCTION BASIS	DCF CALCULATED IN VALUATION	OTHER SECONDARY MODELS USED IN VALUATION
A	P/E	No	Yes	Peer group, EV/EBITDA
B1 & B2	Valuation basket of EV/EBITDA, P/E, and P/B	No	Yes	Peer group
C	EV/EBITDA and DCF	Yes	Yes	No
D	EV/EBITDA	Yes	Yes	PE, Peer group
E	EV/EBIT	Yes	Yes	Peer group
F	EV/EBIT	Yes	Yes	P/E, EV/EBITDA, Peer group
G	EV/EBITDA	Yes	Yes	P/E, Dividend, cash flow yields
H	EV/EBITDA	Yes	Yes	Peer group, EV/EBIT
I	Valuation basket of EV/Capital Employed and ROCE/WACC	No	No	P/E, EV/EBIT
J	DCF	No	Yes	Peer group, EV/EBITDA, EV/EBIT

Table 2. Primary and secondary valuation models used by the analysts

Factors influencing the primary valuation model choice are presented in Table 3. In this table, "1." stands for the dominant factors and "X" for other relevant factors identified by the researchers through the analysis of the interview answers. The table also summarises analysts' models of deriving a target price for Neste and shows whether they use the same or different models for other companies within and beyond Neste's industrial sector. The analysts covering Neste Oyj brought up several reasons for why they chose a certain model. The most common dominant reasons were target company-specific (4 brokerage firms), client-specific (3), and industry-specific (2). Hence, in the following section, we will review the reasons categorized into these subgroups and then discuss also other reasons.

FACTOR / ANALYST	A	B	C	D	E	F	G	H	I	J
Company-specific reasons	**1.**	**1.**	**1.**	**1.**	x	x	x	x	x	
Client preference (Communication)					**1.**	**1.**	**1.**			x
Industry-specific reasons	x	x	x	x	x	x	x	**1.**	**1.**	
Applicability of valuation model across sectors										**1.**
Market cycle	x		x	x			x			
Inheriting the model from a predecessor		x			x		x			x
Cost-benefit ratio			x		x		x			x
Model familiarity (Habits)				x			x			x
Market consensus about the valuation model					x					x
Valuation model technical limitations	x	x			x					
Ability to account for balance sheet strength		x				x		x	x	
Information availability			x			x			x	
Reflection of cash flows										x
Company ideology		x								
Model to derive target price:										
Neste	*P/E*	*Basket of EV/ EBITDA P/E, PB*	*EV/ EBITDA and DCF (SOTP)*	*EV/ EBITDA (SOTP)*	*EV/ EBIT (SOTP)*	*EV/ EBIT (SOTP)*	*EV/ EBITDA (SOTP)*	*EV/ EBITDA (SOTP)*	*Basket of EV/CE, ROCE/ WACC*	*DCF*
Other firms in the energy sector	D	D	D	D	D	N/A	S	S	S	S
Firms beyond the energy sector	D	D	N/A	D	D	D	N/A	D	D	S

Dominant reason = 1.; Other identified reason = x
(D = different model from Neste; S = the same model as for Neste; N/A = not applicable)

Table 3. Factors that influence primary valuation model choices

Target company-specific factors

For company-specific reasons, analysts specifically pinpointed the newness of the renewables division, with very limited historical data, limited peer group comparison potential, and unestablished profitability level. In four brokerage firms (A, B, C, and D), company-specific reasons could be considered dominant when they selected their valuation models. The dominance of company-specific reasons was supported by the fact that the analysts used different models for other companies within and beyond Neste's industry.

Surprisingly, only Analyst A relied solely on the P/E to derive the target price. This is not his standard valuation model for the energy industry, however, nor for the companies beyond this industry. He uses different approaches, company by company. Analyst A declared the importance of accounting for company-specific aspects—not just universality across sectors—when choosing a valuation model. Specifically, he found that Neste's situation and the market cycle of its industry have impacted his model choice, and he asserted that some valuation models would be more applicable for some firms than for others.

> *Sometimes we look at peer group figures and sometimes at historical figures. Now it is only P/E-based. One should remember that the company was very different five years ago. The valuation model should be built according to how the company looks currently and in two years…. For example, 6–7 years ago when renewables was loss-making, the conversation was very different. How can you value the renewables division when you cannot use P/E because it does not make a profit, but if things go right, volumes rise and margins increase, then in three years, we can expect this and this result. (Analyst A)*

Hence, model limitations play a role when the firm is in a certain situation, for example, when there are losses. Analyst A continued to elaborate on the applicability of the valuation models:

> *"For some firms, you don't need anything else [besides peer analysis] if the market consistently prices the firm according to the European industry level. If you notice that, good. But in Neste's case, there really isn't a proper peer group, so a firm-specific model needs to be applied."*

Thus, it seems that the choice between firm-specific and peer-based valuation models is influenced by the lack of comparability of the firm under valuation and its peers. He emphasized that his valuation model approach is not stable, but it does change when necessary. When asked about the potential use of other alternative primary valuation models, Analyst A highlighted the influence of the industry and market:

> *I could use EV/EBITDA and a sum of the parts model, but one just needs to be chosen. And in my opinion, Neste's result is determined quite directly according to external factors. So, there does not seem to be any large investments or discontinuities in production. So I think it [the valuation] should be constructed starting from the result. In my opinion, the renewable division has achieved a certain profit level and the volatility around the result has decreased significantly. (Analyst A)*

Hence, the analyst asserted that he could have applied EV/EBITDA instead. He aims at making all valuation models results-based as soon as the company's business activities are established. In addition to Analyst A, only the analysts of brokerage firm B used the P/E as a component in their valuation basket to derive the target price.

Based on company-specific reasons, Analysts B1 and B2 use different valuation models (other than for Neste) for the other companies in the energy sector and also for those beyond it. They emphasized company-specific reasons as a dominant overall factor affecting the valuation model choices of Neste and other companies. Specifically, they pinpointed the special characteristics of Neste's renewables business: a volatile, unestablished business with no peer companies. For Neste, Analysts B1 and B2 gave weight to the EV/EBITDA, P/E, and P/B in their target price setting. Thus, their target price was based on a mix of the models, and the DCF was used additionally as a sanity check, as mentioned by Analyst B2:

> *The idea of valuation has been built through multiples. I look at what I get through them and compare it to what DCF says. When the results are in the same playing field, then okay. If not, it [the valuation] should be thought of again from the start. DCF is a reality check. (Analyst B2)*

Analyst B1 further explained how they arrived at the current company-specific approach for Neste:

> *In the case of Neste, the [valuation] approach has been chosen according to our subjective opinion, as this is the best way to get a hold of the valuation because relative valuation is not so good due to the fact that others don't have the renewables business. DCF, on the other hand, in such a volatile business, does not really fit because putting the right parameters in place plays such a big role in getting almost anything out of the valuation. And having a volatile result does not fit either. This has to do with our ideology with many other firms too…. DCF is very theoretical in our opinion. The weight is on the near future to get something concrete. For industrials, P/B is also a good ratio, so we use that to some extent. (Analyst B1)*

With a slight grin, Analyst B1 stated, *"If I would increase the target price of Neste due to DCF, it would ideologically be such a big deal that I would probably be beaten."* He continued to explain their approach and the multiple weightings in the valuation:

> *EV/EBITDA accounts for the balance sheet structure a bit better [than P/E]. At some point, there will come worse times also in this business, so it is preferable to have a strong balance sheet rather than a weak one…. Maybe EV/EBITDA gives a better picture of the cash flows than P/E does. However, we do use P/E. It tells us something also, as it is mocked for no reason. Even though we say that we use EV/EBITDA the most, it does not have a much higher weighting than P/E. If you want to divide it into percentages, it's somewhere around 25% for P/E and 30–35% for EV/EBITDA. The difference is so small…the valuation is a subjective estimate of the big picture. (Analyst B1)*

In addition to company-specific reasons, arguments that support the valuation model choice in brokerage firm B are built around the industry, the difficulty of relative valuation (comparability to peers), limitations of the DCF, ideology of the company, and how the models account for the balance sheet structure and cash flows. Overall, brokerage firm B did not distinguish between the primary and secondary models.

Analyst C (energy sector specialist) emphasized the special characteristics of Neste's renewables business that influenced his valuation model choice, and he used different models for different companies. For Neste, he used a combination of EV/EBITDA and the DCF approach in his valuation to gain the final target price for the share of Neste.

> *Yes, I moved in oil products from a long-term DCF to a much shorter-term perpetuity value, which is actually a very simple DCF, taking the average of the next 2 years' free cash flow and putting that into perpetuity. I use the EV/EBITDA multiple for renewables and retail. Yes, so that hasn't changed, the multiples basis. What changed is how I'm getting to the earnings estimate over time. So, the timeframe is just taking next year's earnings and timing that by a number. Then, a sum of the parts approach is more appropriate given the different business mix. (Analyst C)*

Hence, the analyst moved from a long-term DCF to a shorter one for oil, and he used multiples for renewables and retail, as he had always done. When asked in more detail why he chose that approach instead of the P/E, for example, the analyst argued as follows:

> *PV [Present Value] in Refining better captures the movement in share price, given that fast money often trades off the Refining margin that can be very volatile. (Analyst C)*

It appears that, in general, the industry matters in his valuation model choice, but special characteristics in companies within the energy sector play a major role in the choice. Hence, different approaches are used:

> *Well, all of our companies have different businesses within these companies that perform very differently and have different drivers. They are modeled differently and therefore they should be valued differently. That's why rather than taking a group EBITDA and just putting on a multiple, I take the different businesses and value those different businesses differently. (Analyst C)*

Similar to Analysts A and B, this analyst accounts for Neste's special characteristics related to the renewables business (an unestablished business with no peer companies) and uses a different approach:

> *I don't cover a company with enough similar attributes to Neste. The independent refiners in Europe trade differently with share price more closely correlated to refining margin. The renewables division differentiates Neste. The way I come up with my multiples is through some sort of peer analysis. But the trouble is, in renewables, there aren't any peers. So it's quite tricky to understand what multiple to put on that business. (Analyst C)*

Overall, with regard to the model choice, he stated, "*It's just what I chose to do.*" He continued to say that, if necessary, he might decide to change the approach, but "*that would require a lot of work*". The analyst found that the market cycle could serve as one basis for a potential change in the valuation approach:

> *If in renewables there was a change in regulation or more or less uncertainty and in refining, if umm…if I saw that there is a change in the cycle of margins…. At the moment we've been on the top of the cycle; it appears that we are coming down slightly, but we are still at the toppish of the cycle. The bottom of the cycle is probably…we might be going back there, but we are not there yet. So, in a few years I'd say. (Analyst C)*

Moreover, Analyst D specifically emphasized the target company-specific reasons but also mentioned his own preferences and, to a minor extent, industry-related aspects behind the

model choice (EV/EBITDA). There had not been pressure from clients to use a certain model. In fact, it appeared that clients were more interested in discussing analysts' points of view on the profitability development of the firm than on the outcome of the valuation *per se*. Analyst D justified using different models to value his other energy companies and companies beyond the energy sector as follows: "*These companies, Fortum [energy] and UPM [forest], have shares in so-called Mankala firms*[8]*, and hence, EV/EBITDA is not necessarily a good approach for them, whereas for Neste it is appropriate.*"

Client-specific reasons

Three analysts (E, F, and G) emphasized client-specific reasons for their valuation model choices. Analyst E had inherited the valuation model from the former analyst covering Neste. He had been analyzing Neste for less than a year, so he had not had time to reconsider the model. The inherited model relied on EV/EBIT (integrated with a sum-of-the-parts approach) as the primary valuation model. Specifically, Analyst E highlighted the role of client preference as a reason why he still uses the same multiples-based model: "*Clients are interested in peer groups—with what kinds of multiples they trade.*"

In addition, it appears that his model choice is related to the market's consensus of the appropriateness of the model:

> *The popularity of P/E has declined on the way. P/E figures were talked about a lot five years ago. Now their use has decreased. Depending on the firm and the sector, one can say that EV/EBIT or EV/EBITDA are the most typical parameters. Of course, the other perspective has been dividend yield or cash flow. They are the other models that have become more popular. (Analyst E)*

Also, the firm-specific difficulties of forecasting the cash flow play a role.

> *In Neste's case, it is not so simple to forecast cash flows. If the firm makes big investments, for example, that will shift the figures substantially. (Analyst E)*

He continued by defending the use of a sum-of-the-parts approach in Neste's valuation as follows:

> *As Neste's businesses are so different, the sum of the parts model has been the best valuation model. If you think about other options, DCF models could be used. If you want to do it simply, then you look at the average valuation of the sector and apply it at the firm level. With Neste, you need to take the segments separately. And in this case, that is certainly the most sensible or reasonable model. (Analyst E)*

Analyst E explained further that, even though the industry may play a role in his valuation model choice, the choice is more company-specific and particularly based on client preference:

> *If I think about the companies I follow and their target price formation, I use in practice all different models depending on the company. We have many clients that prefer DCF, for example.*

[9] The "Mankala model" is an ownership model for energy producers, which is unique to the Finnish energy markets. In this model, energy producers are jointly owned by a number of parties that bear the company's operating costs.

With regard to Analyst F, client preference is his dominant reason for choosing multiples (EV/EBIT) instead of, for example, DCF. The ease of communicating the target price particularly influences his model choice:

> *Client preference speaks for the multiples. Think if I started to explain a DCF value. We would go through a tremendous amount of assumptions. This would not be in the interest of anybody. (Analyst F)*

He has no other energy companies, whereas, for example, for forest companies, he typically uses a slightly different model than for Neste: "*For forest companies I use instead EV/EBITDA. It depends on the large variation of the depreciation of different companies.*"

In a similar vein, it seems that the dominant reason behind the current valuation model for Analyst G (energy sector specialist) was strongly related to investor (client) preferences and, thus, communication. The analyst believed that the EV/EBITDA is the model that investors are primarily interested in when they look at stock valuations. The analyst used the same valuation model for other companies within this industry, also supporting the industry argument. Closely related to industry specificity, the cyclicality of the business was an argument that supported the valuation time frame he used. Analyst G explained the cyclicality of the business:

> *I think it was pretty much the methodology that was used by the previous analyst. I think it's the one most investors look at when valuing refining stocks...what I do in the refining business is I use an average of 5 years because that gives you a good idea of the true cycle, the performance. It also includes one major turnaround, which takes place every five years. And thinking retail, renewable products business, I use a shorter timeframe because there is less cyclicality in these two businesses. (Analyst G)*

Analyst G inherited the valuation model and his current methodology from his predecessor. However, he developed the model further since the renewables business had changed significantly. He seemed to have less discretion when choosing a timeframe for calculations compared to other analysts, as the five-year timeframe used in the valuation process was extended for the whole brokerage firm. Although Analyst G had developed the valuation model, the primary model (EV/EBITDA) stayed intact. This approach may also refer to the cost-benefit aspects, which the analyst did not explicitly point out. Nevertheless, he mentioned the organizational habit and its relationship to the perceived client preference when asked about the model choice:

> *Well, it's just that when having discussions with investors, they're very much focused on where it's trading at the moment in terms of multiples, so it's just easier to have this reference point in mind. Then you have the DCF, and you can have a rough idea what kind of discount factor you can use to get that multiple. It is just what we tend to use, the multiple-based price target generally. It works quite well in discussions with investors. (Analyst G)*

In sum, clients may play a major role related to the model choice. Clients' preferences towards certain models, e.g., multiples instead of DCF, and the ease of communicating the valuation were specifically brought up by the analysts.

Industry-specific reasons

Analysts H and I considered that the primary reasons for their model choices were related to the industry. Analyst H emphasized these reasons and used the same model for all his energy companies, whereas for non-energy, other models were used. He links the use of EV/EBITDA multiples integrated with the sum-of-the-parts approach to its suitability to the capital-intensive energy industry and with the firm having very different businesses as follows:

> *We have used this EBITDA approach already seven years. I think that a sum of the parts approach is good in the energy sector because it pays attention to the cost of constructing assets and the pricing of their products. In this business, you need to construct factories that cost a huge amount of money. Neste, like Fortum, they are asset companies. (Analyst H)*

Analyst I used a valuation basket consisting of EV/Capital Employed and ROCE/WACC for all his energy sector companies including Neste, whereas for the other sectors, he applied different models. Both multiples accounted for 50%. He described the motives behind this valuation model choice as follows:

> *The key reason for this valuation approach is industry-related. In this kind of capital-intensive industry, this approach has proven to be quite reliable for many years. So this is the key reason why I am still using it. Nevertheless, I am nowadays receiving mail from my clients asking me why I am not using a sum of the parts approach, because Neste has really different businesses. I am considering changing my model to the sum of the parts. (Analyst I)*

Accordingly, for Analyst H, industry-related aspects, specifically the need to account for the capital intensity of this industry, seem to play the major role in his choice of valuation model. Nevertheless, it appears that there is clearly pressure from clients to pay more attention to the company-specific aspects in his valuation approach.

Other reasons

One analyst based his model choice predominantly on its applicability across sectors. Analyst J utilized the DCF model in all the brokerage firms he worked for during his 15-year career. It appears that this model choice was influenced by his personal preferences and his familiarity with the valuation model. However, when asked about why he chose the model, he asserted that the choice was primarily based on the DCF's applicability across the sectors: *"All firms can be valued by the discounted cash flow model."* In addition to its universality, the analyst perceived the DCF to be an industry standard and, therefore, generally accepted. A general acceptance of this model was also linked to the communication perspective for analysts' valuations.

> *DCF has become a bit like VHS, which became a standard for videotapes. In good and bad. But it works, and everyone understands that it is not the truth, but an opinion. And everyone knows what it consists of. To launch a competing valuation model, I have not found it plausible...*
> (Analyst J)

Analyst A (using a P/E-based target price setting) had a very different opinion about the appropriateness of the DCF as a primary model:

> *It would not go wrong if the target price was tied to the DCF.... But currently, when the firm is in a moderate investment period and the balance sheet is strong, I don't see as much relevance for DCF as I saw four to five years ago. (Analyst A)*

Hence, in contrast to J, Analyst A declared the importance of accounting for company-specific aspects—not just universality across sectors—when choosing a valuation model. In a similar vein, the other analysts also recognized the limitations of the DCF. Analyst F commented on the challenges of communicating DCF-based target prices: *"We all know that it is theoretically correct, but it is very difficult to communicate to the clients, and hence, I use these [EV/EBIT] multiples-based target prices."* In addition, Analyst E described, *"Everyone knows that in many cyclical industries, if you use the DCF, you can get whatever figures from it."*

Although only two analysts used the DCF to some extent to explicitly derive their target prices, all others except for one (Analyst I) calculated the DCF and used it as an auxiliary model. For example, Analysts G and D commented on the essential role of the DCF as a sanity check for their target price:

> *I do a quick DCF as a sanity check for all the different divisions based on their average EBITDA and average maintenance CAPEX. (Analyst G)*

> *Generally speaking, DCF does not define my target price, but never in my valuations has DCF been below the target price. (Analyst D).*

Regarding other potential reasons suggested in the prior literature that influence the valuation model choice, none of the analysts explicitly admitted that incentives played a role. Nevertheless, Analyst A elaborated on the context of the analysts' work and the goals they strived for during the valuation process:

> *One thing regarding the analysts' consensus is that analysts stress their own forecasts all the time to the [market price] consensus. It is a good thing, however, if your forecast diverts from the consensus, because then you represent the positive or negative edge. You can bring additional value to investors when you reason why you are 30% under the consensus. You will likely make the investor think that if his forecasts are correct, the result will be so and so much better or worse than is thought on the market on average. And from there, one can quickly draw a conclusion that at the moment the result is published, the stock price will shoot aggressively either up or down. Those are the kinds of moments in time that are continuously sought by analysts. (Analyst A)*

Accordingly, analysts seem to yearn for situations that guide investors to make decisions, i.e., either to acquire or sell stocks rather than to simply hold them; these are actions that support the business of the brokerage firms.

4.2. Synthesising the Factors that Influence the Primary Valuation Model Choice

Prior research has identified the prevalence of the P/E and, more recently, a rise in DCF use as a primary valuation model. Nevertheless, in this study, it is surprising that only Analyst A relied solely on the P/E and Analyst J solely on the DCF to derive the target price. Among the studied analysts, five preferred earnings-based enterprise value multiples models (integrated with a sum-of-the-parts approach).

All the analysts brought up several factors that affected their primary valuation model choices. It is worth noting that, even though we can find analysts with the same dominant reason behind the choice, the reason mapping per analyst shows different combinations for all 10 analysts. According to the analysts, the most common factors justifying their model choices were

related to target company– and industry-specific characteristics, which appeared simultaneously and were relevant in 9 out of 10 companies (A–I). In four brokerage companies, company-specific reasons can be considered dominant (A–D). Company-specificity rather than industry-specificity as a dominant reason for the model choice is also corroborated by the observation that all analysts value their other energy companies by using models other than those used for Neste. For company-specific reasons, analysts specifically pinpointed the newness of the renewables division, with very limited historical data, limited peer group comparison potential, and an unestablished profitability level. In two companies (H and I), industry-specific reasons can be considered dominant. This reasoning is in line with the observation that these companies, indeed, apply the same valuation approach within the whole industry. With regard to industry-specific reasons, the analysts typically referred to the suitability to value high capital–intensive energy sector firms with multiples.

Client preferences seemed to dominate in three companies (E, F, and G). Analysts want to communicate their valuations in a format that is required by their clients. Interestingly, for one analyst (J) who had always applied the DCF regardless of the valuation target, the habit argument and the analyst's familiarity with a model seemed to play a major role in the model choice. However, he stressed his justification for model choice and stated that the applicability across sectors was the dominant reason.

With regard to other reasons affecting the choice, the market cycle seems to have commonly impacted the model choice. Moreover, the market's consensus on the superiority of certain models was expressed as a justification for model choices. Accordingly, analysts may be interested in models that can be seen as an industry standard or as trendy, a consensus that emerges from either the superiority of a certain model or the general acceptance of its appropriateness.

Regarding the technical limitations of valuation models, one analyst elaborated on the challenges to value a loss-making firm, with certain valuation models showing absurd prices even though the outlook of the firm seemed promising. Analysts using multiples approaches typically argued against using the DCF as their primary model due to its technical limitations. However, this was not the predominant reason for choosing a particular model; rather, it was how they decided to disregard the model (DCF) as a primary one. Reflection on a cash flow focus (instead of an accruals focus) was also not a dominant argument, but it was brought up by an analyst (J) who applied the DCF. Moreover, four analysts stated that the ability to pay sufficient attention to the strengths (and weaknesses) of a valued company's balance sheet is an appropriate reason for their model choice.

Analysts either build their valuation models themselves or inherit them from their predecessors. Four analysts had inherited their models; those who built their own had covered Neste for a relatively long time compared to those who simply inherited the models. Thus, it seems that when the responsibility of covering a company is transferred to a new analyst, that person tends to adopt the old model and continues to improve it. Hence, the inheritance of the valuation model from a predecessor clearly influenced the valuation model choice. This aspect could also be seen as a link to the cost-benefit ratio. Nevertheless, it seems that analysts do not perceive inheritance as a dominant reason for their model choice.

5. Conclusions

Prior literature has investigated valuation model choices by conducting content analysis of analysts' reports to find associations between the use of valuation models and several potentially influential factors in their use. Scholars have been able to find several associations, but they do

not say much about why these associations exist. The exception to this literature is Imam et al. (2008), who utilized both content analysis of analysts' reports and interviews with the analysts to explicitly address the reasons for model choices. Nevertheless, they did not investigate target company-specific aspects in these choices; hence, we lack knowledge about whether target company-specific, rather than industry-specific or other aspects suggested by prior literature influence their valuation model choices. Consequently, following Imam et al. (2008), we drew on analyst interviews but investigated why analysts choose a certain primary valuation model to derive the target price for a particular stock in one company. Although this approach limited the number of analysts to be interviewed and the potential for generalization, we anticipated that this would facilitate our focus on the target company-specific reasons influencing the analysts' choices. It is worth highlighting that there was a great disparity between the valuation models used by the investigated analysts: seven different models were identified among these 10 analysts.

We contribute in many ways to the prior literature on equity valuation, particularly on the reasons for analysts' valuation model choices. Broadly speaking, we provide a more nuanced discussion of these reasons and their importance in this choice. More specifically and most importantly, we first add to the valuation model choice literature by showing that valuation target–specific aspects can play a dominant role in choosing (or not choosing) a particular valuation model, an aspect greatly overlooked by the prior literature. Imam et al. (2008, p. 519) bring forth and provide evidence for the consensus of the prior literature "*that different valuation models are appropriate in different circumstances*". We add to this by providing evidence that different valuation models can be perceived as appropriate by analysts, even in the same circumstances. To further support our arguments about the importance of valuation target specificity in valuation model choices, we provide clear evidence that the analysts emphasizing these aspects appear to differentiate their valuation approaches even within the same industry. A lack of comparability to peers, a lack of history, and uncertainty about forecasting cash flows were all valid for our case company because one of its major businesses (renewable energy) is not yet established. Accordingly, new and unestablished major businesses may greatly affect the valuation model choices for the whole corporation. Nevertheless, it appears that analysts may perceive firm-specific challenges very differently and may still prefer to use multiples even when they do not find appropriate peers for comparison (cf. Demirakos, 2010), or they may use the DCF even if there is great uncertainty about future cash flows. This lends support to Imam et al. (2008), who suggest that the valuation model choice is often a matter of analyst preference.

Second, we add to the scarce literature in the field by corroborating the findings suggested by the prior literature and presenting empirical data for adding nuance to them. In line with Imam et al. (2008), our findings provide clear evidence that analysts consider multiple factors to be influential in their valuation model choices. Regarding the drivers found by prior empirical research, our findings are in congruence with Demirakos et al. (2004), Flöstrand (2006), and Imam et al. (2008), suggesting that industry-specific aspects have great potential to influence the valuation model choice. Like Imam et al. (2008), we also found evidence that client preferences may play a dominant role in model choices. Specifically, they also suggest that client preferences towards multiples instead of DCF were related to the ease of communicating the valuation. Further in line with Imam et al. (2008), we found that reasons related to technical limitations of the model, familiarity with the model, the market cycle, model application universality, and trends/market consensus of the appropriateness of the model have the

potential to influence the model choice.

Third, we also add to the literature by finding some signs of theoretically suggested factors. Although rarely stated, the availability of appropriate information was raised as one reason for a particular model choice (Palepu et al., 2000). Cost-benefit ratio thinking appears to be influential as well. Specifically, this aspect became apparent in cases where the analyst had inherited the valuation model. It appears that the influence of an inherited model can be an essential factor that diminishes analysts' willingness to change it. It is not a root cause behind the model choice, but it cannot be underrated as to why an analyst uses a certain model. Moreover, although the analysts did not name incentive-related aspects as the main reason for their choices, one did elaborate on how situations are sought wherein the analyst's opinion diverts from the consensus. This potential enables the analyst to encourage the client to act on the equity market, and accordingly, they have the potential to bring sales to the brokerage house (cf. Imam et al., 2008). Supporting Flöstrand's (2006) statistical analysis, we did not find any indications of the relative prices argument.

There are fruitful avenues for further research in this field. Inherently limiting the potential for generalization, we focused our study on analysts valuing one company. To extend our knowledge about the target company-specific drivers of valuation model choices, this kind of one-company approach could be extended to other companies within and beyond the energy sector. This would enable researchers to elaborate on whether similar firm characteristics shared by companies influence the model choice, for example. It could also be beneficial to address very large companies with a potentially large number of analysts covering them, hence facilitating statistical analysis per company. We witnessed only weaker signs of possible incentive influence on the valuation model choice and its use. This interesting phenomenon can potentially be further brought to light by conducting case studies at brokerage houses and by using participant observations. In addition, we obtained certain hints that other models sometimes act as a sanity check for the primary model. Consequently, it would be worthwhile to study the interplay between the different (primary and secondary) models and the factors that affect the choices of secondary models.

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Appendix 1: The Valuation Models

SOPHISTICATED MODELS			
DCF	Discounted cash flow model	Future free cash flows discounted to gain present value	Cash flow
DDM	Dividend discount model	Share price determined by the expected dividends and investor required rate of return in the future	Cash flow
EVA	Economic Value Added	Net Operating Profit After Taxes (NOPAT) - (Invested Capital*WACC)	Accruals
RIV	Residual income valuation	Extracts equity costs*equity capital from net income	Cash flow
APV	Adjusted present value	Net present value if financed only by equity + debt financing benefits	Cash flow
CFROI	Cash flow return on investment	Cash flow divided by the market value of the capital employed	Cash flow
NAV	Net asset value	Liabilities deducted from assets and divided by the number of shares outstanding	Cash flow
UNSOPHISTICATED MODELS			
P/E	Price-to-earnings	Stock price / share divided by earnings per share	Accruals
P/B	Price-to-book	Stock price / share divided by book value per share	Accruals
P/S	Price-to-sales	Stock price / share divided by sales per share	Accruals
P/CF	Price-to-cash flow	Stock price / share divided by cash flow per share	Cash flow
EV/ EBITDA	Enterprise value to earnings before interest, tax, depreciation, and amortisation	Enterprise value divided by EBITDA to show how many years the firm will take to generate as much as its market capitalisation (debtless)	Accruals
EV/EBIT	Enterprise value to earnings before interest and tax	Similar to EV/EBITDA, but accounts for depreciation and amortisation	Accruals
DY	Dividend yield	Price gained by dividing annual dividends per share by the price per share	Cash flow

Appendix 2: Interviewee Basic Data

BROKERAGE FIRM	ANALYST	LOCATION	YEARS COVERING NESTE OYJ	TEAM	SPECIALISATION	INTERVIEW DURATION	INTERVIEW TYPE
A	A	Nordic	x>6	Sole	Generalist	1h 10 min	Face-to-face
B	B1 & B2	Nordic	3<x>6; x<3	Team	Generalist; Generalist	47 min	Face-to-face
C	C	UK	3<x>6	Team	Specialist	40 min	Phone
D	D	Nordic	x>6	Sole	Generalist	55 min	Face-to-face
E	E	Nordic	x<3	Sole	Generalist	1h 10 min	Face-to-face
F	F	Nordic	x>6	Sole	Generalist	50 min	Face-to-face
G	G	UK	3<x>6	Sole	Specialist	35 min	Phone
H	H	Nordic	x>6	Sole	Generalist	1h 20 min	Face-to-face
I	I	Italy	x>6	Sole	Generalist	25 min	Phone
J	J	Nordic	x>6	Sole	Generalist	60 min	Phone

Appendix 3: Interview Protocol

Interviewee background

- Tell us about your background.
- What are the industries you cover? Do you specialise in oil and gas (or renewables), or are you a generalist?
- How long have you been covering Neste Oyj?
- What is the size of your team?
- What about task division?
- Who takes part in the analysis? What are the roles of the other analysts?

Valuation

1. During your valuation and information gathering, what is your weighting of the renewable products, oil products, and retail divisions?
2. Do you estimate the turnover and operating income development of renewable products, oil products, and retail in the same manner?
3. How does (Finnish) state ownership affect your valuation?
4. Are there industry-specific factors that should be accounted for in the valuation process? Neste-specific? Can you name these factors?

Information (relevance for valuations and forecasts)

5. What are the main sources for gathering information for models and decision-making?
6. What kind of news is considered to be relevant and usable?
7. Do you consider the reference margin for your valuations? If not, why not?
8. Do you make assumptions about the content of the additional margin? Please elaborate.
9. How are renewable products seen in your valuation report?

ESG

10. What is the value of environmental, social, and governance disclosures (ESG)?
11. Is there an information exchange with the ESG team from the organisation (only applicable if an ESG team exists)?
12. Can you elaborate on whether there is increasing relevance indicated from the buy-side?
13. How do you see the development of ESG-factor relevance in the future?
14. Overall, do you perceive that you have enough access to data for your valuations?

Primary valuation models used

15. How was your model developed or brought into being?
16. What kinds of categories are in the model, and how are they weighted?
17. What types of inputs does your model have?
18. What is the analysis/valuation timeframe? How was it decided?
19. What valuation model is directly linked to the target price?
20. Why did you choose the model?
21. How long has that model been used?
22. Have you considered other models? Why or why not?
23. Is Neste's valuation based on multiple valuation models?
24. If multiple models were used, was weighting used in the decision-making?
25. Do you account for market volatility in your valuations? How do you come up with the discount rate?
26. How do you estimate the turnover and EBIT development for Oil Products and Retail?
27. Do you account for SG&A at the individual business level in your valuations?

Other

28. Are there other qualitative factors that influence the valuation of Neste?
29. Have you accounted for qualitative factors in the valuation model?
30. How important is industry knowledge in your decision-making?
31. What are the biggest challenges in the valuation of Neste?
32. What additional material would you want the company to provide to further support your valuations?
33. How does Neste differ from its peers in the valuations?
34. How do you evaluate the reliability of Neste's management? Do you bring these qualitative factors into your analysis? If so, how?

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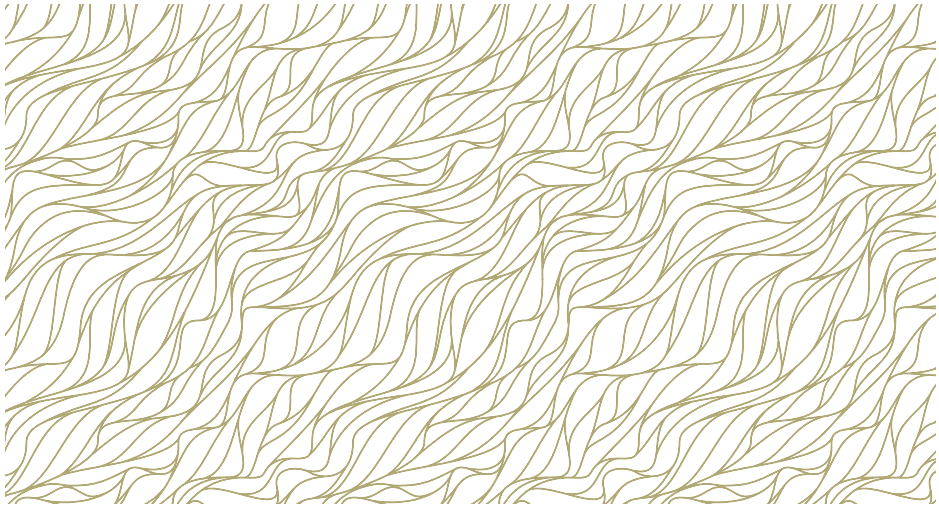

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